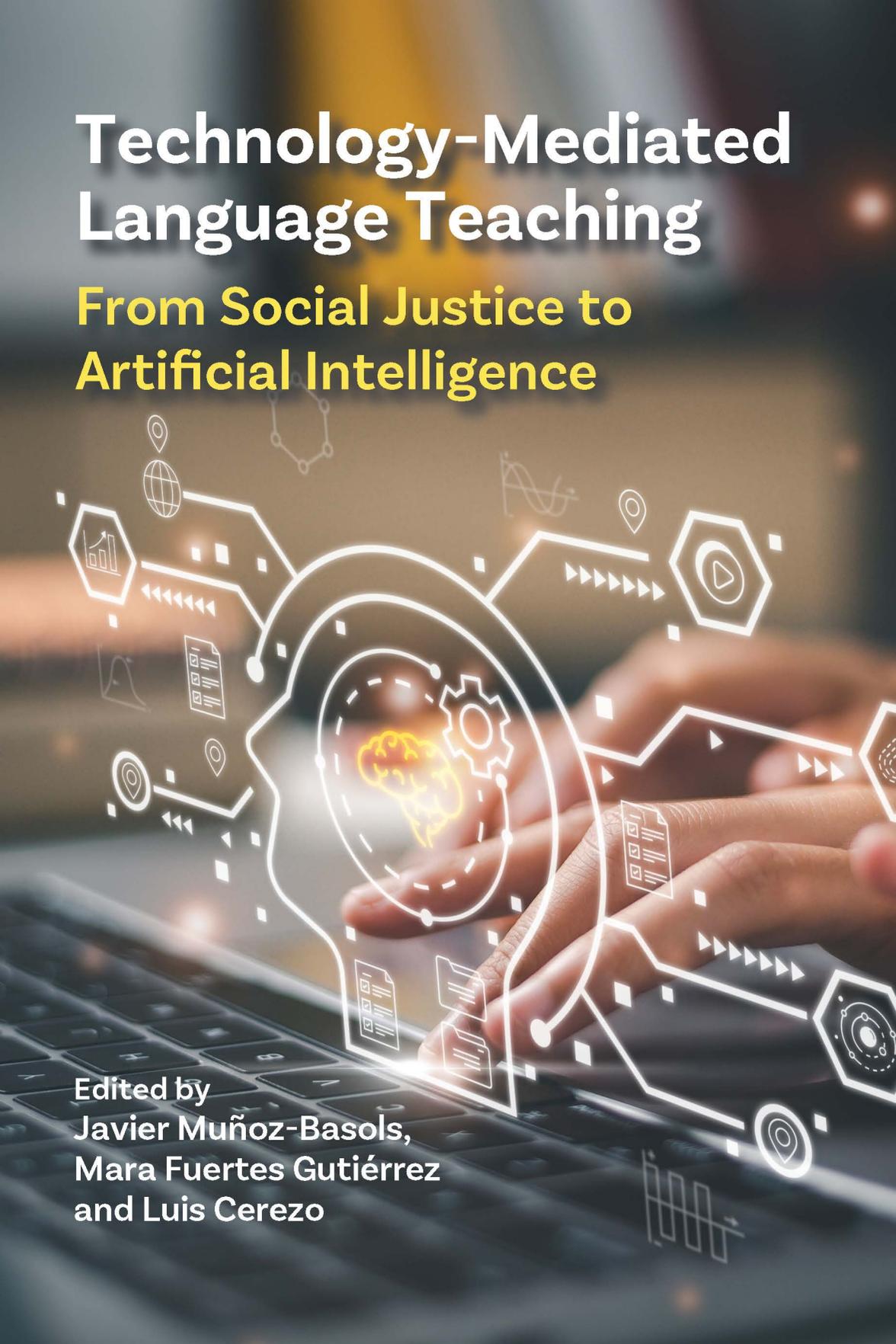


Technology-Mediated Language Teaching

From Social Justice to Artificial Intelligence

The background of the cover features a close-up of a hand typing on a laptop keyboard. Overlaid on this is a glowing white outline of a human head in profile, facing right. Inside the head, a glowing yellow brain is visible, surrounded by a gear icon and a dashed circular line. Various white digital icons are scattered around the head, including a globe, a bar chart, a document with a checklist, a play button, a location pin, and a network diagram. The overall aesthetic is futuristic and tech-oriented, with a warm, golden glow emanating from the top of the image.

Edited by
Javier Muñoz-Basols,
Mara Fuertes Gutiérrez
and Luis Cerezo

Technology-Mediated Language Teaching

Multilingual Matters

UK: St Nicholas House, 31-34 High Street, Bristol, BS1 2AW, UK.

USA: Ingram, Jackson, TN, USA.

Authorised Representative: Easy Access System Europe – Mustamäe tee 50, 10621 Tallinn, Estonia, gpsr.requests@easproject.com.

Website: <https://www.multilingual-matters.com>

X: Multi_Ling_Mat

Bluesky: [@multi-ling-mat.bsky.social](https://bsky.app/profile/multi-ling-mat.bsky.social)

Facebook: <https://www.facebook.com/multilingualmatters>

Blog: <https://www.channelviewpublications.wordpress.com>

The policy of Multilingual Matters/Channel View Publications is to use papers that are natural, renewable and recyclable products, made from wood grown in sustainable forests. In the manufacturing process of our books, and to further support our policy, preference is given to printers that have FSC and PEFC Chain of Custody certification. The FSC and/or PEFC logos will appear on those books where full certification has been granted to the printer concerned.

Full details of our other publications can be found on <http://www.multilingual-matters.com>, or by writing to Multilingual Matters, St Nicholas House, 31-34 High Street, Bristol, BS1 2AW, UK.

Technology-Mediated Language Teaching

From Social Justice to
Artificial Intelligence

Edited by
**Javier Muñoz-Basols, Mara Fuertes
Gutiérrez and Luis Cerezo**

Translated by
Emily Balkwill

MULTILINGUAL MATTERS
Bristol • Jackson

English edition first published in 2025 as
*Technology-Mediated Language Teaching:
From Social Justice to Artificial Intelligence*
by Multilingual Matters

St Nicholas House, 31-34 High Street, Bristol, BS1 2AW, UK
and NBN, Blue Ridge Summit, PA, USA.

Copyright © 2025 selection and editorial matter, Javier Muñoz-Basols, Mara Fuertes Gutiérrez
and Luis Cerezo; individual chapters, the contributors.

The right of Javier Muñoz-Basols, Mara Fuertes Gutiérrez and Luis Cerezo to be identified as
the authors of the editorial material, and of the authors for their individual chapters, has been
asserted in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved.

Authorised translation from the Spanish language edition, first published in 2024 as *La enseñanza
del español mediada por tecnología: de la justicia social a la Inteligencia Artificial (IA)* by
Routledge, 4 Park Square, Milton Park, Abingdon, Oxon OX14 4RN and 605 Third Avenue,
New York, NY 10158, a member of the Taylor & Francis Group.

DOI <https://doi.org/10.21832/MUNOZ9872>

Library of Congress Cataloging in Publication Data

A catalog record for this book is available from the Library of Congress.

Names: Muñoz-Basols, Javier, editor. | Fuertes Gutiérrez, Mara, editor. |
Cerezo, Luis, editor. | Balkwill, Emily, translator.

Title: Technology-Mediated Language Teaching: From Social Justice to
Artificial Intelligence/Edited by Javier Muñoz-Basols, Mara Fuertes Gutiérrez
and Luis Cerezo; translated by Emily Balkwill.

Other titles: Enseñanza del español mediada por tecnología. English

Description: Bristol; Jackson: Multilingual Matters, 2024. | Includes
bibliographical references and index. | Summary: 'This edited volume
explores opportunities for integrating technology in the classroom and
using digital tools including podcasts, gamification and artificial
intelligence. It offers practical advice on planning, personalising and
implementing technology-mediated language teaching in online, hybrid and
in-person teaching contexts' – Provided by publisher.

Identifiers: LCCN 2024034785 (print) | LCCN 2024034786 (ebook) | ISBN
9781800419865 (paperback) | ISBN 9781800419872 (hardback) | ISBN
9781800419889 (pdf) | ISBN 9781800419896 (epub)

Subjects: LCSH: Spanish language – Study and teaching – Technological
innovations. | Spanish language – Computer-assisted instruction. | LCGFT: Essays.

Classification: LCC PC4065 .E5813 2024 (print) LCC PC4065 (ebook) |
DDC 468.0078/5 – dc23/eng/20231116

LC record available at <https://lcn.loc.gov/2024034785>

LC ebook record available at <https://lcn.loc.gov/2024034786>

British Library Cataloguing in Publication Data

A catalogue entry for this book is available from the British Library.

ISBN-13: 978-1-80041-987-2 (hbk)

ISBN-13: 978-1-80041-986-5 (pbk)

ISBN-13: 978-1-80041-988-9 (pdf)

ISBN-13: 978-1-80041-989-6 (epub)

Open Access



Except where otherwise noted, this work is licensed under the
Creative Commons Attribution-NoDerivatives 4.0
International License. To view a copy of this license, visit
<http://creativecommons.org/licenses/by-nd/4.0/> or send a letter to
Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

Typeset by Riverside Publishing Solutions.

Contents

Figures	vii
Tables	ix
Contributors	xi
Planning, Personalization, Implementation (PPI): Technology-Mediated Language Teaching <i>Javier Muñoz-Basols, Mara Fuertes Gutiérrez and Luis Cerezo</i>	1
Part 1: Planning Technology Needs	
1 Access to Technology and Social Justice <i>Melinda Dooly and Anna Comas-Quinn</i>	21
2 Curriculum Planning and Development in Virtual Environments <i>Marta González-Lloret</i>	43
3 Virtual Teachers' Beliefs, Attitudes and Competence <i>Inmaculada Gómez Soler and Marta Tecedor</i>	61
4 Effective Technological Practices and Diversity <i>Daria Mizza and Fernando Rubio</i>	84
Part 2: Personalizing Learning and Teaching	
5 Motivation and Virtual Learning <i>Luis Cerezo and Íñigo Yanguas</i>	111
6 Anxiety and Virtual Learning <i>Zsuzsanna Bárkányi</i>	137
7 Interaction in Virtual Learning Environments <i>Javier Muñoz-Basols and Mara Fuertes Gutiérrez</i>	160
8 Assessment and Feedback in Virtual Learning Environments <i>Sonia Bailini</i>	189

Part 3: Implementing Technology Resources

9	Hybrid and Online Teaching and the Flipped Classroom <i>Robert Blake, Lillian Jones and Cory Osburn</i>	215
10	Digital Language Immersion (DLI) and Virtual Exchanges <i>Carlos Soler Montes and Olga Juan-Lázaro</i>	232
11	Competences and Language Digitalization: Podcasts and Digital Stories <i>Ana Oskoz</i>	256
12	Digital Ludic Pedagogies (DLP): Videogames, Minigames, Extended Realities and Robots <i>Luis Cerezo and Joan-Tomàs Pujolà</i>	270
 Epilogue: New Technology-Mediated Scenarios		
13	Opportunities for Artificial Intelligence (AI) in Language Teaching and Learning <i>Javier Muñoz-Basols and Mara Fuertes Gutiérrez</i>	297
	Index	316

Figures

1.1	Application of the PPI (Planning, Personalization, Implementation) model in this edition	8
1.2	Interdisciplinary reading routes in the book	11
3.1	The 3-class model	69
3.2	Training content in the first few months of the pandemic	72
3.3	Challenges faced by educators at the beginning of the pandemic	73
6.1	Number of responses per parameter before the courses ($n = 23$)	145
6.2	Number of responses per parameter after completing the courses ($n = 23$)	145
6.3	Number of responses related to technology-mediated speaking ($n = 23$)	146
7.1	Model for the analysis of technology-mediated interaction	166
10.1	Diagram illustrating the main elements in the blended learning course at the Belo Horizonte Cervantes Institute	240
10.2	Infographic depicting the main elements of digital language immersion (DLI)	241
10.3	Student cohort total number of hours of work in the VLE per academic year ($n = 119$)	245
10.4	Number of interactions in the forums per academic year ($n = 119$)	246
10.5	Topic selection (%) for the final assignment ($n = 119$)	247
10.6	Best-rated aspects of the course	248
13.1	IMI+ framework (Integration, Multimodality and Interaction + Digital Literacy and Critical Thinking)	305

Tables

3.1	Characteristics of the study participants	67
3.2	Estimation of models	68
3.3	Predictive probabilities	70
4.1	UDL principles, guidelines and checkpoints	88
4.2	Work areas/Learning centers	94
4.3	Examples of technology use in PLLEs	95
4.4	Examples of instructional scaffolding	100
4.5	Examples of supports	101
5.1	Periods of research on motivation in SLA	116
6.1	Self-efficacy values in the pre-tests and post-tests (1 = very bad; 5 = very good)	146
6.2	Changes in perception of self-efficacy; Wilcoxon tests	146
6.3	Anxiety levels at the beginning and end of the courses (1 = no anxiety, 5 = high anxiety)	147
6.4	Kendall's tau-b correlations before the courses (correlation coefficient; significance)	148
6.5	Kendall's tau-b correlations after the courses (correlation coefficient; significance)	148
7.1	Main external factors that affect interaction	161
7.2	Advantages of synchronous learning for interaction	162
7.3	Advantages of asynchronous learning for interaction	162
7.4	Data collection information	168
7.5	Number of attendees at the observed tutorials, classified by level	169
7.6	Template for observing interaction	170
8.1	Assessment typologies	190
8.2	Feedback typologies and modalities	191
8.3	Automated e-feedback techniques	201
8.4	Assessment, test typologies and tools	203

10.1	Enrichment measures for the online course that made up the digital language immersion experience in 2020/2021	244
10.2	Number of digital language immersion work hours	244
13.1	Examples of roles, functions and implementations of ChatGPT in education	300
13.2	Awareness-raising elements in the IMI+ framework to consider AI	305
13.3	Action components in the IMI+ framework to implement AI	306

Contributors

Sonia Bailini is a Professor of Hispanic Linguistics at the Università Cattolica del Sacro Cuore in Milan (Italy). Her research and publications focus on the acquisition and teaching of Spanish as a foreign language, corpus linguistics applied to didactics, learner discourse analysis and professional translation.

Zsuzsanna Bárkányi is a Senior Lecturer in Spanish Language and Linguistics at the Open University (United Kingdom). Her research and publications analyze the phonetics/phonology interface, the acquisition of oral skills in Spanish as a foreign language, anxiety in foreign language oral production and teacher training.

Robert Blake is a Distinguished Professor Emeritus of Spanish at the University of California, Davis (United States) and a member of the North American Academy of the Spanish Language (*Academia Norteamericana de la Lengua Española*, ANLE). He researches both the history of the language and the acquisition of Spanish as an L2. His publications include *El español y la lingüística aplicada* (2016, with Eve Zyzik) and *Brave New Digital Classroom* (3rd edition, 2022, with Gabriel Guillén).

Luis Cerezo is an Associate Professor of Applied Linguistics and Director of the Spanish Program at the American University, Washington, DC (United States). His research focuses on the teaching of additional languages through videogames, computer-mediated communication, and hybrid and online environments based on guided induction, metacognitive instruction and observational learning. He is also a member of the editorial board of *CALICO Journal*.

Anna Comas-Quinn is a Senior Lecturer of Spanish and Translation at the Open University (United Kingdom). Her research and publications focus on technology-mediated language teaching, teaching practices and the use of open resources.

Melinda Dooly is a Serra Húnter Full Professor, Chair in Technology-Enhanced Language & Intercultural Education in the Department of Language & Literature Education and Social Science Education at the Universitat Autònoma de Barcelona (Spain). She researches and publishes on technology-mediated language learning, intercultural communication, multilingual education and 21st-century skills in teacher training.

Mara Fuertes Gutiérrez is a Senior Lecturer in Spanish and Head of the Spanish Department at the Open University (United Kingdom). Her recent research and publications focus on sociolinguistics applied to Spanish teaching, teacher training, and distance and online education. She is Vice President of the Association for the Teaching of Spanish as a Foreign Language (*Asociación para la Enseñanza del Español como Lengua Extranjera*, ASELE), Review Editor for the *Journal of Spanish Language Teaching*, and Secretary of the Association of Hispanists of Great Britain and Ireland (AHGBI).

Inmaculada Gómez Soler is an Assistant Professor of Applied Linguistics and Spanish at Dublin City University (Ireland). Her research explores the connection between the acquisition of Spanish as a second language and heritage language and pedagogy. Her most recent projects examine how teachers exercise their agency by adapting their teaching to new circumstances, contexts and policies.

Marta González-Lloret is a Professor of Spanish and Applied Linguistics at the University of Hawai'i (United States). She researches language acquisition mediated by technology, task-based learning and L2 pragmatics. She is the co-editor of the series 'Task-Based Language Teaching' published by John Benjamins and is editor of the series 'Pragmatics & Language Learning' published by the National Foreign Language Resource Centre (NFLRC).

Lillian Jones is an Assistant Professor of Teaching and Language Program Director of Spanish in the Department of Spanish and Portuguese at the University of California, Irvine (United States). Her thesis research focuses on the pedagogical application of text messaging in the teaching and learning of Spanish as a second language, and her research interests also include CALL (Computer-Assisted Language Learning) and MALL (Mobile-Assisted Language Learning).

Olga Juan-Lázaro is Head of the Department of Teaching Organization and Academic Projects at the Academic Department of the Instituto Cervantes. She researches the redesign of learning scenarios to deploy digital pedagogies, student empowerment through self-regulation

competence and active learning in online teaching. She received the Award for the Best Paper in Quality and Innovation at the International Conference on Virtual Campus (University of Salamanca, University of La Laguna and University of Huelva). Her publications include *Competencias digitales en el aula. Estrategias y modelos de implementación en la enseñanza de idiomas* (2020).

Daria Mizza is an Assistant Professor of Educational Studies at the American University in Cairo (Egypt) and Head of Language Instructional Technology at the School of Advanced International Studies at Johns Hopkins University (United States). Her research and publications focus on teaching methodologies and the role of technology in transforming curricula and instruction.

Javier Muñoz-Basols is a Beatriz Galindo Distinguished Senior Researcher (*Investigador Distinguido Sénior Beatriz Galindo*) at the University of Seville (Spain) and Honorary Faculty Research Fellow at the University of Oxford (United Kingdom). He is the principal investigator of the *Portal de lingüística hispánica* and co-principal investigator of the COMUN-ES digital humanities project. He is co-founder and editor-in-chief of the *Journal of Spanish Language Teaching*, a member of the Board of Trustees of the Instituto Cervantes, a corresponding member of the North American Academy of the Spanish Language (*Academia Norteamericana de la Lengua Española*, ANLE) and President of the Association for the Teaching of Spanish as a Foreign Language (*Asociación para la Enseñanza del Español como Lengua Extranjera*, ASELE).

Cory Osburn is a PhD candidate in Hispanic linguistics and second language acquisition at the University of California, Davis (United States). His research focuses on the recognition and acquisition of the middle voice and other uses of the clitic pronoun ‘*se*’ among Spanish learners. His interests include CALL (Computer-Assisted Language Learning) and Spanish as a heritage language.

Ana Oskoz is a Professor of Spanish in the Department of Modern Languages, Linguistics and Intercultural Communication at the University of Maryland, Baltimore County (UMBC) (United States). Her research focuses on the potential of digital social tools in the development of intercultural competence and writing in a second language. She is an editor of *CALICO Journal*.

Joan-Tomàs Pujolà holds a doctorate in applied linguistics and is a Senior Lecturer in the Department of Linguistic, Scientific and Mathematical Education in the Faculty of Education, University of

Barcelona (Spain). His research interests focus on the use of technology for teaching and learning foreign/second languages, active teaching methodologies and the digital portfolio for teacher training.

Fernando Rubio is the Director of the Center for Language Study at Yale University, where he is also an Adjunct Professor in the Department of Linguistics. His research interests focus on applied linguistics and teaching methodologies, including language learning and technology-facilitated teaching.

Carlos Soler Montes is a Senior Lecturer of Hispanic Linguistics and Head of the Department of Spanish, Portuguese and Latin American Studies at the University of Edinburgh (United Kingdom). His research focuses on Spanish sociolinguistics and its applications in the context of language teaching and learning. Among his most recent publications are the book *La diversidad del español y su enseñanza* (2021) and the special issue *Sociolingüística aplicada a la enseñanza del español* (*Journal of Spanish Language Teaching*, 2021). He is President of the British Association of Spanish Teachers (ELEUK).

Marta Tecedor is an Assistant Professor of Hispanic Linguistics at Arizona State University (United States). Her research focuses on computer-assisted language teaching. In her most recent projects, she investigates teacher training and how technology can be incorporated into language classes to promote the development of linguistic, interactional and intercultural competences.

Íñigo Yanguas is an Associate Professor of Applied Spanish Linguistics at the University of San Diego (United States). His research and publications focus on the application and use of technology in the teaching of Spanish as a second and heritage language, motivational aspects and issues associated with interaction.

Planning, Personalization, Implementation (PPI): Technology-Mediated Language Teaching

Javier Muñoz-Basols, Mara Fuertes Gutiérrez
and Luis Cerezo

I.1 New Gaps in Technology-Mediated Language Teaching

Among the sectors most significantly affected during the global COVID-19 pandemic was education. Institutions, educators, students and their families were forced to adapt to a new way of learning, mediated by technology. In the context of language teaching, this global crisis considerably transformed the traditional learning ecosystem, which had primarily revolved around in-person classes and the use of technology as a mere accessory in the teaching process (Arias Ortiz *et al.*, 2020; BBC, 2020; CEPAL-UNESCO, 2020; Suárez Pertierra, 2020).

Lockdown compelled educational institutions to adopt an entirely virtual teaching model and design contingency plans. Educators had no choice but to reassess their teaching methods. Meanwhile, students had to instantly take control of their own learning process and achieve greater autonomy. Certain data, such as the fact that only 53% of the global population (58% of men and 48% of women) used the internet (ITU Report, 2020), proving particularly concerning in developing countries (United Nations, 2022), revealed our inability to tackle a global pandemic in a coordinated manner (Broom, 2020). In this context, clear dichotomies emerged, even in countries with an established technological trajectory such as the United States. Here, the so-called ‘homework gap’ brought to light the internet connection issues that existed both in rural areas and outside the country’s main cities (Auxier & Anderson, 2020; Horrigan, 2015; Ovide, 2020).

During the pandemic, decision-making in schools was influenced by a range of financial, professional and educational factors. The decisions

focused on ensuring the proper functioning of institutions and significantly impacted society. Certain changes led to the reassessment of educational practices, including international study programs at university, which are essential for the development of intercultural and linguistic skills (Ridler, 2020; Soler Montes & Juan-Lázaro 2025; Strawbridge, 2023; University Council for Languages, 2020). Consequently, it became necessary to re-invent the concepts of *space* and *time* in order to adapt to this new reality. As a result of the physical distance imposed by lockdown, **three educational gaps** emerged in the context of language acquisition:

- (1) A **teaching gap**, where educators, who were used to teaching in person, had to quickly adapt to a virtual environment. As a result, they gained new skills and redesigned essential aspects of their work, such as lesson planning, presenting new learning content and engaging with students in the virtual world.
- (2) A **learning gap**, where students faced challenges regarding accessibility, interaction and learner autonomy, all essential components for the construction of their virtual identity in the classroom.
- (3) A **digital gap**, associated with the technological disparity that paradoxically both connects and separates all those involved (schools, educators and students) in terms of accessibility, availability and technology resource management. Indeed, this exposed the need to make efficient use of technology when it comes to knowledge acquisition.

Within this context, this book goes beyond simply exchanging experiences, adaptations, reformulations and techniques used throughout the years of language teaching and learning in the pandemic: it also reveals the lessons we have learned, focusing on both the present and the future of language teaching through the use of artificial intelligence (AI) applications and prototypes (Muñoz-Basols *et al.*, 2023; Muñoz-Basols & Fuertes Gutiérrez, 2025b). It introduces the **PPI (Planning, Personalization and Implementation) model**, which provides language instructors with the tools they need to exploit the opportunities the virtual world can offer. In this way, the book highlights the need to adopt a comprehensive outlook based on the educational environment's characteristics for the successful implementation of a technology-mediated language teaching model.

1.2 Technology and Learning Environments

More than a decade ago, Goertler (2011) had already identified **four reasons** for the implementation of hybrid and online classrooms in language study plans:

- (1) A **logistical reason**: according to Goertler (2011), technology can optimize the cost–benefit ratio within institutions, reduce spatial and temporal limitations, foster inter-institutional collaboration, as well as facilitate the teaching of minority languages.
- (2) A **theoretical reason**: technology is both a cause of and a means for digital literacy, which is more an ‘ethical imperative’ rather than an ‘option’, according to Ortega & Zyzik (2008). Not only this, technology also allows instructors to apply many of the methodological principles of acquisition theories, including cognitive and socio-constructivist approaches. This is achieved by providing access to authentic material, offering feedback, encouraging interaction and adapting to the learner’s level (see, among others, Cerezo *et al.*, 2015).
- (3) A **pedagogical reason**: technology can go beyond facilitating the development of the four traditional skills (Oskoz, 2025), by promoting competences such as learner autonomy (Lee, 2016) and intercultural communication (Godwin-Jones, 2019; O’Dowd & Dooly, 2020). It can also favor greater consistency in educational programs through the standardization of language courses.
- (4) An **empirical reason**: there is a growing number of synthetic publications and meta-analyses that point towards the effectiveness of hybrid and online teaching, compared to fully in-person models (Cerezo *et al.*, 2014; Gironzetti *et al.*, 2020; Grgurović *et al.*, 2013; Plonsky & Ziegler, 2016).

However, these four arguments are not without challenges and conflicting views. For example, the educational use of technology varies greatly among different geographic areas, institutions and individuals in terms of financial resources (Dooly & Comas-Quinn, 2025), skills, attitudes and knowledge about its didactic potential (Gomez Soler & Tecedor, 2025). In turn, these differences have led to widespread heterogeneity in the development of hybrid and online language teaching programs (Blake *et al.*, 2025).

Events such as the COVID-19 pandemic brought about new technology migration scenarios, extending beyond the four reasons identified by Goertler (2011). These include an initial phase involving the creation and implementation of contingency plans and a subsequent phase for assessment, adjustment and projection towards the future (Gacs *et al.*, 2020). In the first stage, lockdown and the need to teach exclusively online challenged the traditional classifications of technology-mediated learning. Historically, researchers and consortia such as the Babson Research Group, the EDUCAUSE Center for Analysis and Research, and the Online Learning Consortium have defined up to **four types of learning environment** according to the percentage of technologically distributed educational content:

- (1) **First environment:** in-person learning where the use of technology is confined to the classroom or limited to the sharing of logistical content.
- (2) **Second environment:** technology-enhanced classrooms where technology is used to share educational content (whether it be learning content, assessment-related content or both) in up to 30% of the course's teaching hours.
- (3) **Third environment:** 'mixed' teaching where the online teaching percentage may reach up to 80%. Some researchers, including Gruba and Hinkelman (2012), distinguish between blended learning (up to 45%) and hybrid learning (between 45% and 80%) in this case.
- (4) **Fourth environment:** online learning where more than 80% of the educational content is shared and negotiated digitally.

The conclusion of this initial emergency phase, in which most institutions were compelled to replace the first environment with the fourth, gave way to the need for a subsequent phase of assessment, adjustment and projection towards the future. This can be applied to all institutions, both those that created their online classrooms from scratch, as well as those that had already made a head start. Those institutions that created their online classrooms from scratch will have to resort to existing research, including studies on student and teacher perceptions regarding various in-person and online teaching models, as well as empirical studies on their effects on learning processes and outcomes. As argued by Egbert (2005: 5), to prevent teaching from being based solely on trial and error, practice should be guided by theory. On the other hand, those institutions that developed their programs from previous curricula based on academic research will need to assess how they function (González-Lloret, 2025), since in this case practice may contribute to the modification and creation of learning theories (Hulstijn, 2000; Youngs *et al.*, 2011). As stated by Youngs *et al.* (2011: 25), this constant interaction between theory, application/research and theoretical development will allow us to grow both as researchers and educators.

This theoretical development should also consider the ability of technology to include different communicative contexts and to generate discourse hybridity that brings oral and written modes closer together (Schneider *et al.*, 2020). The use of technology tools designed to comprehensively take advantage of multimodality (text, images and sound) blurs the traditional distinction between oral and written texts (Koch & Oesterreicher, 1990; Söll, 1985). In this medium, the communicative parameters and stimuli that regulate face-to-face interaction, characteristic of immediacy, can also be found in written contexts that are traditionally defined by their communicative distance. Indeed, this is the case when it comes to 'chats', as they often include non-verbal elements such as emoticons.

Similarly, the essential proliferation of online environments for language teaching not only encourages us to explore the past and assess the present by identifying perceptions and outcomes of online teaching models: it also compels us to look towards the future and build a new teaching paradigm in which technology plays a central role. This aspect is further reinforced by AI breakthroughs in education, with the emergence of generative AI tools such as ChatGPT. Although these have not been designed specifically for educational purposes, the potential for their use in this context is considerable (Muñoz-Basols *et al.*, 2023; Muñoz-Basols & Fuertes Gutiérrez, 2025b).

In short, current educational models are entirely different from their predecessors, in the sense that technology is not merely a means to transmit knowledge but, rather, a tool for its collective and collaborative construction. Specifically, in the context of language teaching, technology has not only allowed for a shift in focus from the development of receptive to productive skills, as well as communicative interaction and competence: it has also given way to new combinations of individual and collective language learning environments, requiring innovation not only of a technological but also of an educational nature (White, 2017). As stated by Comas-Quinn, de los Arcos and Mardomingo (2012):

attempts to promote interaction in online classrooms necessarily involve a constant redefinition of traditional roles, consequently challenging teacher/learner hierarchies. In fact, this observation can be applied to any technology-mediated educational environment (Muñoz-Basols & Fuertes Gutiérrez, 2025a).

Within this process, Fischer (2012: 28) notes that it is the instructor's responsibility to **empower their students**. This is achieved not only by teaching them to make accurate educational decisions, as attested by the resurgence of research on metacognitive instruction, but also by showing them how to use a variety of technology resources to support such decisions (Cerezo & Pujolà, 2025).

However, as argued in section I.3, this empowerment cannot take place without **first empowering educators in their use of technology**. To this end, sections 1.3 and 1.4 discuss the pedagogical model on which this book is based. This model seeks to raise awareness among language instructors regarding the need to take a series of steps or actions that involve *technology planning* in teaching, *content personalization* according to each group's reality, as well as the *implementation of resources* intended to facilitate and mediate learning.

I.3 Technology Empowerment and Language Teaching

The emergence of cooperative learning technologies (CLTs) and empowerment and participation technologies (EPTs) has shed light on

the gradual integration of information and communication technologies (ICTs) in language teaching. This new environment involves technological changes that affect both curriculum design and the way in which languages are taught.

One of the most significant implications of this new scenario is the importance of identifying and satisfying both students' and educators' needs. On the one hand, integrating technology into teaching requires the use of certain tools and resources that sometimes come with costs for educators, learners and institutions. These may include, for example, devices with an internet connection or software licenses. On the other hand, this change also imposes the need to equip all stakeholders with the skills and competencies necessary to use technology efficiently, effectively and profitably in academic contexts.

As a result, we define **technology empowerment** as educators' and learners' ability to become familiar with tools designed to teach either synchronously (in real-time) or asynchronously, and to actively participate in virtual learning environments. They must also be aware of how to manage the communicative codes specific to these exchanges, which differ from those involved in face-to-face interactions.

Becoming aware of these differences within virtual environments and understanding the opportunities that technology can offer in education has the potential to empower both teachers and students alike. In turn, this allows them to use the available tools in a more efficient manner (Mizza & Rubio, 2025), consequently enhancing the learning experience. Based on this premise, language instructors will also be positioned to gain new skills already present in the context of in-person teaching, but with differences in their approach and execution. To achieve this, they will need to seek strategies that preserve their students' motivation (Cerezo & Yanguas, 2025); promote collaborative learning and interaction; manage anxiety, especially when developing speaking skills (Bárkányi, 2025); deal with participants' expectations in relation to the instructor's availability; and, finally, tackle ethical concerns arising from the use of technology in language classrooms (Álvarez, 2014). Other effects associated with the integration of technology include the need to adapt materials, assessment practices and feedback to this new environment (Bailini, 2025).

While technology-mediated teaching offers social inclusion opportunities for learners with disabilities, it is also crucial to address potential accessibility issues arising from the platforms used, as these may affect certain users. However, if educators are neither exposed to the importance of all these variables, nor provided with information to help them understand the virtual environment's workings and particularities, the technology empowerment necessary to change their attitude towards online practices will not be achieved. Hampel and Stickler (2005) note that all these aspects require educators to develop certain skills which,

generally speaking, are acquired and applied progressively. That being said, this information is rarely centralized, as it depends on every individual institution as well as the experiences each educator has accumulated throughout their career.

In this technological context that is so crucial for language teaching and learning, this book aims to address many of the primary challenges faced by educational program leaders, language instructors and students, including the integration of AI. To this end, it gathers contemporary research in three indispensable knowledge areas to support all language professionals in their pursuit of efficient technology management and use: **knowing how to plan** technology and curriculum needs; **knowing how to personalize** teaching according to different learner profiles; and **knowing how to implement** technology resources and media.

I.4 The PPI Model: Planning, Personalization and Implementation

The design of the PPI model serves as the foundation for this book. The model is based on three fundamental steps, or actions, for technology-mediated teaching:

Planning → Personalization → Implementation

This approach takes into account the analysis of needs prior to sharing knowledge, individual and contextual variables that impact teaching and learning, and the management of tools and resources needed to teach. In the book, four chapters are devoted to each of these three steps, which together constitute a tool that encourages readers to reflect on the instructor's role in technology-mediated language teaching (Figure I.1).

These 12 basic building blocks of the PPI model can be expanded, adapted and redesigned according to the individual educational needs. That said, taken as a whole, the content of the book forms a tool for technology empowerment. This is due not only to the significance of the chosen topics but also to the applicability of the information this book offers.

Part 1 focuses on planning technology-mediated teaching from the perspective of the three main technology needs: those related to curriculum, practice and methodology.

In Chapter 1, 'Access to Technology and Social Justice', Melinda Dooly and Anna Comas-Quinn highlight the importance of considering access-related aspects as an opportunity to promote social justice in online language teaching, keeping in mind the gap caused by socioeconomic inequality in relation to the learners' specific profiles.

Chapter 2, 'Curriculum Planning and Development in Virtual Environments', addresses the main considerations when it comes to

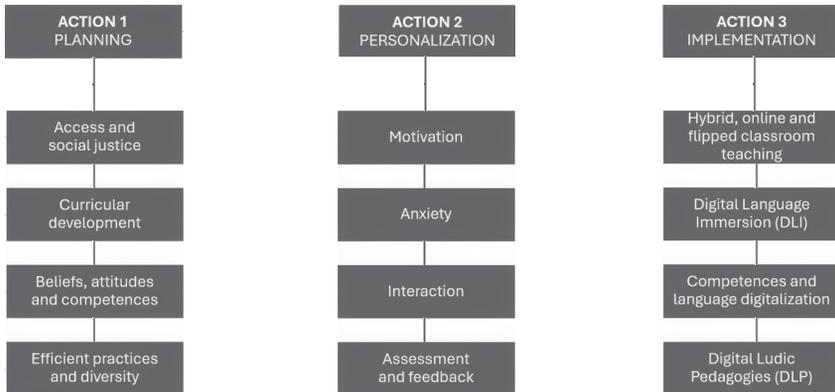


Figure I.1 Application of the PPI (Planning, Personalization, Implementation) model in this edition

successfully planning online language courses. Marta González-Lloret considers the role of methodology, materials, the level of technology integration and teacher training, presenting the ADDIE model (Analysis–Design–Development–Integration–Evaluation) for implementing technology in education.

In Chapter 3, ‘Virtual Teachers’ Beliefs, Attitudes and Competence’, Inmaculada Gómez Soler and Marta Tecedor gather knowledge, skills, competences, values, attitudes and behaviors of language teachers in virtual environments, based on a quantitative study conducted with 241 Spanish teachers in 39 countries across 5 continents. The aim is to encourage the development of digital competences and to promote a positive attitude towards teaching in virtual environments.

Chapter 4, ‘Effective Technological Practices and Diversity’, concludes this first section with a collection of methodological experiences that prove effective for online language teaching. Daria Mizza and Fernando Rubio base their research on the pedagogical principles of the Universal Design for Learning (UDL) paradigm to develop educational programs based on the idea that, in terms of learners’ knowledge and skills, diversity is the norm in any language course.

Part 2 analyzes how to personalize teaching by establishing a direct connection between technology and its ability to adapt, satisfy motivational needs, as well as manage important variables such as anxiety and processes like interaction. It also analyzes how to develop pedagogical interventions in assessment and feedback, keeping in mind the different learner profiles in the classroom.

In Chapter 5, ‘Motivation and Virtual Learning’, Luis Cerezo and Íñigo Yanguas highlight that this crucial aspect in learning has mainly

been researched from the perspective of in-person teaching. In their chapter, these authors offer guidelines to develop and maintain learner motivation in technology-mediated teaching environments.

In Chapter 6, 'Anxiety and Virtual Learning', Zsuzsanna Bárkányi explores, through quantitative data, the anxiety suffered by language students in virtual environments. The research demonstrates that learners' self-efficacy beliefs are stronger at the end of language courses compared to the beginning. As for their anxiety levels, however, these remain stable. Anxiety, as an affective variable, prevents many students from fully participating in oral activities. The author offers recommendations on how to cope with anxiety related to speaking in a virtual environment.

In Chapter 7, 'Interaction in Virtual Learning Environments', Javier Muñoz-Basols and Mara Fuertes Gutiérrez focus on one of the fundamental pillars of language teaching based on a qualitative case study. The authors present a template for the analysis of interactions in synchronous environments, taking into account their nature and content. Examples of real-life interactions in virtual Spanish tutorials are also provided, alongside recommendations for the promotion of interaction in virtual environments.

Chapter 8, 'Assessment and Feedback in Virtual Learning Environments', concludes the second part of the volume with an analysis of the pros and cons of transferring assessment and feedback to virtual environments. Sonia Bailini considers several variables related to the physical context and their impact on the preparation of oral and written tests. The author also offers practical recommendations for the preparation and management of online exams, as well as suggestions for optimal use of information and communication technologies (ICTs) as tools to provide either mediated or automated digital feedback.

Part 3 explores different ways to implement tools and resources to maximize students' learning experience in technology-mediated environments. These may include hybrid, online or flipped classroom teaching models, as well as virtual language immersion environments. There is also a clear focus on the development of digital language skills and the application of ludic teaching methods online.

In Chapter 9, 'Hybrid and Online Teaching and the Flipped Classroom', Robert Blake, Lillian Jones and Cory Osburn present the main characteristics of virtual learning in hybrid, flipped classroom or fully online formats, from an interactionist perspective. A series of practical suggestions is offered regarding the design of online courses, which encompasses both lexico-grammatical and cultural aspects, harnessing students' natural ability to be storytellers (*homo fabulans*).

Chapter 10 contributes to redefining the role of the instructor in intercultural competence acquisition. In 'Digital Language Immersion (DLI) and Virtual Exchanges', Carlos Soler Montes and Olga Juan-Lázaro address the need to practice languages in face-to-face immersion

contexts through resources present in virtual learning environments enriched with pedagogical interventions. The chapter offers a critical analysis of sociolinguistic and intercultural competence acquisition, promoting telecollaboration and production in transmedia formats.

In Chapter 11, ‘Competences and Language Digitalization: Podcasts and Digital Stories’, Ana Oskoz demonstrates how digital tools such as podcasts and digital stories have the power to stimulate learners’ imaginations as they create and develop new meanings. The author describes their potential to develop listening, speaking and writing skills, promote autonomy and provide feedback, as well as mediate the development of language and meaning.

Chapter 12 concludes Part 3. It clarifies the key concepts for understanding the integration of gamification in language teaching. In ‘Digital Ludic Pedagogies (DLP): Videogames, Minigames, Extended Realities and Robots’, Luis Cerezo and Joan-Tomàs Pujolà pay special attention to digital ludic resources such as videogames, minigames, extended reality and robots. The authors also offer considerations for teaching practices in relevant research areas, such as the teaching and learning of vocabulary (incidental, vicarious and intentional learning) and grammar (feedback, guided induction and the persona effect).

Chapter 13 serves as an epilogue to the book, addressing several characteristics of the emerging technological scenarios that AI offers in the context of language teaching. In ‘Opportunities for Artificial Intelligence (AI) in Language Teaching and Learning’, Javier Muñoz-Basols and Mara Fuertes Gutiérrez explore the potential applications of generative AI, paying special attention to the widespread accessibility of such tools and the need to define the role of this technology in terms of its effectiveness and ethical usage. The chapter presents AI as a paradigm shift in the traditional interactional dynamics in education and suggests how this technology can immediately contribute to language acquisition processes through key aspects, including informal learning, learner autonomy and (self)-evaluation.

1.5 Structure of Chapters

To facilitate publication and meet diverse reader expectations, a distinct structure has been adopted.

Parts 1 and 2 follow a similar structure that focuses on (a) the definition of concepts and a historical view of the topics addressed (b) the analysis of the current landscape and research advancements; (c) the presentation of practical recommendations; (d) suggestions for future lines of research; and (e) the presentation of annotated additional reading.

Part 3 is divided into (a) the demonstration of the use of specific teaching tools and their characteristics; (b) a review of the current status

of the topics explored; (c) the analysis of research on curriculum design and teaching practices; (d) the presentation of conclusions and future lines of research; and (f) the presentation of annotated additional reading.

The structure makes it easier for readers to become familiar with the content presented in each chapter. Consequently, the book serves as a versatile tool to reflect on teaching practices.

I.6 Interdisciplinary Reading Routes

While the chapters do follow a sequence, the book is acutely versatile in terms of its management. Indeed, this is evidenced by the various interdisciplinary reading routes that may be followed in order to get the most out of its content (Figure I.2).

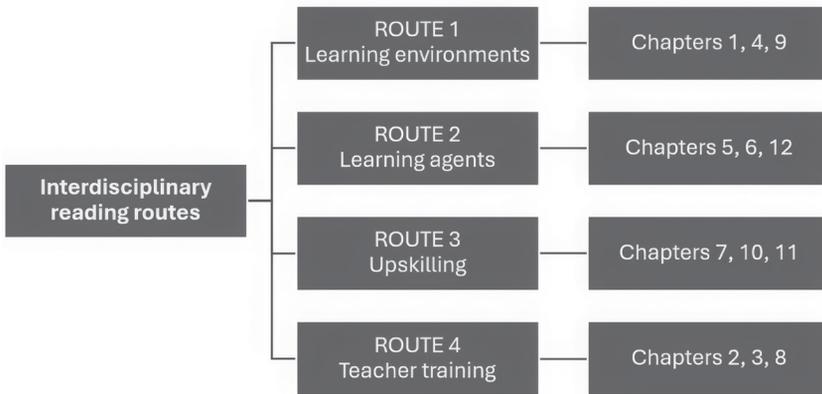


Figure I.2 Interdisciplinary reading routes in the book

I.6.1 Route 1: Learning environments

This route focuses on the importance of offering accessible teaching and reducing the socioeconomic gap in the classroom (Chapter 1), the efficiency and diversity of technology practices in the classroom (Chapter 4), and the differences between hybrid, online and flipped classroom teaching (Chapter 9).

I.6.2 Route 2: Learning agents

This route shines the spotlight on the learner, addressing topics such as motivation and learning dynamics in the classroom (Chapter 5), anxiety with regard to oral production (Chapter 6) and the management of digital ludic resources (videogames, minigames, extended reality and robots) to reinforce the pedagogical component of language learning (Chapter 12).

1.6.3 Route 3: Upskilling

The aim of this route is to support the development of language and intercultural skills, including **interaction** in the classroom (Chapter 7), linguistic immersion to interact with others and relevant content (Chapter 10), and the development of productive and receptive skills through tools such as podcasts and digital stories (Chapter 11).

1.6.4 Route 4: Teacher training

This last route addresses several fundamental aspects of planning and curriculum development to integrate technology into language teaching (Chapter 2), the beliefs, attitudes and competences of virtual teachers (Chapter 3), and assessment and feedback in virtual environments (Chapter 8).

1.7 Target Audience and Open Science

This book is aimed at a wide variety of readers, from both a theoretical and practical perspective. They may be classified into three main groups:

- (1) **Educators.** The book is suitable for individuals who currently work in languages education and show an interest in technology-mediated teaching. This includes people with experience in online teaching who wish to expand their potential or develop new techniques. It is also aimed at future language instructors currently pursuing a Master's or PhD.
- (2) **Researchers.** The book is also recommended for researchers who focus on second language acquisition in general, or for those who wish to further their understanding of the current state of technology-mediated language teaching.
- (3) **Program or team leaders.** The book contains relevant information for department heads or team coordinators. It offers guidelines for teacher training, as well as important content to support decision-making when it comes to implementing technology resources in educational institutions.

In light of the above, the book is an essential resource, allowing readers to maximize their use of technology in language teaching, while keeping in mind the specific learning environment, learner profiles and the use of digital tools. A further objective of this project is to consolidate technology-mediated language teaching as a discipline, identifying distinguishing features that set it apart as an independent area of knowledge.

From its inception, it was essential for the book to be an open science publication (Spanish Ministry of Science and Innovation, 2023), thereby enabling its content to reach a broad audience of teaching professionals worldwide. As a result, it serves not only as an essential source of knowledge on technology-mediated language teaching but the concepts presented herein can also be applied immediately to improve teaching practices. We hope that the fully open access publication of this book has a transformative impact and serves to inspire language teaching professionals.

Acknowledgements

We would like to express our gratitude for the thorough and selfless work carried out by the 30 experts who anonymously reviewed the chapters of this book and provided feedback to ensure that its content meets the standards of rigor, innovation and impact required in an academic publication. For the completion of this book, Javier Muñoz-Basols received funding from the program of the Spanish Ministry of Universities (Ministerio de Universidades del Gobierno de España) as a Beatriz Galindo Distinguished Senior Researcher (Investigador Distinguido Sénior Beatriz Galindo) (BG22/00099) and from the projects ‘Hacia una diacronía de la oralidad/escrituralidad: variación conceptual, traducción y tradicionalidad discursiva en el español y otras lenguas románicas (DiacOralEs)’ (PID2021-123763NA-I00) funded by MCIN/ AEI/10.13039/501100011033 and by FEDER, EU; DEFINERS: Digital Language Learning of Junior Language Teachers (TED2021-129984A-I00) funded by MCIN/AEI/10.13039/501100011033 and by the European Union (NextGenerationEU/PRTR); ‘OralGrab. Grabar vídeos y audios para enseñar y aprender’ (‘Recording Videos and Audios to Teach and Learn’) (PID2022-141511NB-I00), funded by the Spanish State Research Agency and the Spanish Ministry of Science and Innovation (Agencia Estatal de Investigación / Ministerio de Ciencia e Innovación del Gobierno de España).

Mara Fuertes Gutiérrez received funding from the project ‘Language Acts and Worldmaking’ (AH/N004655/1) of the Arts and Humanities Research Council of England.

Both authors would like to thank the Hispanex program (order CUL/2912/2010) and the project PID2021-123763NA-I00, for their support in funding the open access publication of this book. We are also grateful to the Association of Hispanists of Great Britain & Ireland (AHGBI) for awarding this project the Trevor J. Dadson Publication Enhancement Fund and to The Open University for additional funding for this project. This publication follows the principles of the Budapest Open Access Initiative (BOAI) and the National Open Science Strategy (Estrategia Nacional de Ciencia Abierta, ENCA 2023-2027) (Spanish

Ministry of Science and Innovation, 2023), which highlight the importance of open science and accessibility to research.



References

- Álvarez, I. (2014) Ethical and aesthetic considerations in language MOOCs. In E. Martín-Monje and E. Bárcena (eds) *Language MOOCs: Providing Learning, Transcending Boundaries* (pp. 127–142). Mouton De Gruyter. <https://doi.org/10.2478/9783110420067.8>.
- Arias Ortiz, E., Rieble-Aubourg, S., Álvarez Marinelli, H., Rivera, M.C., Viteri, A., López, Á., Pérez Alfaro, M., Vásquez, M., Bergamaschi, A., Ortiz Guerrero, M. and Scannone, R. (2020) *La educación en tiempos del coronavirus: Los sistemas educativos de América Latina y el Caribe ante COVID-19*. Inter-American Development Bank.
- Asensio, A. (2020) La Universidad de Granada recibe 233 tarjetas SIM para distribuir entre estudiantes sin acceso a internet. https://www.granadahoy.com/granada/Universidad-Granada-SIM-estudiantes-conexion-internet_0_1455154616.html.
- Auxier, B. and Anderson, M. (2020) As schools close due to the coronavirus, some US students face a digital ‘homework gap’. *Pew Research Center*, 16 March. <https://www.pewresearch.org/fact-tank/2020/03/16/as-schools-close-due-to-the-coronavirus-some-u-s-students-face-a-digital-home-work-gap/>.
- Bailini, S. (2025) Assessment and feedback in virtual learning environments. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 189–211). Multilingual Matters.
- Bárkányi, Z. (2025) Anxiety and virtual learning. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 137–159). Multilingual Matters.
- BBC (2020) Cambridge University: All lectures to be online-only until summer of 2021. <https://www.bbc.co.uk/news/education-52732814>.
- Blake, R., Jones, L. and Osburn, C. (2025) Hybrid and online teaching and the flipped classroom. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 215–231). Multilingual Matters.
- Broom, D. (2020) Coronavirus has exposed the digital divide like never before. *World Economic Forum*, 22 April. <https://www.weforum.org/agenda/2020/04/coronavirus-covid-19-pandemic-digital-divide-internet-data-broadband-mobility/>.

- CEPAL-UNESCO. (2020) *La educación en tiempos de la pandemia de COVID-19*. CEPAL-UNESCO.
- Cerezo, L. and Pujòà, J.-T. (2025) Digital ludic pedagogies (DLP): Videogames, minigames, extended realities and robots. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 270–293). Multilingual Matters.
- Cerezo, L. and Yanguas, Í. (2025) Motivation and virtual learning. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 111–136). Multilingual Matters.
- Cerezo, L., Baralt, M., Suh, B.R. and Leow, R.P. (2014) Does the medium really matter in L2 development? The validity of CALL research designs. *Computer Assisted Language Learning* 27 (4), 294–310.
- Cerezo, L., Moreno, N. and Leow, R.P. (2015) Psycholinguistically motivated CALL activities. In R.P. Leow, L. Cerezo and M. Baralt (eds) *A Psycholinguistic Approach to Technology and Language Learning* (pp. 243–257). Mouton De Gruyter.
- Comas-Quinn, A., de los Arcos, B. and Mardomingo, R. (2012) Virtual learning environments (VLEs) for distance language learning: Shifting tutor roles in a contested space for interaction. *Computer Assisted Language Learning* 25 (2), 129–143.
- Dooly, M. and Comas-Quinn, A. (2025) Access to technology and social justice. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 21–42). Multilingual Matters.
- Egbert, J. (2005) Conducting research on CALL. In J. Egbert and G.M. Petrie (eds) *CALL Research Perspectives* (pp. 3–8). Lawrence Erlbaum.
- Fischer, R. (2012) Diversity in learner usage patterns. In G. Stockwell (ed.) *Computer-Assisted Language Learning: Diversity in Research and Practice* (pp. 14–32). Cambridge University Press.
- Gacs, A., Goertler, S. and Spasova, S. (2020) Planned online language education versus crisis-prompted online language teaching: Lessons for the future. *Foreign Language Annals* 54 (2), 380–392. <https://doi.org/10.1111/flan.12460>.
- Gironzetti, E., Lacorte, M. and Muñoz-Basols, J. (2020) Teacher perceptions and student interaction in online and hybrid university language learning courses. In M. Planelles, A. Foucart, and J.M. Licerias (eds) *Current Perspectives in Language Teaching and Learning in Multicultural Contexts* (pp. 507–539). Thomson Reuters Aranzadi.
- Godwin-Jones, R. (2019) Telecollaboration as an approach to developing intercultural communication competence. *Language Learning & Technology* 23 (2), 8–28.
- Goertler, S. (2011) Blended and open/online learning: Adapting to a changing world of foreign language teaching. In N. Arnold and L. Ducate (eds) *Present and Future Promises of CALL: From Theory and Research to New Directions in Language Teaching* (pp. 471–502). CALICO.
- Gómez Soler, I. and Tecedor, M. (2025) Virtual teachers' beliefs, attitudes and competence. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 61–83). Multilingual Matters.
- González-Lloret, M. (2025) Curriculum planning and development in virtual environments. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 43–60). Multilingual Matters.
- Grgurović, M., Chapelle, C. and Shelley, M. (2013) A meta-analysis of effectiveness studies on computer technology-supported language learning. *ReCALL* 25 (2), 165–198.
- Gruba, P. and Hinkelman, D. (2012) *Blending Technologies in Second Language Classrooms*. Palgrave Macmillan.
- Hampel, R. and Stickler, U. (2005) New skills for new classrooms: Training teachers to teach online. *Computer Assisted Language Learning* 18 (4), 311–326. <http://dx.doi.org/10.1080/09588220500335455>.

- Horrigan, J. (2015) The numbers behind the broadband 'homework gap'. *Pew Research Center*, 20 April. <https://www.pewresearch.org/fact-tank/2015/04/20/the-numbers-behind-the-broadband-homework-gap/>.
- Hulstijn, J.H. (2000) The use of computer technology in experimental studies of second language acquisition: A survey of some techniques and some ongoing studies. *Language Learning & Technology* 3 (2), 32–43.
- ITU Report (2020) Measuring digital development: Facts & figures 2019. <https://www.itu.int/hub/2020/05/measuring-digital-development-facts-figures-2019/>.
- Koch, P. and Oesterreicher, W. (1990) *Gesprochene Sprache in der Romania: Französisch, Italienisch, Spanisch*. Max Niemeyer.
- Lee, L. (2016) Autonomous learning through task-based instruction in fully online language courses. *Language Learning & Technology* 20 (2), 81–97. <http://hdl.handle.net/10125/44462>.
- Ministerio de Ciencia e Innovación [Spanish Ministry of Science and Innovation] (2023) *Estrategia Nacional de Ciencia Abierta (ENCA) 2023–2027*. Secretaría General Técnica del Ministerio de Ciencia e Innovación, Madrid.
- Mizza, D. and Rubio, F. (2025) Effective technological practices and diversity. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 84–108). Multilingual Matters.
- Muñoz-Basols, J. and Fuertes Gutiérrez, M. (2025a) Interaction in virtual learning environments. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 160–188). Multilingual Matters.
- Muñoz-Basols, J. and Fuertes Gutiérrez, M. (2025b) Opportunities for artificial intelligence (AI) in language teaching and learning. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 297–315). Multilingual Matters.
- Muñoz-Basols, J., Neville, C., Lafford, B.A. and Godev, C. (2023) Potentialities of applied translation for language learning in the era of artificial intelligence. *Hispania* 106 (2), 171–194. <https://doi.org/10.1353/hpn.2023.a899427>.
- O'Dowd, R. and Dooly, M. (2020) Intercultural communicative competence development through telecollaboration and virtual exchange. In J. Jackson (ed.) *The Routledge Handbook of Language and Intercultural Communication*. (2nd edn, pp. 361–375). Routledge.
- Ortega, L. and Zyzik, E. (2008) Online interactions and L2 learning: Some ethical challenges for L2 researchers. In S. Magnan (ed.) *Mediating Discourse Online* (pp. 331–355). John Benjamins.
- Oskoz, A. (2025) Competences and language digitalization: Podcasts and digital stories. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 256–269). Multilingual Matters.
- Ovide, S. (2020) Rural America's digital divide. https://messaging-custom-newsletters.nytimes.com/template/oakv2?uri=nyt://newsletter/07ad6bac-d536-4635-929e-2a8a98d1a8fe&productCode=OT&te=1&nl=on-tech-with-shira-ovide&emc=edit_ot_20200505.
- Plosky, L.D. and Ziegler, N. (2016) The CALL-SLA interface: Insights from a second-order synthesis. *Language Learning and Technology* 20 (2), 17–37.
- Ridler, F. (2020) Language students face a 'virtual year abroad' learning over the internet while living at home if coronavirus travel restrictions remain. *Daily Mail*, 7 May. <https://www.dailymail.co.uk/news/article-8296821/Language-students-face-virtual-year-abroad-learning-Internet.html>.
- Schneider, K., Gu, L. and Rantatalo, O. (2020) Understanding technology use through multimodal layers: A research review. *International Journal of Information and Learning Technology* 37 (5), 375–387. <https://doi.org/10.1108/IJILT-02-2020-0020>.

- Soler Montes, C. and Juan-Lázaro, O. (2025) Digital language immersion (DLI) and virtual exchanges. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 232–255). Multilingual Matters.
- Söll, L. (1985) *Gesprochenes und geschriebenes Französisch*. Schmidt.
- Strawbridge, T. (2023) The relationship between social network typology, L2 proficiency growth, and curriculum design in university study abroad. *Studies in Second Language Acquisition*, 1–31. <https://doi.org/10.1017/S0272263123000049>.
- Suárez Pertierra, G. (2020) Frenar el Covid-19, no la educación. *El Mundo*, 18 April. <https://www.elmundo.es/opinion/2020/04/18/5e9b2c52fdddffcf648b4655.html>.
- United Nations (2022) *Global Connectivity. Achieving Universal Connectivity by 2030*. United Nations. <https://www.un.org/techenvoy/es/content/global-connectivity>.
- University Council for Languages (2020) Virtual year abroad. <https://universitycouncil-for-languages.org/year-abroad/>.
- Upton, J.W. and Bergiel, E.B. (2023) Virtual study abroad: Is there life after the pandemic? *Journal of International Education in Business* 16 (1), 37–55. <https://doi.org/10.1108/JIEB-01-2022-0004>.
- White, C. (2017) Distance language teaching with technology. In C. Chapelle and S. Sauro (eds) *The Handbook of Technology in Second Language Teaching and Learning* (pp. 134–148). Wiley–Blackwell.
- Youngs, B., Ducate, L. and Arnold, N. (2011) Linking second language acquisition, CALL, and language pedagogy. In N. Arnold and L. Ducate (eds) *Present and Future Promises of CALL: From Theory and Research to New Directions in Language Teaching* (pp. 471–502). CALICO.

Part 1

Planning Technology Needs

1 Access to Technology and Social Justice

Melinda Dooly and Anna Comas-Quinn

1.1 Introduction and Key Concepts

Social justice is one of the essential notions around which educational systems should revolve to ultimately ensure human rights. According to the United Nations, social justice is understood as the fair and compassionate distribution of the fruits of economic growth (United Nations Department of Economic and Social Affairs, 2006: 7). It is important to highlight that, in line with the principles governing social justice, equity and equality should be prioritized in the distribution of educational resources (Bolívar, 2012); in other words, ‘society must give more attention to those with fewer native assets and to those born into the less favorable social positions’ (Rawls, 1979: 123) and refrain from distributing resources equally, based on the idea that ‘no one deserves his place in the distribution of natural assets any more than he deserves his initial starting place in society’ (Rawls, 1979: 126).

In relation to the specific links between social injustice and technology-mediated language teaching and learning, it is worth pointing out that social injustice is often associated with **processes of social exclusion** due to factors such as ethnicity, gender, sexual orientation, disability, social class or religion. However, there is less focus on language as one of the variables that may trigger ‘social injustice’, despite the fact that learners from minority linguistic and cultural backgrounds within a community frequently experience linguistic stigmatization in institutions (Rosa & Flores, 2021: 1164). Consequently, their educational achievements are often significantly lower, placing them at a higher risk of dropping out (Vallejo & Dooly, 2013, 2020). Perceptual dialectology has also demonstrated that speakers tend to classify different varieties of the same language hierarchically. As a result, speakers of certain dialectal varieties experience linguistic discrimination based on how their speech is perceived (see, among others, Fuertes Gutiérrez *et al.*, 2021 and Weissler, 2022: 140–142, who discuss how sociolinguistics and psycholinguistics can contribute to social justice).

In this regard, as Nieto and Bode (2012) point out, it is worth recalling that social justice in education is closely linked to the diverse set of skills that learners collectively bring to their education. This includes their cultural and linguistic backgrounds, as well as how these skills are integrated (or not) into daily educational practices.

Similarly, the languages a person speaks can also determine the extent to which they can access technology. As with any educational resource, lack of familiarity and linguistic competence are considered disadvantages for learners who have not yet mastered or have not yet achieved a sufficient level of proficiency in the language of instruction. For example, the US Census Bureau – in particular, the Commission on Language Learning (2016) – points out that 60 million US residents over the age of five (approximately 20% of the population) speak a language other than English at home. Among these language communities, nearly two-thirds are Spanish speakers, although their mastery of this language has been gradually diminishing with each generation. In fact, not only are these communities losing their proficiency in one of their languages but they are also subjected to inherent inequalities within educational settings. These are based on standardized language practices in the United States (Flores & Rosa, 2015) where English prevails in terms of access to academic content as well as the use of technology in teaching. Indeed, this situation contrasts with the persistent warnings from specialists calling for the allocation of more funds to language teaching in the United States (de Costa, 2019; de Mejía, 2002).

To understand the relationship between social (in)justice and learning in any educational system, concepts such as **accessibility** or the **digital divide**, among others, are also of crucial importance because they help us to appreciate how this topic impacts technology-mediated language learning.

In the context of education and technology, **accessibility** can be defined as the ability or opportunity to access resources, systems or institutions in order to learn and benefit from their use. Access, on the other hand, only covers the first part of this definition, as it does not consider whether the person is using the said resources, systems or institutions for their own benefit. Accessibility has traditionally been associated with disability, understood as the indispensable condition for spaces, products and services to be intelligible and usable by everyone safely, autonomously and naturally (Cocemfe, 2021). However, in the context of technology, UNESCO (2019b) has recently suggested an extension of this concept, incorporating the notion of **meaningful universal connectivity**. This includes both the idea of availability and accessibility, focusing on empowering individuals and generating a positive impact (see Chapter 4 of this book).

Another important concept when discussing social justice and technology is the **digital divide**, which describes patterns of unequal access to information technology. This is often due to factors such as

cost, restricted access depending on physical context, lack of skills, lack of access to education, lack of information or limited access to high-performance technology. According to UNESCO (2019b), so-called **second-level digital divides** are still a concern; in fact, they are on the rise. Setting aside issues involving network coverage and access to technology, these divides are a consequence of structural inequalities, such as literacy limitations, individual empowerment or the availability of relevant content. In this regard, the digital divide is closely related to social inclusion or exclusion, which result from the ability, or inability, to access and use technology (Cabero, 2004; Santoyo & Martínez, 2003).

According to a 2019 report (ITU, 2019), around 87% of the wealthiest countries' populations have internet access, compared to 19% in the least developed regions. In Latin America and the Caribbean, for example, less than 50% of the population has access to fixed broadband, while less than 10% has high-speed fiber internet at home (Drees-Gross & Zhang, 2021). These figures can also be broken down according to other factors within individual countries. For example, 80% of the white population in the United States accesses the internet via broadband at home, compared to 71% of African Americans and 65% of the Latino population (Pew Research Center, 2021).

Of course, it does prove difficult to define exactly what is considered equal (or unequal) access to technology. As mentioned previously, there are multiple factors to keep in mind, such as income, literacy, age, geographic location, sex, languages, place of residence, disability, etc. For example, a young girl in rural Pakistan, or a Spanish-speaking girl in South Carolina, are less likely to have access to technology, or at least be able to use it properly, compared to their male counterparts in a classroom setting (United Nations Department of Economic and Social Affairs, 2020). Beyond the direct socioeconomic differences stemming from one's family situation, which considerably limit access to high-performance technology, we know that males have much greater access to information and communication technologies (ICTs), education and ICT-related jobs than their female counterparts almost anywhere in the world (UNESCO, 2019a). This has been attributed to many factors, ranging from sociocultural stigma in certain societies towards technical and scientific subjects, to the unequal allocation of domestic duties according to gender. According to United Nations Women (2019), girls tend to carry out more household tasks, leaving them with less time to use technology and, therefore, to become more confident using it (see Pérez-Escoda *et al.*, 2021). If we combine all these factors, including linguistic limitations that restrict access to technological content and the fact that girls tend to have lower literacy levels (UNESCO, 2019a; United Nations Department of Economic and Social Affairs, 2020), we can begin to make out some of the main factors that contribute to inequality with regard to technology and language education.

Taking all this into account, we have now reached the focal point of this chapter: **educational technology**. This term encompasses several considerations: (1) **technology for education**, for instance, tools and resources specifically designed for this purpose; (2) **technology in education**, or the plethora of practices and experiences of both educators and learners; and (3) **technology education**, such as specific training courses on technology use and/or design. When discussing educational technology, the first examples that come to mind are apps and platforms designed for teaching and learning (for instance, *Moodle*, *ClassDojo*, *LessonUp* or *Wizer*, among others). These are tools that have clearly been designed specifically for educational purposes, although their designers are not necessarily educators; in other words, they are examples of technology for education. More and more teachers have started to adapt technology for classroom use, including elements that have not necessarily been designed for educational purposes. It is also becoming increasingly clear that both teachers and learners alike must, as a matter of urgency, develop their digital skillset. The focus on technology education is gradually taking on a more central role in educational policy.

That being said, much less attention is being paid to **technology-enhanced education** and to the level of access this concept implies. Therefore, it is necessary to analyze access to technology in education, both in school settings and other contexts, regardless of whether it is for learning purposes. This is because independent access to technology contributes significantly to the development of digital competence and consequently impacts the extent to which learners benefit from technology-mediated educational activities. To further understand this impact, the next section examines, from a historical perspective, why certain groups of learners are faced with greater educational disadvantages.

1.2 State of the Art

Before exploring how unequal access to technology impacts different socioeconomic groups, as well as how it highlights social inequality, first it is important to consider the social and educational characteristics that explain why certain groups suffer greater educational disadvantages. Despite the prevalent merit and equal opportunities discourse used by democratic societies to justify inequality and shape their educational systems (Bolívar, 2012), these disadvantages exist at both the social and governmental levels. A meritocratic educational system awards those it considers the ‘best’, facilitating social mobility so that those who are more hardworking and intelligent can improve their socioeconomic status. Consequently, academic failure is often blamed on the individual, either for not reaching a certain level or for lack of motivation, while

simultaneously ignoring the impact of the disadvantages faced by this group of people (Young, 1958). This way, the meritocracy narrative implicitly ignores institutional and structural obstacles that prevent certain people from achieving the same success as others. Indeed, this situation is highlighted by digital divides from both a technological and educational perspective.

This understanding of education frequently appears in limited-impact and sometimes even counterproductive initiatives. This is evidenced by the fact that, despite the growing presence of technology resources in numerous educational institutions, educators have often failed to fully adopt them. Many educators not only assume that learners know how to use technology, but they also promote its use as a structural practice within the educational system. For instance, they may set homework in digital formats that certain learners cannot access outside the school's facilities (Katz *et al.*, 2017; Rideout & Katz, 2016). Lack of familiarity with or access to technology is yet another disadvantage for those with lower **digital competence** levels – an even more significant issue that cannot be resolved by simply giving a laptop or tablet to people from economically disadvantaged backgrounds. Heath (2006) demonstrated that attitudes towards literacy trends in different socioeconomic areas either positively or negatively affect students' performance in the classroom, as well as the way they are assessed by teachers. Educators tend to place greater value on digital skills related to the professional world (e.g. knowing how to draft texts), while other skills, such as those associated with gaming, not only receive less attention in the classroom but are often considered non-essential in the context of formal education (European Commission, 2019). Several experts argue that it is necessary to take learners' prior technology knowledge into account and incorporate their digital practices into the classroom's educational culture, including those that educators may not necessarily consider valuable (European Commission, 2019). It is also essential to recognize diverse digital practices that are generated within distinct social sectors, considering both economic and cultural differences (Darvin, 2018; Warschauer & Matuchniak, 2010). At the same time, while it is important to recognize the central role digital competences are starting to play in teacher training initiatives, such as the Spanish *Marco común de competencia digital docente* [Common Framework for Teacher Digital Competence] (INTEF, 2017), it is hard to ignore, for instance, the lack of reflection on digital divides and their consequences within this referential competence framework.

This misalignment between educational expectations, technology resources and students' sociocultural backgrounds is not so different from the linguistic imbalances identified in education over the past few decades. Since the 1980s, numerous studies (Blackledge & Creese, 2009; García, 2009; Shohamy, 2006) have identified the languages students

speak as a key factor in educational inequality, in turn showing that the linguistic and cultural resources that minority language speakers bring to the classroom are not always compatible with the practices required for success in formal education. Paradoxically, **multilingualism** (i.e. the coexistence of different languages at the social or individual level) and **plurilingualism** (the dynamic, constantly evolving linguistic repertoire of an individual) are promoted as key standards for competences related to internationalization and mobility (Council of Europe, 2018). However, in more developed societies, there is a kind of **elite multilingualism** at play (Barakos & Selleck, 2019; de Costa, 2019), where English prevails as essential for facilitating socioeconomic mobility. Not only this, it also promotes the learning of certain major or widely spoken languages due to their historical hegemony or sociopolitical influence, namely French, Spanish, German and Chinese. On the other hand, there are certain contexts, such as the United States, where the multilingual condition of immigrant children or minority language speakers is considered an obstacle to academic success (Vallejo & Dooly, 2013).

As noted above, the lack of linguistic models and explicit appreciation of languages other than those spoken by the majority can negatively impact children who speak minority languages (Winstead, 2013). In fact, it can even affect the way they perceive themselves. Similarly, ICTs reinforce the educational use of internationally dominant languages, since both the presence and visibility of many indigenous or minority languages in cyberspace are severely limited (Wagner & Kozma, 2005). As Martín Rojo (2010: 67) points out: ‘this value-giving process is inextricably bound to the representation of students as legitimate or non-legitimate participants in the classroom’.

In short, access to language education, in the sense of elite multilingualism, has been traditionally linked to educational institutions with more resources. Not only this, but inequities have also been observed within institutions in relation to **technology for education**, **educational technology** and **technology education** (Kozol, 1991). If we add the fact that foreign language teaching is becoming increasingly dependent on technology (Ghanizadeh *et al.*, 2015), the lack of resources in both the educational and technological sense looms as an even greater problem.

Beyond potential language barriers, the opportunities that technology offers to facilitate language acquisition are significantly harder to come by for learners in educational institutions with fewer resources and limited access to technology (e.g. rural areas or socioeconomically disadvantaged regions), for learners who are less familiar with tools and technologies that are increasingly available in leading institutions (e.g. artificial intelligence or extended reality), and for learners whose educators may be less technologically competent (see Bautista Murillo, 2021; Gutiérrez-Provecho *et al.*, 2021). Technology and social inclusion (Warschauer, 2003) bring together not only physical resources but also digital (relevant

content in several languages), human (literacy, education level) and social (institutional and community support) resources.

1.3 Contributions of Current Research

1.3.1 Technology and language teaching: Opportunities and challenges

A study published by Katz, Gonzalez and Clark (2017) revealed that most research on technology and child development has focused on families in contexts that are Western, educated, industrialized, wealthy and democratic. According to the authors, in the United States such research has mainly documented the case of white, middle-class families, in settings where the youngest learners are in fact overexposed to technology. They also argue (2017) that simply asking whether the families taking part in the research have access to the internet does not reflect how the digital divide is experienced. This question does not consider aspects such as connection type, speed and, therefore, its utility, nor does it consider whether there is only one computer or smartphone at home, whose service may be interrupted due to a lack of financial resources.

Not only do the authors highlight these families' lower access rates to important information (for example, health-related news), they also point out that their **lack of connectivity** may negatively impact socioemotional and educational development. Indeed, this observation coincides with the conclusions of other empirical studies (for instance, see García Martínez & Silva Payró, 2022). Furthermore, the authors suggest that digital inequalities seem to limit the opportunities that children from low-income families have for developing or perfecting certain social skills, such as digital literacy (Katz *et al.*, 2017). This negative impact can even be exacerbated if the content being accessed is not in their first language (Ortega, 2017), or if the children do not possess the same competence level as their classmates when it comes to accessing and using the materials and content that educators recommend for the completion of their homework. Teachers tend to identify with the homogenized rules that govern educational norms (Prinstein & Dodge, 2008) and to interact, at the technological level, in normalized academic systems with better command compared to students from different language, cultural or socioeconomic backgrounds. As a result, these teaching professionals are unaware of the implications of their own practices when using technology (Ladson-Billings, 2013). In other words, by acting without awareness on the diverse realities of technological access in their classrooms, they are perpetuating the digital divide in terms of how effective technology can be in teaching and learning.

As Ortega (2017: 287) points out: 'digital technologies are part and parcel of the lives of multilinguals and [...] of the inequities and social injustice we see in our societies'. It has been widely demonstrated that

technology can have a positive effect on language learning. Nearly 30 years ago, Gee (1996) suggested that technology offered the opportunity to interact within an authentic social context, benefiting language learners at the sociocognitive level. With the proliferation of online games (see Chapter 12 of this book), the opportunities offered by interacting in various linguistic, social and cultural contexts have quickly become clear. As a result, there has also been a positive impact on the use and metalinguistic awareness of other languages (Reinhardt, 2017). In a literature review of publications on technology-mediated language learning between 2004 and 2014, Ghanizadeh *et al.* (2015) identified that technology was being used in almost all areas of language education: to improve the input quality of the target language; to expose students to authentic communication opportunities in all areas (listening, writing, reading and speaking); and to provide exposure to the language and opportunities to practice grammar and vocabulary. As a result, due to the digital transformation in language education (Ghanizadeh *et al.*, 2015) – an area that implies a significant volume of interaction and understanding – it is clear that children whose first language is not the language of instruction in their educational setting are at a higher risk of being left behind when it comes to technology. In fact, this holds especially true since, according to UNESCO (2016), a child who does not understand how interaction in the classroom works cannot learn (see Chapter 7 of this book).

The integration of technology into various literacy processes can introduce new opportunities in the classroom (United Nations Department of Economic and Social Affairs, 2020). Up to now, factors such as high publication costs, the need to guarantee a large number of readers to compensate these costs, as well as commercial pressure from publishers, have made it harder, for example, to publish in minority languages. Digital publication has begun to transform this sector that now offers new options such as open access, direct publishing and self-publishing (Hall, 2013). However, institutional support remains essential, otherwise the responsibility to change current practices and attitudes towards publishing in minority languages will once again fall upon the language group in question. The results of teaching strategies that take advantage of dual-language resources are positive when they are used to cultivate a ‘bilingual interactional space’ in the classroom (Welch, 2015). Teacher training must also address the use of bilingual books, as well as foster initiatives that unite a school and its community to collaboratively create more technology resources of a lasting nature and impact (Glazer *et al.*, 2017).

1.3.2. Technology and spaces for dialogue

One area of language teaching stemming from virtual connectivity is the use of communication technology through pedagogical approaches,

such as **virtual exchange** or **telecollaboration**, to connect learners with speakers of their target language (using one lingua franca or the first language of one of the participants). Greater access to communication technology has brought with it opportunities for learning as well as technology-mediated language and cultural contact, aspects that would be financially inaccessible for many learners in person. Most of the existing scientific literature on this pedagogical approach (Dooly & O'Dowd, 2018; Godwin-Jones, 2019; O'Dowd, 2018) has focused on the case of English as the target language (Çiftçi & Savaş, 2018). However, researchers are becoming increasingly interested in this topic in the context of virtual exchanges to improve linguistic competence in other languages, such as Spanish (Lenkaitis & English, 2017; Strawbridge, 2021) (see Chapter 10 of this book).

In a critical reading of the use of telecollaboration for intercultural education, Helm (2018) suggests that educators should never assume that educational contexts are neutral, and that it is their ethical duty to explore and keep in mind underlying beliefs and attitudes in teaching practices. This hypothesis can also be extended to the design of virtual exchange projects that explore explicitly the social inequalities that impact telecollaboration participants. In turn, this can help to reinforce the notion that all cultural and language identities are valid, as well as a sense of belonging for learners who may feel different within the classroom.

Some educators have even used social media to promote what Wang and Winstead (2016) call **digital cultural integrity**; in other words, the appreciation and preservation of minority populations' and individuals' linguistic and cultural assets through the use of technology (see González, 2018). This idea is founded upon the notion that learners must understand and value the resources and knowledge of different groups or populations. In turn, this dynamic contributes to appreciating linguistic and cultural assets while also potentially exposing learners to other languages and cultures. Specifically, language educators can make an effort to help learners overcome the digital divide in terms not only of linguistic and cultural deprivation but also the lack of positive gender representation. In this way, they can encourage young female learners to take an interest in science and technology through using the various languages available online.

As part of *ENACT – Learn Language Through Culture* (<https://enacteuropa.com/>), a project funded by the European Union, an online app has been created to offer users a task bank to practice different languages through cultural activities and descriptions. The tasks can be accessed free of charge and they cover a range of languages, cultures and countries. The materials have been created collaboratively in pairs or groups and include people from different linguistic backgrounds, cultural origins and even different generations. The project's inclusive

approach in terms of how the materials have been developed enables a variety of cultural groups to make their traditions and languages known. These materials can be used in both formal and informal educational settings. For language instructors, the fact that the app is free means they can complement their lesson plans with these cultural tasks. The app can also be used to expose students to the rich variety of languages and cultures around the world, while placing value on the diversity within their own classroom. Moreover, instructors can take advantage of available tools to generate, alongside their students, cultural activities that represent the languages present in the classroom. These can be published on their platform of choice to further promote the value of diversity in their local or immediate context.

Another interesting and relevant initiative when it comes to encouraging language learning through intercultural dialogue is the *Global Story Bridges* project (<http://www.globalstorybridges.com/>). Researchers and educators can use this platform to connect young learners from different parts of the world. Coming from globally diverse backgrounds, learners make videos exploring their own worlds through stories that they later share with their peers in other countries. This exchange promotes the kind of intercultural dialogue and communication to which learners would not normally have access, providing them with a platform to discuss their respective cultures. The project also encourages reflection on how our living contexts are transformed and interconnected through the effects of globalization, mobility, and technologies that enable cross-border and translocal communication. At the same time, these changes encounter diverse perspectives and ways of understanding the world (Vallejo *et al.*, 2020). Although for the time being the platform only allows exchanges in English, it can serve as a model for local projects that connect learners in any language and that place value on understanding and accepting other ways of life. This enables a certain psychological distancing to take place while critical thinking skills are developed. Subsequently, these can be applied in the classroom to encourage a dialogue about diversity in the local context.

1.3.3 Emerging technology and pedagogical approaches

Virtual reality and **augmented reality** are other areas of research and practice which, while still relatively minor, are growing in the field of language learning, thanks to their applicability. What is more, they are currently being investigated as tools to increase cultural and linguistic awareness. The more affordable the relevant devices become, the more appealing these virtual immersive environments will be for teachers and learners alike. The use of virtual reality in language teaching can foster reading skills through information tagged on 3D objects within the

scenario. Not only this, it can also promote listening comprehension and oral expression by interacting with other participants (either avatars or bots) and 3D objects with associated sound. As for writing skills, these can be practiced when participants interact with each other through text messages (see Chapter 12 of this book). That being said, however, much of the research on virtual and augmented reality focuses on learners with special needs or well-resourced educational institutions. As noted by Southgate *et al.* (2019: 28): ‘most schools will not have state-of-the-art technology labs and [...] the bring-your-own-device approach in low-income school communities presents serious issues in terms of digital inclusion for learning’.

Another area of growing interest which links language education, technology and social justice is the applied use of **linguistic landscapes** as a pedagogical tool. In his explanation of linguistic landscapes, Gorter (2019) insists that the concept goes far beyond merely listing the languages visible in public spaces: it also implies a debate about the languages at play, as well as how the signs in question are constructed (Makoni & Pennycook, 2007). Likewise, wider linguistic concepts must be considered, such as visual and multimodal components (Gorter *et al.*, 2021).

Linguistic landscapes have been present in language education for several years now. For example, Aladjem and Jou (2016) explain how they take advantage of them to design a learning context that fosters constant interaction with the target language, while also increasing learners’ awareness of its presence in spaces beyond the classroom. Consequently, a link is created between the classroom and the students’ everyday environment. What is most noteworthy, perhaps, is that linguistic landscapes have been used to highlight and increase language learners’ awareness regarding how the linguistic context is a visible link between equity and social justice in their everyday contexts. The aim of these projects is to help learners better understand which languages are visible in public spaces and which ones are relegated to the background, rendered practically invisible, despite being spoken by communities in their environment. In turn, this dynamic encourages reflection on how the languages present in public spaces include or exclude different people, as well as how these linguistic landscapes reflect or obscure social and linguistic diversity within these spaces. In this regard, it is also worth considering the students’ virtual linguistic landscapes (VLLs), an aspect that emphasizes how technology plays an important role in the configuration of learners’ virtual plurilingual ecologies, both within and without the classroom (Davis *et al.*, 2019).

From a technological perspective, virtually all digital devices today have a camera. This makes it possible for student productions, based on the analysis of their linguistic landscapes, to have a broader impact than ever before. Students can create a ‘digital depiction’ of their immediate

reality to discuss this topic with a multilingual audience, whether in their direct surroundings or through online platforms. However, aside from depicting technology as an enabling tool, this fact also takes us back to the beginning: it reveals how language learners' access to these technology-mediated learning environments is inevitably influenced by their family's socioeconomic status (Santoyo & Martínez, 2003).

1.4 Recommendations for Practice

So far, this chapter has provided a historical perspective of the connections between social justice, lack of accessibility and the digital divide – in addition to its impact on language teaching – as well as some of the advances made in this field. The purpose of this section is to offer recommendations and information from the point of view of teaching agents, as well as some of the resources available to language professionals.

1.4.1 Educators, researchers and administrators

1.4.1.1 *Transformations in academic management and curriculum design*

To achieve a greater balance between educational expectations, individual skills and access to technology (Bolívar, 2012; Nieto & Bode, 2012), first it is important to foster a culture of collaboration between the administration, the teaching staff and the community. In a school setting, it is essential to recognize that teachers act as a link between the school's administration, the learners and their families. Teachers interact with their students on a daily basis, meaning that they are in the position to better understand their technology skills and needs. Therefore, academic administrators must work alongside educators to implement programs that promote equitable access to technology for their learners, starting by conducting surveys to identify both students' and teachers' needs before investing, for example, in technology resources for the school. In fact, a rather widespread practice within educational institutions is to purchase technology of little use, without consulting with the teaching staff beforehand. Indeed, this is despite the fact that it is precisely this group of professionals who need to *want* to use the said technology, know how to use it efficiently and, ultimately, consider it relevant to their teaching practices.

Although educators cannot act singlehandedly to drastically reduce the digital divide, they can help to mediate its effects and identify opportunities among their students. Consequently, and as part of the initial survey the school can conduct, analyzing students' needs in terms of their access to technology outside the classroom can help to create a technology-mediated learning environment that is more closely connected with the actual possibilities and limitations of the context in

question. In this regard, it is essential to maintain an up-to-date database with all this technology-related information. This is because family circumstances (as well as individual variables) may vary and, therefore, have an impact on students' accessibility to technology. With this in mind, there are **three key areas** which educators should focus on when it comes to understanding their students' situation in terms of technology: (1) **access**, (2) **technological competence** and (3) the **perception of digital activities**.

Regarding **access**, it is necessary to investigate whether, and to what extent, learners can access technology outside the school setting. This aspect is much more important than people tend to believe, since it has an impact when it comes to tasks that require the use of resources such as videos or podcasts. As a result, if the said resources cannot be accessed, students may find it difficult or impossible to complete the tasks at hand. It is also essential to know the type of internet subscription that learners have access to outside the classroom: for instance, a plan with limited data determines the volume of material that can be downloaded. Finally, it is necessary to collect information about the kinds of devices students have at their disposal, and whether they are shared or not with other family members. These considerations constitute an important first step in understanding the limitations some students may face.

Learners' **technological competence** is also important when gathering information. Therefore, it is essential to identify their past and current experiences as well as how they navigate these environments (European Commission, 2019). For example, some students may have attended language classes where technology was used on a regular basis, while others may use it to stay in touch with the target language. On the other hand, there may be learners who have never used technology to explore other languages, either due to a lack of interest or because they do not know how. These resources can range from basic online tools such as dictionaries, language corpora or machine translators up to other, more advanced and autonomous resources or platforms, such as certain mobile apps. While it is important to be aware of students' technological preferences and interests within the language classroom, it is also necessary to keep in mind that, although these tools and platforms are positioned as universally accessible, as often claimed on their websites – 'our ultimate goal is to give everyone access to a private tutor experience through technology' or 'we created Duolingo so that everyone could have a chance' (Duolingo, 2024) – they are not for those who lack connectivity or the necessary skills to benefit from these resources (Guillén, 2020).

Finally, language instructors must be aware of how their students may feel when it comes to activities that involve technology and, therefore, of how they **perceive technology-mediated activities**. Lack of

confidence in terms of their linguistic competence may hinder learners' participation in digital discussions. In fact, this situation is not limited to speaking: it also extends to writing, since more time may be needed to draft a text or to form complete sentences (see Chapter 6 of this book). Putting together a questionnaire to assess technology-mediated activities, including questions about the tool's use and what the students learned, could help to gather information about how such activities are perceived. It could also discourage educators from simply basing their practices on intuition. It is equally important to use technology comprehensively and, therefore, understand different modalities that boost learning with technologies that include both visual and auditory support (Tagg & Seargeant, 2021), in addition to other multimodal resources.

1.4.1.2 Collaboration between educators and researchers

Educational approaches and their applicability tend to lag decades behind sociotechnological changes (Ketelaar *et al.*, 2012). However, there is a growing demand for a more immediate use of technology, consequently emphasizing the need for equally rapid and efficient innovation in second language education. One way to improve technological innovation in the teaching sector is through collaborative research between instructors and academics (Bucholtz, 2021), in order to find the best way to combine technology and language education. As noted by Avineri and Martínez (2021: 1045) – specifically in the context of applied linguistics – after all the efforts made to describe the causes of access-related inequalities when it comes to using technology for education, it is now time to take a more active stance that ‘cultivates relationships for justice’ (CRJ). Indeed, today, the use and applicability of educational technology does not always include the perspectives of key actors in the process: teachers and learners. Ethnographic research that places all agents involved (learners, instructors and researchers) in positions of equality can form the foundation for a more equitable use of technology in language classrooms.

Smythe *et al.* (2020) state that any educational transformation should be backed by research. This implies gathering empirical data in the classroom, whether in the context of research or as part of a teaching project, and involving both educators and researchers in their analysis to jointly contribute to the co-construction of social justice (see, for instance, the initiative described by López-Gopar *et al.*, 2021). Universities and educational faculties are generally allocated more resources to purchase technological equipment and develop digital educational materials. Sharing these materials with language instructors across all educational levels as open educational resources (OERs) (Comas-Quinn, 2011) may serve as a catalyst to empower this collective in their use of technology. This interaction between researchers and educators also requires the removal of the economic, linguistic and

psychological barriers that sometimes prevent individuals from taking part in research. It also calls for a review of how research is disseminated to ensure access for non-specialists (Figueroa, 2022: 45). Finally, the publication of case studies on technology-mediated language teaching, including those that demonstrate its educational benefits and those that address its limitations, must be supported both by schools and public administration. That said, it is also vital for educators' voices to be heard as the primary agents of this technological mediation in the classroom.

1.4.2 Technology and decolonizing the curriculum

1.4.2.1 *Towards an inclusive language teaching curriculum*

To facilitate accessibility and promote social justice in language teaching and learning, some of the actions put forth as part of **decolonizing the curriculum** can serve as a starting point. In the education sector, this idea refers to the need to reflect and give a voice to minorities that have been silenced by the historical consequences of phenomena such as colonization and imperialism on educational and institutional curricula. This course of action requires curriculum design to move away from these ideological models and become more inclusive, accessible and pluricultural (see, for instance, Fuertes Gutiérrez *et al.*, 2023; Macedo, 2019; Phipps, 2019). In addition to the general principles, such as flexibility, collaboration, transparency and equity (The Higher Education Academy, 2011) that must govern the design of a curriculum of this nature, other questions that should also be considered specifically affect language teaching. These include the perspective adopted by raciolinguistic studies (see, among others, Charity Hudley & Flores, 2022).

In this regard, technology can contribute to developing a more inclusive approach as a tool for localization and resource creation to address the lack of authentic materials in non-international languages (Wagner & Kozma, 2005). This may involve, for example, including linguistic varieties with fewer speakers (such as Amazonic Spanish or Judeo-Spanish), or giving visibility to language contact phenomena as in the case of English and Spanish in the US or Guaraní and Spanish in Paraguay. This area of study has been expanding in line with the decreasing costs and improved portability of technology. Not only this, but technology can also be used to alleviate anxiety when it comes to speaking practice (see Chapter 6 of this book) and to break down possible barriers that may make it harder to learn a language in contexts of immersion (see Chapter 10). Similarly, it can also help to document minority languages in multilingual communities and, in turn, improve the educational experience of their speakers. As a result, thanks to the increased capacity of cloud storage, some institutions and NGOs have begun to research and document endangered languages and even create digital dictionaries, including audio, to preserve indigenous languages

(see *The Living Tongue Institute for Endangered Languages*: <https://livingtongues.org/> and *The Endangered Languages Project*: <http://www.endangeredlanguages.com>). In some cases, such initiatives are started by members of the language community, resulting in the creation of educational resources in minority languages. These resources are then made available to families and educators to ensure the preservation of the languages in question. For example, *CultureTree TV* is a YouTube channel that uses music, children's stories and educational videos to teach Yoruba, a West-African language, to children.

There are also projects designed to facilitate the use of resources for learners with limited access to technology. Among other initiatives, *Global Storybooks* (<https://globalstorybooks.net/>) is an example of an open educational resource that promotes language learning and literacy for families, schools and communities. It includes bilingual digital books (generally English and another language), with a wide variety of stories and languages available. One of the advantages of such resources is that they can be downloaded and printed at school, thereby circumventing any connectivity-related limitations. As for the books' audio components, these can be reviewed in class, or even recorded and stored for later use on a smartphone.

1.4.2.2 *Specialized publications*

In the same way that providing students with access to technology resources is not enough without the necessary support to develop digital literacy, language instructors must also be open to learning and constantly re-thinking their own practices. This includes exploring resources available to them both in an autodidactic way and through support networks that can be set up to enhance educators' professional skills, as suggested by Barko-Alva (2022: 23). In addition to attending seminars and training workshops with support from their educational settings, Spanish language instructors can access several open access journals. The *Porta_ELE* website includes a repertoire of these publications and serves as a useful starting point when looking for specialized resources (see Lloret Cantero, 2020). Specifically, the journal *E-eleando*, published by the University of Alcalá, has dedicated several of its recent volumes to the use of digital news articles in Spanish, digital interaction, as well as multiple intelligences and the use of ICTs, among other topics. Volume 6 (2020) of *Doblele*, a journal associated with the Autonomous University of Barcelona, may also be of interest as it discusses 'critical perspectives on Spanish as a foreign language as an industry and market'. Furthermore, *Edutec-e*, a digital journal focusing on educational technology, offers studies, experiences and teaching resources in the context of teaching and learning with technology. The emergence of *TEISEL – Tecnologías para la investigación en segundas lenguas* [Technologies for Second Language Research] (University of

Barcelona), a journal whose first issue was published in 2022, is yet another example of the need to design reflective spaces that combine educator and researcher perspectives on how to integrate technology into teaching practices. Finally, for a more panoramic view of social justice, with a focus on Spanish from an applied perspective, it is useful to refer to the special issue: ‘Descolonización de la enseñanza del español y justicia social: Enfoques, competencias y propuestas de aplicación’ [Decolonizing Spanish Teaching and Social Justice: Approaches, Competences and Suggestions for Application], in the *Journal of Spanish Language Teaching* (Fuertes Gutiérrez *et al.*, 2023).

1.5 Conclusion and Future Lines of Research

Socioeconomic inequality, reinforced by the digital divide, has led to a dual lack of access to technology in educational settings. In turn, this has brought about a phenomenon that Homer-Dixon (2000) describes as the ‘ingenuity gap’: that is, the lack of access to essential knowledge needed to navigate and interact in today’s society. It is not enough to simply recognize the existence of digital, linguistic and even gender divides that contribute to, and sometimes overlap in, the creation of unfair educational systems. Families, educators, administrators and political representatives must come together to reflect on these fundamental topics that will affect generations to come. It is vital to create more spaces where both teachers and learners can acquire knowledge together, to first recognize and then challenge the patterns that perpetuate the privileges and injustices entrenched in the educational system. In the case of language learning, it is essential to identify projects that not only promote the use of the language but also the use of communication directed towards linguistic and cultural equality. As part of this process, technology-mediated learning activities must be designed to serve as catalysts for critical thinking, democratic values and equality. To achieve this, it is every educator’s duty, as those responsible for the younger generation’s linguistic education, to self-reflect and ask themselves to what extent they too have contributed to the perpetuation of injustice and inequality in language education and access to technology.

1.6 Annotated Additional Reading

Digital Future Society (2020) *Reducir las brechas digitales: un marco de colaboración digital* [Reducing digital divides: a framework for digital collaboration]. Government of Spain. https://digitalfuturesociety.com/app/uploads/2020/04/THINK_TANK_I4_BRIDGING_DIGITAL_DIVIDE_ES.pdf

This publication analyzes the right to digital literacy and collaboration. It also describes initiatives that promote digital literacy in different parts of the world.

Journal of Spanish Language Teaching 10 (2), 2023. Special issue: Decolonising Spanish Language Teaching and Social Justice: Approaches, Competences and Practices. Mara Fuertes Gutiérrez, Rosina Márquez-Reiter and Aris Moreno Clemons.

References

- Aladjem, R. and Jou, B. (2016) The linguistic landscape as a learning space for contextual language learning. *Journal of Learning Spaces* 5 (2), 66–70.
- Avineri, N. and Martínez, D.C. (2021) Applied linguistics cultivating relationships for justice: An aspirational call to action. *Applied Linguistics* 42 (6), 1043–1054. <https://doi.org/10.1093/applin/amab065>.
- Barakos, E. and Selleck, C. (2019) Elite multilingualism: Discourses, practices, and debates. *Journal of Multilingual and Multicultural Development* 40 (5), 361–374. <https://doi.org/10.1080/01434632.2018.1543691>.
- Barko-Alva, K. (2022) Enseñando en español: The need to support dual language bilingual education teachers' pedagogical language knowledge. *Annual Review of Applied Linguistics* 42, 18–24. <https://doi.org/10.1017/S0267190521000106>.
- Bautista Murillo, J.C. (2021) El lugar importa: Brecha digital y desigualdades territoriales en tiempos de Covid-19. Una revisión comparativa sobre la realidad argentina, sus provincias y principales centros urbanos. *Argumentos. Revista de crítica social* 24, 66–100.
- Blackledge, A. and Creese, A. (2009) *Multilingualism: A Critical Perspective*. Continuum.
- Bolívar, A. (2012) Justicia social y equidad: Una revisión actual. *Revista Internacional de Educación para la Justicia Social* 1 (1), 9–45. <http://hdl.handle.net/10486/9162>.
- Bucholtz, M. (2021) Community-centered collaboration in applied linguistics. *Applied Linguistics* 42 (6), 1153–1161. <https://doi.org/10.1093/applin/amab064>.
- Cabero, J. (2004) Reflexiones sobre la brecha digital y la educación. In F.J. Soto and J. Rodríguez (eds) *Tecnología, educación y diversidad: Retos y realidades de la inclusión social* (pp. 23–42). Consejería de Educación y Cultura [Department of Education and Culture].
- Charity Hudley, A.H. and Flores, N. (2022) Social justice in applied linguistics: Not a conclusion, but a way forward. *Annual Review of Applied Linguistics* 42, 144–154. <https://doi.org/10.1017/S0267190522000083>.
- Çiftçi, Y.E. and Savaş, P. (2018) The role of telecollaboration in language and intercultural learning: A synthesis of studies published between 2010 and 2015. *ReCALL* 30 (3), 278–298. <https://doi.org/10.1017/S0958344017000313>.
- Cocemfe (2021) Definiciones básicas. *Observatorio accesibilidad y vida independiente*. <https://observatoriodelaaccesibilidad.es/archivos/3104>.
- Comas-Quinn, A. (2011) Recursos educativos abiertos para la enseñanza de lenguas. *MarcoELE* 13, 90–104.
- Commission on Language Learning. (2016) *The State of Languages in the U.S.A. Statistical Portrait*. American Academy of Arts and Sciences.
- Council of Europe (2018) *Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume with New Descriptors*. Council of Europe.
- Darvin, R. (2018) Social class, and the acquisition of unequal digital literacies. *Language and Literacy* 20 (3), 26–45. <https://doi.org/10.20360/langandlit29407>.
- Davis, N., Harris, L. and Cunningham, U. (2019) Professional ecologies shaping technology adoption in early childhood education with multilingual children. *British Journal of Educational Technology* 50 (3), 1320–1339. <https://doi.org/10.1111/bjet.12774>.
- de Costa, P. (2019) Elite multilingualism, affect and neoliberalism. *Journal of Multilingual and Multicultural Development* 40 (5), 453–460. <https://doi.org/10.1080/01434632.2018.1543691>.
- de Mejía, A.M. (2002) *Power, Prestige and Bilingualism: International Perspectives on Elite Bilingual Education*. Multilingual Matters.
- Dooly, M. and O'Dowd, R. (2018) Telecollaboration in the foreign language classroom: A review of its origins and its application to language teaching practices. In M. Dooly and R. O'Dowd (eds) *In This Together: Teachers' Experiences with Transnational, Telecollaborative Language Learning Projects* (pp. 11–34). Peter Lang.

- Drees-Gross, F. and Zhang, P. (2021) El escaso acceso digital frena a América Latina y el Caribe: ¿Cómo solucionar este problema? *Banco Mundial Blogs [World Bank Blogs]*, August 12. World Bank.
- Duolingo. (2024) 'About us'. <https://www.duolingo.com/info>.
- European Commission. (2019) *2nd Survey of Schools: ICT in Education*. Publications Office of the European Union. <https://doi.org/10.2759/23401>.
- Figueroa, M. (2022) Podcasting past the paywall: How diverse media allows more equitable participation in linguistic science. *Annual Review of Applied Linguistics* 42, 40–46. <https://doi.org/10.1017/S0267190521000118>.
- Flores, N. and Rosa, J. (2015) Undoing appropriateness: Raciolinguistic ideologies and language diversity in education. *Harvard Educational Review* 85 (2), 149–171. <https://doi.org/10.17763/0017-8055.85.2.149>.
- Fuertes Gutiérrez, M., Soler Montes, C. and Klee, C. (2021) Sociolingüística aplicada a la enseñanza del español [Applied sociolinguistics in Spanish language teaching (SLT)]. *Journal of Spanish Language Teaching* 8 (2), 105–113. <https://doi.org/10.1080/23247797.2021.2019448>.
- Fuertes Gutiérrez, M., Márquez-Reiter, R. and Moreno Clemons, A. (eds) (2023) Decolonising Spanish language teaching and social justice: Approaches, competences and practices/Descolonización de la enseñanza del español y justicia social: enfoques, competencias y propuestas de aplicación. *Journal of Spanish Language Teaching* 10 (2), Special Issue.
- García, O. (2009) *Bilingual Education in the 21st century. A Global Perspective*. Wiley–Blackwell.
- García Martínez, V. and Silva Payró, M.P. (2022) Percepción académica sobre las barreras en la adopción de innovaciones tecnológicas durante la pandemia por la covid-19. *Apertura: Revistas de Innovación Educativa* 14 (1), 96–113. <https://doi.org/10.32870/ap.v14n1.2150>.
- Gee, J.P. (1996) *Social Linguistics and Literacies*. Routledge.
- Ghanizadeh, A., Razavi, A. and Jahedizadeh, S. (2015) Technology-enhanced language learning (TELL): A review of resources and upshots. *International Letters of Chemistry, Physics and Astronomy* 54, 73–87. <https://doi.org/10.18052/www.scipress.com/ILCPA.54.73>.
- Glazer, M., Harris, K., Ost, D., Gower, M. and Ceperano, M. (2017) Creating bilingual books to facilitate second language learning. *Journal of Inquiry & Action in Education* 8 (2), 81–89.
- Godwin-Jones, R. (2019) Telecollaboration as an approach to developing intercultural communication competence. *Language Learning & Technology* 23 (3), 8–28. <http://hdl.handle.net/10125/44691>.
- González, G. (2018) *Newspaper Partnership Results in Thousands of Freely Licensed Infographics*. Wikimedia Foundation.
- Gorter, D. (2019) Methods and techniques for linguistic landscape research: About definitions, core issues and technological innovations. In M. Pütz and N. Mundt (eds) *Expanding the Linguistic Landscape: Linguistic Diversity, Multimodality and the Use of Space as a Semiotic Resource* (pp. 38–57). Multilingual Matters.
- Gorter, D., Cenoz, J. and van der Worp, K. (2021) The linguistic landscape as a resource for language learning and raising language awareness. *Journal of Spanish Language Teaching* 8 (2), 161–181. <https://doi.org/10.1080/23247797.2021.2014029>.
- Guillén, G. (2020) Tecnología e impacto social en la enseñanza de español. *Doble* 6, 82–96. <https://doi.org/10.5565/rev/doble.73>.
- Gutiérrez-Provecho, M.L., López-Aguado, M., García Llamasy, J.L. and Quintanal Díaz, J. (2021) La brecha digital en población en riesgo de exclusión social. *Pedagogía Social. Revista Interuniversitaria* 39, 123–138. https://doi.org/10.7179/PSRI_2021.39.08.
- Hall, F. (2013) *The Business of Digital Publishing*. Routledge.
- Helm, F. (2018) *Emerging Identities in Virtual Exchange*. Research-publishing.net.

- The Higher Education Academy (2011) *Inclusive Curriculum Design in Higher Education: Languages, Linguistics and Area Studies*. The Higher Education Academy.
- Homer-Dixon, T.F. (2000) *The Ingenuity Gap*. Knopf.
- INTEF (2017) *Marco común de competencia digital docente [Common Framework for Teacher Digital Competence]*. Ministerio de Educación, Cultura y Deporte [Ministry of Education, Culture and Sport].
- ITU (2019) *ITU-D Digital Inclusion* (website). ITU.
- Katz, V.S., Gonzalez, C. and Clark, K. (2017) Digital inequality and developmental trajectories of low-income, immigrant, and minority children. *Pediatrics* 140 (S2), 132–136. <https://doi.org/10.1542/peds.2016-1758R>.
- Ketelaar, E., Beijaard, D., Boshuizen, H.P.A. and Den Brok, P.J. (2012) Teachers' positioning towards an educational innovation in the light of ownership, sense-making and agency. *Teaching and Teacher Education* 28 (2), 273–282. <https://doi.org/10.1016/j.tate.2011.10.004>.
- Kozol, J. (1991) *Savage Inequalities. Children in America's Schools*. Harper.
- Ladson-Billings, G. (2013) Lack of achievement or loss of opportunity. In P. Carter and K. Welner (eds) *Closing the Opportunity Gap: What America Must Do to Give Every Child an Even Chance* (pp. 11–22). Oxford University Press.
- Lenkaitis, C.A. and English, B. (2017) Technology and telenovelas: Incorporating culture and groupwork in the L2 classroom. *MEXTESOL Journal* 41 (3), 1–20.
- Lloret Cantero, J. (2020) Repertorio, análisis y difusión de las publicaciones periódicas en línea especializadas en Español como Lengua Extranjera (ELE). PhD thesis, Pompeu Fabra University.
- López-Gopar, M.E., Schissel, J.L., Leung, C. and Morales, J. (2021) Co-construction social justice: Language educators challenging colonial practices in Mexico. *Applied Linguistics* 42 (6), 1097–1109. <https://doi.org/10.1093/applin/amab047>.
- Macedo, D. (ed.) (2019) *Decolonizing Foreign Language Education. The Misteaching of English and Other Colonial Languages*. Routledge.
- Makoni, S. and Pennycook, A. (2007) Disinventing and reconstituting languages. In S. Makoni and A. Pennycook (eds) *Disinventing and Reconstituting Languages* (pp. 1–41). Multilingual Matters.
- Martin Rojo, L. (2010) *Constructing Inequality in Multilingual Classrooms*. Mouton de Gruyter.
- Nieto, S. and Bode, P. (2012) *Affirming Diversity: The Sociopolitical Context of Multicultural Education* (5th edn). Allyn & Bacon.
- O'Dowd, R. (2018) From telecollaboration to virtual exchange: State-of-the-art and the role of UNICollaboration in moving forward. *Journal of Virtual Exchange* 1, 1–23. <https://doi.org/10.14705/rpnet.2018.jve.1>.
- Ortega, L. (2017) New CALL-SLA research interfaces for the 21st century: Towards equitable multilingualism. *Calico Journal* 34 (3), 285–316. <https://doi.org/10.1558/cj.33855>.
- Pérez-Escoda, A., Lena-Acebo, F.J. and García-Ruiz, R. (2021) Brecha digital de género y competencia digital entre estudiantes universitarios. *Aula Abierta* 50 (1), 505–514. <https://doi.org/10.17811/rife.50.1.2021.505-5014>.
- Pew Research Center. (2021) Internet/Broadband fact sheet. *Pew Research Center*.
- Phipps, A. (2019) *Decolonising Multilingualism: Struggles to Decreate*. Multilingual Matters.
- Prinstein, M.J. and Dodge, K.A. (2008) Current issues in peer influence research. In M.J. Prinstein and K.A. Dodge (eds) *Understanding Peer Influence in Children and Adolescents* (pp. 3–13). Guilford Press.
- Rawls, J. (1979) *Teoría de la justicia*. Fondo de Cultura Económica.
- Reinhardt, J. (2017) Digital gaming in L2 teaching and learning. In C. Chapelle and S. Sauro (eds) *The Handbook of Technology in Second Language Teaching and Learning* (pp. 202–216). Wiley–Blackwell.

- Rideout, V.J. and Katz, V.S. (2016) *Opportunity for All? Technology and Learning in Lower-income Families. A Report of the Families and Media Project*. The Joan Ganz Cooney Center at Sesame Workshop.
- Rosa, J. and Flores, N. (2021) Decolonization, language, and race in applied linguistics and social justice. *Applied Linguistics* 42 (6), 1162–1167. <https://doi.org/10.1093/applin/amab062>.
- Santoyo, A. and Martínez, E. (2003) *La brecha digital: Mitos y realidades*. Autonomous University of Baja California.
- Shohamy, E. (2006) Imagined multilingual schools: How come we don't deliver? In O. García, T. Skutnabb-Kangas and M.E. Torres-Guzmán (eds) *Imagining Multilingual Schools: Language in Education and Globalization* (pp. 171–183). Multilingual Matters.
- Smythe, S., Toohey, K., Dagenais, D. and Forte, M. (eds) (2020) *Transforming Language and Literacy Education: New Materialism, Posthumanism, and Ontoethics*. Routledge.
- Southgate, E., Smith, S.P., Cividino, C., Shane Saxby, S., Kilham, J., Eather, G., Scevak, J., Summerville, D., Buchanan, R. and Bergin, C. (2019) Embedding immersive virtual reality in classrooms: Ethical, organisational and educational lessons in bridging research and practice. *International Journal of Child-Computer Interaction* 19, 19–29. <https://doi.org/10.1016/j.ijcci.2018.10.002>.
- Strawbridge, T. (2021) Modern language: Interaction in conversational NS-NNS video SCMC eTandem exchanges. *Language Learning & Technology* 25 (2), 94–110. <http://hdl.handle.net/10125/73435>.
- Tagg, C. and Seargeant, P. (2021) Context design and critical language/media awareness: Implications for a social digital literacies education. *Linguistics and Education* 62, 100776. <https://doi.org/10.1016/j.linged.2019.100776>.
- UNESCO (2016) *If You Don't Understand, How Can You Learn? Policy Paper 24, Global Education Monitoring Report*. UNESCO.
- UNESCO (2019a) *Global Educational Monitoring Report 2019*. UNESCO.
- UNESCO (2019b) *The State of Broadband 2019*. International Telecommunication Union and United Nations Educational, Scientific and Cultural Organization.
- United Nations Department of Economic and Social Affairs (2006) *Social Justice in an Open World: The Role of the United Nations*. United Nations.
- United Nations Department of Economic and Social Affairs (2020) *World Social Report 2020. Inequality in a Rapidly Changing World*. United Nations.
- United Nations Women (United Nations Entity for Gender Equality and the Empowerment of Women) (2019) *Progress of the World's Women 2019–2020. Families in a Changing World*. UN Women.
- Vallejo, C. and Dooly, M. (2013) Early school leavers and social disadvantage in Spain: From books to bricks and vice versa. *Journal of Education* 48 (3), 389–404. <https://doi.org/10.1111/ejed.12037>.
- Vallejo, C. and Dooly, M. (2020) Plurilingualism and translanguaging: Emergent approaches and shared concerns. *International Journal of Bilingual Education and Bilingualism* 23 (1), 1–16. <https://doi.org/10.1080/13670050.2019.1600469>.
- Vallejo, C., Moore, E., Llompert, J. and Hawkins, M. (2020) Semiosis y cosmopolitismo crítico: Un análisis transmodal de un dilema ético en comunicación transnacional entre jóvenes. *Profesorado. Revista de Currículum y Formación de Profesorado* 24 (1), 304–325.
- Wagner, D.A. and Kozma, R. (2005) *New Technologies for Literacy and Adult Education: A Global Perspective*. UNESCO.
- Wang, P. and Winstead, L. (2016) *Handbook of Research on Foreign Language Education in the Digital Age*. IGI Global.
- Warschauer, M. (2003) *Technology and Social Inclusion. Rethinking the Digital Divide*. MIT Press.
- Warschauer, M. and Matuchniak, T. (2010) New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education* 34 (1), 179–225. <https://doi.org/10.3102/0091732X09349791>.

- Weissler, R.E. (2022) A meeting of the minds: Broadening horizons in the study of linguistic discrimination and social justice through sociolinguistic and psycholinguistic approaches. *Annual Review of Applied Linguistics* 42, 137–143. <https://doi.org/10.1017/S0267190521000131>.
- Welch, I. (2015) Building interactional space in an ESL classroom to foster bilingual identity and linguistic repertoires. *Journal of Language, Identity & Education* 14 (2), 80–95. <https://doi.org/10.1080/15348458.2015.1019784>.
- Winstead, L. (2013) Apprehension and motivation among adolescent dual language peers: Perceptions and awareness about self-directed teaching and learning. *Language and Education* 27 (1), 1–21. <https://doi.org/10.1080/09500782.2012.669767>.
- Young, M. (1958) *The Rise of Meritocracy, 1870–2033: An Essay on Education and Society*. Thames & Hudson.

2 Curriculum Planning and Development in Virtual Environments

Marta González-Lloret

2.1 Introduction and Key Concepts

The COVID-19 pandemic brought to light the utility and importance of technology in all educational areas and contexts (González-Lloret *et al.*, 2021), including foreign and second language teaching. When schools and universities were forced to close their doors, many institutions had no choice but to simply transfer their existing (in-person) curriculum to an online environment. While it is true that educators' tenacity and dedication saved many students from having to repeat the whole year, in most cases actual learning was minimal. This is because the transfer of materials created for in-person teaching to an online context prevents the benefits of technology from being fully exploited, thus hindering effective learning. Technology, without a doubt, can contribute to learning; however, this does not imply causality. Learning takes place thanks to a meticulous planning process that includes the following components: a methodology based on existing research on language acquisition; a pedagogical framework suited to the learning objectives and context; the use (or creation) of materials aligned with these pedagogical and methodological principles; and a carefully thought-out selection of tools and technologies to put them into practice.

Although for some language instructors this sudden technological immersion was uncharted territory and many were eager to return to in-person classes, there is half a century's worth of research on technology-mediated language teaching. The findings of this research reveal that technology is indeed effective when it comes to developing oral, written and intercultural skills in the additional language (AL). In fact, it also proves useful for the development of essential digital skills in the professional world, such as the ability to use technology to communicate and collaborate, the ability to find and critically assess

existing information, and the ability to handle and solve problems in technology-mediated contexts (European Union, 2020).

The terminology used to describe the role that technology can play in the curriculum varies greatly. In specialized literature, **e-learning** is an inclusive term to describe the use of technology in both in-person teaching (featuring technological components) and fully online teaching. A more nuanced distinction can also be made by highlighting the difference between **technology-enhanced** programs, which occasionally include technology, and **technology-mediated** programs, where technology plays an essential role in learning and assessment. Both teaching methods are usually deployed in a classroom where both the instructor and the students are in the same place at the same time. When a physical or temporal distance separates the instructor from their students, the terms **distance learning** or **online learning** are often used. Generally, this type of education implies a range of technologies and modalities (synchronous/live; asynchronous/recorded). Finally, **hybrid learning** refers to a combination of online and in-person teaching, where the online component occupies between 30% and 70% of the entire course. In 2020, AL instructors were forced to adopt remote/distance/online teaching as an immediate response to the pandemic. This was followed by various models of hybrid teaching while gradually returning to in-person classes (e.g. flipped classroom, group rotation, individual rotation and ‘Here or There’ models). It is important to emphasize that there is a significant difference between this remote teaching model and a well thought-out AL course specifically developed to be taught online (Hodges *et al.*, 2020).

When it comes to **planning and developing** an online AL course, it is essential to be clear on the context, course participants, program objectives and resources (both human and technological). When it comes to deciding on a **methodology**, it is crucial to be up to date with the current research on language acquisition and develop a program in line with the methodology of choice (see González-Lloret, 2016, for an example of task-based language teaching (TBLT)). Moreover, it is equally important to be familiar with online course creation models, such as the ADDIE model (Analysis-Design-Development-Integration-Evaluation), which is described in detail in section 2.4 of this chapter.

2.2 State of the Art

Technology-mediated learning and distance education have been around for decades. It is only in the last few years, however, that they have transformed into omnipresent and decisive aspects of our lives and educational systems.

Among the historical milestones that marked the inception of this field is the publication of the first volumes of the academic journals

CALICO in 1983 and *ReCALL* in 1989. Since then, relevant research and the incorporation of technology in the classroom have steadily evolved, not only by following technological developments but also in the progress made in the fields of language acquisition and education. Studies have gone from trying to prove that technology works (and that it is worth the associated investment of time and resources) to describing how to incorporate the latest innovations in the language classroom. In fact, some of the most recent studies move the spotlight away from technology, presenting it as just another variable to consider in the field of language acquisition.

Without a doubt, two of the most influential factors in the evolution of the field were: first, the **development of increasingly powerful, compact and affordable processors** that have facilitated more widespread use of technology tools both within and beyond the AL classroom; and second, **easy access to the internet** and the expansion of connection networks. These factors have brought about more opportunities to plan and develop materials to work on all relevant skills within the AL classroom.

Although word processors marked the evolution of how **writing skills are approached** in AL teaching through the use of technology (e.g. production, speed, autocorrection), writing activities remained the same. Indeed, it was the arrival of the internet that encouraged learners to become authors both inside and outside the classroom (e.g. through writing in fandoms, blogs, wikis or discussion groups). In turn, this boosts their motivation to write, their sense of authorship and the development of an identity in their AL of choice (Kramsch *et al.*, 2000). In fact, this practice also leads to an increase in complexity and accuracy in written work (Chen & Brown, 2012). Additionally, with the arrival of Google documents, writing became a collaborative activity, consequently favoring the development of writing skills in an AL (Storch, 2016). Finally, writing online for a real audience provides learners with yet another opportunity to improve their writing skills. To echo Manchón (2011: 3), learners do not only *write to learn* their AL of choice, but they also *learn to write* through writing in the language.

Regarding **aural comprehension** in the AL, one could say that it has gone hand in hand with technology since the inception of the audio-lingual method in the early 20th century. The evolution of technology has facilitated the development of materials that include instant and personalized correction, which is essential to learning an AL. Similarly, **reading comprehension** has not only benefited from the significant volume of existing online material but also from the possibility to provide the necessary scaffolding to promote learning (for instance, different types of glossaries, text modification, the use of multimedia elements within the text, interactive comprehension questions, text with hyperlinks, etc.). In the case of Spanish, for instance, one example of

such materials are the leveled reading resources on *Profe de ELE* (<https://www.profedelee.es/categoria/actividad/lecturas/>).

Oral interaction is possibly the communication skill that has benefited the most from technological innovation. While it is true that second language voice recognition is still far from perfect, apps and studies have already emerged regarding the use of conversation simulations for language learning (e.g. Sydorenko *et al.*, 2019; also, see Muñoz-Basols & Gironzetti, 2019, for a methodological proposal for teaching oral expression in Spanish).

One of the main advantages for the development of **oral interaction and expression** came with the ability to connect language learners with other speakers to take part in remote interactive activities. The most common tools for these types of telecollaborative activities (or virtual exchanges) include computer-mediated communication – initially via chat and then via video and multimodal media – virtual spaces such as *Second Life*, as well as massively multiplayer role-playing games. These technologies have not only changed the quantity and quality of interactions language learners can experience, but also the planning, development and methodology of language teaching. One of the first curriculum proposals that used collaborative environments was the *Cultura* project (Furstenberg *et al.*, 2001), which described an intercultural learning methodology through telecollaborative projects between two institutions, in which each one learns about the culture and language of the other. Since then, **telecollaborative projects** have been on the rise, adopting different technologies as meeting and interaction spaces, while maintaining the same methodological learning premise through authentic collaboration with other speakers of the target language and culture (Çiftçi & Savaş, 2018; Gutiérrez & O’Dowd, 2021). For a detailed historical view of the impact of technology on the development of oral competences, it is useful to read Jordano de la Torre (2011).

Another factor worth highlighting in the technological evolution is device mobility. Cell phones have transformed into pocket-sized computers with a network connection, essentially replacing tablets and laptops. In turn, this increases the learner’s opportunities to work on the AL beyond the classroom, as well as the potential for their quick and seamless integration into lessons. In fact, cell phones are often used as dictionaries, voice and video recorders, as well as means to access assessment apps and games within the classroom (e.g. *Kahoot!*). Not only this, they also allow students to access multimedia activities in textbooks, virtual and augmented realities, as well as first-rate learning materials such as BBC languages, (<https://www.bbc.co.uk/languages/index.shtml>) or LingroToGo (<https://casls.uoregon.edu/classroom-resources/lingrotogo/>) for autonomous work outside the classroom.

Finally, since the beginning of the pandemic, various institutions have experimented with the potential of different technologies to facilitate

remote language teaching. Online education is nothing new, although the COVID-19 pandemic propelled its widespread adoption. **Learning management systems** (LMS) have been around since the late 20th century. Several examples of these are *WebCT*, *Blackboard* (since the late 1990s), *Moodle* (since 2002), *Sakai* (since 2005) and *Canvas*, which is now one of the most popular platforms since its launch in 2011. These platforms also led to the growth of the *OpenCourseWare* movement that emerged in Germany in the late 1990s. It was then popularized through universities such as the Open University in the United Kingdom and was further developed in the United States almost a decade later, with MIT's *OpenCourseWare* (<https://ocw.mit.edu/index.htm>) and the appearance of massive open online courses (MOOCs).

2.3 Contributions of Current Research

This section aims to answer **three key questions** based on existing research:

- (1) Is it possible to successfully develop an online language course?
- (2) Are online courses more, less or equally effective as their hybrid counterparts?
- (3) What are the key elements a course should include to be effective, according to the most recent research?

The answer to the first question is, 'Yes, it is'. Several meta-analytical studies focused on the effectiveness of online teaching show that learning is indeed possible (e.g. Allen *et al.*, 2004; US Department of Education, 2010), and that the medium is not what conditions effectiveness but, rather, the methodology and elements of instruction used (Malissa, 2018). Existing examples of remote courses based on a solid methodology that are still relevant years after their creation include *Voxy* for learning English (*Voxy.com*), *Spanish without Walls* (UC Davis) and *EuroCatering*, a platform where hospitality professionals can learn any of 12 European languages (*eurocatering.org*).

Furthermore, several studies **compare the effectiveness of fully online courses to that of hybrid or blended ones** (where one part takes place online and the other in person) that include the best of both worlds. In fact, some of these studies even compare these courses to fully in-person ones. Most of this research was conducted at the beginning of the century and, while not all of it focuses on language learning, it certainly provides information about certain aspects of online education that can inform language teaching. For example, Rovai and Jordan (2004) showed that hybrid courses generated a stronger sense of community than their online or in-person counterparts. Not only this, the success of learners in hybrid courses seems to be determined by their individual characteristics.

For instance, Asarta and Schmidt (2017) found that learners with better academic results and a higher degree of self-regulation benefited more from hybrid courses than in-person ones. It also appears that the subject studied affects the extent to which hybrid courses are effective. Learners seem to be less successful in hybrid courses when it comes to subjects that require a more reiterative and critical knowledge-building process, and with those that call for more direct support and guidance from the teacher (Vo *et al.*, 2017).

In the context of **second language (L2) teaching**, in a review of 68 language programs across the US, Anderson (2018) describes how definitions of hybrid courses vary greatly among learners, instructors and administrators. Although educational administrators believe that these kinds of courses save a considerable amount of space, the higher workload for instructors is often overlooked. Not only this but, despite the success of the programs reviewed, some instructors expressed their frustration when it came to using materials created by book publishers that dictated the online content. In addition, Anderson found that there was a discrepancy between how much autonomous work students are expected to do online and the amount of work that students are actually willing to do outside the classroom. Finally, Anderson also emphasizes the idea that technology should serve the curriculum, not the other way around.

Over the past few years, there has been a significant decline in studies that compare hybrid, online and in-person courses. This is because it has now been understood that the medium has a much smaller impact on learning compared to the design, tools and methodology used to promote active participation among students. The most recent studies focus on describing the use of different tools and different learning environments, as well as on assessing their effectiveness when it comes to teaching the AL online. Not only this, they also address the various activities and tasks that can be carried out through such courses. For further information, readers can refer to existing meta-analytical and synthetic research that gathers results across different topics (e.g. Grgurović *et al.*, 2013).

Regarding the key elements to plan and design an online, hybrid or technology-mediated language course, the reviewed research indicates that the teaching methodology and materials used are the two most important aspects to keep in mind (Anderson, 2018; Malissa, 2018). In the following subsections, these elements will be further explored.

2.3.1 Methodology for technology-mediated language teaching

Among all L2 teaching methodologies, **task-based language teaching (TBLT)**, **project-based language learning (PBLL)** and **content and language integrated learning (CLIL)** are possibly the ones that are best suited to the planning and development of online courses.

A programmatic version of task-based language teaching (Long, 2015) is very similar to the ADDIE online course development model (explained in detail in section 2.4). As a result, it lends itself to the integration of technologies across the various components that make up the design. Project-based language learning is also an excellent method for online courses. This methodology is closely related to development models based on the standards and best practices of ACTFL (American Council on the Teaching of Foreign Languages), which promote language acquisition for communication and the development of interculturality through connections with other disciplines, as well as the comparison of one's own language/culture with the target language/culture and participation in the learning community. The main purpose of these projects is to provide learners with a practical and direct experience of the language through its interactive use as a vehicle to learn specific content. This methodology results in projects that benefit and are directed towards individuals outside the AL classroom (e.g. schools, the L2-speaking community, businesses where the L2 is spoken, younger learners of the L2, etc.). There are two main principles that set this methodology apart from task-based language teaching and CLIL (the content-based approach). On the one hand, it gives learners a voice and a range of options; on the other, it involves them in a process of **sustained inquiry**, which develops their capacity for critical literacy and self-correction and also ends in a public and socially beneficial final product. To plan and develop an online course as per the project-based methodology, it is useful to follow a guide, such as the one provided by the National Foreign Language Resource Center (NFLRC), whose website also includes several examples of projects (<https://nflrc.hawaii.edu/projects/view/2014a/>).

2.3.2 Materials development and research

In addition to choosing a methodology that suits the course's online nature, it is essential for the teaching materials to be based on recent research in the field of language acquisition. Therefore, all materials and activities should, at the very least, include:

- **Large amounts of input that is as authentic as possible.** If it needs to be adapted, it is important to make sure that it is elaborated and not simplified, as the authenticity of the language is lost. Language samples should also be multimodal (e.g. written, visual, aural) and should allow the learner to work with the content repeatedly if necessary.
- Opportunities to **produce spoken or written work**, as well as the chance to **interact orally**. This interaction can either take place among the learners themselves or activities can be implemented that connect the class with the outside world and other speakers of the language.

- **Immediate and elaborate feedback** that helps the learner understand their mistakes and correct them. This feedback should also aim to promote learner autonomy.
- The option to **personalize the experience**, both at the cognitive level (through the use of different formats, the provision of the necessary amount of time to complete the activities, as well as the acceptance of multilingualism as part of the learner's evolution) and the personal level (i.e. establishing connections with the community of speakers, integrating the students' own language and culture in the class, and helping the students develop their own identity as L2 speakers).

2.3.3 Curriculum integration of technology

For technology to have the desired effect on learning, it must be included across all levels of planning, from the needs analysis up to the creation of activities to work on all the different competences. Two aspects that are often overlooked when planning an online curriculum, program or course are learner assessment and curriculum evaluation.

In an online course (whether hybrid or technology-mediated), it is essential to assess whether learners have acquired not only the language and the sociopragmatic skills necessary for communication but also digital competences and abilities such as digital literacy, a critical understanding of online materials, as well as knowledge and understanding of technologies, as proposed by the European Union in its *Digital Education Action Plan (2021–2027)* (European Union, 2020). It is therefore important to assess whether learners are capable of performing tasks in a socially appropriate manner having reached the required level of complexity, accuracy and fluency in the language. To achieve this, it is necessary to leave behind traditional assessment methods (i.e. grammar, vocabulary and writing tests) in favor of more innovative approaches (see Chapter 10 of this book). For example, educators could opt for performance-based assessment, evaluating whether learners can use the relevant tools in an efficient and critical manner. Finally, when it comes to evaluating the curriculum, it is also important to analyze whether the tools of choice were suitable for the activities carried out, whether the way it was planned facilitated learning or whether other emerging technologies could possibly work better with the activities designed. For a guide including a material evaluation checklist, see González-Lloret (2016); for a practical example of how to evaluate an online course, see Nielson (2014).

2.3.4 Implementation

It is essential to point out that the extent to which a course is effective does not only depend on its planning and development: its

implementation is of equal importance. Once the instructor takes the reins, it is crucial to implement practices that favor interaction opportunities between the instructor and their students, as well as among the students themselves. The aim of this is to develop and maintain a sense of community, which is an essential component of online learning. According to Boettcher and Conrad (2021), this sense of community can be generated **through three types of presence**:

- **social presence**, or the connection people establish based on their personal information (tastes, practices, lifestyle, relationships, etc.);
- **teaching presence**, or educators' actions to create, guide, direct and advise students during the course;
- **cognitive presence**, or the support students receive to develop their knowledge and skills.

This sense of community can be generated online through a wide range of tools that help learners break the ice and get to know each other at a more personal level. Examples include simply letting everyone chat for a few minutes about personal topics in synchronous classes, or even encouraging the use of tools such as Padlet, Flipgrid, Twitter (Lord & Lomicka, 2014) or Instagram (Fornara & Lomicka, 2019) to make personal videos or digital stories. The COVID-19 pandemic certainly highlighted the importance of creating and maintaining a community in the AL classroom, not only for academic success but also to manage stressful situations and experiences. In online classes, it is crucial never to overlook the central role played by empathy, respect, patience and perseverance when it comes to building connections and motivating learners (Hawk *et al.*, 2002).

2.3.5 Teacher training

Integrating technology into foreign language classes opens up numerous **professional development opportunities** for instructors. However, these advances have also brought about new challenges for them since now, not only do they need to learn how to use the new technologies, but also how to generate the right conditions to promote learning (Dooly, 2018). Oftentimes, instructors do not feel capable of starting projects or providing the necessary support to learners (Vinagre Laranjeira, 2010). It can certainly be said that there is no 'one size fits all' approach to training and equipping instructors with the right skills to plan, develop and implement technology in the AL classroom. In this regard, Dooly (2018) recommends exposing instructors (or future instructors) to the design of online activities and their completion through telecollaborative work. Meanwhile, Hubbard (2022) suggests that teacher training should promote knowledge of learning

methodologies through technology, critical training in how technologies can be used to avoid the element of surprise (e.g. when faced with the latest innovations) and knowledge of technology standards that offer clear, consistent and global objectives.

Some of the techniques put forth in research for training educators to use technology suggest **reflective activities** (e.g. narratives, portfolios, diaries, forums, etc.) to understand their motivations and expectations regarding their training (Slaouti & Motteram, 2006). Several examples of reflective teaching in the context of technology can be found in the volume edited by Hubbard and Ioannou-Georgiou (2018). **Constant training** is crucial for AL instructors who use technology. It is essential to be up to date with contemporary teaching practices and new technology trends. This can be achieved through work groups, existing publications such as *CALICO Journal*, *Language Learning & Technology*, *CALL*, *ReCALL*, *System*, etc., as well as online resources such as those recommended by Vanderbilt University's Center for Teaching (<https://www.vanderbilt.edu/cdr/>) or the University of Hawai'i's Technology Innovation Center (<https://lftic.lll.hawaii.edu/blended-learning-essentials/>).

2.4 Recommendations for Practice

As mentioned previously, in order to create and implement a solid and effective course or curriculum, it is essential to consider a development model. One of the most popular ones is the ADDIE model (Branson *et al.*, 1975). As the acronym suggests, it consists of **five key elements** that correspond to the following stages: **analysis, design, development, implementation and evaluation**.

2.4.1 Analysis of the context and participants

In the first stage, the context and participants are analyzed, and the course objectives and materials are determined. This stage helps us to identify:

- **The target audience and their characteristics.** Here, it is important to keep in mind the potential limitations imposed by the participants' age. For example, many schools restrict access to the internet and the programs that learners may use. In the case of young learners, it is necessary to be aware of the principles established for the use of technology by the relevant educational authorities (e.g. US Department of Education, 2016).
- Participants' **level of access** to technology and their **digital literacy**. From a pragmatic perspective, this aspect is crucial when planning a curriculum and its activities to promote equitable participation among

all learners. Planning or developing activities that require a high-speed internet connection (e.g. the use of games, virtual environments, such as *Minecraft*, or videoconference apps, such as *Zoom*) is only possible if **all** learners have access to broadband and computers with sufficient processing capacity. Indeed, overlooking this could negatively impact vulnerable students both financially and socially.

- The **objectives of the course** and learners' **motivations to study** the language. For example, within a task-based methodology, the question would focus on discovering what tasks students will need to carry out beyond the classroom once the course or program is over. To find answers, one would not only ask the learners (who can reveal their interests but not always their needs), but also ask instructors in more advanced courses, potential employers or even parents in the case of young learners. One would also ideally consult a variety of institutional documents, such as study plans, entrance exams for higher levels or job ads.
- The **type of resources** used in the project and the **limitations** that may arise. Designing a single module or lesson is very different from creating a full course. Indeed, it requires time and people with the necessary skills and knowledge who are willing to contribute. Moreover, the resources that institutions are prepared to invest can also be one of the main factors that determine the type of course developed (Russel & Murphy-Judy, 2021).
- The **topics** and **tasks** that must be included in the curriculum. When planning a task-based curriculum, the analysis should offer information concerning: the tasks that learners must do, the language (e.g. grammatical structure, vocabulary, etc.), the sociocultural norms and the technology that mediates these tasks. In this regard, technology is dictated and determined by the task, and not the other way around.

This analysis also proves very useful when it comes to compiling authentic material, such as language samples and documents, to include in the course's activities. The Appendix at the end of this chapter provides a template that can serve as a guide.

2.4.2 Design and development

The design stage involves selecting the **type of platform and technologies** to be incorporated (according to the information collected previously), as well as designing activities to help learners navigate the platform, manage the content and learn to use the chosen technologies. In the development stage, the content planned in the previous stage is created and then implemented in the learning platform. At this point in the process, it is essential to decide on the **quantity of content** to be included, the **time planned for each activity**, the **pace** at which learners

must complete the course, as well as how much *time the instructor is expected to dedicate*.

The most important aspect to keep in mind is that the course's design must, above all, focus on **the methodological and pedagogical approach of the materials**. Oftentimes, technologies are fleeting and ever-changing. Consequently, planning and developing a curriculum based on specific technologies implies that, once they disappear (which now happens increasingly quickly), the curriculum will also be obsolete. It is essential, therefore, to start the planning phase by considering the teaching methodology, course objectives and pedagogical options (e.g. type of input, type of feedback, type of activities, etc.) that will maximize learning in a specific context, and to then select the best tools to facilitate the types of activities inherent to the said methodology.

In a **task-based methodology**, based on the target tasks identified in the initial analysis, target task types (i.e. abstractions of similar target task types) can be created. For instance, when learning how to make a reservation for a trip, restaurant or hotel, hire a car or perform other similar transactions, all these tasks can be grouped under the category 'making a reservation'. Finally, to help learners succeed at the final tasks, a series of pedagogic tasks can be developed to work on the relevant vocabulary, grammar structures, sociopragmatics, cultural aspects, etc., through the use of the necessary technologies for their completion. These pedagogical tasks should provide interaction opportunities – for example, by working in pairs or groups – and should also be organized and sequenced coherently. For a guide on how to create a task-based technology-mediated curriculum, refer to González-Lloret (2016).

For instance, a common conversation topic in most AL classes is food and restaurants. In pairs, beginner language learners could decide which restaurant to choose for the end-of-year dinner (according to the menu and customer reviews) or what shared dishes to order (by checking the menu on the restaurant's website). This only requires a basic knowledge of the relevant vocabulary and structures, such as 'I like/I don't like/I would like'. More advanced learners, on the other hand, could discuss which restaurant to go to in their area according to the reviews (in the target language) on *Yelp* or *Google*. Alternatively, they could also go to a restaurant of their choice and then write a review themselves to help the community or visitors who speak the AL.

Besides developing the materials, this stage is when both ongoing and final assessment tools should be designed, too. Of course, these should be consistent with the chosen teaching methodology. In a communication-based approach, for example, instructors can assess whether learners are able to carry out an activity fluently. In the context of task-based learning, **assessment should be performance based** to be able to assess whether learners are able to perform successfully the task

in question, as well as to evaluate the language used in terms of fluency, complexity, appropriateness and sociocultural adequacy. Finally, learners' digital skills and their ability to use technology appropriately should also be considered.

The ADDIE model suggests conducting **alpha tests** with the instructors involved in the course, followed by at least one round of post-development **beta testing** with a group of learners before starting the course and using the materials for the first time. In fact, this practice is especially recommended for courses developed exclusively online.

2.4.3 Implementation and evaluation

The last two stages are directly linked to the previous ones. This is because, in the ADDIE model, each stage must be evaluated before moving on to the next. In fact, the whole course (or module/lesson) must also be assessed once completed in order to make any necessary improvements.

According to Boettcher and Conrad (2021), there are certain **essential practices** that instructors must consider when it comes to implementing online courses, which must also be reflected in the previous planning and development stages. These essential practices include:

- keeping in mind the aspect of presence in the course (social, teaching and cognitive presence) to foster a supporting community;
- specifying what is expected of the instructor and learners regarding methods of communication and the time that learners must dedicate to the online course each week;
- striking a balance between working in large groups, in small groups and autonomously;
- implementing both synchronous and asynchronous activities;
- frequently requesting feedback to remedy any unsuccessful practices;
- providing a virtual space to post answers, ask questions, discuss and reflect;
- making use of content and resources that already exist in digital format (e.g. dictionaries, corpuses, translators, editors);
- combining the learning of essential concepts with individualized and personalized learning;
- planning solid activities to start and conclude the course;
- collecting evidence that demonstrates the students' learning throughout the course in order to analyze their progress;
- ensuring that the content and activities are aligned with the learning objectives established;
- structuring the content in a way that is clear and accessible for learners;
- designing experiences that help learners move forward in their learning journey.

2.5 Conclusion and Future Lines of Research

Planning and developing an online L2 teaching program is a very specific task that requires a set of particular, clear-cut skills. This chapter has sought to provide guidelines that can be considered to plan and develop online, hybrid or technology-mediated courses. While it may appear to be a complex task, one option is to start by planning smaller teaching units, learning sequences or modules. Moreover, it is a good idea to work as a team, including instructors/educators, researchers, programmers and publishers as far as possible. It is also advisable to collect information from learners at different points in the planning, development and implementation processes.

Although there is an increasing understanding of how to plan and develop online courses and integrate technology into the AL classroom, the speed at which technology progresses opens up a number of research opportunities. One possibility is to research cutting-edge innovations such as mobile technologies, virtual reality, sensory spaces and intelligent personal assistants such as Alexa or Siri, to discover how they can be applied to language teaching. This area already includes works such as Seedhouse's (2017) study on a kitchen equipped with sensors that enabled learners to interact with the space and learn French while cooking. Other examples include research on personal assistants such as the voice-recognition device known as Alexa (Dizon, 2020) or the study by Bibauw, François and Desmet (2019) on chatbots and the development of L2 speaking skills.

Beyond the research focused on the different available tools, more studies are needed on learning outside the classroom to complement the curriculum. It is safe to say that technology is now omnipresent in our lives; as a result, the line between what can be learned through it inside and outside the classroom is becoming increasingly blurred. Essentially, the idea is to uncover possibilities and opportunities that promote sustained, lifelong learning (Sundqvist & Sylvén, 2016).

Research should also include people who are learning an AL outside the classroom (informal learning). There is still a need for research on the type of curriculum planning and development necessary for individuals who are learning an AL online as part of their job or everyday life (for instance, immigrants, refugees and long-term foreign students). The changes brought about by the COVID-19 pandemic, which pushed education into the virtual realm, revealed the urgent need to research how we plan, develop and implement technology into AL teaching for different groups, including young children, people with limited access to technology, the elderly, and people with disabilities, among others. Without a doubt, more studies will be conducted that give a voice to the needs of these demographics (for example, see Giraldo Martínez & Ramos Carvajal, 2021).

Finally, as new technologies emerge, it will be necessary to assess their suitability when it comes to applying them to AL teaching in various contexts. Given how quickly technology evolves, this research avenue will remain ever open, and will undoubtedly require studies currently beyond even our wildest imagination.

2.6 Annotated Additional Reading

Russell, V. and Murphy-Judy, K.A. (2021) *Teaching Language Online: A Guide for Designing, Developing, and Delivering Online, Blended, and Flipped Language Courses*. Routledge.

This is a very useful guide for language instructors as it includes research-based strategies, practices and tools, as well as extra online materials and resources. While following the ADDIE model for the design of teaching materials, this guide also considers the standards proposed by the ACTFL, CEFR and WIDA.

Ziegler, N. and González-Lloret, M. (eds) (2022) *The Routledge Handbook of Second Language Acquisition and Technology*. Routledge.

This encyclopedia includes chapters about the most recent innovations for language learning and teaching and suggests ways to effectively implement them in the language classroom.

Appendix: Steps to Design a Needs Analysis

Step 1: Who has the answers? What sources of information are available?

- Instructors in more advanced courses
- Students
- Students in more advanced courses
- Students who have already completed the program
- Students who have found a job that requires them to use the L2
- Curricula for more advanced courses
- Final assessments or entrance exams for the next level
- Potential future employers
- Existing publications on similar contexts

Step 2: How can the information be obtained? What research methods will be applied?

- Interviews (they provide more detailed information but require more time, they can be conducted individually, in groups, etc.)
- Questionnaires (e.g. for current students who completed the course, instructors, parents, etc.) designed to obtain many but more superficial answers. In fact, it is good practice to base these questionnaires on the results of an initial round of interviews and conclude them with another set of subsequent interviews.

- Observation (e.g. of employees using the L2 at work, students in more advanced groups, students abroad)
- Focus groups (e.g. language instructors, employers, designers, parents)
- Documents (e.g. exams, curricula for other courses, job ads, etc.)

Step 3: What opportunities and limitations can be identified?

- The human component. Who will be working on the project? Has their regular workload been reduced or are they receiving other forms of compensation? Do they possess the skills and knowledge necessary to develop the tools, analyze the results and create reports?
- Time. How much time is available?
- Budget for course development and technologies.
- Cultural restrictions (social and institutional). Are there any cultural restrictions that make it difficult to ask questions or obtain data? Who must authorize the analysis? Who should be involved and who should not?

Step 4: How will the information collected be used?

- Will it be used for anything beyond the creation of the curriculum?
- Who will review/see the results?
- Does a report need to be drafted? Should it include qualitative data? Will it be published? Does the institution need to authorize its completion and dissemination?

References

- Allen, M., Mabry, E., Mattrey, M., Bourhis, J., Titsworth, S. and Burrell, N. (2004) Evaluating the effectiveness of distance learning: A comparison using meta-analysis. *Journal of Communication* 54 (3), 402–420. <https://doi.org/10.1111/j.1460-2466.2004.tb02636.x>.
- Anderson, H.M. (2018) *Blended Basic Language Courses: Design, Pedagogy, and Implementation*. Routledge.
- Asarta, C.J. and Schmidt, J.R. (2017) Comparing student performance in blended and traditional courses: Does prior academic achievement matter? *The Internet and Higher Education* 32, 29–38. <https://doi.org/10.1016/j.iheduc.2016.08.002>.
- Bibauw, S., François, T. and Desmet, P. (2019) Discussing with a computer to practice a foreign language: Research synthesis and conceptual framework of dialogue-based CALL. *Computer Assisted Language Learning* 32 (8), 827–877. <https://doi.org/10.1080/09588221.2018.1535508>.
- Boettcher, J.V. and Conrad, R. (2021) *The Online Teaching Survival Guide: Simple and Practical Pedagogical Tips* (3rd edn). Jossey-Bass.
- Branson, R.K., Rayner, G.T., Cox, J.L., Furman, J.P., King, F.J. and Hannum, W.H. (1975) *Interservice Procedures for Instructional Systems Development*. US Army Training and Doctrine Command.
- Chen, J.C. and Brown, K.L. (2012) The effects of authentic audience on English as a second language (ESL) writers: A task-based, computer-mediated approach. *Computer Assisted Language Learning* 25 (5), 435–454. <https://doi.org/10.1080/09588221.2011.606224>.

- Çiftçi, E.Y. and Savaş, P. (2018) The role of telecollaboration in language and intercultural learning: A synthesis of studies published between 2010 and 2015. *ReCALL* 30 (3), 278–298. <https://doi.org/10.1017/S0958344017000313>.
- Dizon, G. (2020) Evaluating intelligent personal assistants for L2 listening and speaking development. *Language Learning & Technology* 24 (1), 16–26. <https://doi.org/10125/44705>.
- Dooly, M.A. (2018) ¡Flipo con tus clases!: La formación de profesores en la didáctica de lenguas a través de clases invertidas y telecolaboración. In M. González-Lloret and M. Vinagre Laranjeira (eds) *Comunicación mediada por tecnologías: Aprendizaje y enseñanza de la lengua extranjera* (pp. 167–182). Equinox Publishing.
- European Union (2020) *Digital Education Action Plan (2021–2027): Resetting Education and Training for the Digital Age*. Directorate-General for Education Youth, Sport and Culture, European Commission.
- Fornara, F. and Lomicka, L. (2019) Using visual social media in language learning to investigate the role of social presence. *CALICO Journal* 36 (3), 184–203. <https://doi.org/10.1558/cj.37205>.
- Furstenberg, G., Levett, S., English, K. and Maillet, K. (2001) Giving a virtual voice to the silent language of culture: The Cultura Project. *Language Learning & Technology* 5 (1), 55–102. <https://doi.org/10125/25113>.
- Giraldo Martínez, Z.L. and Ramos Carvajal, S.A. (2021) Teaching English online to students with autism spectrum disorder (ASD) and Down syndrome (DS) during the COVID-19 pandemic. *Íkala. Revista de Lenguaje y Cultura* 26 (3), 715–730. <https://doi.org/10.17533/udea.ikala.v26n3a13>.
- González-Lloret, M. (2016) *A Practical Guide to Integrating Technology into Task-Based Language Teaching*. Georgetown University Press.
- González-Lloret, M., Canals, L. and Pineda Hoyos, J.E. (2021) Role of technology in language teaching and learning amid the crisis generated by the COVID-19 pandemic. *Íkala. Revista de Lenguaje y Cultura* 26 (3), 477–482. <https://doi.org/10.17533/udea.ikala.v26n3a01>.
- Grgurović, M., Chapelle, C.A. and Shelley, M.C. (2013) A meta-analysis of effectiveness studies on computer technology-supported language learning. *ReCALL* 25 (2), 165–198. <https://doi.org/10.1017/S0958344013000013>.
- Gutiérrez, B.F. and O’Dowd, R. (2021) Virtual exchange: Connecting language learners in online intercultural collaborative learning. In T. Beaven and F. Rosell-Aguilar (eds) *Innovative Language Pedagogy Report* (pp. 17–22). Researchpublishing.net.
- Hawk, K., Cowley, E.T. and Hill, J. (2002) The importance of the teacher/student relationship for Māori and Pasifika students. *Set: Research Information for Teachers* 3, 44–49. <https://doi.org/10.18296/set.0716>.
- Hodges, C., Moore, S., Lockee, B., Trust, T. and Bond, A. (2020) The difference between emergency remote teaching and online learning. *Educuse Review*, March 27.
- Hubbard, P. (2022) Bridging the gap between theory and practice: Technology and teacher education. In N. Ziegler and M. González-Lloret (eds) *The Routledge Handbook of Second Language Acquisition and Technology* (pp. 21–35). Routledge.
- Hubbard, P. and Ioannou-Georgiou, S. (eds) (2018) *Teaching English Reflectively with Technology*. IATEFL.
- Jordano de la Torre, M. (2011) La enseñanza-aprendizaje de la competencia oral en lengua extranjera en el contexto de la educación abierta y a distancia: De la casete a la interacción virtual. *Revista Iberoamericana de Educación a Distancia* 14 (1), 15–39. <https://doi.org/10.5944/ried.1.14.798>.
- Kramsch, C., Van Ness, F. and Lam, E.W.S. (2000) Authenticity and authorship in the computer-mediated acquisition of L2 literacy. *Language Learning & Technology* 4 (4), 78–104. <http://dx.doi.org/10125/25101>.
- Long, M. (2015) *Second Language Acquisition and Task-Based Language Teaching*. Wiley–Blackwell.

- Lord, G. and Lomicka, L. (2014) Twitter as a tool to promote community among language teachers. *Journal of Technology and Teacher Education* 22 (2), 187–212.
- Malissa, M.M. (2018) Technology and language – What works and what does not: A meta-analysis of blended learning research. *The Journal of Asia TEFL* 15 (2), 365–382. <https://doi.org/10.18823/asiatefl.2018.15.2.7.365>.
- Manchón, R.M. (2011) Situating the learning-to-write and writing-to-learn dimensions of L2 writing. In R.M. Manchón (ed.) *Learning-to-Write and Writing-to-Learn in an Additional Language* (pp. 3–14). John Benjamins.
- Muñoz-Basols, J. and Gironzetti, E. (2019) Expresión oral. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2* (pp. 198–212). Routledge.
- Nielson, K.B. (2014) Evaluation of an online, task-based Chinese course. In M. González-Lloret and L. Ortega (eds) *Technology-Mediated TBLT: Researching Technology and Tasks* (pp. 295–321). John Benjamins.
- Rovai, A. and Jordan, H. (2004) Blended learning and sense of community: A comparative analysis with traditional and fully online courses. *International Review of Research in Open and Distance Learning* 5 (2). <https://doi.org/10.19173/irrodl.v5i2.192>.
- Russell, V. and Murphy-Judy, K.A. (2021) *Teaching Language Online: A Guide for Designing, Developing, and Delivering Online, Blended, and Flipped Language Courses*. Routledge.
- Seedhouse, P. (ed.) (2017) *Task-Based Language Learning in a Real-World Digital Environment: The European Digital Kitchen*. Bloomsbury.
- Slaouti, D. and Motteram, G. (2006) Reconstructing practice: Language teacher education and ICT. In P. Hubbard and M. Levy (eds) *Teacher Education in CALL* (pp. 81–97). John Benjamins.
- Storch, N. (2016) Collaborative writing. In R.M. Manchón and P.K. Matsuda (eds) *Handbook of Second and Foreign Language Writing* (pp. 387–406). Mouton de Gruyter.
- Sundqvist, P. and Sylvén, L.K. (2016) *Extramural English in Teaching and Learning: From Theory and Research to Practice*. Palgrave Macmillan.
- Sydorenko, T., Smits, T.F.H., Evanini, K. and Ramanarayanan, K. (2019) Simulated speaking environments for language learning: Insights from three cases. *Computer Assisted Language Learning* 32 (1–2), 17–48. <https://doi.org/10.1080/09588221.2018.1466811>.
- US Department of Education (2010) *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. Office of Planning, Evaluation, and Policy Development, US Department of Education.
- US Department of Education (2016) *Early Learning and Educational Technology Policy Brief*. Office of Educational Technology, US Department of Education.
- Vinagre Laranjeira, M. (2010) *Teoría y práctica del aprendizaje colaborativo asistido por ordenador*. Síntesis.
- Vo, H.M., Zhu, C. and Diep, N.A. (2017) The effect of blended learning on student performance at course level in higher education: A meta-analysis. *Studies in Educational Evaluation* 53, 17–28. <https://doi.org/10.1016/j.stueduc.2017.01.002>.

3 Virtual Teachers' Beliefs, Attitudes and Competence

Inmaculada Gómez Soler and Marta Tecedor

3.1 Introduction and Key Concepts

Understanding the **beliefs** and **attitudes** of teachers regarding new pedagogical models or tools in times of crisis, reform or change is essential not only for assessing teaching quality but also for designing effective training initiatives. As educators, we are ultimately 'executive decision makers of the curriculum' (Barnard & Burns, 2012: 2). Consequently, we have a significant impact on whether reforms are implemented successfully or not.

Recent studies on foreign language teachers' attitudes towards the use of technology in the classroom have yielded contradictory results. On the one hand, some found a certain level of reluctance among teachers (e.g. Gironzetti *et al.*, 2020), while others report a positive attitude (e.g. Petrovich, 2018; Taraneko, 2014). That being said, it is important to consider that the majority of prior studies are based on tightly controlled initiatives associated with specific tools, carried out within a single institution or a homogeneous group of educators and schools, or are the product of short-term interventions.

The first few months of the pandemic forced the vast majority of educators to switch to an online teaching model practically overnight. However, this created a unique opportunity to explore both their beliefs and attitudes regarding virtual environments, as well as their digital competence, on a very large scale.

With regard to teachers' beliefs and attitudes, these aspects have been researched in the context of educational psychology, specifically within the area of **teacher cognition**, which includes the study of both conscious and unconscious knowledge repertoires. Initially, Borg (2003: 81) defined this term as 'what teachers think, know and believe'. Today, however, the concept has been expanded to include constructs such as teachers' attitudes, identities and emotions, as they too are part of

the unobservable dimension of teaching (Borg, 2012). Although in the past this affective dimension was perhaps viewed as marginal, it is now recognized as an essential component in the teaching–learning process, since it is directly related to what takes place in the classroom. Within this area, the study of teachers’ beliefs and attitudes – principles that guide and define our role as educators (Borg, 2003, 2006) – has generated growing interest in the field of educational psychology over the past few decades (Song, 2015).

Even though the terms ‘beliefs’ and ‘attitudes’ are independent constructs – the concept of beliefs refers to how individuals interpret reality without implying a positive or negative assessment (Richardson, 1996), while the concept of attitudes adds an evaluative component (Sarnoff, 1970) – they are often used interchangeably (Pajares, 1992). In line with this trend, this chapter also treats them as a single construct. According to Borg (2003), teachers’ beliefs and attitudes are both influenced by a variety of factors, including each educator’s personality, their own experiences as learners, and the training they have received. Consequently, this chapter explores different individual factors – type of institution, years of teaching experience, training, etc. – to determine which of them predict positive attitudes and beliefs regarding online teaching.

The 2020 pandemic also highlighted both the need for **digital competence among teachers** and the importance of promoting high-quality teaching in virtual environments. Defined in the *European Profiling Grid* (Mateva *et al.*, 2013: 10) as ‘the teacher’s competence level when it comes to implementing digital content (text, graphics, audio and video) and tools into their teaching’, digital competence has attracted growing interest from researchers and educational organizations around the world in recent years. Within Europe, for example, the *European Framework for the Digital Competence of Educators (DigCompEdu)* (Redecker, 2017) describes the digital competences that educators must have all the way from early years education up to university and vocational training. Additionally, it provides a framework to promote the development of these digital competences. In the United States, ACTFL (American Council on the Teaching of Foreign Languages) has developed the *21st Century Skills Map* (ACTFL, 2011), which establishes how these so-called ‘21st century skills’, including **digital and technological literacy**, can be integrated into foreign language teaching. However, despite the existence of these roadmaps, the pandemic revealed a lack of digital competences among language teachers. Consequently, it also highlighted the need for relevant training programs to help teachers gain the necessary skills in a sustainable and consistent way (Paesani, 2020). The goal should be to offer teachers training opportunities that enable them to reconsider their own beliefs and modify them where necessary (Chao, 2015; Ertmer, 2005).

To contribute to the design of training initiatives for the development of educators' digital competence, this chapter analyzes teachers' beliefs and attitudes with regard to the virtual classroom. This analysis is based on identifying any needs and shortcomings expressed by the teaching staff. To this end, the chapter is structured as follows. Section 3.2 covers the most relevant studies conducted over the last two decades on teachers' beliefs, attitudes and competences regarding technology and online teaching. Section 3.3 presents our own contribution to this field based on a quantitative study. In section 3.4, specific recommendations are provided regarding how to improve pedagogical competences in the virtual classroom while section 3.5 concludes the chapter by offering potential future lines of research.

3.2 State of the Art

3.2.1 Teachers' beliefs and attitudes regarding virtual teaching

Language teachers' beliefs and attitudes regarding online teaching is a topic that has generally received little attention from researchers to date (Gironzetti *et al.*, 2020). While there are several studies on teachers' use of technology tools (forums, chats, apps, etc.), research on their beliefs and attitudes towards hybrid or virtual teaching was scant before the pandemic. Generally speaking, it can be said that, before the pandemic, there was a certain degree of reluctance among most teachers when it came to online teaching. According to a survey conducted by *Inside Higher Ed* in 2018, which included teachers of all subjects, nearly 50% believed that in-person teaching was more effective than its virtual counterpart (Jaschik & Lederman, 2018: 27).

Similar reservations about online education have also been detected among language teachers. For example, Comas-Quinn (2011) used a survey to study the reactions of 20 teachers after receiving training and teaching part of a hybrid course. The participants pointed out three main issues associated with this method of teaching: **technology-related difficulties**; **poor integration of online activities** with the course's other components; and a **higher workload**. The author of the study indicated that the rapid transition to this model made teachers feel overwhelmed, compelling them to focus on learning how to use the tools needed for synchronous classes. Consequently, they neglected the asynchronous component, as they did not consider it essential. Comas-Quinn concluded that these negative attitudes towards technology are related to **traditional perceptions** of language teaching and the respective roles of teachers and learners. The author argued that for training to be effective it should help teachers accept identity-related changes associated with shifts in the pedagogical model. Moreover, this training should not only be based on the acquisition of technical knowledge or on the ability to

use specific tools: rather, it should focus on helping teachers develop a critical attitude towards technology and learn to explore independently the functional possibilities of any resource they may come across in the future (Chao, 2015).

In a study by Canals and Al-Rawashdeh (2019), the authors examined the perceptions of 10 teachers after receiving training and teaching an English course offered online for the first time. Through a questionnaire and interviews with some of the participants, it was concluded that, in general, educators had positive attitudes towards online teaching. That said, they did perceive greater potential for developing receptive skills (reading and listening) compared to productive skills (speaking and writing) in this format. Regarding the training received, although the participants were satisfied overall, they did say that they would have preferred a more language-teaching specific approach. Finally, they also mentioned the importance of **training learners** and receiving continuous upskilling opportunities and support.

Lastly, Gironzetti, Lacorte and Muñoz-Basols (2020) studied the perceptions of teachers ($n = 8$) and learners ($n = 44$) in hybrid and online language courses. Although both groups felt comfortable using technology tools, teachers reported lower satisfaction ratings due to the **challenge of developing a personal relationship** with learners, **the inability to discuss ideas, concepts and points of view**, and the **absence of a sense of community**. In light of these results, the authors suggest that teachers should receive training to encourage social interaction in virtual environments, with a focus on the characteristics and affordances of technology instead of trying to recreate the kind of interaction that takes place in face-to-face classes.

3.2.2 Teachers' competences in the virtual classroom

When thinking about how to train educators for online teaching, it is important to consider, firstly, **what competences** teachers need and, secondly, **how the training should be designed** in order to be effective. Without doubt, online teaching requires a different set of skills compared to its traditional counterpart. Several models have attempted to capture these skills, with one example being the *DigCompEdu* model (Redecker, 2017). In the field of foreign language teaching, among the most influential studies is the one conducted by Hampel and Stickler (2005), which presents a pyramid of the **seven skills** that teachers need to master for online teaching. The base of the pyramid, which as a whole reflects the progressive acquisition of these skills, represents 'basic Information and Communication Technology (ICT) competence'. This is followed by 'specific technical competence for the software', 'dealing with constraints and possibilities of the medium' and 'online socialization'. The next skill up involves 'facilitating communicative

competence', followed by the penultimate level of the pyramid, which represents 'creativity and choice'. Finally, the last skill, which demonstrates mastery of online teaching, consists in developing one's 'own style'.

Despite the existence of frameworks such as this one, which identify the skills to be developed in training programs, the upskilling opportunities that teachers actually receive are not always as effective or even sufficient. For example, in a study on trainee Spanish teachers in the US, Gómez Soler and Tecedor (2018) concluded that technology-related training mainly focused on how to use tools to practice formal aspects of the language, as well as tools such as PowerPoint. Consequently, this suggests that digital competence upskilling opportunities are still in their early stages. On comparing training in language, culture and technology, it was noted that technology training was perceived as less effective and transferable to advanced-level courses than language training. Conversely, it was considered more effective and transferable than cultural training.

In the context of the COVID-19 health crisis, Paesani (2020) described the professional development received by teachers in the first months of the pandemic as survival training. According to the author, although this training played a key role in preventing the complete disruption of classes, it should be understood as an emergency measure rather than a model to be replicated. This is because it is neither a consistent nor a sustainable approach in the long term. Paesani insists that effective professional development should focus on clear objectives, and that it should be collaborative, experiential, scaffolded and sustainable. Moreover, exploring the beliefs and attitudes of teachers when it comes to virtual teaching and the training received during the health crisis can serve as a starting point to suggest initiatives in line with the characteristics outlined by authors such as Comas-Quinn (2011) and Paesani (2020). In section 3.3 of this study, these beliefs and attitudes are analyzed to offer a set of recommendations for practice, which are presented in section 3.4.

3.3 Contributions of Current Research

This case study covers a significant gap in the area of Spanish teachers' beliefs, attitudes and training, based on two main contributions. Firstly, the participants practice their profession in a wide variety of contexts, from both a geographical and educational point of view. In turn, this allows us to draw broader conclusions compared to previous research, which has mainly involved smaller-scale studies focused on a specific group of teachers at a single institution in one geographical region. Secondly, previous studies are, overall, of a qualitative nature, and those that do include a quantitative analysis go

no further than simply describing the data obtained (Borg, 2012). Our research, on the other hand, uses a combination of inferential statistical techniques, specifically latent class analysis (LCA) and multinomial logistic regression. This allows us to go beyond merely describing trends and to draw conclusions that apply to the entire population; in this case, Spanish as a Foreign Language (ELE, for its acronym in Spanish) teachers.

The study is guided by the following research questions:

- (1) What attitudes/beliefs do ELE teachers have in terms of online teaching?
- (2) What factors predict a positive attitude?
- (3) What training did they receive during the first few months of the pandemic?
- (4) What challenges did they come across during the transition to online teaching?

3.3.1 Questionnaire on beliefs and attitudes

In order to gather information about teachers' experiences and beliefs in terms of online teaching during the first few months of the pandemic, we designed an electronic **survey** (see the Appendix at the end of this chapter) with the following sections: (A) demographic information, (B) challenges, (C) training for online teaching, and (D) beliefs about online teaching. The last section consisted of 19 questions to be rated on a 5-point Likert scale, with answers ranging from 'strongly agree' to 'strongly disagree'. It also included the following constructs: enjoyment of online teaching; self-efficacy in virtual environments; effectiveness of online teaching; transferability of the practices applied; and effectiveness of the training received.

3.3.2 Data collection

Between June and August 2020, the survey was disseminated via social media in ELE teacher groups, mailing lists from associations of Spanish teachers and Hispanists in various countries, as well as via emails to schools, universities and offices of the Cervantes Institute.

3.3.3 Participants

A total of 241 Spanish educators in 39 countries across five continents completed the survey. The number of participants per country was as follows: Argentina, Austria, Chile, Colombia, Finland, Ghana, India, Indonesia, Norway, Dominican Republic, Romania, South Africa,

Table 3.1 Characteristics of the study participants

<i>Institution</i>	
Elementary and secondary	32.36% (<i>n</i> = 78)
Language school	36.51% (<i>n</i> = 88)
University	31.12% (<i>n</i> = 75)
<i>Years teaching Spanish</i>	
1–5 years	26.14% (<i>n</i> = 63)
6–15 years	32.78% (<i>n</i> = 79)
More than 15 years	41.07% (<i>n</i> = 99)
<i>Years teaching Spanish online</i>	
0 years	68.87% (<i>n</i> = 166)
1–5 years	19.50% (<i>n</i> = 47)
6–15 years	7.05% (<i>n</i> = 17)
More than 15 years	4.56% (<i>n</i> = 11)
<i>Technology-related training received before the pandemic</i>	
Yes	34.02% (<i>n</i> = 82)
No	65.97% (<i>n</i> = 159)
<i>Technology-related training received during the pandemic</i>	
Yes	68.04% (<i>n</i> = 164)
No	31.95% (<i>n</i> = 77)

Türkiye (1); Canada, Portugal (2); Belgium, Japan, Greece, Tunisia (3); Bulgaria, Jordan, France, Hungary, New Zealand, Poland, not reported (4); Morocco, Russia, the Netherlands (5); Australia, China, Italy, Czech Republic (6); Brazil (7); Spain (8); Algeria (10); Germany (15); Ireland (22); United Kingdom (25); United States (58).

Table 3.1 shows the distribution of participants according to the type of institution, years of experience teaching Spanish and years of experience teaching Spanish online.

As can be seen, our sample is balanced in terms of educational level and Spanish teaching experience. While they did have professional development opportunities during the pandemic, most of the participants had never taught online nor received any training related to virtual education before then. With regard to the participants' geographical distribution, 39 countries are represented, although some, such as the United States, the United Kingdom and Ireland, are more prominently featured in the sample.

3.3.4 Data analysis

Once the data had been collected, the answers were coded. For the questions based on the Likert scale, we assigned a rating from 1 ('strongly disagree') to 5 ('strongly agree') to all the answers. Then, to

determine the underlying structure of teachers' beliefs about online teaching, we performed an LCA. This statistical procedure models the relationships between observed variables (section D) and identifies the number of latent classes that best describes the relationship between them (Garson, 2009); in other words, the LCA detects significant trends and classifies the participants into groups based on the probability that they exhibit a similar response pattern in their survey answers (Monroy *et al.*, 2010). The analysis generally estimates several models that are compared through two goodness-of-fit measures, namely the Bayesian information criterion (BIC) and the Akaike information criterion (AIC). These two measures indicate a better fit to the data the lower their values. Once the model that best described the data had been identified, we used a multinomial logistic regression to determine which of the demographic variables (institution, years teaching Spanish, years teaching online) and which of the variables related to the training received (before and after the pandemic) predicted a positive attitude towards online teaching. Finally, we performed a descriptive analysis to examine the content of the training received during the first few months of the pandemic and the challenges faced by the participants.

3.3.5 Results

The results of the LCA generated three potential models: a 3-class model, a 4-class model, or a 5-class model. The AIC and BIC indicators yielded contradictory results: the AIC selected the 5-class model, while the BIC selected the 3-class one, as illustrated in Table 3.2.

Faced with this contradiction, the criterion of conceptual interpretability was used to identify the most appropriate and economical model: in other words, the model with the fewest classes. On using this criterion, the 3-class model was not only easier to interpret but it was also the one where all the groups had a high membership percentage. That is, the model accurately classified 96.69% of the participants based on their attitude towards online teaching: Negative Attitude Class (NegAC) ($n = 96$); Neutral Attitude Class (NAC) ($n = 99$); and Positive Attitude Class (PAC) ($n = 46$).

As mentioned previously, the questions related to beliefs about online teaching included five constructs (enjoyment, self-efficacy, effectiveness

Table 3.2 Estimation of models

	AIC	BIC
3 classes	11,857.399	12,658.902
4 classes	11,705.994	12,775.826
5 classes	11,609.875	12,948.037

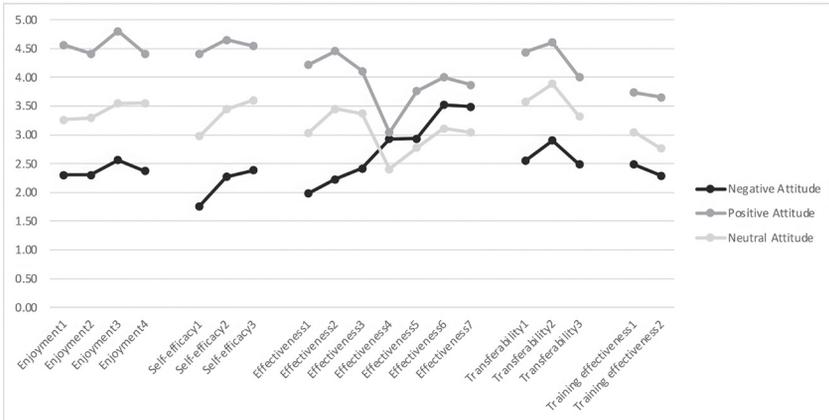


Figure 3.1 The 3-class model

of online teaching, transferability and effectiveness of the training received) that participants rated on a scale from ‘strongly agree’ (5) to ‘strongly disagree’ (1). As shown in Figure 3.1, all three classes present similar answer profiles but at different points along the scale. On average, teachers with a negative attitude rated the questions between 2 and 2.5 (‘disagree’), teachers with a neutral attitude answered between 3 and 3.5 (‘neither agree nor disagree’), while those with a positive attitude rated the questions between 4 and 4.5 (‘agree’). Nonetheless, it is worth noting that the answers to some of the questions related to the ‘effectiveness of online teaching’ construct (4 to 7) deviated from this pattern. The average of these answers among participants with a negative attitude rises to 3.5, suggesting that they struggled more with beginner levels (question 4). This also reveals that they considered oral skills (question 5) to be the most affected in online teaching, followed by listening comprehension (question 6) and writing (question 7). Conversely, in the other two groups a significant drop can be observed in question 4, suggesting that participants in these two groups did not experience greater difficulties when teaching beginner levels. As for the questions related to specific skills (questions 5–7), the mean of the answers drops slightly in both cases, but remains within the average for each group. This indicates that, unlike participants with a negative attitude, these groups did not face greater challenges when it came to teaching a specific skill.

The results of the multinomial logistic regression revealed that the ‘institution’ and ‘training’ (before and after the pandemic) variables were predictive factors in the model, while ‘years teaching Spanish’ and ‘years teaching online’ were not significant predictors for any of the classes. The results for each of the independent variables that proved significant

Table 3.3 Predictive probabilities

	<i>NegAC</i>		<i>NAC</i>		<i>PAC</i>	
	Probability	CI	Probability	CI	Probability	CI
<i>Institution</i>						
Elementary and secondary	0.55	0.46–0.63	0.37	0.27–0.46	0.07	0.02–0.12
Language school	0.13	0.07–0.19	0.55	0.46–0.65	0.30	0.22–0.38
University	0.54	0.46–0.63	0.28	0.18–0.37	0.17	0.11–0.23
<i>Years teaching</i>						
1–5 years	0.34	0.26–0.43	0.46	0.35–0.57	0.19	0.11–0.27
6–15 years	0.41	0.33–0.49	0.38	0.28–0.47	0.20	0.13–0.27
>15 years	0.41	0.34–0.48	0.40	0.32–0.48	0.18	0.12–0.23
<i>Years teaching online</i>						
0 years	0.42	0.36–0.47	0.42	0.36–0.49	0.15	0.10–0.19
1–5 years	0.40	0.29–0.51	0.31	0.19–0.44	0.27	0.18–0.37
6–15 years	0.23	0.07–0.39	0.47	0.25–0.69	0.29	0.10–0.48
>15 years	0.27	0.09–0.45	0.45	0.20–0.70	0.27	0.08–0.46
<i>Training before</i>						
Yes	0.10	0.23–0.37	0.38	0.28–0.47	0.51	0.24–0.69
No	0.44	0.39–0.50	0.42	0.36–0.49	0.12	0.08–0.16
<i>Training during</i>						
Yes	0.43	0.37–0.48	0.39	0.33–0.46	0.17	0.12–0.21
No	0.32	0.25–0.39	0.44	0.34–0.54	0.23	0.15–0.30

in terms of relative risk ratio and predictive probability are outlined in Table 3.3, where the significant comparisons in the regression are highlighted in bold.

The results of the analysis revealed that language school teachers stood out from the rest by exhibiting mainly neutral attitudes. On the other hand, elementary, secondary and university educators expressed negative, neutral and positive attitudes, in that order. Participants who worked at language schools had a greater relative risk ratio of belonging to the NAC compared to the NegAC or the PAC. The results of the Bonferroni post hoc test showed that language school teachers were considerably different from those who worked at elementary or secondary schools (RRR = 0.25; $z = -2.66$; $p = 0.01$; CI = 0.07–0.8) and universities (RRR = 0.18; $z = 2.72$; $p = 0.01$; CI = 1.28–12.8). The analysis did not generate significant differences between elementary and secondary teachers compared to university professors (RRR = 1.01; $z = 0.03$; $p = 1.00$; CI = 0.37–2.76). On calculating the predictive probability of belonging to one of the three classes, the results revealed that language school teachers had a probability of 0.55 of being assigned to the NAC, compared to a probability of 0.3 and 0.13 when it came to the PAC and the NegAC, respectively. As for elementary and secondary

teachers, they had a predictive probability of 0.55 of being assigned to the NegAC, and a probability of 0.37 and 0.07 when it came to the NAC and the PAC, respectively. University professors had similar probabilities: 0.54 for the NegAC, 0.28 for the NAC and 0.17 for the PAC.

With regard to pre-pandemic professional development, the results of the analysis showed that teachers who received training for online teaching before the onset of the health crisis exhibited a more positive attitude towards this model. On the other hand, teachers who did not receive prior training mainly expressed negative and neutral attitudes. Participants who received training before the pandemic had a greater relative risk ratio of belonging to the PAC, compared to the NAC or the NegAC. The results of the Bonferroni post hoc test indicated that participants who received training before the pandemic were considerably different from those who had not ($RRR = 3.14$; $z = 2.34$; $p = 0.01$; $CI = 1.2-8.23$). On calculating the predictive probability of belonging to one of the three classes, the results revealed that participants who did receive training before the pandemic had a predictive probability of 0.51 of being assigned to the PAC, compared to 0.38 and 0.10 when it came to being assigned to the NAC or the NegAC, respectively. As for participants who had not received training before the pandemic, they had a predictive probability of 0.44 of being assigned to the NegAC, compared to 0.42 for the NAC and 0.12 for the PAC.

For the 'training during the pandemic' variable, the results of the analysis showed that teachers who received training during the first few months of the crisis mainly exhibited negative attitudes, while teachers who did not receive any expressed neutral, negative and positive attitudes, respectively. Participants who received training during the first few months had a greater relative risk ratio of belonging to the NegAC or the NAC, compared to the PAC. The results of the Bonferroni post hoc test exposed significant differences between the participants who received training during the pandemic and those who did not ($RRR = 0.24$; $z = -2.29$; $p = 0.02$; $CI = 0.07-0.81$). On calculating the predictive probability of belonging to one of the three classes, the results revealed that participants who did receive training in the first few months of the pandemic had a predictive probability of 0.43 of being assigned to the NegAC, compared to 0.39 for the NAC and 0.17 for the PAC. As for participants who did not receive training in those initial months, they had a predictive probability of 0.44 of being assigned to the NAC, compared to 0.32 and 0.23 when it came to the NegAC and the PAC, respectively.

Finally, we examined the content of the training received during the first few months of the pandemic and the challenges faced by the participants. As shown in Figure 3.2, a higher percentage of teachers from the PAC reported that they received training in the different categories, compared to teachers from the NegAC and the NAC. The

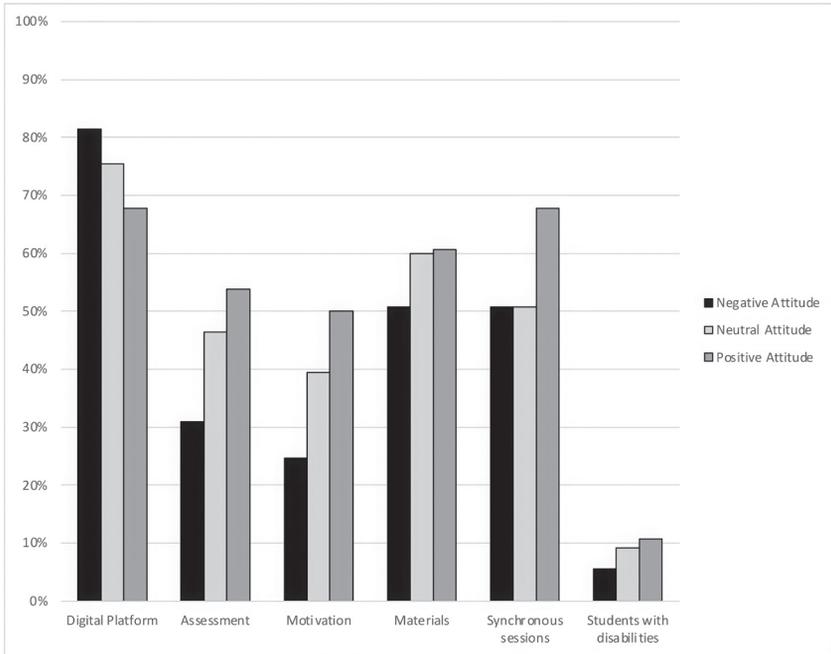


Figure 3.2 Training content in the first few months of the pandemic

‘digital platform’ category is the only exception to this trend. Here, 80% of teachers from the NegAC reported that they received training, compared to 75.38% of teachers from the NAC and 68% of those from the PAC. The results in the ‘assessment’, ‘motivation’ and ‘synchronous sessions’ categories are of particular interest due to the contrast observed among the three classes. In these categories, the difference is approximately 20% between the PAC and the NegAC. As for the PAC and the NAC, it is around 10% for the first two categories and 20% for the third. These results indicate that the training received by teachers who expressed negative attitudes focused primarily on the basics of online teaching (e.g. how to navigate virtual platforms). Conversely, a higher percentage of teachers with neutral and positive attitudes received training on more complex aspects (e.g. how to manage synchronous sessions, create effective materials, assess and motivate learners). Indeed, these are essential not only to successfully manage an online class, but also to offer a high-quality education in the virtual realm.

Regarding the challenges faced by the participants, the trend in this area is clear, as shown in Figure 3.3. The percentage of teachers with a negative attitude who reported experiencing difficulties in the different categories is higher in nearly all cases, followed by teachers with a

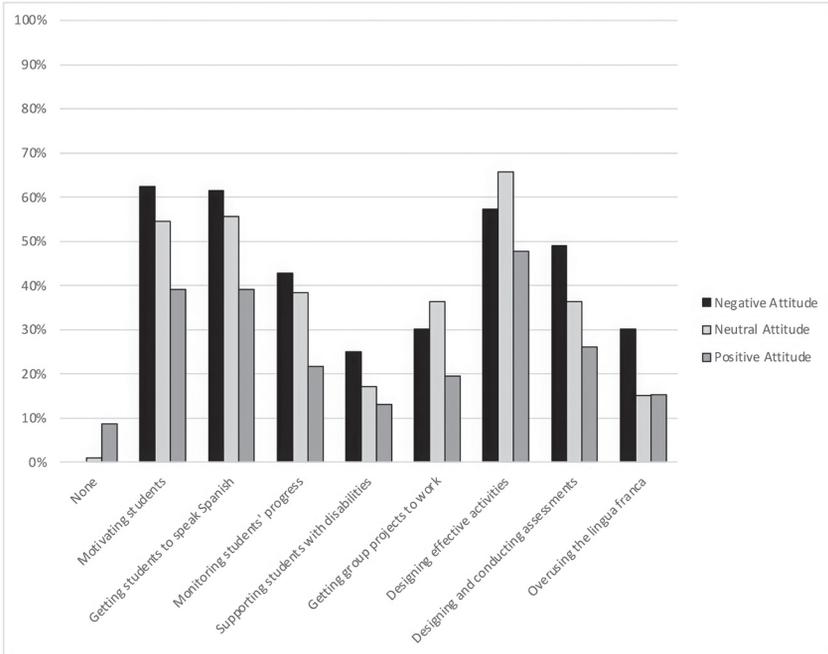


Figure 3.3 Challenges faced by educators at the beginning of the pandemic

neutral attitude. The lowest percentage in this area corresponds to teachers with a positive attitude. Of particular note are the challenges of ‘motivating the students’ and ‘getting the students to speak Spanish in synchronous sessions’: 60% of teachers from the NegAC reported facing difficulties here, followed by 55% and 40% of those from the NAC and the PAC, respectively. The challenge of ‘designing effective online activities’ also deserves a mention, since a high percentage of participants in the NAC (66%) and the PAC (48%) reported struggling in this area.

These results reveal that although, as expected, teachers who expressed negative attitudes faced more challenges than teachers in the other classes, there are also certain difficulties experienced by educators across the board, even those who received training in these areas. Consequently, these findings make it possible to identify aspects that require special attention when designing future training courses.

3.3.6 Discussion

The aim of this study was to explore teachers’ beliefs and attitudes when it comes to online teaching, to determine their level of digital

competence and identify how future training courses can be improved. This section revisits the initial research questions, to answer and interpret them based on the data collected.

The first question focused on the attitudes and beliefs of ELE teachers regarding online teaching. Our data show that 39.8% of teachers expressed a negative attitude, 42.07% had a neutral attitude and 19.08% had a positive attitude. These results represent a slight evolution compared to the findings of the *Inside Higher Ed* survey (Jaschik & Lederman, 2018), which concluded that 50% of teachers had certain reservations about online teaching.

The second question explored what factors predicted a positive attitude towards online teaching. Our analysis reveals that, although years of experience teaching in-person or online do not predict attitude, the type of institution and having received training before teaching online do predict a positive attitude. Meanwhile, the training received during the pandemic had a negative impact on teachers' attitudes towards online teaching.

Concerning the type of institution, overall language school teachers exhibited more positive attitudes compared to elementary, secondary and university educators. There may be several reasons for this difference: students' motivation (which tends to be greater at such schools, since they sign up voluntarily), the number of students per class (which is normally lower than at other types of institutions) and the availability of reliable and consolidated platforms (such as the Cervantes Institute's *Aula Virtual de Español* [AVE]).

With regard to training before the pandemic, the fact that it predicted more positive attitudes not only reveals the need for professional development to be staged and sustainable, as argued by Paesani (2020), but also that it can be related to the importance of providing the scaffolding necessary to drive the identity-related changes discussed by Comas-Quinn (2011). It is crucial to recall that a transformation of this magnitude requires, on the one hand, a true understanding of the pedagogical possibilities of technology and, on the other, the acceptance of new roles. Time and reflection are both key to these processes. Conversely, training during the pandemic predicted negative attitudes, which is consistent with the observations made by Paesani (2020) regarding the ineffectiveness of professional development for survival. The results show that this kind of training focused on how to manage virtual platforms (e.g. *Zoom*, *Moodle*, *Google Classroom*) in an attempt to transfer in-person teaching to a virtual environment. That being said, virtual education cannot simply be a copy of an in-person class: rather, it needs to be designed and developed in line with its own principles, taking into account both the potential offered by these virtual spaces as well as their limitations (Gironzetti *et al.*, 2020). Effective professional development needs to focus on underlying pedagogical

principles, moving the spotlight away from specific tools (Chao, 2015). In addition, one of the problems with the emergency training initiatives at the beginning of the pandemic was perhaps the large amount of information that had to be assimilated in a short period of time. Now that the initial crisis is over, gradual, progressive technology training is the key to success.

The third and fourth questions – regarding the training received during the first few months of the pandemic and the challenges faced – are essential to determining the different levels of competence and for planning professional development initiatives. The results of the descriptive analysis make it possible to infer that teachers with a negative attitude towards online teaching possess a very limited level of digital competence. This is evidenced by the fact that their training focused on the lowest levels of Hampel and Stickler's skills pyramid (2005) and that a high percentage (up to 60% in some cases) reported experiencing difficulties in all the categories addressed in this research. With regard to future training initiatives, the results for question 4, which addressed the challenges teachers faced, reveal that more than 50% of the participants, irrespective of the class they belonged to, struggled in three areas: motivating their students, getting them to speak in synchronous classes, and designing effective activities. This suggests that these areas should be prioritized when it comes to designing training programs in the future.

This study underlines the importance of adopting a positive attitude towards technology-mediated teaching through continuous and sustainable professional development. As mentioned previously, before the pandemic there were already theoretical initiatives that outlined a roadmap for the development of digital competences in the field of education in general (*DigCompEdu*, Redecker, 2017), as well as in language teaching more specifically (*skills pyramid*, Hampel & Stickler, 2005; *European Profiling Grid*, Mateva *et al.*, 2013). The pandemic highlighted that these initiatives were not generally being applied in the ELE teaching community. This could be due to several reasons, including a lack of suitable training, reluctance to adapt to these new educational contexts, or to other external constraints. The crisis served to demonstrate that digital competence training initiatives cannot take place sporadically or on a one-off basis: rather, they should be integrated coherently and systematically as an essential part of teachers' professional development.

3.4 Recommendations for Practice

Using the characteristics described by Paesani (2020) and the recommendations put forth by Comas-Quinn (2011) as a starting point to support the construction of a virtual professional identity, several initiatives designed to promote training in digital competences are

suggested in this section. It is worth noting that these must be adapted to the needs of each institution as well as the individual needs of its teachers, whose digital competence levels may vary considerably due to age, years of teaching experience or previous professional development opportunities. The responsibility to seek training opportunities should not only fall on teachers: it should also be recognized and facilitated by institutional administrators. For instance, it is to be expected that remunerated opportunities or those that take place within working hours will be better received. Similarly, differentiated and staged training that takes into account teachers' diverse skills and experiences will likely be more effective and better received than opportunities that do not address participants' individual differences. With this in mind, it is clear that teacher training should be a collective effort that includes educators, administrators and organizations that promote useful and sustainable upskilling. Six specific initiatives will now be described.

3.4.1 Mentorship programs

This type of initiative leverages the knowledge of professionals with more training and experience in digital competences, allowing them to share it effectively with less seasoned colleagues. If it is not viable to assign in-school mentors, initiatives are available such as ACTFL's Distance Learning Mentoring Program (<https://www.actfl.org/learn/mentoring-program>), which is offered to members free of charge.

3.4.2 Observations among teachers

This practice has proved to be effective both in traditional contexts (Kissau & King, 2015) and in virtual environments (O'Riordan *et al.*, 2021). The process should be guided by the person being observed and can be organized into three phases: a meeting before the observation takes place to determine where feedback should be given; the observation itself; and a final meeting to address the areas or initiatives to be improved.

3.4.3 Communities of practice

These groups are essentially a meeting point with other professionals in the field to discuss topics of mutual interest in a relaxed atmosphere. Advantages include the fact that they allow different degrees of participation and that they expose participants to external perspectives beyond their own institutions. Some of these communities, such as the Technology for Language Teaching and Learning Facebook group, emerged informally on social media. However, there are also more

formally established communities of practice, such as the Distance Learning Mentoring Special Interest Group (ACTFL), or professional associations including the Computer-Assisted Language Instruction Consortium (CALICO) and the European Association of Computer Assisted Language Learning (EuroCALL). In fact, these associations also have special interest groups (SIGs) and organize annual conferences where their members have the chance to socialize.

3.4.4 Pedagogical workshops

These talks, which take place either in-person or online, are a way to stay up to date on the new technological advances applied to ELE teaching. Regardless of the format, it is important to keep in mind that this type of training should go beyond simply becoming familiar with specific tools and should include a presentation or debate on the pedagogical principles that support their use in the classroom.

3.4.5 Learner survey

In addition to informal conversations with learners, anonymous surveys – carried out through services such as *Google Forms* or *Survey Monkey* – are an alternative way to measure teaching effectiveness and to include learner perspectives. Since learners' opinions can differ from those of teachers' (Gironzetti *et al.*, 2020), it is a useful exercise for educators to reflect on where they may not agree, look for tangible solutions to issues exposed by students and use this feedback to improve their teaching practices.

3.4.6 Guided critical reflection

Critical reflection is an essential component for teachers to assimilate any type of training and integrate it coherently into their teaching practices. Haines (2015: 177) suggests focusing the exploration of new tools within three areas:

- (1) the tool's pedagogical potential;
- (2) similarities and differences compared to other tools;
- (3) the tool's potential uses in a specific context: how it can be applied to support teaching and learning.

Reflecting on a new tool after its use is also an important step in the process. This could involve thinking about what worked and what did not, how the learners reacted, whether there were any unforeseen issues or functions and, based on the conclusions drawn, performing a cost-benefit analysis.

3.5 Conclusion and Future Lines of Research

One of the main conclusions that can be drawn, based on teachers' experiences with online teaching during the pandemic, is that professional development cannot simply be offered as a Band-aid solution in times of crisis, since this approach tends to be limited to basic competences and can therefore generate negative attitudes. Instead, training opportunities should be offered in advance and on a continuous basis, while also using a wide variety of resources and initiatives, such as those presented in section 3.4. Technology is constantly evolving, and our teaching practices have no choice but to keep up with the pace. As pointed out previously, connecting with colleagues both within one's own institution and in virtual communities is key to the success of this evolution. Teachers need to be open to these new forms of professional development in order to actively participate in the educational community of the 21st century.

While the results of our study make it possible to offer a series of training initiatives in line with previous proposals, they also give rise to new questions and research avenues. Experts in technology-mediated language teaching (e.g. Gacs *et al.*, 2020; Paesani, 2020) seem to agree that the rapid transition to the virtual world in the first few months of the pandemic makes it hard to use the term 'online teaching' to describe the kind of teaching that took place, as it did not follow the baseline recommendations established in the field. Indeed, this is a view we definitely share. This is precisely why it is essential to develop real training initiatives and to examine their impact on teachers' attitudes, beliefs and digital competences. Our study presents a panoramic overview of these constructs, only a few months after the initial crisis. With the right training, teachers' attitudes, beliefs and digital competences can certainly be expected to evolve favorably.

3.6 Annotated Additional Reading

Gironzetti, E., Lacorte, M. and Muñoz-Basols, J. (2020) Teacher perceptions and student interaction in online and hybrid university language learning courses. In M. Planelles Almeida, A. Foucart and J.M. Liceras (eds) *Current Perspectives in Language Teaching and Learning in Multicultural Contexts [Perspectivas actuales en la enseñanza y el aprendizaje de lenguas en contextos multiculturales]* (pp. 507–539). Thomson Reuters-Aranzadi.

This chapter examines the perceptions of both teachers and learners regarding effectiveness and satisfaction levels in hybrid or online courses. What is interesting about this study is the discrepancy detected between teachers' and learners' statements, with teachers expressing lower satisfaction levels compared to learners. The authors point out the importance of training that promotes interaction in virtual environments.

Stickler, U. and Hampel, R. (2015) Transforming teaching: New skills for online language learning spaces. In R. Hampel and U. Stickler (eds) *Developing Online Language Teaching: Research-Based Pedagogies and Reflective Practices* (pp. 63–77). Palgrave Macmillan.

The authors propose a framework for training language teachers in digital competences. The framework is presented as a pyramid including seven skills or competences: basic Information and Communication Technology (ICT) competence; specific technical competence for the chosen software; dealing with the constraints and possibilities of the medium; online socialization; facilitating communicative competence; creativity and choice; and developing one's own teaching style.

Appendix: Electronic Survey

Note: To help readers identify the questions associated with each construct, the names of said constructs have been included in square brackets.

(A) General information

You work at...

- an elementary school
- a secondary school
- a university
- other (please specify):

How long have you been teaching?

- 1–5 years
- 6–15 years
- More than 15 years

How long had you been teaching online **BEFORE** the COVID-19 crisis (spring 2020)?

- I had never taught online before the crisis
- 1–5 years
- 6–15 years
- More than 15 years

In which country do you teach?

(B) Challenges

What were the main challenges you faced when teaching online in spring 2020? Please choose all options that apply.

- None
- Motivating the students
- Getting the students to speak Spanish in synchronous sessions
- Monitoring students' progress
- Supporting students with disabilities

- Getting group projects to work
- Designing effective online activities
- Designing and performing assessments
- Overusing the L1 or other facilitating language (e.g. English) during synchronous sessions
- Other (please specify):

(C) Training

Had you received any kind of training for online teaching **BEFORE** the COVID-19 crisis (spring 2020)?

- Yes
- No

Did you receive any training **DURING** the first months of the COVID-19 crisis (spring 2020)?

- Yes
- No

[Training content]

What content did these training sessions address? Please choose all options that apply.

- How to effectively use the digital platform at your school/university (for example, *Moodle, Google Classroom, Blackboard, Canvas*, etc.)
- How to adapt assessment methods to the virtual context
- How to motivate students in a virtual context
- How to create materials for a virtual context
- How to carry out synchronous sessions
- How to support students with disabilities in the context of virtual teaching
- Other (please specify):

(D) Beliefs about online teaching

The following questions required a rating on a 5-point Likert scale, where (1) denoted ‘strongly disagree’ and (5) denoted ‘strongly agree’.

Choose the most suitable option for each of the following statements:

[Enjoyment]

- (1) I enjoy teaching online
- (2) I felt comfortable teaching online
- (3) I feel comfortable teaching online **NOW**
- (4) Teaching online during the COVID-19 crisis **positively** changed my opinion regarding online teaching

[Self-efficacy]

- (1) I believe I can teach online as effectively as in person
- (2) I feel confident designing an online class
- (3) I feel confident that I can carry out collaborative activities in online classes

[Effectiveness of online teaching]

- (1) I believe that students can learn online to the same extent as in person
- (2) I believe that languages can be taught effectively online
- (3) I believe that we can make cultural connections online as effectively as in person
- (4) I believe that teaching beginners is harder than teaching advanced learners online
- (5) I believe that speaking skills suffer the least in online classes
- (6) I believe that listening skills suffer the least in online classes
- (7) I believe that writing skills suffer the least in online classes

[Transferability to in-person classes]

- (1) I believe that what I have learned in online classes can be transferred to in-person classes
- (2) I will include more technological tools in my in-person classes from now on
- (3) I will include the types of assessments I performed online in my in-person classes from now on

[Effectiveness of the training received]

- (1) The support I received during the COVID-19 crisis was useful
- (2) I received the support I needed during the COVID-19 crisis

References

- American Council on the Teaching of Foreign Languages [ACTFL] (2011) *21st Century Skills Map*. Partnership for 21st Century Skills.
- Barnard, R. and Burns, A. (eds) (2012) *Researching Language Teacher Cognition and Practice: International Case Studies*. Multilingual Matters.
- Borg, S. (2003) Teacher cognition in language teaching: A review of research on what language teachers think, know, believe, and do. *Language Teaching* 36 (2), 81–109. <https://doi.org/10.1017/S0261444803001903>.
- Borg, S. (2006) *Teacher Cognition and Language Education: Research and Practice*. Continuum.
- Borg, S. (2012) Current approaches to language teacher cognition research: A methodological analysis. In R. Barnard and A. Burns (eds) *Researching Language Teacher Cognition and Practice: International Case Studies* (pp. 11–29). Multilingual Matters.
- Canals, L. and Al-Rawashdeh, A. (2019) Teacher training and teachers' attitudes towards educational technology in the deployment of online English language courses in Jordan. *Computer Assisted Language Learning* 32 (7), 639–664. <https://doi.org/10.1080/09588221.2018.1531033>.

- Chao, C. (2015) Rethinking transfer: Learning from CALL teacher education as consequential transition. *Language Learning & Technology* 19 (1), 102–118. <http://dx.doi.org/10125/44404>.
- Comas-Quinn, A. (2011) Learning to teach online or learning to become an online teacher: An exploration of teachers' experiences in a blended learning course. *ReCALL* 23 (3), 218–232. <https://10.1017/S0958344011000152>.
- Ertmer, P.A. (2005) Teacher pedagogical beliefs: The final frontier in our quest for technology integration. *Educational Technology, Research and Development* 53 (4), 25–39. <https://doi.org/10.1007/BF02504683>.
- Gacs, A., Goertler, S. and Spasova, S. (2020) Planned online language education versus crisis-prompted online language teaching: Lessons for the future. *Foreign Language Annals* 53 (2), 380–392. <https://doi.org/10.1111/flan.12460>.
- Garson, G.D. (2009) *Statnotes: Topics in Multivariate Analysis*. <http://www2.chass.ncsu.edu/garson/pa765/statnote.htm>.
- Gironzetti, E., Lacorte, M. and Muñoz-Basols, J. (2020) Teacher perceptions and student interaction in online and hybrid university language learning courses. In M. Planelles Almeida, A. Foucart and J.M. Licerias (eds) *Current Perspectives in Language Teaching and Learning in Multicultural Contexts* (pp. 507–539). Thomson Reuters-Aranzadi.
- Gómez Soler, I. and Tecedor, M. (2018) Foreign language teaching assistant training: A contrastive analysis of trainers and trainees' perspectives. *Hispania* 101 (1), 38–54. <https://10.1353/hpn.2018.0083>.
- Haines, K. (2015) Learning to identify and actualize affordances in a new tool. *Language Learning & Technology* 19 (1), 165–180. <http://dx.doi.org/10125/44407>.
- Hampel, R. and Stickler, U. (2005) New skills for new classrooms: Training tutors to teach languages online. *Computer Assisted Language Learning* 18 (4), 311–326. <https://doi.org/10.1080/09588220500335455>.
- Jaschik, S. and Lederman, D. (2018) *2018 Survey of Faculty Attitudes on Technology: A Study by Inside Higher Ed and Gallup*. Inside Higher Ed/Gallup.
- Kissau, S.P. and King, E.T. (2015) Peer mentoring second language teachers: A mutually beneficial experience? *Foreign Language Annals* 48 (1), 143–160. <https://doi.org/10.1111/flan.12121>.
- Mateva, G., Vitanova, A. and Tashevska, S. (2013) *European Profiling Grid User Guide. Lifelong Learning Programme*. Equals.
- Monroy, L., Vidal, R.S. and Saade, A. (2010) *Análisis de Clases Latentes: Una técnica para detectar heterogeneidad en poblaciones*. Centro Nacional de Evaluación para la Educación Superior, A.C. (CENEVAL).
- O'Riordan, F., Buckley, K. and Lincoln, A. (2021) *Peer Observation of Teaching: Can Peer Observation of Teaching Enhance Professional Development Practices within Higher Education? A Literature Scoping Review*. Dublin City University.
- Paesani, K. (2020) Teacher professional development and online instruction: Cultivating coherence and sustainability. *Foreign Language Annals* 53 (2), 292–297. <https://doi.org/10.1111/flan.12468>.
- Pajares, M.F. (1992) Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research* 62 (2), 307–332. <https://doi.org/10.3102/00346543062003307>.
- Petrovich, I. (2018) La interacción oral y las TIC en el aula de ELE. Un estudio sobre las actitudes de los profesores hacia las herramientas digitales. Unpublished Master's thesis, Dalarna University.
- Redecker, C. (2017) *European Framework for the Digital Competence of Educators: DigCompEdu*. Joint Research Centre.
- Richardson, V. (1996) The role of attitudes and beliefs in learning to teach. In J. Sikula (ed.) *Handbook of Research on Teacher Education* (pp. 102–119). Macmillan.
- Sarnoff, I. (1970) Social attitudes and the resolution of motivational conflict. In M. Jahoda and N. Warren (eds) *Attitudes* (pp. 271–282). Penguin.

- Song, S.Y. (2015) Teachers' beliefs about language learning and teaching. In M. Bigelow and J. Ennser-Kananen (eds) *The Routledge Handbook of Educational Linguistics* (pp. 263–275). Routledge.
- Stickler, U. and Hampel, R. (2015) Transforming teaching: New skills for online language learning spaces. In R. Hampel and U. Stickler (eds) *Developing Online Language Teaching: Research-Based Pedagogies and Reflective Practices* (pp. 63–77). Palgrave Macmillan.
- Taraneko, O. (2014) Creatividad y TICs. Un reto en el aula. Actitudes y percepciones del profesorado de ELE en Islandia. Unpublished Master's thesis, University of Iceland.

4 Effective Technological Practices and Diversity

Daria Mizza and Fernando Rubio

4.1 Introduction and Key Concepts

Since the early 21st century, as technology became integral to classrooms and beyond, language instructors have been compelled to get familiar with an endless array of new tools, apps and platforms. The goal is to implement communicative activities built on a solid pedagogical foundation (Eutsler, 2019; Godwin-Jones, 2015) and in this way to facilitate language exposure and practice in their students' everyday lives (Collins & Muñoz, 2016). The integration of technology into the education sector has been taking shape over the past few years. This is particularly true in geographical contexts with more economic resources, where many professionals have access to the tools and training necessary to use technology in the language classroom (Eaton, 2010).

However, the technological gap between learners and educators, and even among learners themselves, can be an obstacle and result in a **lack of engagement**. In turn, this can generate feelings of isolation (Branon & Essex, 2001) and lead to a loss of motivation. These problems especially affect **those with learning difficulties**, who accounted for 13.7% to 19.5% (Campbell & Wescott, 2019) of the student population in elementary, secondary and higher education in the United States during the 2017–2018 school year, for example. Moreover, this problem is particularly alarming when technology falls into the hands of educators who lack experience or are not familiar with its use, or who do not employ pedagogical strategies, such as scaffolding, to encourage learners to participate in virtual contexts (Chenoweth *et al.*, 2006). Isolation and a loss of motivation can also negatively impact **learners who struggle with self-discipline** and who **lack autonomous learning strategies**. Indeed, this is especially problematic when engagement is essential in a virtual course (Arispe & Blake, 2012).

Another issue is that learners may feel distanced from the language and culture they are studying. In 2017, ACTFL (American Council on

the Teaching of Foreign Languages) issued a statement on the role of technology in language learning (American Council on the Teaching of Foreign Languages, 2017b), indicating that certain learners tend to focus their attention on purely linguistic or formal aspects that are irrelevant to the course's pedagogical objectives. Excessive emphasis on these topics may be a source of distraction, preventing learners from decoding the central message of a text, for instance. In turn, this can affect their speaking and reading abilities, going on to negatively impact their writing. Similarly, excessive concern for formal aspects leads to an increase in **anxiety levels** with regard to language learning (Schwartz, 1972, cited in Scovel, 1991; also see Chapter 6 of this book).

To consider the different needs present in the classroom, the instructor must design learning experiences that are as inclusive as possible and that benefit the class as a whole. Specifically, these needs are influenced by variables such as the **diversity** of the learners' individual profiles (ethnic origin, *religion*, sexual orientation, disability; see DeAngelis, 2007) and the *variability* or multidimensional traits of their educational profiles (previous educational experiences, preferences, abilities, among others). One way to approach the complexity derived from all these needs involves following the *Universal Design for Learning Guidelines* (UDL), where the learner's diversity and variability are considered a key element for curriculum design (Center for Applied Special Technology, 2017). UDL is presented as a framework for curriculum development due to its focus on an inclusive and proactive **pedagogical design** (PD).

This stance in favor of an inclusive PD is the focus of this chapter. First of all, starting with an interpretation of the diverse needs present in the virtual classroom, the essential factors shaping participatory, learner-centered environments are considered (Barab *et al.*, 2001), with relevant and meaningful experiences. Next, these contexts are referred to as **participatory learning environments** (PLE) and, in the specific case of language learning, **participatory language learning environments** (PLLE).

The sections of this chapter dedicated to the state of the art and the contributions of current research follow the guidelines of studies in the fields of learning science and cognitive neuroscience (Gazaille, 2009; Gilbert, 2001; Hiss, 2000; Lewis & Atzert, 2000; Thomas, 2013; White, 2000), as well as the statement issued by ACTFL on the importance of technology in language learning (American Council on the Teaching of Foreign Languages, 2017b). The UDL framework and the concept of the learner's variability as an asset for learning is also explored in detail. The final section, which includes recommendations for practice, suggests ways to plan for and anticipate diversity. The purpose of this is to help language instructors implement efficient and inclusive pedagogical practices to ultimately eliminate learning barriers.

4.2 State of the Art

The concept of **universal design** (UD) originally comes from the field of architecture, referring to the creation of physical spaces that are accessible to any user, regardless of their abilities or needs (Mace, 1997; Rao & Tanners, 2011). After the Americans with Disabilities Act was passed in 1990, UD gained popularity in architecture and design in an effort to make streets and public buildings as accessible as possible. UD is defined by three fundamental pillars: (1) a significant portion of modifications and accommodations could have been avoided if accessibility had been planned from the start to address the needs of a diverse population; (2) modifications made to existing environments, such as automatic door openers, accessible sidewalks and ramps, not only benefit people with disabilities but also the rest of the population; and (3) disabilities have less to do with individual deficits and more to do with environmental barriers that limit people's ability to cope and participate fully in society (United Nations, 2007: Preamble E).

Several projects have attempted to apply this philosophy of UD to the field of education. One of the first appeared in 1984, when a group of researchers founded the Center for Applied Special Technology (CAST; see Edyburn, 2013). Its primary mission was to explore ways in which to use technology to offer better educational experiences to learners with difficulties. Therefore, UD in education represented 'a conceptual and philosophical foundation on which to build a model of teaching and learning that is inclusive, equitable, and guides the creation of accessible course materials' (Schelly *et al.*, 2011: 18). This approach was given the name **Universal Design for Learning** (UDL). So, if the aim of UD is to eliminate barriers in physical spaces, UDL seeks to **eliminate barriers in learning environments**. To quote David Rose, one of the founders of CAST: 'UDL puts the tag "disabled" where it belongs – on the curriculum, not the learner. The curriculum is disabled when it does not meet the needs of diverse learners' (Council for Exceptional Children, 2011). Initially, UDL was applied to include learners with difficulties in general education classes. Today, however, it is considered more of an initiative to design **accessible teaching** for learners with or without disabilities (Rao *et al.*, 2015).

In the field of language teaching, the application of inclusive pedagogies that focus on equitable teaching for all learners is evident in key documents, including *World-Readiness Standards for Learning Languages* (National Standards in Foreign Language Education Project (US) & American Council on the Teaching of Foreign Languages, 2015) and *Diversity and Inclusion in World Language Teaching & Learning*. (American Council on the Teaching of Foreign Languages, 2019).

However, even before the appearance of these publications, and in response to a new interpretation of linguistic competence based on

what language learners can do rather than comparing them to native speakers (American Council on the Teaching of Foreign Languages, 2017a; Council of Europe, 2020), language learning programs had been redesigned to ensure that learners had the opportunity to develop their skills in a meaningful way. As a result, these programs have become increasingly accessible for a wider range of interests, motivations and learning preferences.

4.3 Contributions of Current Research

Neuroscience studies show that each learner has unique qualities, skills, interests, desires and levels of disposition (Ralabate, 2020). In line with this idea, UDL considers that diversity is the norm among 21st-century learners and describes learning barriers as **elements inherent to the learning environment**, instead of describing them as learners' characteristics associated with their abilities. Thus UDL contributes to providing an education that minimizes the need to adapt teaching to specific students' requirements (Black *et al.*, 2014; Rao & Tanners, 2011). Rather, it seeks to achieve accessible education for everyone.

4.3.1 UDL principles, guidelines and checkpoints

UDL is structured around three principles (Dell *et al.*, 2015; Meyer *et al.*, 2014; Rao *et al.*, 2015; Robinson & Wizer, 2016), each of which is aligned with one of the three main neural networks responsible for learning: **affective networks** (motivation and setting priorities); **recognition networks** (identification and analysis of information); and **strategic networks** (planning and performance of actions). Moreover, educators can present the content to achieve three primary objectives: (1) to promote engagement (affective network, or the 'Why?' of learning); (2) to facilitate the **representation of information** (recognition network, or the 'What?' of learning); and (3) to achieve **action and expression among learners** (strategic network, or the 'How?' of learning). By using several strategies to achieve these objectives, a sort of **redundancy effect** is generated, ensuring that the teaching is clear and understandable (Center for Applied Special Technology, 2017; Meyer *et al.*, 2014; Rose & Meyer, 2002).

In connection with these three main objectives, there are 9 guidelines (highlighted in uppercase in Table 4.1) and 31 checkpoints, (see bullet points in Table 4.1), which offer an array of ideas with several types of scaffolding. They also provide options to make classes engaging and accessible for diverse learners, in this way meeting their needs (Center for Applied Special Technology, 2011; Israel *et al.*, 2014).

Table 4.1 UDL principles, guidelines and checkpoints

Engagement	Representation	Action and expression
<i>Affective networks</i> <i>The WHY of learning</i>	<i>Recognition networks</i> <i>The WHAT of learning</i>	<i>Strategic networks</i> <i>The HOW of learning</i>
Provide options to...		
Access RECRUITING INTEREST <ul style="list-style-type: none"> Optimize individual choice and autonomy Optimize relevance, value and authenticity Minimize threats and distractions 	PERCEPTION <ul style="list-style-type: none"> Offer ways of customizing the display of information Offer alternatives for auditory information Offer alternatives for visual information 	PHYSICAL ACTION <ul style="list-style-type: none"> Vary the methods for response and navigation Optimize access to tools and assistive technologies
Build SUSTAINING EFFORT AND PERSISTENCE <ul style="list-style-type: none"> Heighten salience of goals and objectives Vary demands and resources to optimize challenge Foster collaboration and community Increase mastery-oriented feedback 	LANGUAGE AND SYMBOLS <ul style="list-style-type: none"> Clarify vocabulary and symbols Clarify syntax and structure Support decoding of text, mathematical notation and symbols Promote understanding across languages Illustrate through multiple media 	EXPRESSION AND COMMUNICATION <ul style="list-style-type: none"> Use multiple media for communication Use multiple tools for construction and composition Build fluencies with graduated levels of support for practice and performance
Internalize SELF-REGULATION <ul style="list-style-type: none"> Promote expectations and beliefs that optimize motivation Facilitate personal coping skills and strategies Develop self-assessment and reflection 	COMPREHENSION <ul style="list-style-type: none"> Activate or supply background knowledge Highlight patterns, critical features, big ideas and relationships Guide information processing and visualization Maximize transfer and generalization 	EXECUTIVE FUNCTIONS <ul style="list-style-type: none"> Guide appropriate goal-setting Support planning and strategy development Facilitate managing information and resources Enhance capacity for monitoring progress
Expert learners who are...		
Goal	Resourceful and Knowledgeable	Strategic and Goal-directed

Source: Center for Applied Special Technology (2018).

It is worth pointing out that the guidelines and checkpoints are, to a certain extent, descriptive. As a result, they allow enough room for educators to be creative (Rao *et al.*, 2015) and can be applied to any level, subject or learning context, both in person and online (Rao *et al.*, 2014). The specific design will depend on the learning context, the learners' diversity and variability, as well as any barriers present in the given environment (Rao & Meo, 2016).

4.3.2 PD and the learning environment

A well-organized learning environment promotes motivation, performance and consistency. An analysis of assessments of online classes at the University of Yale (Poorvu Center for Teaching and Learning, 2021) revealed a close correlation between how learners rated the criterion 'the organization of the course facilitates learning' in teacher evaluation surveys and the overall assessment of the course. Furthermore, the *Wabash National Study of Liberal Arts Education* (Blaich *et al.*, 2016) concluded that clarity in the teaching and structure of a course had a number of benefits: it motivates learners; it improves their consistency, performance and grades; and it helps first-generation as well as financially and socially vulnerable students to achieve their goals (Poorvu Center for Teaching and Learning, 2021; Roksa & Whitley, 2017; Wang *et al.*, 2015).

However, designing effective, inclusive learning environments can be especially challenging if a new, entirely virtual setting is required. Therefore, to begin the process, a good starting point is to use one of the pedagogical design models available. Based on learning theories, these can help educators to develop materials that result in effective and participatory experiences for their students.

The **ADDIE model** (Analysis–Design–Development–Implementation–Evaluation) (Branch, 2009) is one of the most frequently adopted options. In fact, it has even inspired other models, like the successive approximation model (SAM) (Allen & Sites, 2012). Other examples include the backward design model (Wiggins & McTighe, 1998), based on research in the field of cognitive psychology, and the Dick and Carey model (1996), which focuses on the interrelation of the different components involved in the design process (teacher, learners, materials, pedagogical activities, learning and teaching methods).

Regardless of the model adopted, language instructors should analyze learners' needs and contextual limitations (e.g. available time or number of learners), to define the learning objectives and to implement pedagogical principles derived from second language acquisition theories. Not only this, but they should also consider other relevant aspects of virtual teaching. This means keeping in mind two separate elements of pedagogical intervention: **planning** and **design**.

While planning requires the consideration of limitations related to a combination of logistic and pedagogical factors (time, context, number of learners, learning objectives, content), design focuses on what can be achieved within these limitations to motivate and engage the learners (Masterman, 2013). This distinction between planning and design is particularly useful in language teaching, since it makes the instructor aware of the resources and limitations of a PLE before considering the relevant second language acquisition theories.

4.3.2.1 *Planning for learning: needs analysis*

To plan a PLE, it is essential to analyze and identify the characteristics of both the learners (learner analysis) and the environment where the teaching will take place (context analysis).

The **learner analysis** can be based on other needs analyses used in language teaching. For example, to ensure that the PD adapts to the diversity in the classroom, the instructor can collect information on each learner's characteristics as well as their previous learning experiences, to better understand their ability to adapt to new pedagogical approaches. It is also essential to gather information on the learners' motivation levels, why they are taking the course, as well as their competence and skills in other languages (see Dick & Carey, 1978, 1996; Dudley-Evans & St John, 1998: 25; among others).

To perform the **context analysis**, the instructor can identify specific characteristics of the course that can help learners develop and practice their language skills. It is advisable to set realistic base levels and to design the learning objectives in line with the requirements of each program and the relevant regional guidelines. These include those proposed by the *Common European Framework of Reference for Languages* (Council of Europe, 2020) for Europe and the American Council on the Teaching of Foreign Languages (2012) for the United States. In the US, it is also useful to consider standards such as the *World-Readiness Standards for Learning Languages* (National Standards in Foreign Language Education Project (US) & American Council on the Teaching of Foreign Languages, 2015) and those proposed by the American Council on the Teaching of Foreign Languages (2017a).

4.3.2.2 *Design for learning: a research-based framework*

The key to designing a virtual PLLE is to follow a framework based on both the basic features of distance learning and the theoretical foundations of language teaching.

One of the main aspects to focus on is the **promotion of autonomous learning**. In this regard, it is important to recall that autonomy does not only imply independent interaction with the learning tasks and materials: it also involves a dynamic social process in which the instructor provides the student with fundamental support. In addition to individual access

to grammatical explanations – often in the form of video tutorials – and other types of content, the instructor can prepare interactive and social activities based on collaborative scaffolding. Studies on the relationship between social collaboration and autonomy (Little, 1996; Vygotsky, 1962) confirm the importance of social interaction when it comes to promoting autonomous learning. In fact, it is key to language learning among adults (Orsini-Jones *et al.*, 2013), due to their innate predisposition to autonomous behavior (Little, 1996). Moreover, other researchers, such as Bax (2011) and White (2013), show that **interaction within communities of practice** also has a significant influence on the development of linguistic competence. Similarly, research on technology and autonomy has furthered our understanding of how learner autonomy is developed, both in formal environments created by the instructor (Goodwin-Jones, 2011; Little & Thorne, 2017; Pellerin, 2017) and in more informal contexts where learning is self-directed and developed by the learner themselves (Reinders & White, 2016).

Another important aspect for the development of the PLLE is based on **providing spaces for reflection**. In this regard, reflection must also involve a collective effort that implies dialogue with others (Day, 1993; Freeman, 1982). It may include **individual** and **social reflection**, in cases where learners are able to share and exchange learning experiences. Furthermore, in most learning activities that involve reading and writing, reflection allows us to spend some time preparing the task, giving learners the opportunity to think about the content and how to convey it. In turn, this can reduce stress and anxiety, as well as make it more likely for the activity to succeed (Brandl, 2008; see Chapter 6 of this book).

Technology can provide learners with a variety of resources for reflection, helping them to develop their learning capacity through reflective practice. However, it is important to keep in mind that, according to research, educators may struggle to combine conscious reflection with spontaneous interaction when designing technology-mediated experiences (Lamy & Goodfellow, 1999). In this case, asynchronous audio or written journals are particularly suitable, as they allow for the exchange of audio or written text, ranging from carefully planned and monologued formats (e.g. an anecdote) to spontaneous and dialogued formats (e.g. a conversation). Thanks to their flexibility in terms of setting and pace, an element of reflection on the task can be added.

It is also beneficial to **encourage collaboration** within communities of practice. Interacting with educators and the rest of the group is particularly important for distance learners, since they are often susceptible to isolation and a lack of communication. In this regard, several studies have shown that a lack of support can lead to frustration and affect learners' confidence (Brown & Campione, 1996; Williams & Sharma, 1988). As noted by Kilpatrick, Barrett and Jones

(2003), rather than focusing on the individual, learning should be planned as part of a community, made up of at least four or five participants. This change is particularly evident in virtual environments, where both learners and educators need to establish some kind of community through the learning process and achieve a satisfactory level of social interaction (Dabbagh, 2003; Pifarré, 2007). Therefore, the concepts of *virtual learning community* (Palloff & Pratt, 1999) and *community of practice* (Wenger *et al.*, 2002) are essential components of a research-based framework that supports an inclusive language learning environment.

Finally, it is essential *to provide opportunities for interaction and negotiation of meaning*. Interaction is a key factor in second language acquisition (Ellis, 1994; Swain, 1995; van Lier, 1996; see Chapter 7 of this book), which is clearly reflected in the communicative approach to teaching. According to interactionist–cognitive learning theories, interaction – especially conversational interaction – takes on a ‘facilitation effect’ in language learning. This effect is summarized in the ‘interaction hypothesis’ (Long, 1996), where interaction is considered an essential requirement for acquisition by exposing the learner to a modified input and encouraging negotiation of meaning (Pica, 1994; Pica *et al.*, 1987). This need to negotiate meaning, accompanied by the feedback the speaker receives during the interaction, helps them produce what is known as **pushed output**: that is, the type of output a user must produce when the circumstances require the use of precise, comprehensible language. Therefore, it is important for learners to be exposed to situations where they must employ prolonged discourse, compelling them to apply their linguistic resources not only to focus on ‘what they say’, but also on ‘how they say it’.

With the technologies available in the 21st century, as well as traditional face-to-face interaction, there are several ways learners of a second language can collaborate and interact through both synchronous and asynchronous environments. For example, in telecollaborative projects (Bohinski & Mulé, 2016) where learners interact both asynchronously and synchronously, in writing and orally, participants must apply their knowledge to successfully communicate in a coherent and meaningful way. When they are unable to express themselves as intended or how they would do so in their mother tongue, they must find their own resources to convey the message, negotiating meaning as they go (Blake, 2000, 2005; Bower & Kawaguchi, 2011; Elola & Oskoz, 2008; Jepson, 2005; O’Rourke, 2005; Smith, 2009; Yanguas, 2010; Yuksel & Inan, 2014). In synchronous oral activities during a video meeting, for instance, participants can use a variety of strategies and verbal techniques to negotiate meaning in the conversation. The aim is not only for the group to understand, but also for the learner to consolidate and move forward in their language learning journey.

4.4 Recommendations for Practice

Guided by the principles of UDL and the steps involved in PD, this section provides practical tips and recommendations for implementing a pedagogical model that translates into an inclusive technology-mediated PLLE. Each of these examples aims to encourage educators to analyze proactively the diversity present in the classroom and apply flexible options and reinforcements in their classes to anticipate and support teaching, instead of making adaptations afterward. If these recommendations are followed, it is advisable to adopt an iterative design cycle. In this cycle, the results of the reflection on both satisfactory aspects and access-related areas for improvement will be implemented, and any necessary changes to lesson plans and activities will also be made (Rao & Meo, 2016).

4.4.1 UDL-based PLLEs

In PLLEs designed for language learning in hybrid or online contexts, the aim is to operationalize the concepts of UDL through the following elements: ‘work areas’ or ‘learning centers’ aided by technology, teacher presence and support strategies. These elements help to individualize and optimize the learning experience, as well as make the teaching more accessible and engaging.

4.4.1.1 *Work areas/Learning centers*

One example of a learning space based on UDL could include the following tasks, known as **work areas** or **learning centers** under the UDL framework: (1) a **space for synchronous or asynchronous group brainstorming**, to activate learners’ prior knowledge and direct their attention towards the topic of the activities that follow; (2) a **space for asynchronous individual reading/listening**, where the learner has access to preparation activities, written or oral input and activities to process the said input; (3) a **synchronous and asynchronous work area** to work on practical projects and tasks; and (4) an **asynchronous space that serves as a personal file**, providing opportunities for self-assessment and reflection with guidance from the instructor when necessary.

Table 4.2 explains the UDL principle recommended for each work area, with reference to the fundamental principles of online education. The social, interactive and collaborative features of synchronous work areas are combined with invitations for reflection in asynchronous spaces.

While it is possible to implement the principles of UDL without advanced technology, there are assistive learning technologies that can facilitate and make it more viable to achieve the necessary redundancies (multiple forms of engagement, representation of content and action/

Table 4.2 Work areas/Learning centers

Work areas/ Learning centers	Universal Design for Learning (UDL)	Research-based objectives
1. Synchronous or asynchronous group brainstorming	<p>→ Drawing interest towards the topic <i>Principle:</i> Engagement <i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide options to recruit interest <p><i>Checkpoints:</i></p> <ul style="list-style-type: none"> • Optimize relevance, value and authenticity • Optimize individual choice and autonomy 	<ul style="list-style-type: none"> • Promote autonomous learning • Facilitate opportunities for interaction
	<p>→ Providing support for comprehension <i>Principle:</i> Representation <i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide options for production • Provide options for perception • Provide options for comprehension <p><i>Checkpoints:</i></p> <ul style="list-style-type: none"> • Offer different ways to clarify vocabulary, syntax and structure • Illustrate through multiple media 	
2. Asynchronous individual reading/listening	<p>→ Facilitating access to text input <i>Principle:</i> Representation <i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide options for perception <p><i>Checkpoints:</i></p> <ul style="list-style-type: none"> • Offer ways of customizing the display of information 	
	<p>→ Facilitating comprehension <i>Principle:</i> Representation <i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide options for comprehension <p><i>Checkpoints:</i></p> <ul style="list-style-type: none"> • Highlight main ideas and connections • Highlight information processing 	
3. Group-based practical projects and tasks	<p>→ Offering different ways to respond <i>Principle:</i> Representation <i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide options for expression and communication <p><i>Checkpoints:</i></p> <ul style="list-style-type: none"> • Use multiple media for communication • Use multiple tools for composition 	<ul style="list-style-type: none"> • Promote collaboration within communities of practice
4. Personal file	<p>→ Helping the learner demonstrate their autonomy level <i>Principles:</i> Engagement; action and expression <i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide options for self-regulation • Provide options for executive functions <p><i>Checkpoints:</i></p> <ul style="list-style-type: none"> • Develop self-assessment and reflection • Support planning and strategy development • Enhance capacity for monitoring progress 	<ul style="list-style-type: none"> • Promote autonomous learning • Provide space for reflection
	<p>→ Helping the learner reach the strategic and goal-directed learning level <i>Principles:</i> Action and expression <i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide options to use executive functions <p><i>Checkpoints:</i></p> <ul style="list-style-type: none"> • Support strategy and planning development • Enhance capacity for monitoring progress 	

expression) (Dell *et al.*, 2015). In fact, recent studies show that UDL-based interventions lead to improvements in learners' academic results across all main content areas. They also mention the importance of **implementing technologies** such as content acquisition podcasts (Kennedy *et al.*, 2014), videos and narrated presentations (King-Sears *et al.*, 2015), digital backpacks (Basham *et al.*, 2010), videogames (Marino *et al.*, 2014) and computer-based reading programs (Hall *et al.*, 2015) (see also Chapters 11 and 12 of this book).

For all the activities described in section 4.4.1, the integration of technology can offer flexibility and support. As shown in Table 4.3, a variety of multimedia tools, social networks and interactive websites can provide well-integrated and beneficial supports (Center for Applied Special Technology, 2011), in turn making the PLLE more accessible for any kind of learner.

For example, brainstorming sessions as an activity to do before presenting the input (see *1 Synchronous or asynchronous group brainstorming* in Tables 4.2 and 4.3) can be carried out in both synchronous and asynchronous environments with the help of online forums, digital bulletin boards, etc. Among the technologies that can be used for online brainstorming, *Padlet* (www.padlet.com) is particularly helpful. Essentially, it is a free online tool that provides users with a digital canvas where they can post text, videos and images using a mobile device or computer. Thanks to its ability to foster collaborative learning, students can take part in a shared task both synchronously and asynchronously. *Padlet* constitutes, therefore, a virtual space that serves as an alternative to presenting information orally, where learners can expose their ideas in writing rather than expressing them in conventional oral discussions. As a result, it can also be used as a space to prepare for the written text or audiovisual material proposed as input, since it activates background knowledge, personal perspectives or expectations related to the text's content. Furthermore,

Table 4.3 Examples of technology use in PLLEs

Work area/Learning center	Modality	The tool's function	Example
1 Synchronous or asynchronous group brainstorming	Synchronous/asynchronous	Online forums, bulletin boards, digital walls	<i>Padlet</i>
2 Asynchronous individual reading/listening	Asynchronous	Mind maps, Venn diagrams, infographics, sketchnoting	<i>MindMeister, bubbl.us, Lucidchart</i>
3 Group-based practical projects and tasks	Synchronous/asynchronous	Online storage devices, wikis, augmented reality (AR) or virtual reality (VR) apps	<i>VoiceThread</i>
4 Personal file	Asynchronous	Digital portfolio (showcase, growth), rubrics, bar graphs	<i>Google Workspace for Education</i>

in an asynchronous virtual environment, learners have time to think and formulate their answers. A well-coordinated forum, bulletin board or digital wall are valuable tools not only for promoting reflection but also for sharing information and perspectives. This is because these resources connect the learners and allow educators to monitor their engagement and intervene in the learning activities (De Lima *et al.*, 2019; Stephens-Martinez *et al.*, 2014).

In the **Asynchronous individual reading/listening space** (see 2 **Asynchronous individual reading/listening in** Tables 4.2 and 4.3), a good way to apply the principles of UDL and the notion of comprehension is to use active reading software (ARS) as a support for learners engaged in reading and interpreting texts (input) as they develop their comprehension skills and fluency. These apps are able to read text aloud while also highlighting individual words or even full sentences. The learner logs in to the program, clicks the play button and the program reads the book while highlighting the text on the screen. Key vocabulary is underlined, creating a hyperlink. The learner can then click on the word to access its definition and listen to its pronunciation or see it written on the screen. At specific points, the program also provides links to prompts and questions that encourage the learner to react to what they have just read. This offers them the chance to answer questions of different types and difficulty levels, such as open-ended, literal, interpretative, multiple choice and short-answer questions. In addition to activities that help students learn new concepts, some apps include features that allow them to organize their thoughts.

Meanwhile, low-tech digital graphic organizers, such as concept maps, Venn diagrams, infographics and sketchnoting, help learners process the input, making it easier for them to organize their thoughts. We recommend using online mapping tools, for instance *MindMeister* (www.mindmeister.com) and *bubbl.us* (www.bubbl.us), as well as diagram-making apps, such as *Lucidchart* (www.lucidchart.com). These tools enable users to take advantage of the internet to view, analyze or share a visual representation of geospatial data in diagram form. These graphic organizers, which can be adapted to cater to learner diversity, are also suitable for those with learning difficulties who may require specialized equipment, formats and technologies. For example, concept maps can be used to organize vocabulary and explicitly connect it to previously learned material or previously discussed ideas. When asked to summarize, prioritize or categorize information, learners can use online tools to generate Venn diagrams, infographics and sketchnoting. Particularly for those with lower competence levels, the instructor can use these visual products to facilitate instructional scaffolding. In the case of more competent learners, on the other hand, they can be asked to apply their metaknowledge to reconstruct and verbalize the process they followed to create the visual product using the graphic organizer.

In the **group-based practical projects and tasks work area**, which can be approached both synchronously and asynchronously, tasks and projects based on asynchronous writing or synchronous oral discussion in virtual contexts (see 3 *Group-based practical projects and tasks* in Tables 4.2 and 4.3) help learners to reflect on what they have read or listened to, as well as to express themselves in various ways. In turn, this encourages a sense of ownership and helps them evolve into more critical readers or listeners. Different digital tools for written and oral production, such as online storage devices, wiki spaces (e.g. www.pbworks.com), augmented and virtual reality apps or collaborative writing tasks and presentations, can be used for these purposes. One resource designed to improve learner engagement and collaboration in multimedia presentations and projects is *VoiceThread* (www.voicethread.com), a creative, technology-based collaboration tool with video, audio and text commenting. *VoiceThread* enables learners to navigate through slides and share comments, either publicly or privately, using text, voice recordings, audio files or video recordings.

Furthermore, in the **personal file space** (see 4 *Personal file* in Tables 4.2 and 4.3), when used asynchronously, **digital portfolios** provide learners with the opportunity to showcase their work. They can also be used to demonstrate progress and learning over an extended period of time. According to Basken (2008), not only do digital portfolios generate learning, they also document and record it. Offering the opportunity and virtual space for learners to assess critically their academic work, reflect on it and make connections between different courses, tasks and other activities – such as work experience, extracurriculars or volunteering – generates learning. This is because the learners are given a sense of control while highlighting key aspects of their learning process. *Google Workspace for Education* (www.edu.google.com) is a useful toolset to support the creation of digital portfolios. At a very basic level, the portfolio could simply be a *Google Drive* folder where both educators and learners compile and select the work they want to store. Although the opportunities for reflection are limited here, the folder could also be combined with a *Google Sites* landing page to gather reflections and even serve as a central hub for organizing the portfolio. The optional or complementary use of rubrics or guidelines can also help learners to stay focused on the task throughout the activity.

At the beginning of each class, the instructor can review the rubric to ensure that the learners are following the necessary steps. Furthermore, visual tools such as self-assessment bar graphs incorporated into rubrics can help learners monitor their progress. In fact, anything that shows the ‘before’ and ‘after’ within the learning process makes it easier for learners to understand their progression.

To select and integrate technology resources, language instructors need to recognize the importance of the learner’s experience within the

PLLE. A structured, technology-mediated learning environment that is well designed and perfectly integrated into the language learning context highlights the transformative power of technology resources, consequently rejecting the idea that technology is a mere accessory (Adair-Hauck *et al.*, 2000: 269; Gillespie & McKee's, 1999: 452; Sharpe & Oliver, 2007: 49; Yang, 2001: 91–92). Language instructors play a crucial role in this integration process, since they are responsible for making decisions about technology that can improve the learning environment.

4.4.1.2 *Social presence and feedback*

In each work area within a UDL-based PLLE, learners must have the opportunity to interact with the instructor and the rest of the group on a regular basis. This is because their presence ensures a wider variety of options for support, guidance and engagement, which in turn helps to maintain the necessary levels of effort and consistency. Guaranteeing this **social presence** (Garrison *et al.*, 2000) is particularly important in virtual environments, especially when communication is text based, as learners may feel more isolated. Within a virtual community, social presence – that is, the extent to which a person considers themselves a ‘real member of the group’ – has a positive impact on how learners perceive the instructor and other members, how they manage their interactions and the overall learning experience (Picciano, 2002; Richardson & Swan, 2003; Russo & Benson, 2005; Swan & Shih, 2005; Tu & McIsaac, 2002).

To foster a trusting and safe atmosphere through empathy and instructor–learner collaboration, the instructor can apply strategies that reflect their social presence within the learning community. One such strategy, for instance, could be to send messages between sessions. As far as possible, it is also advisable to avoid using one-dimensional text-based spaces, such as discussion forums, for carrying out activities. Instead, apps that promote collaboration in virtual environments can be a useful alternative. These include platforms where the learner can create their own videos for different purposes, such as responding to the instructor’s feedback, providing feedback for their classmates or answering questions.

Furthermore, social presence is associated with and, to a certain extent, depends on formative feedback. The systematic use of feedback impacts learners’ performance and the quality of their learning experience. When it comes to UDL-based PLLEs, feedback should be approached from a positive angle: that is, rather than promoting self-criticism, it should help the learner achieve their goals (Nelson, 2021; see Chapter 9 of this book). For this reason, indirect feedback is one of the strategies instructors can use to guide language learners, as it helps them to recognize their mistakes and find solutions on their own (Chapelle, 1998). To implement this approach, the instructor can use programs that

automatically generate correction codes to simply indicate mistakes for the learner to self-correct. Once again, this fosters autonomous learning and motivation (Lee, 2001; Murray & Barnes, 1998).

When integrating feedback, it is advisable to employ practices that ‘humanize’ the comments (DeWaard, 2016), combining the use of text, voice and images. This can be done, for instance, through apps that record oral feedback or avatars that stand in for the person providing the comments. These forms of oral feedback are often more effective than their written counterparts, since they include features of the human voice such as rhythm, volume and intonation. In turn, this fosters engagement and improves information retention (Ice *et al.*, 2007).

Borup, West and Graham (2012) conducted an analysis on video feedback, where oral comments are provided alongside a video of the instructor. The authors noted the limitations of text-based feedback, especially in courses with a large number of participants or those that take place online. They concluded that audio and video feedback could constitute a pedagogical advancement in hybrid and online courses.

In fact, several studies show that video content enhances learners’ engagement in the learning process and increases their collaboration in reviews. It helps to relieve the feeling of isolation (Jaggars & Xu, 2016; Thompson & Lee, 2012). Additionally, and because they convey affective indicators such as expressions of emotion, humor and self-disclosure, video recordings play a role in increasing social presence (Borup *et al.*, 2012). They also enhance the reflective and metacognitive components of learning – for example, in the case of screencasts or screen recordings (see Chapter 12 of this book).

4.4.1.3 Scaffolding and support strategies

We have now laid the foundations regarding the use of work areas in PLLEs, the attitude and role of the instructor, and the activities and instructional materials that maximize usability and accessibility for as many learners as possible. In this context, inclusive language teaching strategies can encourage learners to participate more in class, collaborate in social settings and reflect in individual spaces.

Various strategies support the application of UDL principles. The first strategy is known as scaffolding which, under the UDL framework and principles, enables the creation of a learning space that minimizes distractions and contributes to the ‘engagement’ principle of UDL. Web-based tools such as *Loom* (www.loom.com) and *EdPuzzle* (www.edpuzzle.com) – programs that allow the user to easily record video and audio on their device – screencasts or a combination of both, can assist instructors in creating and sharing videos. In turn, these enable learners to develop their prior knowledge, since they can watch them at their own pace and discuss their content before tackling a challenging text, for example.

Scaffolding promotes tailored content delivery, providing diverse comprehension options, in line with the ‘presentation’ principle of UDL. With *Flipgrid Shorts* (www.info.flipgrid.com), for instance, the instructor can demonstrate how to annotate and analyze a text excerpt using screenshots or visual aids such as filters, textboxes, emojis, etc. Graphic organizers, on the other hand, such as those available on *Google Drawing*, help to visualize, connect and organize new information.

Finally, scaffolding makes it easier to monitor progress, aligning with the ‘action and expression’ principle. Tools such as *Actively Learn* (www.activelylearn.com) and *Pear Deck* (www.peardeck.com) offer the opportunity to slow down and review what has been learned so far. The instructor can provide question models and give learners the time they need to prepare their answers, helping them to revise fundamental ideas and deepen their understanding of complex texts.

Table 4.4 contains examples of support tools organized according to the principles of UDL. It also suggests questions whereby the instructor may reflect upon how these aspects can be implemented in the classroom. These examples describe a series of research-based scaffolding options that help to address learner variability (Meyer *et al.*, 2014).

Meanwhile, unlike scaffolding strategies, **supports** (Table 4.5) are permanent aids or adjustments. That said, in some cases, the same material or tool that serves as a long-term support for one learner may be a form of temporary scaffolding for another.

Spellcheckers, which are usually built into word processors, are one of the support options available. Research has shown that, even in phonologically transparent writing systems, as is the case with Spanish,

Table 4.4 Examples of instructional scaffolding

Options for scaffolding strategies	UDL principle	Examples
<ul style="list-style-type: none"> • Offering task options • Adjusting the difficulty level (task complexity) • Providing varied materials or resources • Allowing different types of groups • Providing varied feedback 	<p>Engagement → Guiding questions: How can you guide the learners’ motivation so that they will want to learn more? How do you minimize distractions?</p>	<i>Loom, EdPuzzle</i>
<ul style="list-style-type: none"> • Using concept maps, graphs, organizers and diagrams • Offering writing models • Providing opportunities to think aloud • Illustrating with multimedia and tools (e.g. text-to-speech tools, audio narration) 	<p>Representation → Guiding questions: How do you present the information in a customized way? How do you offer options for comprehension?</p>	<i>FlipGrid Shorts, Google Drawing</i>
<ul style="list-style-type: none"> • Offering models for product creation • Providing guidelines, suggestions, gestures or clues • Using guiding questions • Allowing the use of multimedia resources (e.g. word processors, map applications, digital drawing tools) 	<p>Action and expression → Guiding questions: How can you provide scaffolding with focused practice? How do you monitor progress and, if necessary, provide precise feedback?</p>	<i>Actively Learn, Pear Deck</i>

Table 4.5 Examples of supports

Support options	UDL principle
<ul style="list-style-type: none"> • Access to a monolingual or bilingual dictionary • Glossary • Spellchecker • Editing checklist 	Engagement → Guiding question: How can you help the learner stay involved?

for instance, L2 learners often struggle with spelling (Blázquez-Carretero & Woore, 2021). Written synchronous corrective feedback, provided automatically by computerized spellcheckers, is a way of teaching orthography without taking away from lesson time. However, the extent to which this feedback is effective or not, has yet to be demonstrated, especially since existing spellcheckers are designed for native speakers and do not specifically suit the pedagogical needs of L2 learners (Shintani & Aubrey, 2016). The study conducted by Blázquez-Carretero and Woore (2021) regarding an experimental trial of a pedagogical spellchecker (PSC) developed specifically for L2 learners is part of a small but growing research area which suggests that written synchronous corrective feedback for spelling mistakes can indeed be effective. In this regard, the role of the instructor is essential in the search for a balance between supports and scaffolding, while always providing the necessary feedback and guidance to promote learner autonomy.

Moreover, the principles of UDL can be applied to teaching materials and learning environments in the context of **accommodations**. These are another type of instructional aid, whose purpose is different from that of scaffolding and supports. Even though in some cases the scaffolding options provided to all learners in a UDL-based PLLE may be the same or at least very similar, accommodations are only offered to those with learning difficulties who would otherwise be unable to move forward. So, while scaffolding is optional, accommodations are a requirement for certain learners. These can take various forms:

- instructional accommodations: graphic organizers, duplicated notes, additional processing time;
- environmental accommodations: alternative work areas or a calm setting;
- assessment-related accommodations: extra time, oral presentation of instructions or test components, additional/alternative devices.

In the **asynchronous individual reading/listening space**, **digital texts** provide much more flexibility than traditional printed formats. When working with written input, learners can independently access the digital text to increase the font size, change the background color for better visibility, highlight the main points, use summarization features, apply text-to-speech functions and use screen readers. For learners who may struggle to read information presented in digital format, text-to-speech

programs can be particularly helpful. While they are frequently used by people with visual or reading disabilities, they are also very helpful for L2 learners, since they can be installed on mobile devices. This way, learners can listen to the text as they read, which in turn helps them to recognize and pronounce words and sounds. All this increases learners' ability to stay focused while also contributing to better language comprehension. When working with oral input, learners have the option to play segments as many times as they need. This enables them to review the input at their own pace, consequently reducing anxiety levels (Schwartz, 1972, cited in Scovel, 1991). Ultimately, learners can work autonomously with both written and oral input, using technology to make decisions that boost their learning. Not only this, but learners who need more time to understand a specific message in the target language are free to do so, while those who advance at a faster pace have the option to explore new avenues of information or move forward in their learning journey.

4.5 Conclusion and Future Lines of Research

This chapter has revealed that, for language learning to be efficient and accessible, its design must be based on UDL guidelines. Although optimizing individual choice and autonomy is one of the objectives of UDL in promoting responsible and active learning, educators must also keep in mind that not all learners can function in this way. This is the case, for example, for those accustomed to traditional teaching in a highly structured environment where the teacher is essentially the center of attention. Therefore, it is necessary to 'guide' learners from a dependent context to a more independent one, creating an environment with guidelines for interaction, feedback, reflection and self-assessment. Ultimately, the aim is for this guided environment to help learners develop these skills successfully.

Further research is needed to analyze and describe examples that illustrate how to implement in practice the principles, guidelines and checkpoints of UDL (Rao *et al.*, 2015). Similarly, to develop a favorable environment based on this type of design, educators must ensure that they take into account aspects related to learner variability, UDL strategies, and the use of technology that meets the needs of the entire group of learners. Finally, all this should be accomplished through the integration of a materials design strategy that recognizes diversity, thus achieving inclusivity.

4.6 Annotated Additional Reading

Ralabate, P.K. (2020) *Your UDL Lesson Planner*. Paul H Brookes.

This useful and accessible guide helps educators across all levels to implement UDL theory into their classes. Based on different situations, exercises, questions for reflection and video demonstrations, the book guides the reader through the UDL planning process.

Torres, C. and Rao, K. (2019) *UDL for Language Learners*. CAST Professional Publishing. This book shows language instructors how to prepare for learner diversity in relation to their academic and cultural profiles, as well as their language acquisition needs. The authors describe the design processes that are relevant to specific skills and levels, and also share strategies for applying UDL in classes that enable language learners to achieve high levels of competence.

References

- Adair-Hauck, B., Willingham-McLain, L. and Youngs, B.E. (2000) Evaluating the integration of technology and second language learning. *CALICO Journal* 17 (2), 269–306. <https://www.jstor.org/stable/24152630>.
- Allen, M.W. and Sites, R.H. (2012) *Leaving ADDIE for SAM: An Agile Model for Developing the Best Learning Experiences*. American Society for Training and Development (ASTD).
- American Council on the Teaching of Foreign Languages (2012) *ACTFL Proficiency Guidelines*. American Council on the Teaching of Foreign Languages. <https://www.actfl.org/educator-resources/actfl-proficiency-guidelines>.
- American Council on the Teaching of Foreign Languages (2017a) *NCSSFL-ACTFL Can-Do Statements*. American Council on the Teaching of Foreign Languages. <https://www.actfl.org/resources/ncssfl-actfl-can-do-statements>.
- American Council on the Teaching of Foreign Languages (2017b) *The Role of Technology in Language Learning*. American Council on the Teaching of Foreign Languages. <https://www.actfl.org/advocacy/actfl-position-statements/the-role-technology-language-learning>.
- American Council on the Teaching of Foreign Languages (2019) *Diversity and Inclusion in World Language Teaching & Learning*. American Council on the Teaching of Foreign Languages. <https://www.actfl.org/advocacy/actfl-position-statements/diversity-and-inclusion-world-language-teaching-learning>.
- Americans with Disabilities Act of 1990. Public Law 101–336. § 1.108th Congress, 2nd session (July 26, 1990).
- Arispe, K. and Blake, R.J. (2012) Individual factors and successful learning in a hybrid course. *System* 40 (4), 449–465. <https://doi.org/10.1016/j.system.2012.10.013>.
- Barab, S.A., Hay, K.E., Barnett, M. and Squire, K. (2001) Constructing virtual worlds: Tracing the historical development of learner practices. *Cognition and Instruction* 19 (1), 47–94. https://doi.org/10.1207/S1532690XCI1901_2.
- Basham, J.D., Meyer, H. and Perry, E. (2010) The design and application of the digital backpack. *Journal of Research on Technology in Education* 42 (4), 339–359. <https://doi.org/10.1080/15391523.2010.10782555>.
- Basken, P. (2008) Electronic portfolios may answer calls for more accountability. *The Chronicle of Higher Education*, 18 April. <https://www.chronicle.com/article/electronic-portfolios-may-answer-calls-for-more-accountability/>.
- Bax, S. (2011) Normalisation revisited: The effective use of technology in language education. *International Journal of Computer-Assisted Language Learning and Teaching* 1 (2), 1–15. <https://doi.org/10.4018/ijcallt.2011040101>.
- Black, R.D., Weinberg, L.A. and Brodwin, M.G. (2014) Universal design for instruction and learning: A pilot study of faculty instructional methods and attitudes related to students with disabilities in higher education. *Exceptionality Education International* 24 (1), 48–64. <https://doi.org/10.5206/eei.v24i1.7710>.
- Blaich, C., Wise, K., Pascarella, E.T. and Roksa, J. (2016) Instructional clarity and organization: It's not new or fancy, but it matters. *Change: The Magazine of Higher Learning* 48 (4), 6–13. <https://doi.org/10.1080/00091383.2016.1198142>.
- Blake, R. (2000) Computer-mediated communication: A window on L2 Spanish interlanguage. *Language Learning & Technology* 4 (1), 120–136. <http://dx.doi.org/10125/25089>.

- Blake, R. (2005) Bimodal CMC: The glue of language learning at a distance. *CALICO Journal* 22 (3), 497–511. <https://www.jstor.org/stable/24147935>.
- Blázquez-Carretero, M. and Woore, R. (2021) Can a ‘pedagogical’ spellchecker improve spelling accuracy in L2 Spanish? *Language Learning & Technology* 25 (2), 135–157. <http://hdl.handle.net/10125/73437>.
- Bohinski, C.A. and Mulé, N. (2016) Telecollaboration: Participation and negotiation of meaning in synchronous and asynchronous activities. *MEXTESOL Journal* 40 (3), 1–16.
- Borup, J., West, R.E. and Graham, C.R. (2012) Improving online social presence through asynchronous video. *The Internet and Higher Education* 15 (3), 195–203. <https://doi.org/10.1016/j.iheduc.2011.11.001>.
- Bower, J. and Kawaguchi, S. (2011) Negotiation of meaning and corrective feedback in Japanese/English eTANDEM. *Language Learning & Technology* 15 (1), 41–71. <http://dx.doi.org/10125/44237>.
- Branch, R.M. (2009) *Instructional Design: The ADDIE Approach*. Springer.
- Brandl, K. (2008) *Communicative Language Teaching in Action*. Pearson Prentice-Hall.
- Bronan, R.F. and Essex, C. (2001) Synchronous and synchronous communication tools in distance education. *TechTrends* 45 (1), 36. <https://doi.org/10.1007/BF02763377>.
- Brown, A.L. and Campione, J.C. (1996) Psychological theory and the design of innovative learning environments: On procedures, principles, and systems. In L. Schauble and R. Glaser (eds) *Innovations in Learning* (pp. 289–325). Routledge.
- Campbell, T. and Wescott, J. (2019) *Profile of Undergraduate Students: Attendance, Distance and Remedial Education, Degree Program and Field of Study, Demographics, Financial Aid, Financial Literacy, Employment, and Military Status: 2015–16*. National Center for Education Statistics. <https://nces.ed.gov/pubsearch/pubsinfo>.
- Center for Applied Special Technology (2011) *Universal Design for Learning Guidelines Version 2.0*. Center for Applied Special Technology.
- Center for Applied Special Technology (2017) *What is Universal Design for Learning?* Center for Applied Special Technology. <https://www.cast.org/impact/universal-design-for-learning-udl>.
- Center for Applied Special Technology (2018) *Universal Design for Learning Guidelines*. Center for Applied Special Technology. <https://udlguidelines.cast.org/>.
- Chapelle, C. (1998) Multimedia CALL: Lessons to be learned from research on instructed SLA. *Language Learning & Technology* 2 (1), 21–39. <http://dx.doi.org/10125/25030>.
- Chenoweth, N.A., Ushida, E. and Murday, K. (2006) Student learning in hybrid French and Spanish courses: An overview of language online. *CALICO Journal* 24 (1), 115–146. <https://www.jstor.org/stable/24156297>.
- Collins, L. and Muñoz, C. (2016) The foreign language classroom: Current perspectives and future considerations. *The Modern Language Journal* 100 (S1), 133–147.
- Council for Exceptional Children (2011) *New Guidelines for Universal Design for Learning Provide a Roadmap for Educators and Educational Publishers*. Council for Exceptional Children. <https://web.archive.org/web/20120116035812/http://www.cec.sped.org/AM/Template.cfm?Section=Home&CAT=none&CONTENTID=10573&TEMPLATE=/CM/ContentDisplay.cfm>.
- Council of Europe (2020) *Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume*. Council of Europe.
- Dabbagh, N. (2003) Scaffolding: An important teacher competency in online learning. *TechTrends* 47, 39–44.
- Day, C. (1993) Reflection: A necessary but not sufficient condition for professional development. *British Educational Research Journal* 19 (1), 83–93. <https://www.jstor.org/stable/1500513>.
- DeAngelis, T. (2007) *An Expanding Notion of Diversity*. American Psychological Association. <https://www.apa.org/gradpsych/2007/03/cover-notion>.
- De Lima, D.P., Gerosa, M.A., Conte, T.U. and Netto, J.F.D.M. (2019) What to expect, and how to improve online discussion forums: The instructors’ perspective. *Journal of*

- Internet Services and Applications* 10 (1), 1–15. <https://doi.org/10.1186/s13174-019-0120-0>.
- Dell, C.A., Dell, T.F. and Blackwell, T.L. (2015) Applying Universal Design for Learning in online courses: Pedagogical and practical considerations. *Journal of Educators Online* 12 (2), 166–192.
- DeWaard, H. (2016) Voice and video instructor feedback to enhance instructor presence. In W. Kilgore (ed.) *Humanizing Online Teaching and Learning* [ebook]. Pressbooks.
- Dick, W. and Carey, L. (1978) *The Systematic Design of Instruction*. Scott Foresman.
- Dick, W. and Carey, L. (1996) *The Systematic Design of Instruction* (4th edn). Harper Collins.
- Dudley-Evans, T. and St John, M. (1998) *Developments in ESP: A Multi-Disciplinary Approach*. Cambridge University Press.
- Eaton, S.E. (2010) *Global Trends in Language Learning in the Twenty-First Century*. Onate Press. <https://files.eric.ed.gov/fulltext/ED510276.pdf>.
- Edyburn, D.L. (2013) Critical issues in advancing the special education technology evidence base. *Exceptional Children* 80 (1), 7–24. <https://doi.org/10.1177/001440291308000107>.
- Ellis, R. (1994) *The Study of Second Language Acquisition*. Oxford University Press.
- Elola, I. and Oskoz, A. (2008) Blogging: Fostering intercultural competence development in foreign language and study abroad contexts. *Foreign Language Annals* 41 (3), 454–477. <https://doi.org/10.1111/j.1944-9720.2008.tb03307.x>.
- Eutsler, L. (2019) 1:1 iPads in first Grade: Case study of a teacher's concerns and implementation. In Y. Zhang and D. Cristol (eds) *Handbook of Mobile Teaching and Learning* (pp. 873–887). Springer. https://doi.org/10.1007/978-981-13-2766-7_132.
- Freeman, D. (1982) Observing teachers: Three approaches to in-service training and development. *TESOL Quarterly* 16 (1), 21–28. <https://doi.org/10.2307/3586560>.
- Garrison, D.R., Anderson, T. and Archer, V. (2000) Critical thinking in a text-based environment: Computer conferencing in higher education. *Internet and Higher Education* 2, 87–105. [https://doi.org/10.1016/S1096-7516\(00\)00016-6](https://doi.org/10.1016/S1096-7516(00)00016-6).
- Gazaille, M. (2009) Successful IT integration: The human factor behind it. *EDULEARN09*, 454–462.
- Gilbert, S.D. (2001) *How to Be a Successful Online Student*. McGraw-Hill.
- Gillespie, J. and McKee, J. (1999) Does it fit and does it make any difference? Integrating CALL into the curriculum. *Computer Assisted Language Learning* 12 (5), 441–455. <https://doi.org/10.1076/call.12.5.441.5692>.
- Godwin-Jones, R. (2011) Emerging technologies: Mobile apps for language learning. *Language Learning & Technology* 15 (2), 2–11. <http://dx.doi.org/10125/44244>.
- Godwin-Jones, R. (2015) The evolving roles of language teachers: Trained coders, local researchers, global citizens. *Language Learning & Technology* 19 (1), 10–22. <http://dx.doi.org/10125/44395>.
- Hall, T.E., Cohen, N., Vue, G. and Ganley, P. (2015) Addressing learning disabilities with UDL and technology: Strategic reader. *Learning Disability Quarterly* 38 (2), 72–83. <https://doi.org/10.1177/0731948714544375>.
- Hiss, A. (2000) Talking the talk: Humor and other forms of online communication. In K.W. White and B.H. Weight (eds) *The Online Teaching Guide* (pp. 24–36). Allyn & Bacon.
- Ice, P., Curtis, R., Phillips, P. and Wells, J. (2007) Using asynchronous audio feedback to enhance teaching presence and students' sense of community. *Journal of Asynchronous Learning Networks* 11 (2), 3–25.
- Israel, M., Ribuffo, C. and Smith, S. (2014) *Universal Design for Learning: Recommendations for Teacher Preparation and Professional Development (Document No. IC-7)*. University of Florida, Collaboration for Effective Educator, Development, Accountability, and Reform Center website. <http://cedar.education.ufl.edu/tools/innovation-configurations>.
- Jaggars, S.S. and Xu, D. (2016) How do online course design features influence student performance? *Computers & Education* 95, 270–284. <https://doi.org/10.1016/j.compedu.2016.01.014>.

- Jepson, K. (2005) Conversations – And negotiated interaction in text and voice chat rooms. *Language Learning & Technology* 9 (3), 79–98. <http://dx.doi.org/10125/44033>.
- Kennedy, M.J., Thomas, C.N., Meyer, J.P., Alves, K.D. and Lloyd, J.W. (2014) Using evidence-based multimedia to improve vocabulary performance of adolescents with LD: A UDL approach. *Learning Disability Quarterly* 37 (2), 71–86. <https://doi.org/10.1177/0731948713507262>.
- Kilpatrick, S., Barrett, M. and Jones, T. (2003) Defining learning communities discussion. Paper presented at the Joint AARE/NZARE Conference, Auckland, 29 November–3 December.
- King-Sears, M.E., Johnson, T.M., Berkeley, S., Weiss, M.P., Peters-Burton, E.E., Evmenova, A.S. and Hursh, J.C. (2015) An exploratory study of universal design for teaching chemistry to students with and without disabilities. *Learning Disability Quarterly* 38 (2), 84–96. <https://doi.org/10.1177/0731948714564575>.
- Lamy, M.N. and Goodfellow, R. (1999) Reflective conversation in the virtual classroom. *Language Learning & Technology* 2 (2), 43–61. <http://dx.doi.org/10125/25042>.
- Lee, L. (2001) Online interaction: Negotiation of meaning and strategies used among learners of Spanish. *ReCALL* 13 (2), 232–244. <https://doi.org/10.1017/S0958344001000829a>.
- Lewis, A. and Atzert, S. (2000) Dealing with computer-related anxiety in the project-oriented CALL classroom. *Computer Assisted Language Learning* 13 (4–5), 377–395. [https://doi.org/10.1076/0958-8221\(200012\)13:4-5;1-E;FT377](https://doi.org/10.1076/0958-8221(200012)13:4-5;1-E;FT377).
- Little, D. (1996) Freedom to learn and compulsion to interact: Promoting learner autonomy through the use of information systems and information technologies. In R. Pemberton, S.L. Edward Li, W.F. Winnie and H.D. Pierson (eds) *Taking Control: Autonomy in Language Learning* (pp. 203–218). Hong Kong University Press.
- Little, D. and Thorne, S. (2017) From learner autonomy to rewilding: A discussion. In M. Cappellini, T. Lewis and A. Rivens Mompean (eds) *Learner Autonomy and Web 2.0* (pp. 12–35). Equinox.
- Long, M.H. (1996) The role of the linguistic environment in second language acquisition. In W.C. Ritchie and T.K. Bhatia (eds) *Handbook of Second Language Acquisition* (pp. 413–468). Academic Press.
- Mace, R. (1997) *What is Universal Design?* North Carolina State University.
- Marino, M.T., Gotch, C.M., Israel, M., Vasquez, E., Basham, J.D. and Becht, K. (2014) UDL in the middle school science classroom: Can video games and alternative text heighten engagement and learning for students with learning disabilities? *Learning Disability Quarterly* 37, 87–99. <https://doi.org/10.1177/0731948713503963>.
- Masterman, L. (2013) The challenge of teachers' design practice. In H. Beetham and R. Sharpe (eds) *Rethinking Pedagogy for a Digital Age: Designing and Delivering e-Learning* (pp. 234–259). Routledge.
- Meyer, A., Rose, D.H. and Gordon, D.T. (2014) *Universal Design for Learning: Theory and Practice*. CAST Professional Publishing.
- Murray, L. and Barnes, A. (1998) Beyond the 'Wow' factor – Evaluating multimedia language learning software from a pedagogical viewpoint. *System* 26 (2), 249–259. [https://doi.org/10.1016/S0346-251X\(98\)00008-6](https://doi.org/10.1016/S0346-251X(98)00008-6).
- National Standards in Foreign Language Education Project (US) and American Council on the Teaching of Foreign Languages (2015) *World-Readiness Standards for Learning Languages*. American Council on the Teaching of Foreign Languages.
- Nelson, L.L. (2021) *Design and Deliver Planning and Teaching Using Universal Design for Learning*. Brookes Publishing.
- O'Rourke, B. (2005) Form-focused interaction in online tandem learning. *CALICO Journal* 22 (3), 433–466. <https://www.jstor.org/stable/24147933>.
- Orsini-Jones, M., Brick, B. and Pibworth, L. (2013) Practising language interaction via social networking sites: The expert student's perspective on personalized language learning. In B. Zou, M. Xing, Y. Wang, M. Sun and C.H. Xiang (eds) *Computer-assisted Foreign Language Teaching and Learning: Technological Advances* (pp. 40–53). IGI Global.

- Palloff, R.M. and Pratt, K. (1999) *Building Learning Communities in Cyberspace*. Jossey-Bass.
- Pellerin, M. (2017) Rethinking the concept of learner autonomy within the MALL environment. In M. Cappellini, T. Lewis and A. Rivens Mompean (eds) *Learner Autonomy and Web 2.0* (pp. 91–114). Equinox.
- Pica, T. (1994) Research on negotiation: What does it reveal about second-language learning conditions, processes, and outcomes? *Language Learning* 44 (3), 493–527. <https://doi.org/10.1111/j.1467-1770.1994.tb01115.x>.
- Pica, T., Young, R. and Doughty, C. (1987) The impact of interaction on comprehension. *TESOL Quarterly* 21 (4), 737–758. <https://doi.org/10.2307/3586992>.
- Picciano, A.G. (2002) Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks* 6 (1), 21–40. <http://dx.doi.org/10.24059/olj.v6i1.1870>.
- Pifarré, M. (2007) Scaffolding through the network: Analysing the promotion of improved online scaffolds among university students. *Studies in Higher Education* 32 (3), 389–408. <https://doi.org/10.1080/03075070701346972>.
- Poorvu Center for Teaching and Learning (2021) *Awareness of Socioeconomic Diversity*. Yale University. <https://poorvucenter.yale.edu/SocioeconomicDiversityAwareness>
- Ralabate, P.K. (2020) *Your UDL Lesson Planner* (3rd edn). Paul H. Brookes.
- Rao, K. and Tanners, A. (2011) Curb cuts in cyberspace: Universal instructional design for online courses. *Journal of Postsecondary Education and Disability* 24 (3), 211–229.
- Rao, K. and Meo, G. (2016) Using Universal Design for Learning to design standards-based lessons. *SAGE Open* 6 (4), 1–12. <https://doi.org/10.1177/2158244016680688>.
- Rao, K., Ok, M. and Bryant, B.R. (2014) A review of research on universal design educational models. *Remedial & Special Education* 35, 153–166. <https://doi.org/10.1177/0741932513518980>.
- Rao, K., Edelen-Smith, P. and Wailehua, C.U. (2015) Universal design for online courses: Applying principles to pedagogy. *Open Learning: The Journal of Open, Distance and e-Learning* 30 (1), 35–52. <https://doi.org/10.1080/02680513.2014.991300>.
- Reinders, H. and White, C. (2016) 20 Years of autonomy and technology: How far have we come and where to next? *Language Learning & Technology* 20 (2), 143–154. <http://dx.doi.org/10125/44466>.
- Richardson, J. and Swan, K. (2003) Examining social presence in online courses in relation to students' perceived learning and satisfaction. *IDEALS* 7 (1), 68–88.
- Robinson, D.E. and Wizer, D.R. (2016) Universal Design for Learning and the quality matters guidelines for the design and implementation of online learning events. *International Journal of Technology in Teaching and Learning* 12 (1), 17–32.
- Roksa, J. and Whitley, S.E. (2017) Fostering academic success of first-year students: Exploring the roles of motivation, race, and faculty. *Journal of College Student Development* 58 (3), 333–348. <https://10.1353/csd.2017.0026>.
- Rose, D.H. and Meyer, A. (2002) *Teaching Every Student in the Digital Age: Universal Design for Learning*. Association for Supervision and Curriculum Development. <http://www.ascd.org/publications/books/101042.aspx>.
- Russo, T.C. and Benson, S. (2005) Learning with invisible others: Perceptions of online presence and their relationship to cognitive and affective learning. *International Forum of Educational Technology and Society* 8 (1), 5–62. <https://www.jstor.org/stable/jeductechsoci.8.1.54>.
- Schelly, C.L., Davies, P.L. and Spooner, C.L. (2011) Student perceptions of faculty implementation of Universal Design for Learning. *Journal of Postsecondary Education and Disability* 24 (1), 17–28.
- Schwartz, L. (1972) *Educational Psychology: Focus on the Learner*. Holbrook Press.
- Scovel, T. (1991) The effect of affect on foreign language learning: A review of the anxiety research. In E.K. Horwitz and D.J. Young (eds) *Language Anxiety: From Theory and Research to Classroom Implications* (pp. 15–24). Prentice Hall.

- Sharpe, R. and Oliver, M. (eds) (2007) *Designing Courses for e-Learning. Rethinking Pedagogy for a Digital Age: Designing and Delivering e-Learning*. Routledge.
- Smith, B. (2009) The relationship between scrolling, negotiation, and self-initiated self-repair in an SCMC environment. *CALICO Journal* 26, 231–245. <https://www.jstor.org/stable/calicojournal.26.2.231>.
- Stephens-Martinez, K., Hearst, M.A. and Fox, A. (2014) Monitoring MOOCs: Which information sources do instructors value? In M. Sahami (ed.) *L@s' 14: Proceedings of the First ACM Conference on Learning @ Scale Conference* (pp. 79–88). Association for Computing Machinery. <https://doi.org/10.1145/2556325.2566246>.
- Swain, M. (1995) Three functions of output in second language learning. In G. Cook and B. Seidlhofer (eds) *Principle and Practice in Applied Linguistics* (pp. 125–144). Oxford University Press.
- Swan, K. and Shih, L.F. (2005) On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks* 9 (3), 115–136.
- Thomas, G. (2013) A review of thinking and research about inclusive education policy, with suggestions for a new kind of inclusive thinking. *British Educational Research Journal* 39 (3), 473–490. <https://doi.org/10.1080/01411926.2011.652070>.
- Thompson, R. and Lee, M.J. (2012) Talking with students through screencasting: Experimentations with video feedback to improve student learning. *The Journal of Interactive Technology and Pedagogy* 1 (1), 1–16. https://digitalcommons.tacoma.uw.edu/ias_pub/229.
- Torres, C. and Rao, K. (2019) *UDL for Language Learners*. CAST Professional Publishing.
- Tu, C.H. and McIsaac, M. (2002) The relationship of social presence and interaction in online classes. *The American Journal of Distance Education* 16 (3), 131–150. https://doi.org/10.1207/S15389286AJDE1603_2.
- United Nations Convention on the Rights of Persons with Disabilities. Doc.A/RES/61/106(2007). <https://www.un.org/development/desa/disabilities/resources/general-assembly/convention-on-the-rights-of-persons-with-disabilities-ares-61106.html>.
- van Lier, L. (1996) *Interaction in the Language Curriculum*. Routledge.
- Vygotsky, L.S. (1962) *Thought and Language*. MIT Press.
- Wang, J., Pascarella, E., Laird, T. and Ribera, A. (2015) How clear and organized classroom instruction and deep approaches to learning affect growth in critical thinking and need for cognition. *Studies in Higher Education* 40 (10), 1786–1807. <https://doi.org/10.1080/03075079.2014.914911>.
- Wenger, E., McDermott, R.A. and Snyder, W. (2002) *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Harvard Business Review Press.
- White, J. (2013) Language economy in computer-mediated communication: Learner autonomy in a community of practice. In B. Zou, M. Xing, Y. Wang, M. Sun and C.H. Xiang (eds) *Computer-Assisted Foreign Language Teaching and Learning: Technological Advances* (pp. 75–90). IGI Global.
- White, K. (2000) Face to face in the online classroom: Keeping it interpersonal and human. In K.W. White and B.H. Weight (eds) *The Online Teaching Guide* (pp. 1–12). Allyn & Bacon.
- Wiggins, G. and McTighe, J. (1998) *Understanding by Design*. ASCD (Association for Supervision and Curriculum Development).
- Williams, S. and Sharma, P. (1988) Language acquisition by distance education: An Australian survey. *Distance Education* 9 (1), 127–146. <https://doi.org/10.1080/0158791880090111>.
- Yang, S.C. (2001) Language learning on the world wide web: An investigation of EFL learners' attitudes and perceptions. *Journal of Educational Computing Research* 24 (2), 155–181. <https://doi.org/10.2190/VDJC-FGTQ-79FH-M615>.
- Yanguas, I. (2010) Oral computer-mediated interaction between L2 learners: It's about time! *Language Learning and Technology* 14 (3), 72–93. <http://dx.doi.org/10125/44227>.
- Yuksel, D. and Inan, B. (2014) The effects of communication mode on negotiation of meaning and its noticing. *ReCALL: Journal of Eurocall* 26 (3), 333–354. <https://doi.org/10.1017/S0958344014000147>.

Part 2

Personalizing Learning and Teaching

5 Motivation and Virtual Learning

Luis Cerezo and Íñigo Yanguas

5.1 Introduction and Key Concepts

5.1.1 Motivation and technology: A complicated relationship

Since early on, technology has been regarded as a motivating force in second language acquisition (SLA). Li (2017: 39) noted that possibly the most widely recognized advantage of technology is its ability to motivate students and enhance their engagement. Stockwell (2013: 163) additionally observed that the **relationship between technology and motivation can be bidirectional**. On the one hand, a tech enthusiast might be encouraged to learn a language to communicate with other members of their community of practice. One such example is provided by the many manga and anime fans who end up learning Japanese. On the other hand, a highly motivated language learner may turn to technology for its ‘inherent motivational effects’ (Stockwell, 2013: 157), since it enables them to engage with authentic speakers (in real time or asynchronously), learn in a personalized way, receive instant and private feedback, express themselves anonymously, take stock of their progress, or satisfy their curiosity thanks to the ‘novelty effect’, among other reasons (Bahari, 2022).

With the turn of the millennium, however, conflicting opinions emerged, questioning whether there is in fact an automatic link between technology and motivation. Bax (2003: 23–25) warned of the obsolescence of the novelty effect, predicting that technology would eventually become normalized in classrooms, and criticized two common misconceptions (Bax, 2003: 26): the **omnipotence fallacy** (the expectation that technology can solve every problem in the SLA classroom) and the **sole agent fallacy** (the expectation that simply having access to technology is enough to implement it successfully, without the backing of a strategic plan).

In fact, Bax’s criticisms remain relevant two decades later (Stockwell & Reinders, 2019: 41). Technology has been normalized in many contexts, and it is becoming increasingly challenging to spark and maintain learners’ curiosity through new technology tools (Arnone *et al.*, 2011).

Regarding the omnipotence fallacy, people often ask questions such as ‘What is the best app for learning Spanish?’, without specifying the learner’s level, the skills they are looking to build on or their learning objectives. As for the sole agent fallacy, learner autonomy is often taken for granted when there is actually no guarantee that students will choose to use their electronic devices to increase the quality and quantity of their linguistic exposure and practice.

Incipient research corroborates this. Several studies (Appel & Mullen, 2002; Maloney & Isbell, 2022) have revealed surprisingly low rates of engagement with digital activities in the L2 outside the classroom. What could be the reason for this? Is there a general lack of intrinsic motivation among L2 learners? Are learners unaware of some of the affordances of technology? Clearly, along with its inherent motivational effects, technology can have a negative impact (Stockwell, 2013: 165). For instance, learners may be distracted by the large number of constant stimuli (Murray *et al.*, 2020), become frustrated when they do not receive the right support from their instructor to solve technology-related issues, feel overwhelmed by the abundance of authentic input on the internet or even resist using personal devices, such as their cell phones, for learning purposes (Bahari, 2022; Stockwell, 2013: 164–165).

In fact, several secondary sources invite readers to question the relationship between technology and motivation. In their research synthesis, Golonka *et al.* (2014: 90–91) found only moderate support for the argument that learners prefer working with technology. In addition, they found weak support for the claim that learners feel more motivated, enjoy the learning process more, gain more confidence when expressing themselves in the L2, or invest more time in activities in technological environments. This has prompted many to conclude that the expectations regarding the impact of technology on language learning are often exaggerated (Stockwell & Reinders, 2019: 40), and that there is no direct correlation between technology use and increased motivation (Stockwell, 2013: 170).

Furthermore, the literature on technology and motivation is often criticized for its lack of rigor. Some authors have pointed out that existing empirical evidence regarding the motivational effects of technology is usually anecdotal or simply relies on learners’ subjective opinions during short-term interventions (Felix, 2005; Hubbard, 2005). Others have accused most studies on motivation in SLA of completely overlooking the role of technology (Al-Hoorie, 2017; Mahmoodi & Yousefi, 2022). Finally, Henry & Lamb (2019: 613) have denounced the absence of chapters on motivation in recent publications on technology-mediated, or computer-assisted, language learning (CALL). Consequently, as stated by Al-Hoorie (2017: 7), one might conclude that CALL and motivation in SLA have mainly evolved as independent areas.

Against this backdrop, this chapter puts forth a critical review of when, how and why technology can contribute to motivation in language

learning, connecting SLA and CALL research to propose a new research agenda.

5.1.2 Key concepts: From motivation to engagement

The previous section has introduced concepts such as **intrinsic motivation, engagement and autonomy**. Along with many others, these concepts shape the terminological repertoire of the field of motivation, arguably the most widely researched area within individual differences in SLA (Boo *et al.*, 2015: 148–149). This section defines the most influential concepts.

Motivation, at its core, is usually understood as the desire to begin learning a second language and the determination to continue (Dörnyei, 2001). The **earliest definitions** can be traced back to the pioneering work of Robert Gardner in the 1960s, who considered motivation to be the **sum of three components**: the desire to learn (how much one desires to learn an L2); motivational intensity (how much effort one puts into learning it); and attitudes towards learning (how much one enjoys learning it) (e.g. Gardner, 2010). For Gardner, the strongest form of motivation is the so-called integrative motive, which requires high levels of another three factors: motivation itself (defined previously), attitudes towards the learning context (the more positive, the better) and ‘integrativeness’, which is a key concept in the field. **Integrativeness** is understood as the will to learn an L2 in order to connect more closely with its linguistic community, and it is influenced by a general interest in second languages, positive attitudes towards their speakers and a desire to interact with them. This desire is known as **integrative orientation** and can appear alongside other reasons to learn an L2, **including instrumental orientation** (the practical reasons to learn an L2, such as better career prospects) and, more recently, a desire to quench a thirst for knowledge, travel, friends, influence or self-discovery (Belmechri & Hummel, 1998).

Over time, scholars have questioned the concept of integrativeness, especially with global languages like English and Spanish, where identifying with a specific group of speakers can be challenging. Furthermore, in foreign (rather than second) language acquisition contexts, access to native speakers outside the classroom is often limited. As a result, the ‘integrative/instrumental’ dichotomy has gradually been replaced by that of ‘intrinsic/extrinsic motivation’. A learner is **intrinsically motivated** when they study the language simply because they enjoy doing so. They may be driven by curiosity, pleasure, self-improvement or personal objectives. Conversely, a learner is **extrinsically motivated** if their desire to learn the language is regulated by external factors, such as personal gain, praise or power. There are various subtypes based on the degree of external regulation, including **integrated**

regulation, identification, or introjected regulation (see Noels *et al.*, 2019). Finally, in extreme cases – for instance, in institutions where L2 classes are mandatory – learners may become **demotivated**.

There is arguably some overlap between ‘intrinsic/extrinsic motivation’ and ‘integrative/instrumental orientation’. Several studies have shown that they are correlated constructs, especially in the case of integrative orientation and intrinsic motivation (Kreishan & Al-Dhaimat, 2013). However, they have been found to yield different predictive values depending on individual differences such as gender, age or educational level (Vakilifard & Khaleghizadeh, 2021). Moreover, Dörnyei (2005) suggested that instrumental orientation possesses aspects that are both extrinsic (**preventative instrumentality**, such as avoiding being penalized) and intrinsic (**promotional instrumentality**, such as achieving academic and professional success).

Subsequently, Dörnyei (2005, 2009) proposed a conceptual shift, moving the focus towards the multiple identities (or *selves*) of the learner. He thus defined motivation as the desire to shorten the distance between one’s self-concept and what one aspires to become in order to achieve one’s ideals (the **ideal L2 self**) or fulfill one’s responsibilities (the **ought-to L2 self**) in the context of the **L2 learning experience**. Other key constructs in the field of motivation come from social cognitive theory (Bandura, 1986), which makes a distinction between **self-efficacy** (a learner’s beliefs about their ability to perform the actions necessary to learn something) and **self-regulation** (the learner’s cognitive, motivational and behavioral capacity to successfully manage said actions by setting goals, assessing their performance to achieve them and reacting accordingly). Furthermore, self-determination theory (Ryan & Deci, 2017) posits that, for a learner to become intrinsically motivated, three psychological needs must be met: **competence** (similar to self-efficacy), **relatedness** (having a support network), and **autonomy** (feeling in control of the learning process).

Recently, authors such as Henry (2019: 44) have criticized that, while the aforementioned constructs have contributed to an understanding of the cognitive–emotional factors that influence learners’ motivational predispositions, they say little about how motivation can be generated in the classroom. As a result, the field has shifted from general **predispositions to learning** towards actual **behaviors** in situated contexts (Ushioda, 2009), focusing on alternative constructs (Mahmoodi & Yousefi, 2022).

One of the most notable constructs is **engagement**, understood as the extent to which learners participate in an activity. According to Reeve (2012), there are four types: **behavioral engagement**, which is determined by learners’ attention, participation and effort levels; **emotional engagement**, which depends on the positive and negative emotions towards the activity (e.g. interest or frustration); **cognitive**

engagement, which depends on how sophisticated the learning strategies are (e.g. task planning and rehearsing); and **agentic engagement**, which is based on the attempts made to enrich the learning experience, taking it beyond that of a mere passive recipient. In short, engagement refers to what learners think, do and feel during the learning process, as well as to how they contribute to it (see the synthesis review by Hiver *et al.*, 2021).

In addition to engagement, another variable used to measure learners' behavior in situated contexts is their **willingness to communicate**, understood as the state of mental readiness to use the L2 when the opportunity arises (MacIntyre, 2007). Although MacIntyre *et al.* (1998) identified more than 30 variables that may influence a learner's willingness to communicate in the L2, they can be classified into three areas: the learner's individual motivation; their current state of linguistic self-confidence; and their desire to communicate with a specific person.

Finally, when a learner appears to be highly motivated in a situated context, they can achieve motivational states such as **flow** (Csikszentmihályi, 1997). Flow refers to the mental state that learners are in when they become so immersed in an activity that they lose track of time. When this immersion endures, not so much due to the activity itself but because there is an irrepressible desire to achieve a goal – e.g. to finish a project, to master the L2, etc. – scholars refer to **directed motivational currents** (Dörnyei *et al.*, 2016).

Without a doubt, the multiplicity of constructs briefly outlined here illustrates the vitality of the field of motivation in SLA. Yet, this multiplicity is also accompanied by a certain degree of circularity and referentiality, which warrants a critical gaze to extrapolate conclusions from the specialized literature.

5.2 Historical Perspective: Awaiting a Much Needed Fifth Period

Historically, the study of motivation in SLA has maintained an intermittent relationship with psychological theories of human motivation, sometimes drawing inspiration from them (Ortega, 2009: 168), and at other times evolving independently (Ushioda & Dörnyei, 2012: 396). Ryan *et al.* (2019) identified several periods in the general psychology literature: the **post-Darwinian theories** from the early 20th century; **behaviorism**, which prevailed in the first half of the century; and three reactions to behaviorism, namely the **cognitive movement** (including both behavioral and social approaches), theories focused on **intrinsic motivation** or **psychological needs** and, more recently, perspectives from **evolutionary psychology**. In SLA, the study of motivation took off in the mid-20th century, skipping over post-Darwinian and behaviorist theories and radically getting ahead of its

Table 5.1 Periods of research on motivation in SLA

Period	Approximate dates	Models, systems and theories
Psychosocial	1959–1990	<ul style="list-style-type: none"> • Socio-educational model • Social context model • Acculturation model
Cognitive-situated	1990–2000	<ul style="list-style-type: none"> • Expectancy–value theory • Attribution theory • Self-efficacy theory • Self-worth theory • Goal orientation theory • Self-determination theory
Process-oriented	2000–2010	<ul style="list-style-type: none"> • Process model • L2 motivational self system
Sociodynamic	2010–present	<ul style="list-style-type: none"> • Person-in-context relational model • Chaos theory • Usage-based theory • Complexity theory • Dynamic systems theory • Complex dynamic systems theory • L2 motivational self system
Technological	In the future	<ul style="list-style-type: none"> • New theories based on connectivism

time, as it included socio-contextual perspectives that did not gain traction in general psychology until the 1990s (Dörnyei, 2005: 67). Ushioda and Dörnyei (2012) distinguished between four periods, to which we add a fifth, as shown in Table 5.1.

The first period, which Ushioda and Dörnyei (2012) call the **psychosocial period** (1959–1990), was dominated by the **socio-educational model** developed by Canadian psychologist Robert Gardner and his collaborators (Gardner, 2010). Other noteworthy proposals included the social context and acculturation models by Clément (1980) and Schumann (1986), respectively. Alongside his collaborators, Gardner triangulated responses to different questionnaires (including the **Attitude/Motivation Test Battery** [AMTB], Gardner, 2010) with academic performance data. He demonstrated that success in SLA not only depends on individual differences in cognitive capacity and linguistic aptitude, but also on motivation, thus validating it as an independent construct. Additionally, he posited that the most successful learners are characterized by low learning anxiety and high integrative motivation (Gardner, 2010, 2019).

Over time, the socio-educational model received substantial criticism. For instance, critics questioned its specificity to the Canadian context in which it emerged, the irrelevance of the concept of integrativeness in foreign language acquisition contexts, the overlap between integrative and instrumental orientation (Csizér & Dörnyei, 2005) and, above all, the lack of specific solutions to motivate learners. This last point was acknowledged by Gardner himself (2010: 26). As a result, a second period, known as the **cognitive-situated period**

(Ushioda & Dörnyei, 2012), began. Based on *cognitive* psychology, it linked motivation to how the learner perceives their abilities, limitations and experiences, while also *situating* the object of study in the specific classroom context. Here, several theories emerged, including the expectancy–value, attribution, self-efficacy, self-worth and goal orientation theories (see Dörnyei, 2019: 45 for a summary of each one). Among the most influential ones, however, was **self-determination theory**, conceived in the 1970s in the field of psychology (Ryan & Deci, 2017) and transferred to SLA by Canadian psychologist Kimberly Noels and her colleagues. Thus far, numerous empirical studies, based mainly on questionnaires (**Language Learning Orientation Scale** [LLOS], Noels *et al.*, 2000), have validated the hypotheses of this theory. On the one hand, these studies found a positive correlation between self-perceived competence, autonomy and relatedness with intrinsic and other types of self-regulated motivation and, on the other, a negative correlation between these constructs and demotivation (Noels *et al.*, 2019: 105).

Around the turn of the millennium, a growing interest in situated learning gave way to a third period, known as the **process-oriented period** (Ushioda & Dörnyei, 2012). Its objective was to capture the ever-changing and dynamic nature of motivation and analyze the interaction between different variables in the learning context. For instance, Ushioda (2001) described how a group of French learners in Ireland shifted between intrinsic and extrinsic motivation as they became aware of the advantages of mastering an L2. Meanwhile, Dörnyei (2002) showed that positive attitudes towards a course or interacting with more motivated learners could compensate for a learner’s initial lack of motivation towards an activity. Within this period, the **process model** (Dörnyei & Ottó, 1998) is of particular note. Inspired by the theory of action control by Heckhausen and Kuhl (1985), it defines the motivation process before, during and after learning. Subsequently, Dörnyei (2005, 2009) proposed the **L2 motivational self system**, inspired by possible-selves theory (Markus & Nurius, 1986) and self-discrepancy theory (Higgins, 1987). As mentioned previously, this theory reinterpreted motivation not as a desire to approach others but, rather, as a way to pursue the self-concept one wants or believes one should attain. In response to the AMTB and LLOS questionnaires, Dörnyei (2010) developed the **Motivational Factors Questionnaire** (MFQ), from which multiple versions have emerged (Papi *et al.*, 2019). According to several reviews (Boo *et al.*, 2015; Mahmoodi & Yousefi, 2022), this theory is the most commonly used today; yet, it is not without criticism (see Csizér, 2019: 84–85). For example, arguments have been made for the need to expand the range of selves (Dörnyei, 2019: 48–49), while the validity of the ought-to L2 self has been questioned, due to contradictory results regarding its supposed correlation with learner behaviors. Furthermore, the lack of research on the L2 learning experience (Dörnyei, 2019: 48),

as well as on the role of past and present experiences in motivation (de Bot *et al.*, 2007), has been criticized. Finally, even Dörnyei himself (2019: 53) recognized that the system is not ideal for capturing the dynamic nature of motivation.

Overall, the process-oriented period contributed to understanding motivation as ever-changing and served as a ‘transitional phase’ (Dörnyei, 2019: 49) to the fourth and current period: the **sociodynamic period** (Ushioda & Dörnyei, 2012). Here, approaches such as the person-in-context relational model, chaos theory, complexity theory, dynamic systems theory and usage-based theory emerged, with some authors (Boo *et al.*, 2015) also including the L2 motivational self system due to its adaptability. Among all these approaches, **complex dynamic systems theory** (Dörnyei *et al.*, 2015) is gaining more and more traction. According to this theory, motivation is a variable that cannot be fully dissected, interacting with both emotional and cognitive variables (Al-Hoorie, 2017: 3; Ushioda & Dörnyei, 2012: 400) and fluctuating over time (from one day to another, from one task to another, and within the same task) and through space (from one context to another). According to several authors (Al-Hoorie, 2017; Papi & Hiver, 2020), this theory marks a radical shift in how motivation is conceptualized and researched. However, its success hinges on the ability to surmount the numerous challenges associated with its implementation (MacIntyre *et al.*, 2015: 428).

As we anticipated in the introduction to this chapter, the above review illustrates a striking lack of theoretical exploration regarding the interplay between technology and motivation, as well as a clear disconnect between the research strands of CALL and motivation in SLA (Al-Hoorie, 2017: 7). Arguably, both strands could benefit from delving into related disciplines such as educational psychology and emerging theories like **connectivism** (Siemens, 2018), which examines the impact of technology on education. This theory views learning as a continuous process where informal learning and metacognition are particularly relevant to assess what and how we should learn, especially given the current reality, where technology is taking over many of the cognitive operations traditionally performed by us humans and altering our own way of thinking. Such exploration could mark the start of a much-needed fifth period, the so-called **technological period**, with promising opportunities to redefine the research strand of language learning motivation.

5.3 Contributions of Current Research

5.3.1 Motivation according to secondary sources

Over the past six decades, research on **motivation in SLA** has grown exponentially, probably more than any other research strand

on individual differences (Boo *et al.*, 2015: 145). This is evidenced by recent synthetic (Al-Hoorie, 2017; Boo *et al.*, 2015; Mahmoodi & Yousefi, 2022) and bibliometric (Wu, 2022) studies based on a corpus of publications from 2000 to 2021. These secondary sources illustrate that, so far, theoretical studies have outpaced practical ones (Boo *et al.*, 2015: 149–150) and that the dominant theoretical approach today is the **L2 motivational self system** (Boo *et al.*, 2015: 153–154; Wu, 2022: 11–14). They also point out that empirical studies have mainly analyzed **motivation in learners**, rather than in educators or learners with disabilities (Mahmoodi & Yousefi, 2022), as well as in predominantly **Asian tertiary-level institutions** where **English** was studied as a **foreign language** (Boo *et al.*, 2015: 151; Mahmoodi & Yousefi, 2022: 282–283). Surprisingly, **research on motivation in Spanish as a second language remains limited**. Spanish is even absent in large-scale studies, such as the one conducted by Dörnyei, Csizér and Németh (2006) with 13,000 learners of English, German, French, Italian and Russian over 12 years. Methodologically, there has been a shift from quantitative to qualitative or mixed-method studies, with the **questionnaire + interview** model as the current standard in the field (Ushioda, 2019: 669). Similarly, data analysis has moved from classical statistical procedures towards more innovative techniques that capture the dynamic nature of motivation. Examples include the idiodynamic method and the **latent growth** or **trajectory equifinality models** (Dörnyei *et al.*, 2015).

Regarding empirical results, at least three meta-analyses (Al-Hoorie, 2018; Masgoret & Gardner, 2003; Yousefi & Mahmoodi, 2022) have researched the correlation between motivation and learning using both **objective measures** (test scores or course grades) and **subjective ones** (learners' self-ratings of proficiency or intended effort). These meta-analyses, which include data from between 10,000 and 32,000 learners in studies published between 1959 and 2019, confirm this correlation, though mainly for subjective measures. The AMTB questionnaire obtained the strongest correlations for objective measures, probably because the majority of studies that explore the L2 motivational self system are based on intended effort, which has not been without criticism (Al-Hoorie, 2018: 740). The constructs with the highest predictive value were **motivation** (as defined in the AMTB) and the **ideal L2 self**, while those with the lowest predictive value were **instrumental orientation** and the **ought-to L2 self**.

Meanwhile, the empirical study of **motivation in CALL** is still in its early stages, as shown by the recent reviews by Bodnar *et al.* (2016) and Bahari (2022) of a corpus of publications from 1999 to 2021. According to Bodnar *et al.* (2016: 208): 'there is a gap between how recent theories recommend evaluating motivation and how CALL studies which evaluate motivational impact operate'. Most studies continue to cling to theories on **global and static motivation**

(predispositions to learning of a relatively permanent nature), using approaches such as the cognitive theory of multimedia learning and the socio-educational model (Bahari, 2022: 13–14; Bodnar *et al.*, 2016: 193–195). In response, both Bahari (2022: 16) and Bodnar *et al.* (2016: 201) advocate for further studies that investigate **situated and dynamic motivation** (analysis of motivational changes in specific learning situations), as discussed in the next section.

5.3.2 Situated and dynamic motivation

Most studies on situated motivation in CALL have approached the construct indirectly, viewing it as something **static**. In a typical study, learners interact with a specific technology, complete a series of diagnostic tests to measure their learning – the focus of the study – and, *at the end*, they answer questions about variables such as their self-efficacy, self-competence or self-confidence in the L2 (e.g. ‘This tool has helped me improve my vocabulary’), their willingness to communicate (e.g. ‘This tool increased my motivation to write in Spanish’) or attitudes towards the learning environment (e.g. ‘In the future, I would like to continue using a tool like this one’). This type of research generally reports positive results (e.g. ‘X percent of learners reported vocabulary improvement’). Now, while these studies can illustrate how a certain technology is received (see Bodnar *et al.*, 2016: 198), their contribution to the field of motivation is limited, as they rarely apply a theoretical framework that allows for the extrapolation of general conclusions to other technologies and contexts.

More informative in this regard are studies seeking to identify **the common denominators among several technologies** that can motivate students. For example, Butler *et al.* (2014) discovered that the digital minigames most frequently chosen by almost 4,000 Japanese children for learning English had elements of ‘challenge’ (their difficulty level was optimal), ‘mystery’ (they contained surprises or sparked curiosity) and ‘control’ (they offered autonomy to make decisions about the learning process). In a similar vein, Chen *et al.*’s (2018: 73) meta-analysis concluded that adventure games may be more ‘stimulating, interesting, and motivating’ than other genres, as they invoke higher-order cognitive functions like critical thinking and problem-solving. However, these presumed links to motivation need to be validated empirically, as they are indirectly based on interpretations of the games chosen by the learners (Butler *et al.*, 2014) or the amount of vocabulary that they learned (Chen *et al.*, 2018).

On this note, studies exploring learners’ motivation and engagement **during their interaction** with technology may offer additional insight. For instance, Chen and Brown (2012) triangulated data from the learning process of six college students of English with interviews and

observations from their professor. They analyzed the motivational effects of three variables: the use of wikis, the implementation of a task-based learning approach and the presence of an authentic audience. A qualitative analysis of the data revealed that each variable fostered different motivational aspects. The opportunity to consult work by other learners via wikis stimulated competition and a sense of achievement (extrinsic motivation). The use of tasks encouraged intrinsic motivation, since the topic – writing web pages about their home countries – appealed to the learners' identities. Finally, the presence of an authentic audience – the learners' work was reviewed not only by the instructor but by external professionals – fostered the need for competence (learners saw themselves as experts, which rarely occurs in the L2 classroom), autonomy (they consulted resources to express themselves effectively) and relatedness (they exercised their ought-to L2 self, adapting their work to what they thought the audience was expecting).

Meanwhile, Yang (2011) triangulated data from questionnaires answered by 118 English learners with an **analysis of their engagement** in an online course. The learners reported high levels of satisfaction with the course's ability to foster their behavioral (number of modules completed), cognitive (linguistic problem solving) and emotional (expression of opinions) engagement, as Yang illustrated with various examples. Delving deeper into behavioral engagement and, more specifically, **participation**, Cerezo's (2021: 500–502) review of 10 comparative studies concluded that computer-mediated written communication can offer advantages over oral interaction. Several factors (e.g. the option to remain anonymous behind the screen, the possibility to re-read input and having additional time to produce output) seem to encourage a higher percentage of learners to express their opinions online in writing. Learners, however, also tended to produce less output online than when speaking in class, writing shorter statements to mark their social presence amidst the larger number of voices. In addition, participation may dwindle in larger groups, as some learners may become demotivated in chaotic conversations or may decide to conveniently blend into the background. This may also occur in collaborative writing activities, where learners may opportunistically divide labor (thus negotiating less) to avoid the hassle of using two tools simultaneously (the text editor and the chat window).

Another group of studies, mainly correlational in nature, has measured changes in motivation using **pre-tests** and **post-tests**. For instance, Ushida (2005) administered a version of the AMTB to 30 American university students in the third week of a French course (beginner level) and a Spanish course (beginner and intermediate levels), and then again three weeks before completing the course. The results of all the sections showed a significant reduction in anxiety levels and a considerable improvement in attitudes towards the target culture.

Attitudes towards the language, however, remained stable. Correlational analyses showed that the most motivated learners took greater advantage of the conversation sessions with language assistants. They also achieved better grades, both at the beginning and at the end of the course. Furthermore, the Spanish learners exhibited significantly better attitudes towards the course and the instructors, who took a more student-focused approach and did not take their learning autonomy for granted.

On a larger scale, B ark anyi (2021) analyzed 978 responses from beginner Spanish learners in a language massive open online course (LMOOC). These responses were gathered from surveys administered at the beginning and end of the course, as well as from forum discussions held during the course. B ark anyi found that, in the LMOOC, where dropout rates are typically high, learners with greater intrinsic motivation were most likely to complete the course. In addition, a negative correlation was observed between learners' sense of self-efficacy in the L2 and anxiety. However, while the learners' sense of self-efficacy increased by the end of the course, anxiety did not decrease, unlike in Ushida's study (2005). This could be due to various factors, including the idiosyncrasy of LMOOCs or the fact that B ark anyi was unable to perform a within-subject analysis because of the high dropout rates.

Even though the previous studies can answer questions about *how much* motivation certain uses of technology may foster, *how* this motivation may materialize and *what* constructs it may correlate with, they are unable to provide information about *when* motivation may fluctuate. To achieve this, several studies have investigated dynamic motivation, measuring it at different points in time. For instance, Jauregi *et al.* (2012) measured **fluctuations in the motivation levels** of their participants – 36 Czech learners of beginner and intermediate Dutch – over eight weeks, using a specially prepared questionnaire. In three of the eight weeks, the learners interacted with native trainee instructors over video call. A comparative analysis showed that learners at both levels exhibited higher levels of motivation during these videoconferencing weeks. However, the motivational effects of technology were more pronounced for beginner learners. As noted by Jauregi *et al.* (2012: 12–13), the observed differences could be due to several factors, such as the learners' L2 proficiency level or the novelty factor, since the intermediate students started with more positive attitudes overall and had already experienced videoconferencing in the previous course.

In addition to measuring between-session fluctuations, Kruk (2015, 2022) also measured **within-session** fluctuations while students of English in Polish secondary and tertiary institutions interacted in virtual worlds like *Active Worlds* and *Second Life*. Taken together, these studies demonstrated that learners seemed more willing to communicate in virtual worlds compared to traditional classes. There were also notable fluctuations in this willingness, within and between sessions, which was

attributed to the unpredictable nature of each gaming experience and the presence of motivating factors (friendly interlocutors, comprehensible input, interesting conversation topics) or demotivating ones (difficulty in finding interlocutors, unpleasant interlocutors or incoherent conversations due to the large number of speakers). It is worth noting, however, that the techniques used to measure willingness to communicate were problematic, due to their retrospective nature (Kruk, 2022) or because they interrupted the game (Kruk, 2015).

To solve this, studies may **analyze verbal interactions** during task completion (Yanguas, 2011) or use the **idiodynamic method** (MacIntyre, 2012). With this method, learners complete the task without interruptions; next, they watch a recording of their performance and use a ‘motometer’ to rate their motivation levels at each point; finally, the researcher asks them about the dips and spikes in their plotted trajectories. This was Aubrey’s (2022) preferred method, where 16 English learners at a university in Hong Kong completed collaborative writing activities by interacting via text-chat and video call. The results revealed a strong positive correlation between cognitive (focus) and emotional engagement (interest), both of which were significantly higher and also more stable during video calls. An analysis of the participants’ debriefings showed that learners preferred video calls for generating ideas and found text-chat communication slow and confusing, albeit convenient for copying and pasting fragments of text. Some participants experienced initial spikes when the topic of an activity interested them and when they found solutions later on, while others experienced dips when they felt their English level was insufficient.

5.3.3 Metacognitive instruction to promote self-regulation and autonomy

From a connectivist perspective (Siemens, 2018), it could be argued that technology has profoundly revolutionized language learning, spanning all the way from the means to the end goals, and encompassing the learners themselves. Greater **access to information and communication** has given way to flipped, hybrid and online classes. Rapid technological advancements are redefining **learning objectives**, broadening the notion of literacy, shifting the focus from the acquisition of declarative to procedural knowledge and highlighting the need for continuous and proactive learning. Additionally, the constant sensory overload in this new ‘age of distraction’ (Crawford, 2015) has altered our **attention span**. Without a doubt, all these transformations bring forth challenges for motivation in SLA.

First, **greater access does not translate to greater use**. In a survey including more than 2,500 American university students enrolled in language courses, Maloney and Isbell (2022) found that the majority

reported doing activities in the L2 (reading texts, watching videos or engaging on social media) outside the classroom either ‘never’ or ‘once a month or less’. The data are especially discouraging for Spanish, as it was one of the least frequently accessed languages despite being the most widely studied. Similarly, Dashtestani (2016) interviewed 128 English learners in Iran and found that the majority ‘rarely’ used their cell phones for learning purposes. These findings contrast with Lai and Gu (2011), where half of the 279 university students surveyed in Hong Kong reported using technology for SLA purposes for more than four hours per week. This difference, however, could be due to a possible self-selection bias among the participants (Lai & Gu, 2011: 330). Additionally, dropout rates for apps such as *Duolingo* are extremely high, as revealed by García Botero *et al.* (2019). Out of 422 Colombian university students who were encouraged to use it, only 35% actually did so (for an average of nine hours in a year), while 61% stopped before the 10-day mark. The same holds true for LMOOCs, where dropout rates sometimes exceed 90% (Bárkányi, 2021).

In an initial attempt to address the issue, a series of **correlational studies** has investigated the keys to success for learners in hybrid and online environments. Using an abridged version of the AMTB, Tennant and Gardner (2004) found a positive correlation between the performance of 77 beginner French learners and their motivation, integrativeness and instrumental orientation after 10 weeks of independent study. Similarly, Ushida (2005) and Bárkányi (2021) discovered, respectively, a positive correlation between motivation and test results, on the one hand, and intrinsic motivation and course completion, on the other. In short, these studies demonstrate that **the most motivated learners** are also those who are more likely to persist and achieve better grades in hybrid and online programs.

Other correlational studies have investigated links between autonomy, engagement and academic performance. For example, in a study involving 3,676 English learners in a Chinese LMOOC, Jiang and Peng (2023) found that the number of assignments submitted, videos watched and posts written was positively correlated with course grades, in this order of importance. However, while there was a correlation between self-perceived autonomy and self-perceptions of cognitive, behavioral and emotional engagement, only self-perceived cognitive engagement was correlated with academic performance. Meanwhile, An *et al.* (2021), drawing on surveys from 525 English learners at a Chinese university, discovered that the most motivated learners were more likely to self-regulate their learning through technology, which translated into higher achievement. They did so by using technology to look up vocabulary, get motivated, access audiovisual input, set goals and socialize, among other uses. Together, these studies illustrate **how self-perceptions of motivation and autonomy** indirectly contribute to

academic achievement, while also demonstrating the greater predictive power of actual engagement data compared to surveys.

Building upon correlational studies, **observational studies** can shed light on the specific characteristics that make for a motivated and autonomous learner. Ding and Shen (2022) monitored 38 English students in an 18-week Chinese LMOOC. Through interviews, they identified the strategies that learners used to promote seven constructs of autonomy, organized into three levels. At the **situational level**, all the learners exercised proactive autonomy when choosing an LMOOC that matched their learning goals, but some went even further by identifying especially relevant LMOOC units. At the **behavioral level**, the majority set general goals (e.g. to improve their English), while others were more specific (e.g. to understand videos without reading the subtitles). Most learners also mentioned that they would try to stick to the course's schedule, while some made more specific plans (e.g. studying every night after their in-person classes and revising every three weeks). As for their learning methodologies, the majority reported taking notes while watching the videos, pausing at difficult points and adjusting the speed, while a minority reported looking up words, reading the subtitles aloud, translating them into Chinese and progressively adapting their learning process. Finally, at the **psychological level**, the learners mentioned that they took breaks, studied in the library or gave themselves rewards to retain their attention. They also reminded themselves of their goals and the work already completed or even read inspiring stories to stay motivated. Lastly, they switched activities (e.g. exercising), watched the videos in their spare time, reminded themselves of their goals or took notes, to combat negative emotions such as boredom or guilt. Although this study makes a significant contribution, its observational nature prevents it from establishing direct connections between these behaviors and their effects.

In this regard, it is imperative to conduct **experimental studies** that measure the effects of **metacognitive instruction** to promote autonomy and engagement in technological environments. A pioneering example is the work by García Botero *et al.* (2021), where 52 beginner French learners at a Colombian university were divided into one control group and two experimental groups. One of these groups received training on how to use *Duolingo* and was invited to complete 174 lessons over 11 weeks. The other experimental group also received training on self-regulation processes, information about the components of *Duolingo* designed for self-regulation, a suggested study program for each week, reminders during the first four weeks, and the opportunity to resolve queries. The results revealed that, while both experimental groups used *Duolingo* on a regular basis and in a similar way at the beginning of the study, its use decreased drastically over time. At the end of the 11 weeks, the group that received metacognitive instruction finished the course

with a median of 33% of lessons completed (around 8% more than the other group), and a greater percentage of learners finished all 174 suggested lessons (around 9% more). Their scores were also statistically better in writing tests (but not in reading or listening comprehension tests). Correlational analyses confirmed that frequency of use was linked to writing ability but not to the other skills. The group that did not receive metacognitive instruction did not outperform the control group in any skill.

Studies like this certainly highlight the importance of training learners in metacognitive strategies. However, there is still a lot of work to be done to find ways to further boost motivation and self-regulated learning. This need is especially urgent in today's digital age, where technology can improve access but also create distractions (Murray *et al.*, 2020).

5.4 Recommendations for Practice

Although significant strides have been made over the past six decades, several authors have criticized the field of motivation in SLA for having generated few useful ideas for instructors (Ushioda & Dörnyei, 2012: 404). In this section, we offer our recommendations for how to promote and maintain motivation and engagement in the L2 classroom, drawing on our previous research synthesis and the suggestions of several reference sources, both for in-person (Dörnyei, 2001; Dörnyei & Kubanyiova, 2014) and technology-mediated environments (Egbert, 2020; Henry & Lamb, 2019; Schindler *et al.*, 2017; Stockwell & Reinders, 2019). To organize these recommendations, following Henry and Lamb's (2019) approach, we will use self-determination theory and its main constructs: intrinsic motivation, competence, autonomy and relatedness.

5.4.1 Intrinsic motivation

Intrinsic motivation is intricately linked to identity-related aspects. Therefore, a first step for educators should involve **becoming familiar with the motivational profiles** of their learners. This can be achieved by **administering custom-made or existing questionnaires**, such as the LLOS ([https:// selfdeterminationtheory.org/questionnaires/](https://selfdeterminationtheory.org/questionnaires/)) and the AMTB (<http://publish.uwo.ca/~gardner/>), which are freely available online. Additionally, instructors can help learners to **visualize their ideal L2 self with digital apps** to graphically re-create situations in which they would like to use the L2 (Adolphs *et al.*, 2018). The information collected can be invaluable for **designing tasks around topics the learners are passionate about**, or for using **materials they perceive as authentic** (Egbert, 2020), as these will appeal to either their real or ideal L2 selves. Technology can also be used to **provide open access to other learners'**

work. While this may foster competitiveness and extrinsic motivation, it can also provide models that promote creativity, helping learners to **express what makes them stand out from the crowd** (see Chen & Brown, 2012). Meanwhile, **videogames**, both within and beyond the classroom, give learners the opportunity to explore their identities and **attain motivational states such as ‘flow’**. We especially recommend adventure and simulation games, due to their rich linguistic content (Chen *et al.*, 2018). Finally, we encourage educators to **embark on action research projects** in which they can assess the motivational potential of their tasks and analyze fluctuations in their students’ motivation. This can be done using free tools such as MacIntyre’s **idiodynamic software** (<https://petermacintyre.weebly.com/idiodynamic-software.html#/>).

5.4.2 Autonomy

Empirical evidence shows that educators cannot take their learners’ autonomy for granted (Maloney & Isbell, 2022; Ushida, 2005). Therefore, we recommend starting courses by teaching learners how to **set and assess optimal learning objectives** utilizing SMART (Specific, Measurable, Achievable, Relevant and Time-bound) goals. **Applications for autonomous study** can be introduced to facilitate this process, as they will allow learners to set goals, receive reminders and motivational messages, track time allocation, record success streaks and block notifications (Villalobos-Zúñiga & Cherubini, 2020). Educators should not assume their students’ digital literacy and should instead demonstrate how to maximize the benefits of specific resources. They may find inspiration in García Botero *et al.*’s (2021) study, where learners received training on how to use *Duolingo*’s components for self-regulation. Besides offering solutions, educators should strive to **promote agentic engagement** by encouraging learners to discover technology resources and learning strategies on their own, asking them to share them subsequently with their peers. If the aim is to motivate learners to invest more time accessing L2 input outside the classroom, it is important to teach them how to **develop their comprehension strategies**. Illustrative examples include Thang and Bidmeshki (2010), who used their software to **hone learners’ reading comprehension skills**, or Bozorgian and Shamsi (2022), who applied a custom-made methodology **to help students improve their listening comprehension of podcasts**. However, it is advisable to practice these strategies periodically, since learners may take time to incorporate them.

In the classroom, instructors should aim to minimize micro-management, letting learners **choose between several types of activities** – or, alternatively, the order of completion – based on their preferences. Moreover, autonomy can be promoted by creating **collaborative digital projects** where learners take on different roles (e.g. looking

for information, drafting or editing) and later switch them with their peers (Hafner & Miller, 2011). **Discussion forums** can serve as platforms for students to engage in periodic reflection on their learning progress, compare it with their initial objectives and subsequently reassess those objectives. Yet, **instructors should play a visible and active role** in these forums, in order to generate interest, stimulate conversations or correct misunderstandings (Schindler *et al.*, 2017: 21). They should also **promptly assess participation**, especially at the beginning of the course, so that the learners can **create and consolidate new habits**. Later on, these assessments can be spaced out, so that the habits in question are not necessarily associated with extrinsic rewards.

5.4.3 Sense of competence

In the virtual classroom, competence encompasses both linguistic and technological prowess. Instructors can promote a sense of **linguistic competence** in a variety of ways. These include **scaffolding activities** with attainable objectives that gradually increase in difficulty; **providing informative, positive and stimulating feedback** (as opposed to merely evaluative or intimidating feedback); **teaching learners how to process negative feedback** or feelings of frustration and how to take action; and occasionally choosing topics where learners can feel like experts, which is a rare occurrence in the L2 classroom (Chen & Brown, 2012). As for **technological competence**, instructors can **show learners how to handle the tools** they wish to use. Instructors should not take learners' digital literacy for granted, as learners may experience frustration upon encountering problems. In addition, instructors can **choose these tools according to the sub-competence** to be developed (e.g. X, formerly known as *Twitter*, to promote synthesis skills or *Kahoot!* to foster automation; see Schindler *et al.*, 2017: 20) and encourage learners to **use multiple tools** beyond the classic dictionaries or vocabulary and grammar drills. An example of this is provided by Lai *et al.* (2015), where learners using a wider array of tools (i.e. those who also read and watched videos online) expressed more positive attitudes towards the L2.

5.4.4 Relatedness

To promote relatedness in the virtual classroom, educators should strive to foster a cohesive learning community. To achieve this, we suggest initiating the course by involving learners in a **critical reflection** on the impact of technology in interpersonal relationships. Instructors and students should discuss the benefits of technology, such as the possibility to facilitate interaction and collaboration with peers and other speakers within and beyond the classroom, but also its challenges. Phenomena such as continuous push notifications or multitasking can

cause distractions and reduce eye contact with interlocutors, negatively impacting interpersonal dynamics. This, however, can be prevented by setting **agreed-upon ground rules**.

During the course, the instructor can select several tools to promote **written or oral interaction** between classmates, students from other institutions or unknown interlocutors. These tools include **wikis** (Chen & Brown, 2012), **videoconference apps** (Jauregi *et al.*, 2012), **virtual worlds** such as *Second Life* (Kruk, 2022), **social networks** like *Facebook* (Akbari *et al.*, 2015), **messaging platforms** such as *WhatsApp* (Alamer & Al Khateeb, 2023) and **social reading apps** like *Perusall* (Kohnke & Har, 2022). Additionally, instructors can encourage the use of work groups or **virtual coworking spaces**, such as *Focusmate*, particularly for individual or potentially tedious tasks.

However, for these tools to yield the desired effects, educators must pay special attention to how their activities are designed, creating collaborative projects and tasks in which learners pursue common, converging goals instead of competing and comparing themselves to each other. It is also important to consider issues like **access**, so that all learners can use these tools or do so in different time zones (see Chapter 1 of this book), and **privacy**, potentially creating closed groups on social networks or using virtual backgrounds in apps such as *Zoom* (Schindler *et al.*, 2017: 22). Finally, equipping learners with strategies to engage in lively exchanges and navigate negative experiences on social media and virtual worlds can be beneficial, as these factors can impact motivation (Kruk, 2022).

5.5 Conclusion and Future Lines of Research

In this chapter, we have attempted to **debunk the oft-cited automatic correlation** between technology and motivation in SLA. To achieve this, we invoked contemporary theoretical perspectives, we reviewed empirical findings that indicate a low or moderate correlation between the two constructs, and we presented evidence revealing limited engagement with technology to access the L2 outside the classroom. Furthermore, we have illustrated that, while the field of motivation in SLA has grown exponentially since its inception six decades ago, there is some overlap between the different constructs and theories, as well as a profound lack of theorization about the motivational effects of technology. As a result, we anticipated the emergence of a much-needed **fifth technological period**. We have also synthesized empirical findings from **secondary sources**, highlighting the greater theoretical and methodological sophistication of the field of motivation in SLA compared to CALL. Additionally, we have analyzed two of the most promising research areas within CALL. On the one hand, we discussed **studies on situated and dynamic motivation**, providing examples such as Aubrey (2022), in which the **idiodynamic method** was used to identify factors that

caused motivational dips and spikes during learner interactions under various technological conditions. On the other, we delved into **studies on metacognitive instruction to promote self-regulation and autonomy**, highlighting the work by García Botero *et al.* (2021), which yielded promising results but also revealed that there is still much progress to be made. Finally, we have provided a series of recommendations to foster **intrinsic motivation, autonomy, competence and relatedness** in technology-mediated L2 classrooms.

Looking forward, there are several research areas that require immediate attention. First, more practical studies that serve an **ethical and social purpose** are needed, so that the knowledge generated directly benefits instructors and learners (Ushioda, 2019: 676). Dörnyei himself (2019: 48) signaled the lack of research on the **L2 learning experience**, even though meta-analytical studies have demonstrated its influence on learners' motivation and intended effort (Al-Hoorie, 2018: 721). Specifically, **more experimental studies** – rather than observational ones – are necessary, where more educators, and not just external investigators, are in charge of research efforts (Ushioda, 2019: 670).

Second, there is a significant gap when it comes to **motivation in educators and learners with special needs** (Mahmoodi & Yousefi, 2022). Third, studies that leverage technology to **explore ideal selves and to boost intrinsic motivation** seem particularly promising (Adolphs *et al.*, 2018). Fourth, there is a need for more research on **group dynamics** (Dörnyei & Murphy, 2003) in technology-mediated environments. Finally, in the field of gaming, it is imperative to start assessing the **motivational potential of videogames** for L2 learning (see Chapter 12 of this book) on the basis of rigorous theoretical models. One such example is *The Player Experience of Need Satisfaction (PENS)* (Rigby & Ryan, 2011), inspired by the self-determination theory that has informed much of this chapter.

5.6 Annotated Additional Reading

Henry, A., Sundqvist, P. and Thorsen, C. (2019) *Motivational Practice: Insights from the Classroom*. Studentlitteratur.

This book is an essential resource for language instructors seeking to increase their L2 learners' motivation. It combines theory with practical examples from the *MoTiSSe* project, which is based on ethnographies, interviews and 253 observations of classes led by 16 teachers who successfully fostered motivation in Swedish secondary school classrooms. Chapter 8, by Sundqvist, is particularly relevant, as it discusses technology and motivation.

Lamb, M., Csizér, K., Henry, A. and Ryan, S. (eds) (2019) *The Palgrave Handbook of Motivation for Language Learning*. Palgrave Macmillan.

This is a comprehensive reference manual including 32 chapters by first-rate authors. It is divided into four parts: a theoretical part, a practical part, a part dedicated to different contexts and learners, and a final part about innovation. Chapter 29, by Henry and Lamb, addresses motivation in digital technologies.

References

- Adolphs, S., Clark, L., Dörnyei, Z., Glover, T., Henry, A., Muir, C., Sánchez-Lozano, E. and Valstar, M. (2018) Digital innovations in L2 motivation: Harnessing the power of the ideal L2 self. *System* 78, 173–185. <https://doi.org/10.1016/j.system.2018.07.014>.
- Akbari, E., Pilot, A. and Simons, P.R.-J. (2015) Autonomy, competence, and relatedness in foreign language learning through Facebook. *Computers in Human Behavior* 48, 126–134. <https://doi.org/10.1016/j.chb.2015.01.036>.
- Alamer, A. and Al Khateeb, A. (2023) Effects of using the WhatsApp application on language learners' motivation: A controlled investigation using structural equation modelling. *Computer Assisted Language Learning* 36 (1–2), 149–175. <https://doi.org/10.1080/09588221.2021.1903042>.
- Al-Hoorie, A.H. (2017) Sixty years of language motivation research: Looking back and looking forward. *SAGE Open* 7 (1), 1–11. <https://doi.org/10.1177/2158244017701976>.
- Al-Hoorie, A.H. (2018) The L2 motivational self system: A meta-analysis. *Studies in Second Language Learning and Teaching* 8 (4), 721–754. <https://doi.org/10.14746/ssllt.2018.8.4.2>.
- An, Z., Wang, C., Li, S., Gan, Z. and Li, H. (2021) Technology-assisted self-regulated English language learning: Associations with English language self-efficacy, English enjoyment, and learning outcomes. *Frontiers in Psychology* 11, 1–14. <https://doi.org/10.3389/fpsyg.2020.558466>.
- Appel, C. and Mullen, T. (2002) A new tool for teachers and researchers involved in e-mail tandem language learning. *ReCALL* 14 (2), 195–208. <https://doi.org/10.1017/S0958344002000228>.
- Arnone, M.P., Small, R.V., Chauncey, S.A. and McKenna, H.P. (2011) Curiosity, interest and engagement in technology-pervasive learning environments: A new research agenda. *Educational Technology, Research and Development* 59 (2), 181–198. <https://doi.org/10.1007/s11423-011-9190-9>.
- Aubrey, S. (2022) Dynamic engagement in second language computer-mediated collaborative writing tasks: Does communication mode matter? *Studies in Second Language Learning and Teaching* 12 (1), 59–86. <https://doi.org/10.14746/ssllt.2022.12.1.4>.
- Bahari, A. (2022) Affordances and challenges of technology-assisted language learning for motivation: A systematic review. *Interactive Learning Environments*, 1–21. <https://doi.org/10.1080/10494820.2021.2021246>.
- Bandura, A. (1986) *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice Hall.
- Bárkányi, Z. (2021) Motivation, self-efficacy beliefs, and speaking anxiety in language MOOCs. *ReCALL* 33 (2), 143–160. <https://doi.org/10.1017/S0958344021000033>.
- Bax, S. (2003) CALL – Past, present and future. *System* 31 (1), 13–28. [https://doi.org/10.1016/S0346-251X\(02\)00071-4](https://doi.org/10.1016/S0346-251X(02)00071-4).
- Belmechri, F. and Hummel, K. (1998) Orientations and motivation in the acquisition of English as a second language among high school students in Quebec city. *Language Learning* 48 (2), 219–244. <https://doi.org/10.1111/1467-9922.00040>.
- Bodnar, S., Cucchiari, C., Strik, H. and van Hout, R. (2016) Evaluating the motivational impact of CALL systems: Current practices and future directions. *Computer Assisted Language Learning* 29 (1), 186–212. <https://doi.org/10.1080/09588221.2014.927365>.
- Boo, Z., Dörnyei, Z. and Ryan, S. (2015) L2 motivation research 2005–2014: Understanding a publication surge and a changing landscape. *System* 55, 145–157. <https://doi.org/10.1016/j.system.2015.10.006>.
- Bozorgian, H. and Shamsi, E. (2022) Autonomous use of podcasts with metacognitive intervention: Foreign language listening development. *International Journal of Applied Linguistics* 32 (3), 442–458. <https://doi.org/10.1111/ijal.12439>.
- Butler, Y.G., Someya, Y. and Fukuhara, E. (2014) Online games for young learners' foreign language learning. *ELT Journal* 68 (3), 265–275. <https://doi.org/10.1093/elt/ccu008>.

- Cerezo, L. (2021) Corrective feedback in computer-mediated versus face-to-face environments. In H. Nassaji and E. Kartchava (eds) *The Cambridge Handbook of Corrective Feedback in Second Language Learning and Teaching* (pp. 494–519). Cambridge University Press.
- Chen, J.C. and Brown, K.L. (2012) The effects of authentic audience on English as a second language (ESL) writers: A task-based, computer-mediated approach. *Computer Assisted Language Learning* 25 (5), 435–454. <https://doi.org/10.1080/09588221.2011.606224>.
- Chen, M.H., Tseng, W.-T. and Hsiao, T.-Y. (2018) The effectiveness of digital game-based vocabulary learning: A framework-based view of meta-analysis. *British Journal of Educational Technology* 49 (1), 69–77. <https://doi.org/10.1111/bjjet.12526>.
- Clément, R. (1980) Ethnicity, contact and communicative competence in a second language. In H. Giles, W.P. Robinson and P.M. Smith (eds) *Language: Social Psychological Perspectives* (pp. 147–154). Pergamon Press.
- Crawford, M.B. (2015) *The World Beyond Your Head: On Becoming an Individual in an Age of Distraction*. Farrar, Straus & Giroux.
- Csikszentmihályi, M. (1997) *Finding Flow: The Psychology of Engagement with Everyday Life*. Hachette.
- Csizér, K. (2019) The L2 motivational self system. In M. Lamb, K. Csizér, A. Henry and S. Ryan (eds) *The Palgrave Handbook of Motivation for Language Learning* (pp. 71–93). Palgrave Macmillan.
- Csizér, K. and Dörnyei, Z. (2005) Language learners' motivational profiles and their motivated learning behavior. *Language Learning* 55 (4), 613–659. <https://doi.org/10.1111/j.0023-8333.2005.00319.x>.
- Dashtestani, R. (2016) Moving bravely toward mobile learning: Iranian students' use of mobile devices for learning English as a foreign language. *Computer Assisted Language Learning* 29 (4), 815–832. <https://doi.org/10.1080/09588221.2015.1069360>.
- de Bot, K., Lowie, W. and Verspoor, M. (2007) A dynamic systems theory approach to second language acquisition. *Bilingualism: Language and Cognition* 10 (1), 7–21. <https://doi.org/10.1017/S1366728906002732>.
- Ding, Y. and Shen, H. (2022) Delving into learner autonomy in an EFL MOOC in China: A case study. *Computer Assisted Language Learning* 35 (3), 247–269. <https://doi.org/10.1080/09588221.2019.1681464>.
- Dörnyei, Z. (2001) *Motivational Strategies in the Language Classroom*. Cambridge University Press.
- Dörnyei, Z. (2002) The motivational basis of language learning tasks. In P. Robinson (ed.) *Individual Differences and Instructed Language Learning* (pp. 137–158). John Benjamins.
- Dörnyei, Z. (2005) *The Psychology of the Language Learner: Individual Differences in Second Language Acquisition*. Lawrence Erlbaum.
- Dörnyei, Z. (2009) The L2 motivational self system. In Z. Dörnyei and E. Ushioda (eds) *Motivation, Language Identity and the L2 Self* (pp. 9–42). Multilingual Matters.
- Dörnyei, Z. (2010) *Questionnaires in Second Language Research: Construction, Administration, and Processing* (2nd edn). Routledge.
- Dörnyei, Z. (2019) From integrative motivation to directed motivational currents: The evolution of the understanding of L2 motivation over three decades. In M. Lamb, K. Csizér, A. Henry and S. Ryan (eds) *The Palgrave Handbook of Motivation for Language Learning* (pp. 39–69). Palgrave Macmillan.
- Dörnyei, Z. and Ottó, I. (1998) Motivation in action: A process model of L2 motivation. *Working Papers in Applied Linguistics (Thames Valley University)* 4, 43–69.
- Dörnyei, Z. and Murphy, T. (2003) *Group Dynamics in the Language Classroom*. Cambridge University Press.
- Dörnyei, Z. and Kubanyiova, M. (2014) *Motivating Learners, Motivating Teachers: Building Vision in the Language Classroom*. Cambridge University Press.

- Dörnyei, Z., Csizér, K. and Németh, N. (2006) *Motivation, Language Attitudes and Globalisation: A Hungarian Perspective*. Multilingual Matters.
- Dörnyei, Z., MacIntyre, P.D. and Henry, A. (eds) (2015) *Motivational Dynamics in Language Learning*. Multilingual Matters.
- Dörnyei, Z., Henry, A. and Muir, C. (2016) *Motivational Currents in Language Learning: Frameworks for Focused Interventions*. Routledge.
- Egbert, J. (2020) Engagement, technology, and language tasks: Optimizing student learning. *International Journal of TESOL Studies* 2 (4), 110–118. <https://doi.org/10.46451/ijts.2020.12.10>.
- Felix, U. (2005) Analysing recent CALL effectiveness research – Towards a common agenda. *Computer Assisted Language Learning* 18 (1–2), 1–32. <https://doi.org/10.1080/09588220500132274>.
- García Botero, G., Questier, F. and Zhu, C. (2019) Self-directed language learning in a mobile-assisted, out-of-class context: Do students walk the talk? *Computer Assisted Language Learning* 32 (1–2), 71–97. <https://doi.org/10.1080/09588221.2018.1485707>.
- García Botero, G., Botero Restrepo, M.A., Zhu, C. and Questier, F. (2021) Complementing in-class language learning with voluntary out-of-class MALL. Does training in self-regulation and scaffolding make a difference? *Computer Assisted Language Learning* 34 (8), 1013–1039. <https://doi.org/10.1080/09588221.2019.1650780>.
- Gardner, R.C. (2010) *Motivation and Second Language Acquisition: The Socio-Educational Model*. Peter Lang.
- Gardner, R.C. (2019) The socio-educational model of second language acquisition. In M. Lamb, K. Csizér, A. Henry and S. Ryan (eds) *The Palgrave Handbook of Motivation for Language Learning* (pp. 21–37). Palgrave Macmillan.
- Golonka, E.M., Bowles, A.R., Frank, V.M., Richardson, D.L. and Freynik, S. (2014) Technologies for foreign language learning: A review of technology types and their effectiveness. *Computer Assisted Language Learning* 27 (1), 70–105. <https://doi.org/10.1080/09588221.2012.700315>.
- Hafner, C.A. and Miller, L. (2011) Fostering learner autonomy in English for science: A collaborative digital video project in a technological learning environment. *Language Learning & Technology* 15 (3), 68–86. <https://doi.org/10.125/44263>.
- Heckhausen, H. and Kuhl, J. (1985) From wishes to action: The dead ends and short cuts on the long way to action. In M. Frese and J. Sabini (eds) *Goal-Directed Behaviour: The Concept of Action in Psychology* (pp. 134–160). Lawrence Erlbaum.
- Henry, A. (2019) Understanding language learners' motivation. In A. Henry, P. Sundqvist and C. Thorsen (eds) *Motivational Practice: Insights from the Classroom* (pp. 43–61). Studentlitteratur.
- Henry, A. and Lamb, M. (2019) L2 motivation and digital technologies. In M. Lamb, K. Csizér, A. Henry and S. Ryan (eds) *The Palgrave Handbook of Motivation for Language Learning* (pp. 599–619). Palgrave Macmillan.
- Higgins, E. (1987) Self-discrepancy: A theory relating self and affect. *Psychological Review* 94 (3), 319–340. <https://doi.org/10.1037/0033-295X.94.3.319>.
- Hiver, P., Al-Hoorie, A.H., Vitta, J.P. and Wu, J. (2021) Engagement in language learning: A systematic review of 20 years of research methods and definitions. *Language Teaching Research*. <https://doi.org/10.1177/13621688211001289>.
- Hubbard, P. (2005) A review of subject characteristics in CALL research. *Computer Assisted Language Learning* 18 (5), 351–368. <https://doi.org/10.1080/09588220500442632>.
- Jauregi, K., de Graaff, R., van den Bergh, H. and Kriz, M. (2012) Native/non-native speaker interactions through video–web communication: A clue for enhancing motivation? *Computer Assisted Language Learning* 25 (1), 1–19. <https://doi.org/10.1080/09588221.2011.582587>.
- Jiang, Y. and Peng, J.-E. (2023) Exploring the relationships between learners' engagement, autonomy, and academic performance in an English language MOOC. *Computer Assisted Language Learning* 6, 1–26. <https://doi.org/10.1080/09588221.2022.2164777>.

- Kohnke, L. and Har, F. (2022) *Perusall* encourages critical engagement with reading texts. *RELC Journal*. <https://doi.org/10.1177/00336882221112166>.
- Kreishan, L.J. and Al-Dhaimat, Y. (2013) Intrinsic and extrinsic motivation, orientation and achievements in the L2 of Arab learners of English, French and German: A study from Jordan. *International Education Studies* 6 (12), 52–63. <https://doi.org/10.5539/ies.v6n12p52>.
- Kruk, M. (2015) Willingness to communicate in English in *Active Worlds*. In A. Turula and M. Chojnacka (eds) *CALL for Bridges between School and Academia* (pp. 129–142). Peter Lang.
- Kruk, M. (2022) Dynamicity of perceived willingness to communicate, motivation, boredom and anxiety in *Second Life*: The case of two advanced learners of English. *Computer Assisted Language Learning* 35 (1–2), 190–216. <https://doi.org/10.1080/0958221.2019.1677722>.
- Lai, C. and Gu, M. (2011) Self-regulated out-of-class language learning with technology. *Computer Assisted Language Learning* 24 (4), 317–335. <https://www.learntechlib.org/p/110133/>.
- Lai, C., Zhu, W. and Gong, G. (2015) Understanding the quality of out-of-class English learning. *TESOL Quarterly* 49 (2), 278–308. <https://doi.org/10.1002/tesq.171>.
- Li, L. (2017) *New Technologies and Language Learning*. Palgrave.
- MacIntyre, P.D. (2007) Willingness to communicate in the second language: Understanding the decision to speak as a volitional process. *The Modern Language Journal* 91 (4), 564–576. <https://doi.org/10.1111/j.1540-4781.2007.00623.x>.
- MacIntyre, P.D. (2012) The idiodynamic method: A closer look at the dynamics of communication traits. *Communication Research Reports* 29 (4), 361–367. <https://doi.org/10.1080/08824096.2012.723274>.
- MacIntyre, P.D., Dörnyei, Z., Clément, R. and Noels, K. (1998) Conceptualizing willingness to communicate in an L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal* 82 (4), 545–562. <https://doi.org/10.1111/j.1540-4781.1998.tb05543.x>.
- MacIntyre, P.D., Dörnyei, Z. and Henry, A. (2015) Conclusion: Hot enough to be cool: The promise of dynamic systems research. In Z. Dörnyei, P.D. MacIntyre and A. Henry (eds) *Motivational Dynamics in Language Learning* (pp. 419–429). Multilingual Matters.
- Mahmoodi, M.H. and Yousefi, M. (2022) Second language motivation research, 2010–2019: A synthetic exploration. *The Language Learning Journal* 50 (3), 273–296. <https://doi.org/10.1080/09571736.2020.1869809>.
- Maloney, J. and Isbell, D. (2022) US foreign language student digitally-mediated language engagement outside of class: What does it look like? Speech delivered at CALICO 2022: Social Justice & Diversity in CALL, Seattle.
- Markus, H. and Nurius, P. (1986) Possible selves. *American Psychologist* 41 (9), 954–969. <https://doi.org/10.1037/0003-066X.41.9.954>.
- Masgoret, A.-M. and Gardner, R.C. (2003) Attitudes, motivation, and second language learning: A meta-analysis of studies conducted by Gardner and Associates. *Language Learning* 53 (1), 123–163. <https://doi.org/10.1111/1467-9922.00212>.
- Murray, L., Giralt, M. and Benini, S. (2020) Extending digital literacies: Proposing an agentive literacy to tackle the problems of distractive technologies in language learning. *ReCALL* 32 (3), 250–271. <https://doi.org/10.1017/S0958344020000130>.
- Noels, K.A., Pelletier, L.G., Clément, R. and Vallerand, R.J. (2000) Why are you learning a second language? Motivational orientations and self-determination theory. *Language Learning* 50 (1), 57–85. <https://doi.org/10.1111/1467-9922.53223>.
- Noels, K.A., Lou, N.M., Vargas Lascano, D.I., Chaffee, K.E., Dincer, A., Zhang, Y.S.D. and Zhang, X. (2019) Self-determination and motivated engagement in language learning. In M. Lamb, K. Csizér, A. Henry and S. Ryan (eds) *The Palgrave Handbook of Motivation for Language Learning* (pp. 95–116). Palgrave Macmillan.
- Ortega, L. (2009) *Understanding Second Language Acquisition*. Routledge.

- Papi, M. and Hiver, P. (2020) Language learning motivation as a complex dynamic system: A global perspective of truth, control, and value. *The Modern Language Journal* 104 (1), 1–24. <https://doi.org/10.1111/modl.12624>.
- Papi, M., Bondarenko, A.V., Mansouri, S., Feng, L. and Jiang, C. (2019) Rethinking L2 motivation: The 2 × 2 model of self-guides. *Studies in Second Language Acquisition* 41 (2), 337–361. <https://doi.org/10.1017/S0272263118000153>.
- Reeve, J. (2012) A self-determination theory perspective on student engagement. In S.L. Christenson, A.L. Reschly and C. Wylie (eds) *Handbook of Research on Student Engagement* (pp. 149–172). Springer.
- Rigby, C.S. and Ryan, R.M. (2011) *Glued to Games: How Video Games Draw Us In and Hold Us Spellbound*. Praeger.
- Ryan, R.M. and Deci, E.L. (2017) *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. Guilford Press.
- Ryan, R., Bradshaw, E. and Deci, E. (2019) Motivation. In R. Sternberg and W. Pickren (eds) *The Cambridge Handbook of the Intellectual History of Psychology* (pp. 391–411). Cambridge University Press.
- Schindler, L.A., Burkholder, G.J., Morad, O.A. and Marsh, C. (2017) Computer-based technology and student engagement: A critical review of the literature. *International Journal of Educational Technology in Higher Education* 14 (25), 1–28. <https://doi.org/10.1186/s41239-017-0063-0>.
- Schumann, J.H. (1986) Research on the acculturation model for second language acquisition. *Journal of Multilingual and Multicultural Development* 7 (5), 379–392. <https://doi.org/10.1080/01434632.1986.9994254>.
- Siemens, G. (2018) Connectivism. In R.E. West (ed.) *Foundations of Learning and Instructional Design Technology: The Past, Present, and Future of Learning and Instructional Design Technology* [ebook]. EdTech Books. <https://dx.doi.org/10.59668/3>.
- Stockwell, G. (2013) Technology and motivation in English language teaching and learning. In E. Ushioda (ed.) *International Perspectives on Motivation: Language Learning and Professional Challenges* (pp. 156–175). Palgrave Macmillan.
- Stockwell, G. and Reinders, H. (2019) Technology, motivation and autonomy, and teacher psychology in language learning: Exploring the myths and possibilities. *Annual Review of Applied Linguistics* 39, 40–51. <https://doi.org/10.1017/S0267190519000084>.
- Tennant, J. and Gardner, R.C. (2004) The computerized mini-AMTB. *CALICO Journal* 21 (2), 245–263. <https://doi.org/10.1558/cj.v21i2.245-263>.
- Thang, S.M. and Bidmeshki, L. (2010) Investigating the perceptions of UKM undergraduates towards an English for science and technology online course. *Computer Assisted Language Learning* 23 (1), 1–20. <https://doi.org/10.1080/09588220903467269>.
- Ushida, E. (2005) The role of students' attitudes and motivation in second language learning in online language courses. *CALICO Journal* 23 (1), 49–78. <http://www.jstor.org/stable/24156232>.
- Ushioda, E. (2001) Language learning at university: Exploring the role of motivational thinking. In Z. Dörnyei and R. Schmidt (eds) *Motivation and Second Language Acquisition* (pp. 93–125). University of Hawaii Press.
- Ushioda, E. (2009) A person-in-context relational view of emergent motivation, self and identity. In Z. Dörnyei and E. Ushioda (eds) *Motivation, Language Identity and the L2 Self* (pp. 215–228). Multilingual Matters.
- Ushioda, E. (2019) Researching L2 motivation: Past, present and future. In M. Lamb, K. Csizér, A. Henry and S. Ryan (eds) *The Palgrave Handbook of Motivation for Language Learning* (pp. 661–682). Palgrave Macmillan.
- Ushioda, E. and Dörnyei, Z. (2012) Motivation. In S.M. Gass and A. Mackey (eds) *The Routledge Handbook of Second Language Acquisition* (pp. 396–409). Routledge.
- Vakilifard, A. and Khaleghizadeh, S. (2021) The investigation of integrative instrumental intrinsic and extrinsic motivation of language learners in foreign settings. *Journal of*

- English Language Teaching and Learning* 13 (27), 417–443. <https://doi.org/10.22034/elt.2021.43130.2324>.
- Villalobos-Zúñiga, G. and Cherubini, M. (2020) Apps that motivate: A taxonomy of app features based on self-determination theory. *International Journal of Human-Computer Studies* 140, 1–24. <https://doi.org/10.1016/j.ijhcs.2020.102449>.
- Wu, X. (2022) Motivation in second language acquisition: A bibliometric analysis between 2000 and 2021. *Frontiers in Psychology* 13, 1–17. <https://doi.org/10.3389/fpsyg.2022.1032316>.
- Yang, Y.-F. (2011) Engaging students in an online situated language learning environment. *Computer Assisted Language Learning* 24 (2), 181–198. <https://doi.org/10.1080/09588221.2010.538700>.
- Yanguas, I. (2011) The dynamic nature of motivation during the task: Can it be captured? *Innovation in Language Learning and Teaching* 5 (1), 35–61. <https://doi.org/10.1080/17501229.2010.519771>.
- Yousefi, M. and Mahmoodi, M.H. (2022) The L2 motivational self system: A meta-analysis approach. *International Journal of Applied Linguistics* 32 (2), 274–294. <https://doi.org/10.1111/ijal.12416>.

6 Anxiety and Virtual Learning

Zsuzsanna Bárkányi

6.1 Introduction and Key Concepts

In the field of psychology, the term **anxiety** is defined as the ‘subjective feeling of tension, apprehension, nervousness and worry associated with an arousal of the autonomic nervous system’ (Spielberger, 1983: 15). There are two main types: **trait anxiety**, or the likelihood that an individual will feel anxious under any given circumstance, and **state anxiety**, experienced by a person as a reaction to a specific situation (Spielberger, 1983). In the context of language learning, a specific kind of state anxiety, known as **foreign language classroom anxiety (FLCA)**, is recognized. This is defined as a ‘distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom language learning arising from the uniqueness of the language learning process’ (Horwitz *et al.*, 1986: 128). Over the years, various **instruments to measure anxiety** have been designed, such as the Attitudes and Motivation Test Battery (Gardner *et al.*, 1979), the Language Classroom Discomfort Scale (Ely, 1986), as well as the Input, Processing and Output Anxiety Scales (MacIntyre & Gardner, 1994), whose objective was to measure anxiety at different phases of the language learning process. The most commonly used instrument, however, has proved to be Horwitz *et al.*’s Foreign Language Classroom Anxiety Scale (1986), used to examine various psychometric properties in the classroom and to assess the correlations between anxiety, acquisition and performance. It is not without limitations, however: the data are self-reported and are neither based on physiological measures (e.g. heart rate) nor on observations of behavior. Similarly, it conceptualizes anxiety as a static affective characteristic. On the other hand, more recent studies explore this concept from a **dynamic perspective**, since it is connected with other situational or personal factors and fluctuates over time (e.g. Gregersen *et al.*, 2014). Most studies that analyze anxiety highlight its negative impact on language learners in terms of their learning

process (Sheen, 2008; Steinberg & Horwitz, 1986) and assessment results (Zhang, 2013).

Meanwhile, regarding the factors that generate anxiety in the field of language learning, the exploratory and confirmatory factor analysis of FLCA by Park (2014) reveals that the most significant triggers of anxiety are **understanding and communication apprehension**, while other factors include **fear of inadequate performance when speaking to native speakers, negative attitudes towards the class and fear of negative evaluation** (Aida, 1994; Mak, 2011). Foreign language anxiety (FLA) has been described as a frequent phenomenon among learners. Similarly, the impact of FLA on the development of various skills has also been researched. These include reading comprehension (Zhao *et al.*, 2013), written expression (Latif, 2015), listening comprehension (Elkhafaifi, 2005) and speaking (Çağatay, 2015; Tsiplakides & Keramida, 2009). While any of these skills can trigger anxiety during the learning process, reading comprehension and speaking stand out as those that generate the lowest and highest levels, respectively (see Amengual-Pizarro, 2018; Young, 1992). However, this correspondence between anxiety and specific skills is not established in all related studies. For instance, Torres and Turner (2016), in a study including 206 participants across five Spanish proficiency levels at American universities, found overall low levels of anxiety. In fact, they were lower when it came to speaking compared to listening and reading comprehension, as well as Spanish written expression. Therefore, when trying to measure this affective variable, it is always necessary to consider aspects such as the teaching context, characteristics of the curriculum, the measuring instrument's design and the way the experiment was conducted, to ultimately determine whether these factors potentially affected the results.

Moreover, ways of fostering a low-anxiety atmosphere in language teaching environments have been sought and reported. For example, it has been demonstrated that technology-mediated communication tools reduce anxiety levels when interactions take place in writing via email or chat (Satar & Özdener, 2008). In fact, some authors suggest that learners even associate technology-mediated activities with low anxiety when it comes to oral interactions (Cooke-Plagwitz, 2008). Melchor-Couto (2017) showed that anxiety levels among a group of learners in the virtual reality environment *Second Life* were lower compared to an in-person control group. Not only this: they even exhibited a downwards trend. The author suggested that anonymity helped to reduce anxiety at the beginning of the course and, although this condition disappeared as the participants got to know each other, it did foster oral interaction, as it offered a more gradual start. Other researchers, meanwhile, have shown that the absence of body language and visual information can lead to higher levels of anxiety (Hampel *et al.*, 2005). Even so, it is useful to consider that, with the growing interest in online courses

(Gironzetti *et al.*, 2020) – driven, on the one hand, by the development of communication technologies and, on the other, by the challenges posed by the COVID-19 pandemic – both educators and learners alike are bound to use the video function on various online platforms more frequently. However, it is also worth noting that this feature provides limited body language cues and learners can choose whether to use it or not.

Very few studies focus on the potential of asynchronous tools when it comes to speaking-related anxiety, even though they are considered to develop oral skills and prepare learners for in-person communication (Tecedor & Campos-Dintrans, 2019). In a paper on the use of a tool that allows users to create and upload audio recordings directly on *Moodle*, McIntosh *et al.* (2003) concluded that more than half the participants felt more confident speaking in class after taking part in asynchronous discussions. However, some learners did not feel comfortable enough to upload their recordings online, and overcoming this barrier continued to pose a challenge.

The results obtained by Hamzaoğlu and Koçoğlu (2016) in a study involving 30 English learners from Turkey with high anxiety levels confirm the hypothesis put forth by Sze (2006), which suggested that the use of podcasts is beneficial for ‘less confident students as producing podcasts involves performing behind the scenes’ (Hamzaoğlu & Koçoğlu, 2016, as cited in Sze, 2006: 122). By extension, the use/production of podcasts also involves performing asynchronously and in the students’ free time (see Chapter 11 of this book). The authors showed that, by the end of the semester, learners who produced podcasts saw considerable improvements in their oral productions and exhibited significantly lower anxiety levels compared to their control group counterparts. Conversely, informants in a study by Poza (2011) did not report significant differences in anxiety levels. The experimental group used *Wimba Voice Board* (a messaging environment and video recording software) and the control group attended in-person classes. In the two groups studied, learners were afraid to engage in conversation with native speakers and make linguistic mistakes. However, in comparison, learners in the asynchronous context were less anxious about corrections from the instructor and about the level of their group overall.

There is little research that addresses the affective factors related to speaking in fully asynchronous programs, as in the case of Language Massive Open Online Courses (LMOOCs). The results of a study by B ark anyi (2021) reveal that intrinsically motivated learners – that is, those who sign up to an LMOOC to simply learn a language – are more likely to complete the course compared to those who sign up due to personal needs or to move forward in their professional careers. Even so, the type of motivation does not seem to have a direct impact on anxiety levels. On completing their respective courses, the study

participants experienced improvements in their perceived **self-efficacy** – that is, their confidence in their ability to speak Spanish – while their self-reported anxiety levels showed less change. A limitation of this study worth mentioning is that it is not based on matched-pair data between the answers obtained in pre-tests and post-tests. Consequently, one of the objectives of this chapter is to address this shortcoming to understand how anxiety levels in oral expression and self-efficacy perceptions change as a result of participating in LMOOCs.

6.2 LMOOCs: Language Massive Open Online Courses

A relatively recent phenomenon in the field of online language learning is the emergence of LMOOCs. MOOCs, in general, have been defined as online courses designed for a large number of participants, which can be accessed freely from anywhere with an internet connection. In other words, MOOCs are open to all learners with no prior requirements. Discipline-wise, there are no restrictions. Even so, few MOOCs are dedicated to language learning (Bárcena & Martín-Monje, 2014). In fact, according to Bárcena *et al.* (2015), many online courses advertised as LMOOCs do not actually meet all the criteria outlined by Sokolik (2014). As per these criteria, the course must be: (1) **massive** (with several hundreds or even thousands of registered learners); (2) **open** (free and independent of geographical location, age, etc.); and (3) **online** (completely digital). Furthermore, it must be an actual *course*, rather than simply a repository of materials or an open learning resource. Consequently, it must also provide learners with a schedule and a teacher figure to guide them through the course materials.

In addition to the limited availability of LMOOCs, their effectiveness for language learning has been debated. Several researchers have pointed out the potential of LMOOCs to serve as a space for **continuous learning** and, consequently, for social and professional inclusion (Chacón-Beltrán, 2017; Gibaldi, 2013). However, one of the most common criticisms of LMOOCs is their **high dropout rate** (Jordan, 2014). Due to the constraints of most platforms, one of the reasons for this may lie in the fact that LMOOCs do not generally allow for oral interaction in real time. In turn, this makes it difficult to engage in socialized learning (Stevens, 2013). Such is the case with the LMOOCs we address in this chapter, which do not allow for synchronous interaction either.

Despite the different arguments for and against such courses, it is undeniable that LMOOCs have become an established part of the educational landscape and that they have found a place in online language learning. According to Aparicio *et al.* (2014), LMOOCs will be progressively implemented into formal education. In fact, Munday (2018) has already suggested integrating certain components of LMOOCs into other in-person language courses. It is worth noting,

however, that this debate is not exclusive to LMOOCs; indeed, it can also be extended to distance language learning in general.

Authors such as Nielson *et al.* (2009) have questioned the potential of distance education due to its limitations when it comes to oral interaction. However, several other studies show that online learners' oral competence compares favorably to that of learners who attend in-person or blended learning courses (Blake *et al.*, 2008; see Chapter 9 of this book). It is true that for many learners the ultimate goal when learning a language is, in fact, oral communication. That said, speaking a language is a task that is closely related to **affective factors**, more specifically, to variables such as **anxiety** (He, 2017), **self-esteem** (e.g. Jung & McCroskey, 2009) and **motivation** (Dörnyei & Ryan, 2015; Papi & Hiver, 2020) in the learning process.

The studies listed above confirm the importance of designing tools and strategies to help learners improve their skills, but there is still little research on how affective factors impact asynchronous oral expression. It is worth asking, therefore, how anxiety and other affective variables impact LMOOCs, as well as what role they play. To address this question, based on a case study involving beginner Spanish LMOOCs offered by the Open University in the UK, this chapter aims to investigate the following aspects:

- (1) how **perceptions of self-efficacy** and **anxiety levels** when speaking Spanish **change** after completing an LMOOC;
- (2) whether there is a **correlation between anxiety** when speaking Spanish and **perceptions of self-efficacy**;
- (3) how **anxiety when speaking Spanish** becomes apparent in an **asynchronous environment** or, more specifically, in LMOOCs.

6.3 Research on Anxiety in LMOOCs

6.3.1 Contextualization of the study

The *Spanish for Beginners* program, offered on the MOOC platform *FutureLearn* by the Open University (United Kingdom) – an institution which specializes in distance learning – consists of six four-week courses and covers level A1 of the *Common European Framework of Reference for Languages* (CEFR) (Council of Europe, 2020). The language of instruction for the courses is English. As for the platform, *FutureLearn* follows a social constructivist pedagogy (Ferguson & Sharples, 2014), which is based on Laurillard's conversational framework (2002). The weekly schedule consists of between 23 and 32 activities that include articles (written texts), exercises, tests, quizzes (with short gap-fill, multiple-choice and true/false tasks), audios and videos (often followed by a quiz or discussion) and discussion forums.

These discussion forums are the only collaborative tool offered by *FutureLearn*. They are integrated into the content and have two main functions: on the one hand, learners can practice their written or oral production skills in Spanish and, on the other, they can reflect on the different cultural aspects of Spanish-speaking communities, generally in English. Regarding these cultural reflections, the discussions are planned by the courses' designers based on an article or other audiovisual materials. This way, learners can exchange comments, share knowledge and support each other. The forums are also a space to ask and answer questions, with the aim of encouraging and motivating learners. As for the oral expression activities, there are two main types: those that are based on repetition ('listen and repeat') and those that follow on from a previous activity to practice specific language content (e.g. 'describe a friend or relative'). The only way learners can complete oral activities in these LMOOCs is by recording their voice and then sharing a link to the audio file. Both instructors and other learners in the course can comment on these audio files, ideally via another recording, this way fostering oral production. However, most of the time they engage in writing. Given that the number of participants in some courses can be extremely high, it is often a challenge for instructors to interact with all potential responses in such activities. Nonetheless, in this study, the teaching team made a special effort to comment on all learners' oral productions.

6.3.2 Methodology

6.3.2.1 Participants

The data were collected between February and August 2018, during the third edition of the beginner Spanish courses offered by the Open University on *FutureLearn*. Specifically, the study includes *Spanish for Beginners 2, 3, 5 and 6 (A1)*. For the first course, *FutureLearn* did not recommend the inclusion of our specific questions. As for the fourth one, the survey did not record the pre-test responses due to a technical error. A total of 35,644 participants were registered for the four courses studied (between 6823 and 13,321 per course). The majority (43–46%) were based in the United Kingdom, followed by 6–7% in the United States and 4–6% in Spain. Out of the total number of learners, only 2271 completed at least 50% of the activities (496–825 per course). The participants were evenly distributed across the different age ranges, with two small peaks: 26–35 years old (19–23%) and over 65 (14–18%). Although thousands of people signed up to the LMOOCs, a significant portion did not complete them. This is a common occurrence in such courses, due to their dependence on autonomous learning (Jordan, 2014). The pre-tests and post-tests were voluntary, and only 978 people answered the initial surveys in the four courses studied, while just 138 completed the final surveys. Twenty-three participants responded to both.

6.3.2.2 Data collection

By default, the *FutureLearn* platform already conducts several MOOC participant surveys and allows the designers of the different courses to add five supplementary questions. In the case of this study, these questions were used to gather data on participants' self-efficacy and anxiety. The questions were based on a Likert scale, with one 'yes or no' question and another open-ended one about the possible motivations behind creating and uploading audio recordings to the forum or not (the specific questions appear in section 6.3.3: Results). Although this data collection tool has certain limitations, it makes it possible to reach a large number of participants in an asynchronous and anonymous environment. As a starting point for designing the questions, Horwitz *et al.*'s Foreign Language Classroom Anxiety Scale (1986) was considered, adapting it to the context of LMOOCs.

Regarding the motivational data, these were sourced from the general questions in the surveys. *FutureLearn* anonymizes the data collected and assigns a unique encrypted key to each participant. This anonymity prevents linking the survey data to the forum discussions (where the participants' usernames are visible) and the demographic data gathered by *FutureLearn*. As a result, the quantitative data come from the 23 informants mentioned previously, while the qualitative and demographic data refer to all participants who responded to the surveys or took part in the discussions. Contributions to the forums are presented for illustrative purposes. Of the 23 informants, 20 people signed up to the courses for intrinsic reasons. *FutureLearn's* **motivational labels** were as follows: (1) 'flourish personally and improve my wellbeing'; (2) 'vitalize my mind, learn for pleasure or satisfy intellectual curiosity'; (3) 'complement my personal hobbies or voluntary activities'; (4) for personal needs: 'understand, fix or manage an event or situation in my personal life'; and (5) to move forward professionally: 'prepare for or support a specific work or study goal'.

6.3.2.3 Data analysis

For the statistical calculations, the questions based on the Likert scale were converted to numerical data on a scale from 1 to 5, where 1 corresponds to 'no anxiety' and 5 corresponds to 'high anxiety'. When it came to encrypting the data, whether the question was framed positively or negatively was taken into account. All the quantitative data were transferred to Excel to perform the initial calculations. Subsequently, they were uploaded to the *SPSS* software to carry out the inferential statistical analyses. To identify whether there were significant changes in perceptions of self-efficacy, anxiety levels and preference for technology-mediated speaking tools after attending the courses – following Roberson *et al.* (1995) for the analysis of paired Likert data – Wilcoxon signed rank tests were performed. For the correlational

analysis, Kendall's tau-b test was chosen, since it is a fairly conservative measure. The following **three variables** were included in the correlation analysis: (1) **Foreign Language Speaking Anxiety (FLSA)**; (2) **preference for technology-mediated tools**; and (3) **perceptions of self-efficacy**.

6.3.3 Results

This section presents how perceptions of self-efficacy change after completing an LMOOC and reveals the informants' opinions on the benefits of using technology in oral productions. Afterwards, information is provided about perceptions of anxiety levels at the start and at the end of the courses in the LMOOC's asynchronous environment.

6.3.3.1 Self-efficacy

The participants had to rate their level of self-efficacy for the following five parameters before and after the courses, using a Likert scale with the options 'very good', 'quite good', 'neither good nor bad', 'quite bad' and 'very bad':

For my current level of Spanish, I believe that...

- (1) *My overall speaking ability in Spanish is...*
- (2) *My grammatical correctness in spoken Spanish is...*
- (3) *My fluency in Spanish is...*
- (4) *My pronunciation in Spanish is...*
- (5) *My vocabulary in Spanish is...*

At the beginning of the courses, most of the survey participants rated their general oral competence, grammatical correctness in spoken Spanish, fluency, pronunciation and vocabulary as 'quite bad' or 'neither good nor bad' (Figure 6.1).

However, compared to the results gathered at the end of the courses, there is a noticeable shift towards the positive side in all aspects of oral expression (Figure 6.2), in particular for (1) general speaking ability, (2) pronunciation and (3) fluency.

For the three parameters that stand out, the change is statistically significant with a moderate effect size (Table 6.2). Table 6.1 shows the average score in each of the parameters.

In short, learners believed that their spoken Spanish level had improved as a result of completing the course.

6.3.3.2 Technology-mediated speaking

In general, participants did not express particularly clear opinions on the benefits of technology-mediated speaking. However, at the end

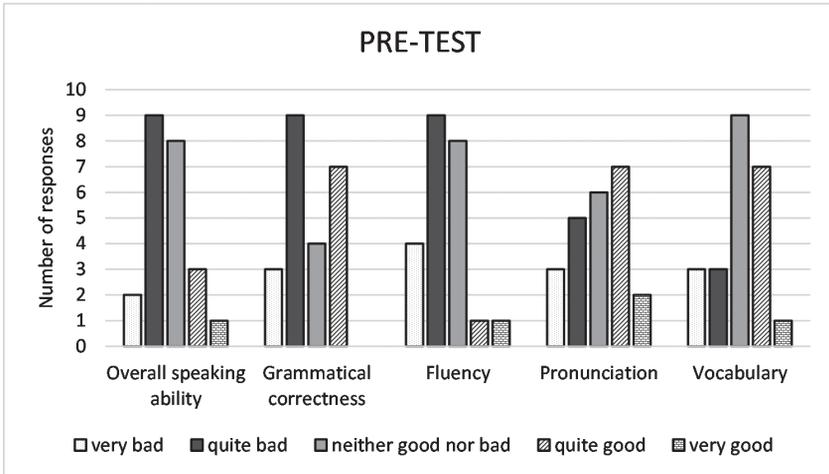


Figure 6.1 Number of responses per parameter before the courses ($n = 23$)

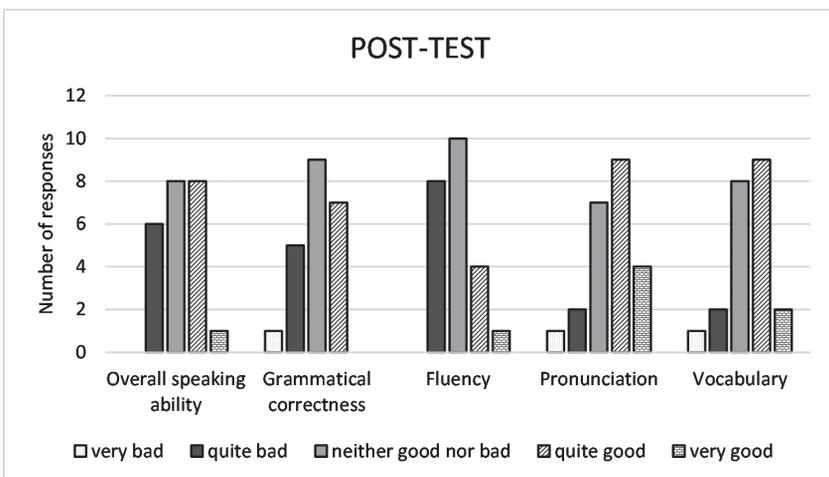


Figure 6.2 Number of responses per parameter after completing the courses ($n = 23$)

of the course they seemed to assess this type of practice more positively (Figure 6.3). The change is statistically significant in the case of statement 2: ‘The lack of physical presence makes me feel more at ease’ (Figure 6.3), with a moderate effect size (1: $z = -1.60$, $p = 0.109$; 2: $z = -2.35$, $p = 0.019$, $r = 0.35$). On the other hand, however, this is not so in the case of statement 1: ‘Speaking to a computer is easier than speaking face to face’ (Figure 6.3).

Table 6.1 Self-efficacy values in the pre-tests and post-tests (1 = very bad; 5 = very good)

Parameter		Mean	Standard deviation	Minimum and maximum values
Overall speaking ability	<i>pre</i>	2.65	0.98	1; 5
	<i>post</i>	3.17	0.89	2; 5
Grammatical correctness	<i>pre</i>	2.65	1.07	1; 4
	<i>post</i>	3.00	0.88	1; 4
Fluency	<i>pre</i>	2.39	0.99	1; 5
	<i>post</i>	2.91	0.98	2; 5
Pronunciation	<i>pre</i>	3.00	1.2	1; 5
	<i>post</i>	3.57	1.03	1; 5
Vocabulary	<i>pre</i>	3.00	1.08	1; 5
	<i>post</i>	3.42	0.96	1; 5

Table 6.2 Changes in perception of self-efficacy; Wilcoxon tests (asterisk denotes statistically significant difference)

Parameter	z-score	p-value	Effect size
Overall speaking ability	-2.29	0.022*	$r = 0.34$; moderate
Grammatical correctness	-1.64	0.101	N/A
Fluency	-2.39	0.017*	$r = 0.35$; moderate
Pronunciation	-2.35	0.019*	$r = 0.35$; moderate
Vocabulary	-1.60	0.109	N/A

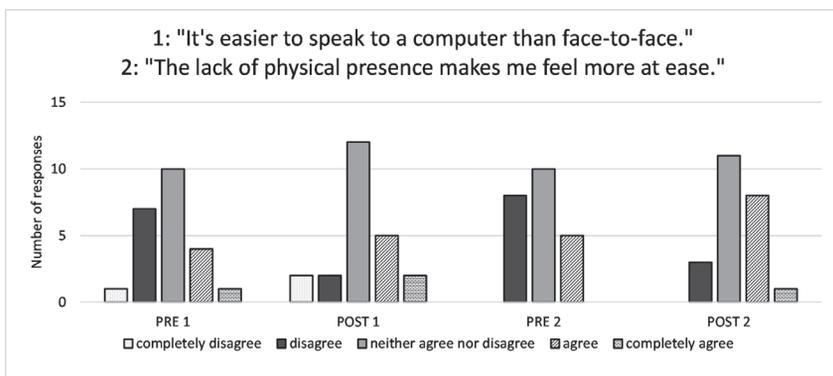


Figure 6.3 Number of responses related to technology-mediated speaking ($n = 23$)

6.3.3.3 FLSA when speaking Spanish

Participants had to rate their anxiety levels before and after the course, with the help of the six statements below:

Rate the following statements with respect to your Spanish speaking:

- (1) *I never feel very confident when I have to record my voice.*
- (2) *I'm not worried about making mistakes.*
- (3) *I get nervous when I don't understand every word in audio recordings and videos from course materials.*
- (4) *I feel embarrassed when speaking Spanish with native speakers.*
- (5) *I feel confident when speaking Spanish with other students.*
- (6) *I always have the impression that other students speak Spanish better than I do.*

While there is some variation in the reported anxiety levels, they are fairly high overall (Table 6.3). Although occasional improvements are observed at the end of the courses, they are not statistically significant, except in the case of statement (e): '*I feel confident when speaking Spanish with other students*'; in other words, the survey respondents felt more comfortable at the end of the course when interacting with other learners ($z = -2.97$, $p = 0.003$, $r = 0.44$).

As far as audio recordings are concerned, at the beginning of the courses 8 participants expressed their intention to upload their recordings to the forum. Meanwhile, 3 declined this option and 2 were unsure. The 10 remaining learners did not answer this question. At the end of the courses, 6 confirmed that they had uploaded their recordings,

Table 6.3 Anxiety levels at the beginning and end of the courses (1 = no anxiety, 5 = high anxiety; asterisk denotes statistically significant difference)

Statement		Mean	Standard deviation	Improvement
(a)	<i>pre</i>	3.52	1.03	0.12
	<i>post</i>	3.30	1.15	
(b)	<i>pre</i>	2.83	0.94	0.09
	<i>post</i>	2.74	1.01	
(c)	<i>pre</i>	2.87	0.87	0.08
	<i>post</i>	2.79	0.82	
(d)	<i>pre</i>	3.26	0.75	0.26
	<i>post</i>	3.00	0.90	
(e)	<i>pre</i>	3.17	0.78	0.60*
	<i>post</i>	2.57	0.84	
(f)	<i>pre</i>	2.96	0.71	0.00
	<i>post</i>	2.96	0.88	

Table 6.4 Kendall's tau-b correlations before the courses (correlation coefficient; significance)

	FLSA	Self-efficacy
FLSA	N/A	-0.074; 0.65
Self-efficacy	-0.074; 0.65	N/A
Technology-mediated speaking	0.071; 0.68	-0.198; 0.234

Table 6.5 Kendall's tau-b correlations after the courses (correlation coefficient; significance; asterisk denotes statistically significant correlation)

	FLSA	Self-efficacy
FLSA	N/A	-0.550; 0.007*
Self-efficacy	-0.550; 0.007*	N/A
Technology-mediated speaking	0.303; 0.160	-0.175; 0.426

while 3 stated that they had not. On the one hand, their reasons were related to technical difficulties, either because they did not know how to do it or they did not have a microphone. On the other hand, there was a degree of apprehension about speaking and hearing their recorded voice – some felt it was not good enough, others did not like the sound of it and some simply felt embarrassed. A potential indicator of the discomfort participants experienced when faced with uploading their recordings is that, while the response rate to the questions was over 95% – meaning nearly everyone always answered the questions – in this particular case it barely exceeded 55%.

To ascertain whether there is a correlation between FLSA and the other two variables, Kendall's tau-b test was applied, for which the results are presented in Tables 6.4 and 6.5 (before and after the courses, respectively). The analysis reveals certain trends – for instance, that participants with higher anxiety levels place more value on technology-mediated speaking. The only statistically significant correlation is the negative one between participants' beliefs of self-efficacy and speaking anxiety obtained in the post-tests. In other words, the higher the anxiety level, the lower the perception of self-efficacy.

6.3.4 Discussion

The results obtained in this study should be interpreted considering the nature of the informants involved. One explanation for the low completion rate of MOOCs among participants is that these courses are voluntary; that is, participation in them is related to each learner's level of motivation (Downes, 2012). The informants in this study were particularly committed: they completed both voluntary surveys and actively studied the course materials. As a result, it can be assumed that they had the ability and willingness to learn independently. It is likely that they had a good

predisposition for distance language learning to start with, providing them with the right tools to look for solutions and overcome obstacles throughout the learning process (Hauck & Hurd, 2005).

The analysis reveals that perceptions of anxiety levels did not improve to the same extent as perceptions of self-efficacy. Furthermore, learners who exhibited higher levels of anxiety had a lower self-efficacy score, a finding similar to that reported by Torres and Turner (2016). When faced with speaking with other learners – an activity carried out asynchronously throughout the course – the respondents felt more confident at the end compared to the beginning. However, the idea of recording their voice and having to interact with native speakers, as well as the feeling that the rest of the group spoke better Spanish, continued to cause anxiety. Therefore, it is likely that the anxiety levels experienced in this context of asynchronous speaking are naturally lower than they would be in an in-person classroom setting; in other words, here learners can work at their own pace and make mistakes without fear of criticism. Despite everything, however, completing the course was not enough to significantly reduce or eliminate their fears. Contrary to expectations, learners still felt anxious when speaking Spanish in this non-formal asynchronous context. Not only this, but they even experienced inhibiting effects: that is, not all of them engaged in the asynchronous conversation activities or, if they did, they did not share their recordings. Just like in traditional classroom settings, anxiety prevents learners from engaging in oral production activities (Horwitz, 2000). It has been shown that sometimes, even after completing the oral activity, learners refrain from sharing their recordings out of a fear of ‘sounding bad’ in Spanish. Certain comments in the discussion forums also reflect this fear: ‘I’m still feeling self-conscious’ or ‘I was too nervous to upload them!’.

Another interesting result is that the respondents placed more value on the benefits of technology after completing the courses. This contradicts the findings of Melchor-Couto (2017) and B ark anyi (2021), which suggest that the anonymity and protection provided by a digital device are beneficial at the beginning of a course. Even given this, it is important to consider that the participants in this study are autonomous, very motivated and determined learners. On the other hand, in the study by B ark anyi (2021), the answers were not paired and the motivational characteristics of the two compared groups (before and after the course) were different. As for the participants in Melchor-Couto’s research (2017), the tasks completed were different from those in this study, as they engaged in both synchronous and asynchronous oral activities.

Based on forum contributions, the aspects of oral communication that concerned participants the most were: (1) **sounding bad**; (2) **not being able to speak so fast**; (3) **not understanding** the audio or what was being said to them; and (4) being constantly worried about **not being**

able to pronounce the erre sound correctly. The qualitative analysis of the forum discussions reveals various strategies for dealing with anxiety when speaking. These include **humor and irony, recognizing one's own and others' efforts, support from the learner group and gratitude for the instructors' encouragement.** Humor has proved to be a useful strategy in difficult situations, as it helps speakers to distance themselves from feelings of shame. The opportunity to laugh at challenges also provides a sense of collective empowerment in situations where the learner may feel less confident. Recognizing one's own efforts also leads to support from peers in the face of potential anxiety – 'I am well impressed with your accent' – which in turn fosters the creation of a supportive learning community. According to Sokolik (2014), this is an essential requirement for success in LMOOCs. Learners also feel very grateful if instructors acknowledge their efforts and provide encouragement: 'Thank you for all the encouragement'.

The results revealed here do not suggest that the successful completion of a course necessarily reduces anxiety levels in the context of LMOOCs. This, combined with the findings of other studies, could mean that, although situations and strategies that reduce anxiety when speaking a foreign language do exist, there is no single learning context that has this power, whether formal or informal, in-person or online, synchronous or asynchronous. Therefore, given its significance and prevalence, anxiety constitutes a factor that educators and course designers must always consider when planning for language teaching.

6.4 Recommendations for Practice

As seen previously, anxiety in language learning can appear in many forms, including a sort of 'stage fright', fear of making mistakes or a reluctance to speak in general due to not feeling competent enough and, above all, the challenge of speaking spontaneously or understanding the interlocutor.

The causes that trigger anxiety when speaking languages have been the subject of extensive research, especially in tertiary-level or adult education. However, few studies explore empirically strategies for dealing with this affective variable beyond theoretical suggestions or teaching practices reported without data-based corroboration. For example, Lucas (1984) mentions two steps to relieve the anxiety experienced by English language learners in Japan. Indeed, this affective variable is especially prevalent in this particular cultural context, where oral interaction in language learning has not been traditionally encouraged. According to the author, the first step is to foster a relaxed and welcoming atmosphere in the classroom: for instance, by encouraging the learners to get to know each other. This can be achieved through the presentation of introductory formulas, expressions used

in everyday conversations or common discourse markers, also teaching them how to get out of embarrassing situations and including rhythmic breathing exercises in class. The second step involves providing the learners with opportunities to practice the target language as much as possible. However, it is important to note that Lucas's study (1984), just like most research on anxiety in oral expression, does not test empirically whether the strategies put forth prove effective or not.

One notable exception to this is the study conducted by He (2017), whose research is based on data from 302 English language learners and 30 university professors in China. The author highlights the persistent application of empirically verified strategies in face-to-face teaching and provides a list of 32 strategies to relieve the anxiety experienced by Chinese English language learners when speaking. These strategies are directed towards instructors, learners or both. The **most important strategies for instructors** involve the use of humor and being patient. Regarding their behavior in class, they should indirectly encourage the learners to correct their mistakes, organize many activities in small groups, set examples before oral tasks and make sure they have a deep understanding of the culture(s) related to the target language. The **main strategies directed towards learners** are: being aware that mistakes are part of the learning process, engaging in group study or practice sessions, speaking with other learners about anxiety and the fear of speaking a foreign language, practicing as much as possible, preparing before class and using more body language. As for the **strategies for both instructors and learners**, these include using the target language in casual contexts, not focusing on correction when speaking, incorporating gamified activities, implementing relaxation exercises and being sensitive to intercultural differences (He, 2017). The instructor plays a central role when it comes to getting familiar with and applying these strategies, guiding the learners towards setting realistic goals, facilitating group work, recognizing anxiety as a factor in the learning process and speaking openly about this affective variable.

As can be seen, all the strategies mentioned so far have been developed with a traditional classroom setting in mind. Therefore, the following sections explore how these strategies can be adapted and integrated into online learning in both synchronous and asynchronous environments.

6.4.1 Online learning communities

In a face-to-face educational institution, the learner community benefits from numerous interaction opportunities, as well as from informal contact amongst themselves. Learners require the support of their community to make progress. In fact, this support is particularly necessary when it comes to managing anxiety. In the case of online

teaching, **forums**, for example, can be used to keep learners connected and active, to build a learning community and to exchange information. These forums tend to work well if the instructor demonstrates their availability and value, but also if they do not intervene constantly and correct (all) mistakes. As a starting point, it is essential to accept that learners will use the digital environment in their own way. Similarly, it is very likely that they will engage in social activities outside the course's official platforms, such as starting a *WhatsApp* group (Toolkit, 2020), which also helps them to stay connected to the course.

Another important aspect to consider when it comes to virtual settings is that the instructor should **keep their camera on throughout the class** (unless their internet connection prevents this), encouraging learners to do the same. In fully online courses, this is the only way to get to know each other. However, it is still a good idea to give learners the option to decide whether or not they want to show their faces on camera. This also applies to the microphone, making sure to include the chat option in oral activities, too (see Chapter 9 of this book). By doing so, less outgoing learners will also have the chance to take part. Similarly, it is useful to keep in mind that not participating in oral activities is not necessarily due to a lack of willingness, interest or a negative attitude towards learning. If it is possible to record the sessions, they can be watched retrospectively (see Pleines, 2020).

Activities in small groups can provide opportunities to practice the target language in a more natural setting, helping learners to develop strategies for conveying their message, as shown in studies such as the one by Tsiplakides and Keramida (2009). In virtual environments, the instructor should specify in advance the contexts and 'netiquette' among the learners. Additionally, it is important to take into account potential proficiency-related differences among the small group's members, as these may cause learners with higher anxiety levels to feel like everyone else speaks better than they do. This is especially relevant if there are highly proficient heritage speakers in the group. To foster an all-round supportive atmosphere within the class, it is also a good idea to encourage learners to express their feelings of anxiety and suggest strategies to overcome them or, at least, learn how to manage them.

6.4.2 Two much needed strategies: Humor and patience

In our study, humor proved to be one of the main strategies for relieving anxiety. This aspect of human behavior fosters the creation of a **relaxed atmosphere** and makes it more likely that learners will **actively participate** in oral tasks (Bell & Pomerantz, 2016), in line with the affective filter hypothesis proposed by Krashen (1982). Moreover, **humor facilitates the acquisition of linguistic and cultural content** (Ziyaemehr *et al.*, 2011). It is important that the production of humor

be directed by the instructor or focused on a gamified activity rather than the learners themselves. In virtual environments, where body language is limited, humor should be managed with even more care. For example, in asynchronous contexts, the instructor could share a short, humorous video in the forum with fun facts or information about themselves for the learners to get to know them, in this way fostering a positive learning environment.

Another essential quality is **patience**. By adopting a **cooperative and obliging attitude**, the instructor can help to mitigate their students' anxiety. Silent pauses – which, without sufficient visual or physical stimuli, may feel very long – are a natural part of any language class. Additionally, learners require time to process the tasks at hand and to prepare their answers. It is advisable to design specific activities that also encourage the participation of learners who may need more time, to prevent them from feeling pressured by the need for immediate communication. Patience is also a key factor for students, since making progress in a foreign language requires time, practice and resilience.

6.4.3 Managing mistakes in learning

Making mistakes is a natural process in language learning, offering the opportunity to receive feedback and improve (Muñoz-Basols & Bailini, 2018). In fact, learners are aware of this process and, in general, they expect to be corrected. However, the consequences of this expectation may vary considerably from one learner to another, as some may feel embarrassed if they are corrected explicitly in front of the class. Creating an ideal environment where all learners feel comfortable enough to risk making mistakes is no easy task. As a result, many instructors opt for **indirect correction**: that is, when the learner finishes speaking, they correctly rephrase what they said. The advantage of this correction method is that it does not interrupt communication and is less intrusive. However, learners are often too nervous to notice their mistake and the subsequent indirect correction. In fact, it has been demonstrated that, when it comes to written productions, learners benefit more from direct corrections rather than indirect ones (Hashemnezhad & Mohammadnejad, 2012).

FLSA is associated with meticulous **mistake monitoring** and the tendency to focus on **accuracy** (Gregersen, 2003), which in turn hinders the development of greater oral fluency (Moser *et al.*, 2013). Therefore, it could be beneficial to **distinguish between activities** directed towards: (1) **linguistic form**, when learners with higher anxiety levels can practice with their microphones either muted or on, but with the entire group at the same time to avoid speaking alone; and (2) **fluency development**, when learners must develop strategies to escape the constraints of constant monitoring and instead focus on the message

they aim to convey. Additionally, in the case of homogeneous groups, **translanguaging** can prove useful in relation to the effective management of participants' emotions (Back *et al.*, 2020). Mistakes can also be used to foster group or pair-based practice, which should be guided and supported by the instructor. In addition, it is equally important to openly address how to manage mistakes when learning a language.

6.4.4 Designing realistic objectives

Helping both individual learners and the whole class set realistic goals, which are neither too easy nor unattainable, is a motivating factor that also reduces anxiety in the foreign language (Dörnyei, 1994). Similarly, in virtual environments it is essential that activities be shorter than in traditional settings. Additionally, they should contain straightforward instructions and follow a step-by-step structure. In virtual contexts, it is easier for learners to get distracted or lost during the process (Toolkit, 2020). It is also useful to provide spoken examples before and after the activities, since learners are at a greater risk of feeling lonely or isolated. Other helpful practices include sending the class schedule and materials in advance to reduce uncertainty about the content, teaching specific strategies for effective listening, as well as strategies to deal with interruptions in the online environment. One way to achieve this, for instance, is to provide a list of expressions to ensure smooth communication, such as: 'Could you please repeat that?', 'I can hear a noise in the background', 'Your microphone is muted', etc. The use of emoticons can also enrich interactions in the lesson (Luke, 2021), help to foster a relaxed atmosphere and reduce anxiety in virtual settings (Avila & Cabrera, 2020). It is important for learners to appreciate their achievements so far and not solely focus on potential long-term objectives. The end goal should never be perfection: rather, learners should focus on improving their oral production through practice.

6.5 Conclusion and Future Lines of Research

The data analyzed in this study come from atypical LMOOC learners: in other words, they are individuals who completed the whole course, including the voluntary surveys at the beginning and end of the courses. This suggests that they are learners who know how to stay motivated during the learning process. **Three main conclusions** have been drawn:

- (1) **Perceptions of self-efficacy were greater at the end of the courses compared to the beginning**, with significant improvements in self-confidence related to correct pronunciation, fluency when speaking, and the learners' general ability to express themselves.

- (2) **Perceptions of FLSA levels did not change significantly after completing the courses:** the only time when the respondents felt more comfortable was when it came to interacting orally with other participants. It is interesting that, despite the fact that oral interaction only took place asynchronously, the learners had certain reservations or were reluctant when it came to sharing their recordings in the forum, and those who did often had strategies to relieve the emotional burden of the anxiety experienced when speaking Spanish.
- (3) **Learners with higher anxiety levels seemed to value technology-mediated speaking more than those with lower anxiety levels.** In relation to this idea, it is noteworthy that, overall, the participants placed greater value on technology-mediated speaking at the end of the courses than at the beginning; that is, the course seemed to have a direct impact on how they perceived this type of communication.

Even though it is clear that the proper management of FLSA is an aspect that both educators and course designers must consider in all learning contexts, whether formal or not, it would be beneficial for future research to compare explicitly the impact of different online learning formats (for instance, a course that is exclusively synchronous, asynchronous or a combination of both). It could also be useful to explore the relationship between body language and the affective variables present in virtual teaching. Similarly, it is important to conduct empirical studies that identify the most effective strategies to relieve the various aspects of anxiety when communicating in a foreign language.

6.6 Annotated Additional Reading

Dörnyei, Z. and Ryan, S. (2015) *The Psychology of the Language Learner Revisited*. Routledge.

This book is a revised edition of Dörnyei's previous work (2005), which describes the most important variables that determine success or failure in foreign language learning, taking into account learners' personality traits, the nature of their motivation and their linguistic aptitude. This new study also includes interactional aspects of learning.

Horwitz, E.K., Horwitz, M.B. and Cope, J. (1986) Foreign language classroom anxiety. *The Modern Language Journal* 70 (2), 125–132.

This is a pioneering study in the systematic description of anxiety in foreign language learning. It also includes a detailed scale to measure this affective variable that has influenced subsequent research.

References

- Aida, Y. (1994) Examination of Horwitz, Horwitz & Cope's construct of foreign language anxiety: The case of students of Japanese. *Modern Language Journal* 78 (2), 155–168. <https://doi.org/10.2307/329005>.
- Amengual-Pizarro, M. (2018) Foreign language classroom anxiety among English for Specific Purposes (ESP) students. *International Journal of English Studies* 18 (2), 145–159. <https://doi.org/10.6018/ijes/2018/2/323311>.

- Aparicio, M., Bação, F. and Oliveira, T. (2014) MOOC's business models: Turning black swans into gray swans. In C.J. Costa and M. Aparicio (eds) *ISDOC14 Proceedings of the International Conference on Information Systems and Design of Communication* (pp. 45–49). Association for Computing Machinery.
- Avila, E.C. and Cabrera, H.I. (2020) The use of Facebook group in distance learning during the time of the COVID-19 pandemic. *PalArch's Journal of Archaeology of Egypt/ Egyptology* 17 (6), 1859–1871.
- Back, M., Han, M. and Weng, S. (2020) Emotional scaffolding for emergent multilingual learners through translanguaging: Case stories. *Language and Education* 34 (5), 387–406. <https://doi.org/10.1080/09500782.2020.1744638>.
- Bárcena, E. and Martín-Monje, E. (2014) *Introduction. Language MOOCs: An Emerging Field. Language MOOCs*. Mouton de Gruyter.
- Bárcena, E., Martín-Monje, E. and Read, R. (2015) Potentiating the human dimension in language MOOCs. In U. Cress and C. Delgado Kloos (eds) *Proceedings of the European MOOC Stakeholder Summit* (pp. 46–54). École Polytechnique Fédérale de Lausanne.
- Bárkányi, Z. (2021) Motivation, self-efficacy beliefs, and speaking anxiety in language MOOCs. *ReCALL* 33 (2), 143–160. <https://doi.org/10.1017/S0958344021000033>.
- Bell, N. and Pomerantz, A. (2016) *Humor in the Classroom: A Guide for Language Teachers and Educational Researchers*. Routledge.
- Blake, R., Wilson, N.L., Cetto, C. and Pardo-Ballester, C. (2008) Measuring oral proficiency in distance, face-to-face, and blended classrooms. *Language Learning & Technology* 12 (3), 114–127. <http://dx.doi.org/10125/44158>.
- Çağatay, S. (2015) Examining EFL students' foreign language speaking anxiety: The case at a Turkish state university. *Procedia - Social and Behavioral Sciences* 199, 648–656. <https://doi.org/10.1016/j.sbspro.2015.07.59>.
- Chacón-Beltrán, R. (2017) The role of MOOCs in the learning of languages: Lessons from a beginners' English course. *Porta Linguarum* 28, 23–35.
- Cooke-Plagwitz, J. (2008) New directions in CALL: An objective introduction to *Second Life*. *CALICO Journal* 25 (3), 547–557. <http://www.jstor.org/stable/calicojournal.25.3.547>.
- Council of Europe (2020) *Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume with New Descriptors*. Council of Europe.
- Dörnyei, Z. (1994) Motivation and motivating in the foreign language classroom. *The Modern Language Journal* 78 (3), 273–284. <https://doi.org/10.2307/330107>.
- Dörnyei, Z. (2005) *The Psychology of the Language Learner: Individual Differences in Second Language Acquisition*. Routledge.
- Dörnyei, Z. and Ryan, S. (2015) *The Psychology of the Language Learner Revisited*. Routledge.
- Downes, S. (2012) What a MOOC does. *Knowledge, Learning, Community* (blog), 1 March.
- Elkhafaifi, H. (2005) Listening comprehension and anxiety in the Arabic language classroom. *The Modern Language Journal* 89 (2), 206–220. <https://www.jstor.org/stable/3588681>.
- Ely, C.M. (1986) An analysis of discomfort, risktaking, sociability, and motivation in the L2 classroom. *Language Learning* 36, 1–25. <https://doi.org/10.1111/j.1467-1770.1986.tb00366.x>.
- Ferguson, R. and Sharples, M. (2014) Innovative pedagogy at massive scale: Teaching and learning in MOOCs. In C. Rensing, S. de Feitas, T. Ley and P.J. Muñoz-Merino (eds) *Open Learning and Teaching in Educational Communities: 9th European Conference on Technology Enhanced Learning, EC-TEL 2014, Graz, Austria, September 16–19, 2014, Proceedings* (pp. 98–111). Springer International Publishing.
- Gardner, R.C., Clément, R., Smythe, P.C. and Smythe, C.L. (1979) *Attitudes and Motivation Test Battery*. Department of Psychology, University of Western Ontario.
- Gibaldi, C. (2013) Will MOOCs eventually go for the money? Let's hope not. In L. Gómez Chova, A. López Martínez and I. Candel Torres (eds) *INTED2013 Proceedings* (pp. 4084–4085). International Association of Technology, Education and Development.

- Gironzetti, E., Lacorte, M. and Muñoz-Basols, J. (2020) Teacher perceptions and student interaction in online and hybrid university language learning courses. In M. Planelles, A. Foucart and J.M. Liceras (eds) *Current Perspectives in Language Teaching and Learning in Multicultural Contexts* (pp. 507–539). Thomson Reuters-Aranzadi.
- Gregersen, T.S. (2003) To err is human: A reminder to teachers of language-anxious students. *Foreign Language Annals* 36 (1), 25–32. <https://doi.org/10.1111/j.1944-9720.2003.tb01929.x>.
- Gregersen, T.S., MacIntyre, P.D. and Meza, M.D. (2014) The motion of emotion: Idiodynamic case studies of learners' foreign language anxiety. *The Modern Language Journal* 98 (2), 574–588. <https://doi.org/10.1111/modl.12084>.
- Hampel, R., Felix, U., Hacuk, M. and Coleman, J.A. (2005) Complexities of learning and teaching languages in a real-time audiographic environment. *German as a Foreign Language Journal* 3 (3), 1–30.
- Hamzaoglu, H. and Koçoğlu, Z. (2016) The application of podcasting as an instructional tool to improve Turkish EFL learners' speaking anxiety. *Educational Media International* 53 (4), 313–326. <https://doi.org/10.1080/09523987.2016.1254889>.
- Hashemnezhad, H. and Mohammadnejad, S. (2012) A case for direct and indirect feedback: The other side of the coin. *English Language Teaching* 5 (3), 230–239. <https://doi.org/10.5539/elt.v5n3p230>.
- Hauck, M. and Hurd, S. (2005) Exploring the link between language anxiety and learner self-management in open language learning contexts. *European Journal of Open, Distance and e-Learning*. <https://oro.open.ac.uk/3542/1/Hurdeurodl.pdf>.
- He, D. (2017) How to cope with foreign language speaking anxiety effectively? The case of university students in China. *Electronic Journal of Foreign Language Teaching* 14 (2), 159–174.
- Horwitz, E.K. (2000) It ain't over 'til it's over: On foreign language anxiety, first language deficits, and the confounding of variables. *The Modern Language Journal* 84 (2), 256–259. <https://doi.org/10.1111/0026-7902.00067>.
- Horwitz, E.K., Horwitz, M.B. and Cope, J. (1986) Foreign language classroom anxiety. *The Modern Language Journal* 70 (2), 125–132. <https://doi.org/10.2307/327317>.
- Jordan, K. (2014) Initial trends in enrolment and completion of massive open online courses. *International Review of Research in Open and Distributed Learning* 15 (1), 133–160. <https://doi.org/10.19173/irrodl.v15i1.1651>.
- Jung, H.Y. and McCroskey, J.C. (2009) Communication apprehension in a first language and self-perceived competence as predictors of communication apprehension in a second language: A study of speakers of English as a second language. *Communication Quarterly* 52 (2), 170–181. <https://doi.org/10.1080/01463370409370188>.
- Krashen, S. (1982) *Principles and Practice in Second Language Acquisition*. Prentice-Hall International.
- Latif, M.M.A. (2015) Sources of L2 writing apprehension: A study of Egyptian university students. *Journal of Research in Reading* 38 (2), 194–212. <https://doi.org/10.1111/j.1467-9817.2012.01549.x>.
- Laurillard, D. (2002) *Rethinking University Teaching: A Framework for the Effective Use of Learning Technologies* (2nd edn). Routledge.
- Lucas, J. (1984) Communication apprehension in the ESL classroom: Getting our students to talk. *Foreign Language Annals* 17 (6), 593–598. <https://doi.org/10.1111/j.1944-9720.1984.tb01748.x>.
- Luke, K. (2021) Twelve tips for using synchronous virtual classroom technologies in medical education. *MedEdPublish* 10 (1), 66. <http://dx.doi.org/10.15694/mep.2021.000066.1>.
- MacIntyre, P.D. and Gardner, R.C. (1994) The subtle effects of language anxiety on cognitive processing in the second language. *Language Learning* 44 (2), 283–305.
- Mak, B. (2011) An exploration of speaking-in-class anxiety with Chinese ESL learners. *System* 39 (2), 202–214. <https://doi.org/10.1111/j.1467-1770.1994.tb01103.x>.

- McIntosh, S., Braul, B. and Chao, T. (2003) A case study in asynchronous voice conferencing for language instruction. *Educational Media International* 40 (1–2), 63–74. <https://doi.org/10.1080/0952398032000092125>.
- Melchor-Couto, S. (2017) Foreign language anxiety levels in *Second Life* oral interaction. *ReCALL* 29 (1), 99–119. <https://doi.org/10.1017/S0958344016000185>.
- Moser, J., Moran, T., Schroder, H., Donnellan, B. and Yeung, N. (2013) On the relationship between anxiety and error monitoring: A meta-analysis and conceptual framework. *Frontiers in Human Neuroscience* 7, 1–19. <https://doi.org/10.3389/fnhum.2013.00466>.
- Munday, P. (2018) Contextos virtuales para el aprendizaje. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2* (pp. 535–546). Routledge.
- Muñoz-Basols, J. and Bailini, S. (2018) Error analysis and error correction. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2* (pp. 94–108). Routledge.
- Nielson, K., González-Lloret, M. and Pinckney, K. (2009) Learning foreign languages at a distance: Characteristics of effective online courses. In *TTO 82131 Technical Report E.3.1* (pp. 169–188). University of Maryland Center for Advanced Study of Language.
- Papi, M. and Hiver, P. (2020) Language learning motivation as a complex dynamic system: A global perspective of truth, control, and value. *The Modern Language Journal* 104 (1), 209–232. <https://doi.org/10.1111/modl.12624>.
- Park, G. (2014) Factor analysis of the Foreign Language Classroom Anxiety Scale in Korean learners of English as a foreign language. *Psychological Reports* 115 (1), 261–275. <https://doi.org/10.2466/28.11.PR0.115c10z2>.
- Plaines, C. (2020) Understanding vicarious participation in online language learning. *Distance Education* 41 (4), 453–471. <https://doi.org/10.1080/01587919.2020.1821605>.
- Poza, M.I. (2011) The effects of asynchronous computer voice conferencing on L2 learners' speaking anxiety. *IALLT Journal of Language Learning Technologies* 41 (1), 33–63. <https://doi.org/10.17161/iallt.v41i1.8486>.
- Roberson, P.K., Shema, S.J., Mundfrom, D.J. and Holmes, T.M. (1995) Analysis of paired Likert data: How to evaluate change and preference questions. *Family Medicine* 27 (10), 671–675.
- Satar, H.M. and Özdener, N. (2008) The effects of synchronous CMC on speaking proficiency and anxiety: Text versus voice chat. *The Modern Language Journal* 92 (4), 595–613. <https://doi.org/10.1111/j.1540-4781.2008.00789.x>.
- Sheen, Y. (2008) Recasts, language anxiety, modified output, and L2 learning. *Language Learning* 58 (4), 835–874. <https://doi.org/10.1111/j.1467-9922.2008.00480.x>.
- Sokolik, M. (2014) What constitutes an effective language MOOC? In E. Martín-Monje and E. Bárcena (eds) *Language MOOCs: Providing Learning, Transcending Boundaries* (pp. 16–32). Mouton de Gruyter.
- Spielberger, C.D. (1983) *Manual for the State-Trait Anxiety Inventory (from Y)*. Consulting Psychologists Press.
- Steinberg, F.S. and Horwitz, E.K. (1986) The effect of induced anxiety on the denotative and interpretative content of second language speech. *TESOL Quarterly* 20 (1), 131–136. <https://doi.org/10.2307/3586395>.
- Stevens, V. (2013) LTMOOC and Instreamia. *TESL-EJ: Teaching English as a Second or Foreign Language* 17 (1).
- Sze, P.M. (2006) Developing students' listening and speaking skills through ELT podcasts. *Education Journal* 34, 115–134.
- Tecedor, M. and Campos-Dintrans, G. (2019) Developing oral communication in Spanish lower-level courses: The case of voice recording and videoconferencing activities. *ReCALL* 31 (2), 116–134. <https://doi.org/10.1017/S0958344018000083>.

- Toolkit (2020) *Moving Your Language Teaching Online. A Toolkit for University Language Teachers*. Open University. <https://www.open.edu/openlearncreate/course/view.php?id=6341>.
- Torres, K.M. and Turner, J.E. (2016) Students' foreign language anxiety and self-efficacy beliefs across different levels of university foreign language coursework. *Journal of Spanish Language Teaching* 3 (1), 57–73. <https://doi.org/10.1080/23247797.2016.1163101>.
- Tsiplakides, I. and Keramida, A. (2009) Helping students overcome foreign language speaking anxiety in the English classroom: Theoretical issues and practical recommendations. *International Education Studies* 2 (4), 39–44. <https://doi.org/10.5539/ies.v2n4p39>.
- Young, D.J. (1992) Language anxiety from the foreign language specialist's perspective. *Foreign Language Annals* 25 (2), 157–172. <https://doi.org/10.1111/j.1944-9720.1992.tb00524.x>.
- Zhang, X. (2013) Foreign language listening anxiety and listening performance: Conceptualizations and causal relationships. *System* 41, 164–177. <https://doi.org/10.1016/j.system.2013.01.004>.
- Zhao, A., Guo, Y. and Dynia, J. (2013) Foreign language reading anxiety: Chinese as a foreign language in the United States. *The Modern Language Journal* 97 (3), 764–778. <https://doi.org/10.1111/j.1540-4781.2013.12032.x>.
- Ziyacemehr, A., Kumar, V. and Faiz Abdullah, M.S. (2011) Use and non-use of humor in academic ESL classrooms. *English Language Teaching* 4 (3), 111–119. <https://doi.org/10.5539/elt.v4n3p111>.

7 Interaction in Virtual Learning Environments

Javier Muñoz-Basols and Mara Fuertes Gutiérrez

7.1 Introduction and Key Concepts

Interaction plays a central role in educational settings since it acts as a regulator of the teaching–learning binomial. In the context of second or foreign languages, **interaction** can be defined as an activity made up of **tasks** and **participants** who share knowledge, while simultaneously negotiating different ways to view and interpret the world (Kato & Dalsky, 2019: 121). Traditionally, **three main types** of interaction have been identified: (1) learner ↔ teacher; (2) learner ↔ learner; and (3) learner → content or materials (Moore, 1989: 1). Knowledge building in language learning takes place through a process of social interaction (van Lier, 1996, 2004; Vygotsky, 1979) as a mutual understanding of the norms, expectations (Hampel & Stickler, 2015: 75) and roles of the participants as members of a specific group (Hall & Walsh, 2002: 187) is established.

Interaction can be affected by **external factors** that surround the teaching and learning processes:

- (1) the teaching **context** (elementary, secondary, university, non-formal education), the **level** (beginner vs. advanced) or the **resources** available within a given institution may promote interaction to a greater or lesser extent;
- (2) the **environment** or setting in which knowledge is transmitted and interaction takes place (face-to-face, hybrid or fully online) and the **modality** in which this interaction unfolds in the completion of learning tasks: **synchronous** or **asynchronous**;
- (3) the **subject** being taught, which may require more or less interaction, as well as the development of specific skills: traditional math learning vs. language learning. The Council of Europe (2020: 70–89) highlights the importance of developing, beyond linguistic competence, sociolinguistic, pragmatic and intercultural competences as well. Indeed, all of these require a high degree of interaction;
- (4) the **curriculum design**, its duration (month, trimester, academic year, etc.) and the specific learning objectives may require different degrees

- of interaction depending on the tasks to be completed and the skills to be developed: oral production, mediation and interaction vs. written production, mediation and interaction;
- (5) the **cultural component**, from a broad or **macro-cultural** perspective, also conditions interaction. Generally speaking, we can distinguish between **vertical cultures**, where the teacher is considered the central figure, and **horizontal cultures**, characterized by higher levels of participation and interaction in the classroom (Yada *et al.*, 2019: 15–16). In this context, the educational models that shape each system (Canale, 2019: 62, 120) can also be compared (for instance, public vs. private). At the **micro-cultural** level, it is useful to consider aspects such as the training received by the teacher, their professional experience and their teaching style in relation to the classroom space and teaching practices (Hampel & Stickler, 2005: 317).

To understand how interaction works in language learning, it is important to take into account all the social, physical and individual factors that constitute the ecology of the environment in which the learning process, the activities and the tasks take place (van Lier, 1998: 129).

All these external factors, which are summarized in Table 7.1, may have an impact on the development and management of interaction, which is further compounded by the participants' expectations.

Table 7.1 Main external factors that affect interaction

Context	<ul style="list-style-type: none"> • Elementary, secondary, university, non-formal education • Level: beginner, intermediate, advanced • Available resources
Environment	<ul style="list-style-type: none"> • Face-to-face, hybrid, online • Modality: synchronous vs. asynchronous
Subject	<ul style="list-style-type: none"> • Traditional maths teaching (– interaction) vs. language teaching (+ interaction)
Curriculum design	<ul style="list-style-type: none"> • Length: month, trimester, academic year • Objectives: oral production vs. written production
Cultural component	<ul style="list-style-type: none"> • Macro-cultural level: vertical culture (teacher as a central figure) vs. horizontal culture (learner participation); educational models (public vs. private) • Micro-cultural level: teacher training received, professional experience and teaching style

Of all the external factors, the **teaching modality** – whether synchronous or asynchronous – allows us to contrast how the negotiation and co-construction of knowledge take place, as well as the role played by interaction in this process.

Synchronous teaching and learning can take place through various means, such as video (screen), text (chat) or audio (phone). It can also occur both inside and outside the classroom or even at the extracurricular level (Sylvén & Sundqvist, 2017), such as through initiatives

like *eTandem* (see Strawbridge, 2021; Yang & Yi, 2017) or conversation exchanges among language learners. Due to its nature, this real-time modality has a series of advantages for learning (see Table 7.2).

Table 7.2 Advantages of synchronous learning for interaction

-
- Immediate and just-in-time access to peers, instructors and knowledge experts.
 - The ability to interact and share ideas concurrently.
 - Hands-on tools through which learners can react to presented concepts or apply knowledge in real time.
 - Direct connections to real-world situations and primary resources.
 - The means to demonstrate and assess real-time skills, and to foster analytical thinking.
 - The ability to create more diverse learner groups in real time.
 - The capacity to integrate guest expertise into the learning environment.
-

Source: Adapted from Finkelstein (2006: 6).

To lay the groundwork for interaction, it is a good idea to begin with an agreement, whether implicit or explicit, among the participants, in order to reduce potential distractions or interruptions during the activities as far as possible. Consequently, the aim is to make the most of the online experience in a meaningful way (Finkelstein, 2006: 5). In face-to-face teaching, technology tools are mainly used to *support* the presentation of information and concepts. In online environments, however, it is essential to approach their use differently, instead viewing them as *the setting* in which the teaching–learning process takes place. The significant increase in the use of these tools during the COVID-19 pandemic was a clear example of their redefinition and usability due to the importance and pedagogical value they acquired (see Fayed & Cummings, 2021).

In **asynchronous teaching and learning**, teachers and learners do not interact in real time: rather, the resources and activities (for instance, an online forum) are accessed individually within a specific timeframe (for example, the total duration of the course) and depending on each user’s availability. This modality also offers certain advantages for interaction (see Table 7.3).

Table 7.3 Advantages of asynchronous learning for interaction

-
- The ability for learners to control how they present themselves to the rest of the learning community (biography, photo, etc.).
 - The opportunity to create an environment with greater equity in terms of turn-taking and communication among participants.
 - More opportunities for participants to express themselves, especially when it comes to written interaction (e.g. forums, blogs, etc.), no matter their level.
 - The chance to improve learners’ attitudes towards learning thanks to the relaxed atmosphere in asynchronous settings and the absence of group pressure inherent to synchronous education.
 - The reduction of social pressure by allowing for more time and planning ahead.
 - The opportunity to respond thoughtfully to ideas expressed by other participants.
 - The ability to interact with a higher degree of independence, agency and inclusion among participants.
-

Source: Adapted from Arasaratnam-Smith and Northcote (2017: 193).

One of the main advantages of this modality is that there are fewer constraints when it comes to the time dedicated to learning, which provides the learner with a higher degree of flexibility. Some of the primary internal factors that appear in the three main learning environments – face-to-face, hybrid/blended and online – are listed in section 7.2.

7.2 Interaction and Dynamics in Language Learning

The environment in which the face-to-face, hybrid or online teaching–learning process takes place leads to the development of its own dynamics, which are influenced by **internal factors** (Gironzetti *et al.*, 2020: 509). Contrasting interaction in these environments helps us to understand the factors that impact its development, as well as to identify which aspects can be enhanced to foster this dynamic.

7.2.1 Face-to-face environments

Interaction in **face-to-face environments** can be predetermined and conditioned by specific factors that have to do both with the **physical space** (the classroom) and with the **participants** (roles) in the communication process. Some examples of these conditioning factors include: the design and configuration of the space and its usual function; physical elements in the classroom; the distribution of the participants during the class; the distance between the teacher and the learners; and the devices used or the level of access to technology (projector vs. interactive whiteboard) (see Chapter 1 of this book). All these components either restrict or give way to numerous possibilities for interaction, determining whether this dynamic is focused on the teacher or promoted among the learners during an activity.

In addition to these factors, in face-to-face interaction it is essential to keep in mind the **multimodal components** of the communication process that are related to social presence, which also play an important role in both perceptions and expectations derived from interaction. Specifically, these include facial expression, gaze direction, posture, clothing, paralinguistic features (tone of voice, volume and pronunciation, hesitation, silence) and other non-verbal elements of communication (Tu & McIsaac, 2002: 133), such as spatial management, which collectively influence the speakers' perceptions during the communicative act.

7.2.2 Hybrid or blended environments

This type of **hybrid or blended interaction** (Dziuban *et al.*, 2015; Garrison & Vaughan, 2008; Martín-García, 2020; Picciano *et al.*, 2014)

combines face-to-face teaching with teaching through online platforms or virtual learning environments (VLEs). Not only this, a flipped classroom dynamic may also come into play (Mehring & Leis, 2018) (see Chapter 9 of this book), in addition to resources that are used in both synchronous and asynchronous learning. One of the main advantages of hybrid environments is the fact that they promote **active learning** (Babb *et al.*, 2010: 735). Consequently, this leads to a higher degree of autonomy by requiring the learner to take a more structured approach to their learning process. In fact, the learner is also more likely to make the most of both the online resources as well as the face-to-face contact hours. As noted by Martín-García (2020: v) hybrid modalities involve adapting and allowing for greater flexibility in face-to-face and online environments, as well as during the learning time available. The aim of this is to promote group interaction, social collaboration and, consequently, efficient knowledge building. All this should be done keeping the learner in mind as the protagonist of the learning process, also considering a set of skills they should develop. Specifically, these include being active, autonomous, strategic, thoughtful, cooperative and responsible (Martín-García, 2020: v).

In terms of interaction, it is important to take into account that, despite it being a blended method (to a greater or lesser extent, depending on the course objectives), this dynamic should be managed as per the medium used, with both spaces (face-to-face and online) being independent of each other. This is because they involve different types of social presence and are also influenced by factors including the learner's personality, motivations, interests and learning style. For example, Hun Lim *et al.* (2007) studied the level of satisfaction of participants in hybrid and online courses from a learner-focused perspective. They concluded that, while online teaching can isolate or make certain people feel disconnected, it can also have a liberating effect for those who are not as comfortable when it comes to socializing and interacting in face-to-face learning environments (Arasaratnam-Smith & Northcote, 2017: 192). Hence, aspects such as the course's quality, its effectiveness and the participants' level of satisfaction (Jackson & Helms, 2008: 7) are just as important for assessing the success of this modality. In this type of course, of the three kinds of interaction during the learning process (Moore, 1989: 1) – (1) learner ↔ teacher; (2) learner ↔ learner; and (3) learner ↔ content or materials – the third is particularly relevant in this context, since it can directly impact the autonomous development of learning and, therefore, its degree of success (Murray *et al.*, 2013).

7.2.3 Online environments

As in the case of face-to-face and hybrid teaching, in **online environments** both meaning and linguistic form are also negotiated.

When it comes to language learning, interaction involves the practical application of communication strategies to make up for the lack of linguistic knowledge. Learners negotiate meaning and structure using resources such as circumlocution, approximation, repetition, made-up words, requests, self-correction or translation between the L1 and the L2 (Lee, 2001: 234). **Interaction in online environments** is characterized by: (1) more **equal participation** than face-to-face interaction; (2) the **option to adjust the learning pace** to individual needs and expectations; and (3) more opportunities for **more complex and greater volumes of linguistic production** compared to face-to-face interactions (Cerezo, 2021; Lee, 2001: 234–235).

However, personal commitment to the course's workload and cognitive efforts to process learning materials are two essential elements when it comes to promoting autonomous learning (Lee, 2016). This is especially true in the case of LMOOCs (Language Massive Open Online Courses), which are not without limitations, since language acquisition is greatly dependent on opportunities for practice and interaction (Martín-Monje & Borthwick, 2021: 108). Even so, Comas-Quinn *et al.* (2012: 142) point out that online settings can promote the protagonism of learners, thanks to being a more relaxed environment compared with face-to-face contexts. Online, learners feel more empowered to play a more active role in managing interaction, which ultimately has a positive impact on learning. Even though this type of environment has numerous advantages, interaction is still a complex process subject to several external and internal variables. In this regard, it is useful to ask the question: Which components are essential to analyze this dynamic in a technology-mediated environment?

García Cabrero *et al.* (2008: 6–9), based on the work of Benbunan-Fich *et al.* (2005), propose a model for analyzing interaction in **computer-mediated communication** (CMC) in learning environments. This model considers the following factors: (1) **contextual factors** that can promote or limit interaction and learning outcomes, including the participants (roles and characteristics), instructional design (course content, activities and assessments) and access to technology (platforms and resources); (2) **interaction processes** or how technology resources are used, for instance, how effectively resources are managed, how much time is invested or how interaction takes place between the teacher and the learners; and (3) **learning outcomes** or how knowledge is built, for example, how information is shared, how discrepancies between ideas are explored, how meanings are negotiated, how knowledge is assessed and modified (co-construction) and how these new meanings are applied (García Cabrero *et al.*, 2008: 6–9) (see Figure 7.1).

During the interaction process, it is important to pay special attention to the content of the different exchanges to ensure that they cater to three aspects in particular: **teaching presence**, that is, how the

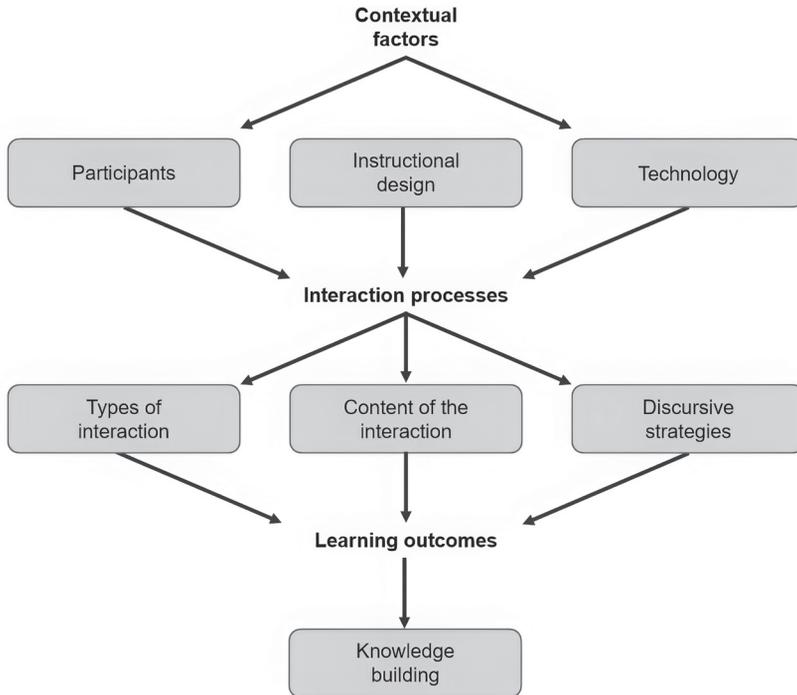


Figure 7.1 Model for the analysis of technology-mediated interaction
Source: García Cabrero *et al.* (2008: 6).

content is presented; **cognitive presence**, or the degree of reflection with which meaning is constructed and shaped; and **social presence**, in other words, the participants' ability to project personal characteristics and contribute to fostering motivation and creating a relaxed, cooperative atmosphere which includes aspects such as affection, empathy and cohesion within the group (García Cabrero *et al.*, 2008: 8–9). Similarly, in terms of teaching presence, it is essential to consider **discursive strategies** that look at how teachers and learners use language to build a network of semantic relationships between the key concepts, with **teacher talk** being particularly relevant when it comes to managing interaction. As will become clear later, this refers to, for instance, how the teacher intervenes to check whether the learners have understood the instructions or the ways in which information and instructions are provided or explained.

Language learners tend to identify anxiety as one of the most common variables in such environments (see Chapter 6 of this book). Furthermore, dissatisfaction with respect to interaction, both within and beyond the classroom, represents another fundamental aspect in online teaching (Carbajal-Carrera, 2021: 2). Therefore, given its significance, in

section 7.3 of this chapter a case study is presented. The aim of this is to illustrate how interaction works in online environments by observing real recordings of interaction dynamics in Spanish language classes. Analyzing interaction in this way allows us to understand how the tasks are implemented and how the participants engage during this process, both in terms of managing interaction and in terms of discourse and, therefore, through the inclusion of language samples. In section 7.4, considering the data obtained from the observation and contrasting this information with specialized literature on the subject, a series of recommendations is proposed for fostering and managing interaction in online language teaching.

7.3 Research on Interaction in Online Environments

7.3.1 Contextualization of the study

Presented below are the results of a pilot study analyzing the communicative strategies used by participants in an online Spanish learning environment. Specifically, six tutorials from the Spanish courses offered by the Open University were observed. The Open University is a British higher education institution specializing in distance learning for more than 50 years. As a pioneer in technology-mediated education, in 2002 it began offering synchronous online classes that have since become an integral part of the institution's teaching practices. As a result, it is considered an ideal setting for conducting a study of these characteristics (see Hampel, 2007).

At the Open University, Spanish modules are taught as part of a languages degree, although they can also be taken as elective subjects. They are taught through materials (developed entirely by the Spanish teaching team) available in the virtual learning environment, where learners also have access to various forums to communicate with their teachers and peers. The tutorials observed are voluntary group classes that serve as reinforcement to expand and practice the content of the modules and prepare for exams. They are taught by associate instructors who also monitor the learners' progress individually and grade the assessment activities within the modules. The topics of the tutorials are announced at the beginning of the course, and each of them is taught at least three times at different times of day to maximize attendance. Learners can book a place in as many tutorials as they like with different instructors, regardless of whether they are regularly taught by them.

In the sample on which the study is based, all the attendees belong to the groups taught by one instructor in particular, who is responsible for designing the tasks as well as designing the complementary material used in the tutorials. The tasks used, whose main objective is to review topics covered in the learning materials and prepare for assessments,

are mostly controlled or semi-controlled practice activities. In this case, the instructor is present, directing and facilitating the tasks in question. This, in fact, constitutes a significant difference compared to other studies on interaction in which this dynamic is explored among learners in guided tasks where the teacher does not intervene (Bueno-Alastuey, 2011, 2013) or in telecollaboration activities where the provision of thorough instructions is avoided (Strawbridge, 2021).

According to internal studies conducted by the Open University, approximately 50% of learners take part in at least one tutorial throughout the course. Furthermore, so-called vicarious students watch the tutorials asynchronously instead of attending (Pleines, 2020). Table 7.4 summarizes the context in which the study was conducted, in line with the external factors described earlier in Table 7.1 that influence interaction between teachers and learners.

Table 7.4 Data collection information

Context	University: The Open University (United Kingdom) Level: beginner, intermediate, advanced (A1–C1)
Environment	Online (platform: <i>AdobeConnect</i>)
Subject	Spanish
Curriculum design	<ul style="list-style-type: none"> • Duration: academic year • Objectives: oral production, preparation of assessment tasks
Cultural component	<ul style="list-style-type: none"> • Macro-cultural level: horizontal culture; public institution • Central teaching figure vs. greater learner spontaneity • Micro-cultural level: teacher with more than 20 years of experience

The research adopts an emic, or internal approach, as it seeks to analyze, through the viewing of real recordings, how interaction is managed in relation to the participants.

7.3.2 Methodology

7.3.2.1 Participants

The participants in this study include one instructor with more than 20 years of experience in distance and online teaching, as well as attendees of the six tutorials analyzed. For the observations, groups of different levels (A1–A2, B2 and C1; cf. Council of Europe, 2020), all taught by the same instructor, were selected in order to analyze interaction according to the linguistic competence of the participants. Given that this is an exploratory study, it was decided to follow the same instructor, since interaction, among other factors, is also linked to aspects such as teaching style, as explained previously. Furthermore, to ensure that the observations did not influence any interactions during the tutorials, it was decided to use recordings instead of attending live sessions. In fact, this is a common practice in studies of this nature

(Bazán Ramírez *et al.*, 2009). Another advantage of this approach is that it facilitates data processing and the identification of interactional phenomena. This is because the material can be transcribed and reviewed. In an initial selection, instructors who teach classes across several Spanish modules were identified (a total of 42), to ultimately select an instructor who teaches across the A1–A2, B2 and C1 courses. All the tutorials recorded in 2019–2020 and 2020–2021 were viewed (a total of 14) and it was decided to include only those with a minimum of 8 attendees ($N = 6$) in this study. This is because this number is considered optimal for analyzing interaction (see Table 7.5).

Table 7.5 Number of attendees at the observed tutorials, classified by level

Course code	Level	Tutorial 1	Tutorial 2	Total
L194	A1–A2	11	12	23
L226	B2	9	9	18
L336	C1	19	9	28
<i>Total number of participants in all six tutorials</i>				69

The tutorials include an average of 11–12 attendees across all levels. To guarantee data protection, tutorials are recorded without registering the attendees' personal details. Many learners prefer to remain anonymous and most of them turn off their cameras during class, although some participants turn their cameras on when making a contribution. No noteworthy differences were observed across the different levels in terms of using the camera, which suggests that camera use is linked to personal preferences.

7.3.2.2 Observation template and data coding

The data collection tool used was a template for observing interaction between the teacher and the learners (see Table 7.6). The template was developed based on the studies conducted by González Argüello (2010) and Sutherland *et al.* (2016), keeping in mind the nature and content of the communicative exchanges in the classroom (see, for example, Reinke and Herman, 2016). Additionally, the template was redesigned and extended to facilitate its handling and better adapt it to the objectives of this study: to observe interaction in online Spanish tutorials. The instrument was validated, before its application, by four specialists in classroom management, interactional competence and teacher talk, who provided feedback that was incorporated into the final version.

The template considers both the nature and the content of the interactions, proposing different items for teachers and learners. For teachers, the nature of the interaction includes aspects such as its character (**positive** [when behaviors and reactions are affirming or validating]; **neutral** [when the interaction does not include positive or negative elements]; or **negative** [when the interactions or behaviors are

Table 7.6 Template for observing interaction

Descriptor	CODE	Definition
(1) Teacher		
(A) Nature of the interaction		
(1) Positive/neutral (teacher) interaction	+TI	Teacher–learner exchange where the teacher exhibits a positive/neutral attitude/relationship.
(2) Negative (teacher) interaction	-TI	Teacher–learner exchange where the teacher exhibits a negative attitude/relationship.
(3) Organization of turn-taking	OTT	Interventions to assign turns (subtype of OTR).
(4) Opportunities to respond	OTR	Questions, requests, guidelines or cues that solicit a response.
(5) Active engagement	AE	The teacher actively engages with the learner.
(6) Passive engagement	PE	The teacher passively engages with the learner (they simply listen).
(B) Content of the interaction		
(1) Discussion about content	DC-T	Introduction and discussion about the content to be addressed, teaching goals and purpose, and assessment details.
(2) Answers to questions	AQ-T	Answers to learners' questions.
(3) Instructions and expectations	IE	Reminding the learners about what is expected before doing an activity.
(4) Instructional feedback	IF	Additional or contextual information is provided without focusing directly on mistakes.
(5) Corrective feedback	CF	The error is acknowledged and the correct form is provided.
(6) Social interventions	SI-T	Discussion about non-academic topics.
Others (use of emoticons, non-verbal interaction through visual cues, e.g. raised thumb, raised hand, etc.)		

(Continued)

Table 7.6 (Continued)

(2) Learner		
Descriptor	CODE	Definition
(A) Nature of the interaction		
(1) Positive/neutral (learner) interaction	+LI	Teacher–learner exchange where the learner exhibits a positive/neutral attitude/relationship.
(2) Negative (learner) interaction	-LI	Teacher–learner exchange where the learner exhibits a negative attitude/relationship.
(3) Spontaneous engagement	SE	The learner takes the initiative to engage.
(4) Prompted engagement	PRE	The learner answers questions directed to them.
(5) Reaction to other learners' interventions	ROI	The learner adds additional information to others' contributions.
(B) Content of the interaction		
(1) Discussion about content	DC-L	The learner contributes to the discussion about the content to be addressed, teaching goals and purpose, and assessment details.
(2) Answers to questions	AQ-L	Answers to the questions posed by the teacher or other learners.
(3) Formulation of questions	FQ	The learner asks questions spontaneously.
(4) Error monitoring	EM	The learner frequently self-corrects.
(5) Social interventions	SI-L	Discussion about non-academic topics.
Others (Use of emoticons, non-verbal interaction through visual cues, e.g. raised thumb, raised hand, etc.)		

Source: Developed by the authors.

adverse to communicative collaboration]), whether the interaction is active (with communicative exchanges) or passive (simply listening) and how the communicative exchanges are organized; regarding the content of the interactions, for teachers' aspects such as how the content is presented and discussed or how questions are answered, the type of feedback provided or whether there are any social interventions that can be observed.

Regarding learners, some of the items concerning the nature of their interactions coincide with those for teachers (positive, neutral, negative; active, passive). Additionally, learners' reactions to their peers' interventions can also be monitored. As for the content of the interactions, aspects such as whether the learners ask and answer questions or whether they (self-)correct their mistakes are explored. In addition, the template leaves room for the observation of elements such as the use of emoticons or non-verbal language, among others, which also influence technology-mediated interaction.

Despite having been originally designed for research purposes, this template serves as a useful tool to assess the practices of trainee teachers and, more generally, to reflect on teaching strategies to encourage interaction. This is because it can be adapted and applied to the analysis of teaching practices in the context of interaction to identify successful strategies, as well as to detect potential areas for improvement, either as part of teacher observations or for self-reflection.

7.3.3 Analysis and results

The aim of this case study is to extract pedagogical recommendations for the online language classroom based on observed teaching practices. To this end, using the template (Table 7.6), the communicative exchanges between the instructor and the learners were coded. The most representative examples were selected based on the following criteria: (1) representativeness (examples that clearly demonstrate the item being discussed); (2) variety (a balanced selection of examples across all levels of competence: A1–C1); and (3) clarity (examples that allow us to observe interaction with enough context). Therefore, considering the objectives of this exploratory study, it was decided to extract recommendations for practice based on the observations made. This approach was preferred over determining the frequency of interactional behaviors and their appropriateness, which would require a broader study. The code included after the examples indicates the corresponding tutorial: the learners' level is specified (A1–A2, B2, C1), as well as whether the communicative exchanges are from the first or second tutorial observed (T1, T2) for each of the levels. Fictitious names are used for the learners to maintain their anonymity.

Regarding the nature of the interactions, it is useful to note that, in all the tutorials, the interactions were either neutral or positive, both in

terms of the instructor and the learners. However, there are two cases, in the same tutorial, where the exchanges between the instructor and the learners could be considered negative. On one occasion, the instructor reprimanded the learners upon finishing an activity in small groups (*'Veo que estabais pasando de esto y hablando de lo que . . . de lo que os apetecía, pero bueno'*/'I see you just ignored [the activity] and talked about whatever you wanted, but okay') [B2, T1]. On another occasion, and as per our interpretation, a learner seemed resigned on hearing the instructor's response to their question (*'¿Cuándo voy a recibir el libro de gramática?'*/'When will I receive the grammar book?'), exclaiming a brief *'Bueno'* (indicating a tone of resignation) [B2, T1].

Cases of active participation by the instructor were documented, especially when she reacted to the learners' contributions. This was particularly evident when she used emoticons in the chat, commented on learner interventions, or asked them to elaborate on their contribution. In most cases, the instructor intervened to organize turn-taking, with two main functions. On the one hand, this involved giving the floor to a learner who wished to speak or had explicitly indicated their intention to do so, generally through the chat (*'dime, Laura'*/'tell me, Laura'). On the other hand, it involved guiding the completion of activities or exercises, especially to indicate whose turn it was to solve them or answer specific questions, which could be closed (CE 1) or open-ended (CE 2). Below, a series of communicative exchanges (CEs) is provided to illustrate the kind of interaction that took place across all levels:

CE 1 *Entonces, vamos a empezar con Alex. Alex, lees uno y dices cuál de estas es la solución. Venga, Alex, uno.*/[So, let's start with Alex. Alex, read one and say which of these is the answer. **Come on Alex, one**]

[...]

Bueno, Anna, *dos*/[**Right, Anna, two**]

[...]

Bueno, vamos a intentar el siguiente. A ver si podemos acertar el siguiente. *Tres, manejo de las nuevas tecnologías, a ver, Sandra.* [B2, T1]/[**Okay, let's try the next one. Let's see if we can get the next one right. Three, managing new technologies. Let's see, Sandra.**] (B2, T1)

CE 2 *Mark, cuéntanos qué sabes tú de la situación lingüística en Perú y qué ocurre en Paraguay. Cuéntanos, Mark.* [C1, T2]/[**Mark, tell us what you know about the linguistic situation in Peru and Paraguay. Tell us, Mark.**] (C1, T2)

Managing communicative exchanges as shown in CE 1, where the instructor called on the learners in order to start solving an exercise, is common in tutorials. However, it is useful to note that the frequency of

such interactions decreased as learners' level increased. They were more frequent in the A1–A2 tutorials, while in the C1 classes a lower number of interventions by the instructor to organize turn-taking was recorded. That said, however, there was a significant increase in spontaneous learner contributions, especially in the chat. Regarding the content of these contributions, in general learners spoke up to confirm their understanding of a given point ('*entendido*'/'understood' [C1, T1]), express approval ('*genial*'/'great' [C1, T1]) or to ask questions without waiting for the instructor to explicitly invite questions or comments. At times, learners asked questions in the chat that the instructor then repeated aloud.

Concerning the content of the instructor's interactions, social interventions can be observed across all levels. Most of them took place at the beginning of the session while carrying out a sound check. Therefore, they were often related to potential technical issues. In the A1–A2 tutorials, there were many occasions on which the instructor referred to the relevant instructions and expectations at the beginning of an activity, especially regarding how to proceed and the mechanics involved (CE 3). This is perhaps because she assumed that certain learners were not yet familiar with the tools necessary to complete the task (for instance, breakout rooms). Furthermore, at this level, the instructor provided a considerable amount of feedback. On the one hand, this feedback was instructional when, for example, she would validate the learners' contributions ('ok', '*muy bien*'/'very good'), repeat something (CE 4) or complement a learner's response with an explanation (CE 5). On the other hand, there were also instances of corrective feedback when the instructor identified mistakes and provided additional information, which was often focused on pronunciation (CE 6) or grammar (CE 7).

- CE 3 so now we are going to practice in breakout rooms, you are going to practice this dialogue in breakout rooms. *Un momento*. I am going to put you in breakout rooms. Ok I think is that. Ups one second. And... *Ya está*.
So we are not even numbers so that means that in room 1 Susan, Lindsay and John you are together, ok? In the other rooms there are two people only, but in room 1 there are three people, yeah (A1–A2, T1)
- CE 4 *Muy bien*, abre a las nueve, *ok*./[Very good, it opens at nine, ok.] (A1–A2, T1)
- CE 5 *Muy bien*. And one thing, a very important thing in this sentence: remember that after *poder*, be able to or can, goes an infinitive. *Pude ir*, ok? Infinitive, *muy bien*.
- CE 6 *Muy bien*, ¿qué película has visto, yeah?/[Very good, what film did you see, yeah?]

Oscar, I still hear a little bit of an H, but I shouldn't hear. *Has*, can you repeat that?

- CE 7 S: *Mi sobrino ha escrito un cuento*/[S: My nephew wrote a bill]
 T: *Muy bien...Cuento. Cuenta is bill, is cost. But cuento, un cuento is a book for children. Is a story for children. So that's important. Ha escrito un cuento, yeah?* (A1–A2, T2)

Regarding levels B2 and C1, it is interesting that a significant portion of the instructor's interventions involved answering questions asked by learners. This was particularly the case in the C1 tutorials, where learners asked multiple questions about the end-of-year project that counted towards their grade and was a focal point in the observed tutorials. The time dedicated to discussing the content of assignments also increased, since explanations were more extensive compared to lower levels. It is also useful to note that on numerous occasions the instructor linked the session's content to the assessment tasks (at the Open University, these are known as 'Tutor-marked assignments' [TMAs]):

- CE 8 *Ahora un consejo, un consejo. Estamos haciendo este ejercicio aquí, esta actividad aquí porque es una tutoría, en el TMA, por favor, no pongáis dónde está Chile, ¿ya?/[Let me give you a tip, a tip. We're doing this exercise here, this activity here because we're in a tutorial. But in the TMA, please, don't say where Chile is, ok?]* (B2, T2)
- CE 9 *Ese es el problema, es que a mí eso me da pena con estas tutorías, sobre todo los que habéis... anoche di esta tutoría y [de] los estudiantes de anoche ninguno había empezado el TMA y yo estaba contenta de la vida, porque cuando nadie ha empezado el TMA no hay preguntas tan específicas que bordean, que es que son casi casi que os estoy corrigiendo el TMA y eso me da mucho miedo, yo no sé si, eso no se debe hacer, ¿sabes? Entonces, ya está. Se acabó [laughter] Ya ya no digo más. [C1, T2]/[That's the issue, that's what I worry about in these tutorials, especially those of you who have... last night I taught the same class and none of the students had started the TMA and I wasn't worried at all, because when nobody's started the TMA there aren't any specific questions that make it seem like I'm correcting your TMAs. And I get really scared because I don't know if that's what I should be doing, you know? But anyway. That's it [laughter], I won't say anything else.]* (C1, T2)

As anticipated, content-related differences can be observed in learner interactions between the lower (A1–A2, B2) and higher (C1) levels. While in the lower levels learner participation was limited to answering questions or social interventions, advanced learners also asked spontaneous questions beyond simply responding. Furthermore, the few

times a learner reacted to their peers' contributions occurred at the C1 level via chat.

Therefore, based on the examples provided and in the context of interaction, the tutorials observed exhibit several **characteristics inherent to online environments**. As a result, the exchanges examined differ from those that take place in face-to-face classes.

Firstly, there is a noticeable **increase in the time dedicated** to explaining the mechanics of certain activities, especially in terms of using specific tools and solving technical issues (Meskill & Anthony, 2015: 130).

Secondly, **the communicative exchanges appear to be managed in a structured manner** (Acosta-Ortega & López Ferrero, 2022). The instructor explicitly selects the next participant calling them by name, such as when asking a specific learner to solve part of an exercise or even the entire task. This approach may serve to encourage everyone to participate and prevent any overlaps, which are easier to manage in person due to the presence of a greater number of stimuli.

Thirdly, **the chat was a popular means for positive interaction**, especially among learners: for instance, to express agreement, smile or confirm their understanding of a message. On numerous occasions, this practice equates to what is known in conversation analysis as **reactive tokens** (Cestero Mancera, 2000). That being said, it must also be noted that the instructor also uses the chat to provide feedback during learner contributions. It would be useful to consider whether learners, when speaking, monitor the chat and are capable of detecting the instructor's written reactions, or whether instead they go unnoticed, suggesting the need for oral reinforcement.

Ultimately, managing real-time interaction in the online classroom appears to involve **understanding the codes that govern digital communication** and knowing how to handle them in a teaching-learning context. It is also essential to be aware of the potential challenges that may arise with respect to the **contextual factors** (participants, instructional design and technology) that influence interaction, as well as to have access to resources and tools to address them successfully. Additionally, in the specific case of the tutorials observed, their purpose (such as practicing a grammar topic or completing assessment tasks) may affect how turn-taking is managed.

7.4 Recommendations for Practice

This section outlines a series of recommendations based on the previous analysis, focusing on certain fundamental aspects of synchronous interaction in online environments, including **participants, instructional design and technology**. Recommendations for **asynchronous interaction** are also provided.

7.4.1 Synchronous interaction

7.4.1.1 Participants in the interaction

Teacher talk is one of the key elements for interaction. This is because, as a discursive act, it is both the medium of instruction and the object of study in the online language classroom (similar to what happens in face-to-face classes). Therefore, it is essential for the teacher, through careful use of didactic discourse, to know how to apply strategies that promote interaction. For instance, asking questions that pose a cognitive challenge or involve exploratory learning is a practice that helps to improve the quality of classroom interactions. This is because it plays a role in learner motivation (Bailini, 2020; González Argüello, 2015). However, it is also necessary to know how to phrase these questions so that they can be seen as an opportunity to contribute to the negotiation of meaning. For example, if the questions are too complex or lack the necessary scaffolding, they are likely to lead to silence or brief and incoherent answers. Furthermore, one of the most striking aspects of the tutorials analyzed in the previous section is the relative lack of spontaneous oral participation among the learners (who mainly used the chat for this purpose). Therefore, **monitoring both the teacher's and the learners' speaking time** also serves to assess the quality of the interactions and to correct, if necessary, any imbalances between participant contributions. Another aspect to consider is how and why the teacher may modify (or simplify) their speech or discourse (i.e. teacher talk) (Dracos, 2018) in online language teaching contexts. It is also useful to consider whether there are any differences compared with face-to-face classes. In fact, as explained below, the chat tool amplifies what is traditionally known as teacher talk, offering multiple possibilities (see section 7.4.1.4). Hence, teachers must plan the types of interventions they wish to make in advance, as well as manage any spontaneous interaction in this medium.

Varying the **nature of the dynamics** proposed in the activities (large vs. small groups, pair-based vs. individual work) can also yield favorable results in terms of interaction. For these dynamics to work in online environments, it is important for learners to know how to navigate **breakout rooms**. They must also have access to clear instructions for the tasks and for how to ask for help if they get stuck. Specifying the duration of a pair or small group-based activity in a breakout room and displaying a timer to help learners manage their time are practices that facilitate the organization and completion of the task at hand. Similarly, it could also be productive to visit the different rooms to answer any questions the learners may have. However, it is still a good idea to inform them beforehand that they should only approach the teacher if they have questions, to avoid interrupting the ongoing interactional dynamic. Finally, using a sound to mark the end of an

activity is an effective way to prompt the learners to return to the main virtual classroom. Sound cues can also be used to alert them that they are about to switch groups, thus preventing them from thinking that a technical issue has occurred.

7.4.1.2 Instructional design

Regarding instructional design, the development of online classroom and assessment materials must consider and capitalize on the benefits offered by the synchronous modality in the context of interaction (see Table 7.2). These benefits include the ease of connecting directly with real-world situations and using primary sources, the ability to access experts or the opportunity to demonstrate skills in real time. An essential aspect related to activity design and interaction is accessibility (see Chapter 1 of this book). Proposing multiple activities that require a considerable amount of oral interaction in a context where not everyone has a microphone or a stable network connection can be counterproductive. To address this issue, **activities that combine oral and written interaction** (i.e. via the chat) can be designed. In fact, it could even be useful to **carry out certain activities without cameras** to help learners get used to communicating and interacting without the support of non-verbal cues and visual stimuli.

It is equally important to carefully assess the pedagogical benefits of using **programs and applications** designed to promote interaction in the classroom (such as collaborative platforms for sharing content, systems for answering questionnaires and surveys, etc.) before implementing them. For example, many of these tools require participants to register, which has ethical implications that must be considered, as it may not be lawful to ask learners to provide these companies with their data in order to take part in class tasks. Furthermore, navigating these tools sometimes involves spending time explaining how they work and preparing for potential technical issues outside the teacher's control. Meanwhile, when it comes to solving operational difficulties with the actual teaching platform, the institution's IT team is usually able to provide support. In many cases, it is possible to find alternatives to promote interaction without having to resort to such tools. For instance, to conduct a survey, a multiple-choice question can be projected on the digital whiteboard for the learners to then use the chat to send their answers.

7.4.1.3 Technology

Managing certain technical aspects is essential for ensuring smooth interaction in online classes. A preliminary issue that must be addressed concerns the **use of the camera** in class. While it can prove beneficial for interaction (thanks to the information provided by non-verbal cues in communicative exchanges, for instance), it can also intimidate

participants, increase feelings of isolation and demotivate those who do not have one or do not feel comfortable using it. An intermediate solution could be to turn it on at the beginning to say hello and then switch it off, with the option of turning it back on when making a contribution and when working in small groups or breakout rooms. As a result, teachers might need to call learners by their name more frequently than in face-to-face classes, as mentioned in the previous section when analyzing the data.

Moreover, it is important to prevent, to the extent possible, technical issues such as sound failures from interrupting an exercise. To this end, in addition to recommending that all learners conduct a sound check a few minutes before joining the class (a feature offered by most platforms), a collective check can also be carried out at the beginning of each session, if the number of participants allows it. In fact, it could even be used as a **warm-up activity** where everyone says hello, reads a passage related to the lesson's topic or takes turns to answer a question posed by the teacher. Similarly, it is a good idea to ask learners to download the platform app on their cell phones. This serves as a backup plan in case of any connectivity issues that might otherwise prevent them from accessing the platform as usual.

7.4.1.4 Multimodal component and support tools

The multimodal nature (text, image and sound) of technology-mediated discourse must also be considered when it comes to managing interaction: oral productions are supplemented by, and often overlap with, written interventions in the **chat**. In fact, in the data analyzed in section 7.3, learners participated much more frequently and spontaneously via the chat compared to oral contributions. As a result, managing this interaction tool is essential for reinforcing communicative exchanges in the online classroom. Multiple ongoing discussions frequently take place simultaneously in the general class chat, sometimes even overlapping. However, **three types of interventions** (spontaneous or planned) are generally observed: (1) reactions to other participants' words (functioning as support turns); (2) questions or comments that provoke or require a response; and (3) answers to questions posed by other learners or the instructor. This aspect confirms observations made by Hampel and Hauck (2006), Yanguas (2010) and Hampel and Stickler (2012) regarding how the available tools influence communicative exchanges in online environments.

Therefore, it is necessary for the **teacher to monitor the chat** (or assign this task to a learner) and apply didactic strategies to ensure that interventions made through this channel contribute effectively to the class. For instance, repeating aloud any chat contributions that may be useful for all learners (such as a question to be answered or a relevant comment) guarantees that participants who have not read these

interventions can still benefit from them. The chat can also be used to quickly answer a quiz or a question, or to check that everyone is actively following the session.

However, participation through this channel may be affected by the learners' potential lack of digital communicative competence. They may consider it appropriate to use this tool as they would in other online communications, such as social media interactions (see, among others, Carpenter *et al.*, 2016; Pikhart & Botezat, 2021; Varo Domínguez & Cuadros Muñoz, 2013). Having a previously established chat protocol validated by both the teacher and the learners – which, from a technical point of view, may also involve teaching the students how to use, for instance, the keyboard to ensure correct spelling in the target language – promotes the **co-construction of virtual conversation**, can prevent excessive digressions and can also prevent negative interactions that may need addressing. For similar reasons, it may also be useful to design a breakout room protocol, explaining the teacher's role or functions while learners are interacting in breakout rooms and establishing what measures must be taken if any technical issues arise, such as alerting the teacher by raising one's hand or returning to the main (class)room.

Another key aspect for interaction is **turn-taking**, and the teacher should employ strategies to facilitate this process. These may include addressing participants by name when they wish to speak, or organizing activities in which everyone has the opportunity to take part: for instance, by answering one question each. Furthermore, these strategies can even be taught to learners so that they can incorporate them into their own interventions, thereby developing their interactional skills in the target language (see Batlle, 2021; Batlle & Deal, 2021; Batlle & Murillo Wilstermann, 2018; Batlle & Suárez, 2021). It is also helpful to show the learners the pragmatic–discursive expressions (see Acosta-Ortega & López Ferrero, 2022) used for opening, maintaining and concluding turns in the target language, so that they can practice them as part of the interaction. It is likely that oral overlaps will be less common than in real conversations in the target language, which also occurs in face-to-face settings and digital interaction in general when all participants have their microphones switched on (Scolari, 2008). Therefore, if this aspect of communication is to be taught, specific activities should be designed to practice it.

7.4.2 Asynchronous interaction

Section 7.3 covered the analysis of synchronous interaction. However, **asynchronous interaction** also has certain benefits for online language teaching (Table 7.3) from the participants' perspective. There are empirical studies that report that many learners enjoy such interactions, especially when they occur among participants from the

same course (Lee, 2021). Despite its benefits, however, asynchronous interaction faces similar challenges to its synchronous counterpart, such as the need for learners to become familiar with and test the necessary tools beforehand to maximize their effectiveness or to ensure accessibility. Additionally, due to its characteristics, asynchronous learning poses certain specific challenges, requiring the teacher to be familiar with strategies for preventing or rectifying issues. In this regard, one of the most common challenges is **limited participation** in asynchronous learning tasks (as in the case of MOOCs). Consequently, this situation may cause frustration for both the teacher and other more engaged learners who may expect the rest of the group to contribute more. To encourage participation and promote interaction, the teacher could consider linking these tasks to the course's summative assessment or final evaluation. Alternatively, the teacher could provide individual feedback to learners who participate in activities or offer another kind of incentive for completing the task. It is also advisable to use data, known as **learning analytics**, about the learners and their engagement in asynchronous interactions (see Arnold & Pistilli, 2012). This approach is useful for (1) identifying learners with low participation rates; (2) designing strategies to address this; or (3) refining the design of asynchronous learning tasks. For instance, one of these tasks could involve **peer feedback**, integrating social reading tools that allow learners to add annotations, further explanations, comments or suggestions asynchronously (see Suhre *et al.*, 2019, regarding *Perusall*).

Another fundamental aspect to consider in this context is the role of the teacher in such interactions. First, prior to implementing an asynchronous task, they must choose the most appropriate tool (forums, blogs, wikis, etc.) for the activities planned, learn how to use it and ideally test it out beforehand to anticipate any issues learners might face. Then, while the students carry out the task, the teacher must monitor their progress, decide when to intervene and even determine how to mediate any potential negative interactions. Finally, once the task is finished, the teacher must assess the learning outcomes, make sure to have a strategy for providing feedback and evaluate the task's success to make improvements for the next iteration, if necessary. It is also important for the learners to know where to turn if they encounter any technical issues during the completion of the task, to prevent them from interrupting or hindering their participation.

Additionally, it is worth mentioning that some of these tools are used not only for academic purposes but also for communicative ones (e.g. forums) in the context of face-to-face, hybrid and online courses. In these cases, it is a good idea to establish a protocol for social interaction. For example, in non-immersive contexts, guidelines regarding the use of the learners' L1 could be collectively determined.

7.5 Conclusion and Future Lines of Research

As seen throughout this chapter, interaction in online environments is subject to both internal and external factors as well as a range of intrinsic variables, just like in the case of hybrid and face-to-face teaching. Therefore, from the teacher's perspective, effective management of interaction in online environments requires becoming aware of **contextual factors**, **interaction processes** and **learning outcomes** to assess how this communicative dynamic unfolds in language teaching. As part of this process of becoming aware, it is important to consider the following factors: **teaching presence**, that is, how the content is presented; **cognitive presence**, or the degree of reflection with which meaning is constructed and shaped; and **social presence**, in other words, the participants' ability to project personal characteristics and contribute to fostering motivation within the group (García Cabrero *et al.*, 2008: 8–9). In this way, interactional and discursive dynamics that contribute to the efficient management of interactional processes can be assessed, reinforced, modified and implemented.

From the language learner's perspective, it is necessary to collectively set expectations regarding interaction from the very beginning. This aspect is crucial for strengthening fundamental language acquisition competences (including grammatical, discursive, sociolinguistic, strategic and pragmatic skills), as well as for boosting pronunciation and fluency. Not only this: it also directly influences the learner's attitude, motivation and self-confidence.

Two **particularly necessary lines of research today** concern teacher training in online environments and the management of tools and platforms that can promote interaction, specifically in the context of language learning and teaching. In the first case, more research is needed on **how to train teachers in classroom management from an interactional perspective**. Analyzing and managing interaction in terms of how the environment operates and in terms of teacher talk are topics that are not commonly addressed in teacher training courses. However, given the impact that this dynamic has on teaching practices, motivation and group cohesion, there is a clear need for the creation of a specific inventory for foreign language teaching including interactional factors and processes. This inventory could serve as a starting point for training teachers who are more aware and who view this dynamic as a tool to enhance certain aspects of interaction in the classroom.

In the second case, from a technological point of view, it is necessary to **analyze virtual platforms that, due to their design or configuration**, could boost interaction in online language learning. We have already mentioned, for instance, how an efficient use of the chat function can reinforce interaction, as either a feedback or turn-taking mechanism, and how breakout rooms provide participants with alternative interaction opportunities in absence of the teacher. However, it is important to

assess whether other tools offered by some of the most popular teaching platforms can also promote interaction to support language learning.

In this regard, generative **Artificial Intelligence (AI)** is expected to play a significant role in the development of human–machine interaction devices and, consequently, in how we understand interaction as a concept. In fact, this has already been observed in voice recognition devices and chatbots (Ali, 2020). Now, to the three traditional **types of interaction** in educational settings mentioned at the beginning of this chapter (Moore, 1989: 1), it is necessary to add a **fourth**: AI-driven tool (e.g. chatbot) ↔ teacher + AI-driven tool (e.g. chatbot) learner, as demonstrated by the revolutionary emergence of *ChatGPT* in November 2022 (Muñoz-Basols *et al.*, 2023). This type of technology tool undoubtedly has significant potential in the context of language learning, as it provides immediate access to a vast repository of linguistic resources as well as corrective feedback. These new functionalities, which foster interaction at a technological level, should operate as facilitators of the teacher’s work and enhancers of programmed, informal and autonomous second language learning. Naturally, they must also be properly integrated into the curriculum (see the IMI+ framework proposal in Muñoz-Basols *et al.*, 2023; Muñoz-Basols & Fuertes Gutiérrez, 2025).

7.6 Annotated Additional Reading

Muñoz-Basols, J., Fuertes Gutiérrez, M., Strawbridge, T. and Acosta Ortega, L. (2023) Interactional patterns in the online language classroom: A quantitative analysis across proficiency levels and lesson types. *Computer Assisted Language Learning*, 1–27. <https://doi.org/10.1080/09588221.2023.2286536>

This article highlights the critical role of interaction in online language learning, emphasizing how different interaction types influence student engagement and learning outcomes. It categorizes interaction into instructor-prompted participation (IPP), unprompted oral participation (UOP), and unprompted text participation (UTP), revealing that instructor-led interaction dominates. The findings suggest that promoting student-led interaction can enhance learning outcomes.

Strawbridge, T. (2021) Modern language: Interaction in conversational NS-NNS Video SCMC eTandem exchanges. *Language Learning & Technology* 25 (2), 94–110. <http://hdl.handle.net/10125/73435>

This article investigates interaction among native and non-native speakers in Mexico and the United States participating in videoconference-mediated *eTandem* conversational exchanges. The author analyzes the quantity of language episodes, the type of trigger, the initiator, the reactive or preventive status, instances of negotiation and the amount of negative feedback, paying attention to the linguistic approaches during the communicative exchanges and how interaction is framed in promoting understanding and production of the target language.

Acknowledgements

We would like to thank Laura Acosta-Ortega (New College of the Humanities, London, United Kingdom), Tripp Strawbridge (Santa Clara University, US), Germán Canale (Universidad de la República, Uruguay)

and Sonia Bailini (Università Cattolica del Sacro Cuore, Italy) for their careful reading and insightful comments on this work.

For the completion of this chapter, Javier Muñoz-Basols has received funding from the program of the Spanish Ministry of Universities (Ministerio de Universidades del Gobierno de España) as a Beatriz Galindo Distinguished Senior Researcher (Investigador Distinguido Sénior Beatriz Galindo) (BG22/00099) and from the projects ‘Hacia una diacronía de la oralidad/escrituralidad: Variación concepcional, traducción y tradicionalidad discursiva en el español y otras lenguas románicas (DiacOralEs)’ (PID2021-123763NA-I00 funded by MCIN/AEI/10.13039/501100011033 and by FEDER, EU; DEFINERS: Digital Language Learning of Junior Language Teachers (TED2021-129984A-I00) funded by MCIN/AEI/10.13039/501100011033 and by the European Union (NextGenerationEU/PRTR); ‘OralGrab. Grabar vídeos y audios para enseñar y aprender’ (‘Recording Videos and Audios to Teach and Learn’) (PID2022-141511NB-I00), funded by the Spanish State Research Agency and the Spanish Ministry of Science and Innovation (Agencia Estatal de Investigación/Ministerio de Ciencia e Innovación del Gobierno de España).

Mara Fuertes Gutiérrez has received funding from the project ‘Language Acts and Worldmaking’ (AH/N004655/1) of the Arts and Humanities Research Council of England.

Both authors would like to thank the Open University for providing them with access to the recordings of the online classes. Throughout this study, the anonymity of all individuals who appear in the recordings has been maintained at all times. Finally, both authors would like to thank the Hispanex program (order CUL/2912/2010) for its support in funding the open access publication of this book. We are also grateful to the Association of Hispanists of Great Britain & Ireland (AHGBI) for their Development Award and to The Open University for additional funding for this project. This publication follows the principles of the Budapest Open Access Initiative (BOAI) and the National Open Science Strategy (Estrategia Nacional de Ciencia Abierta, ENCA 2023-2027) (Spanish Ministry of Science and Innovation, 2023), which highlight the importance of open science and accessibility to research.

References

- Acosta-Ortega, L. and López Ferrero, C. (2022) Exponentes pragmático-discursivos en la interacción oral de español LE/L2. *Journal of Spanish Language Teaching* 9 (1), 81–96. <https://doi.org/10.1080/23247797.2022.2051847>.
- Ali, Z. (2020) Artificial intelligence (AI): A review of its uses in language teaching and learning. *IOP Conference Series: Materials Science and Engineering* 769. <https://doi.org/10.1088/1757-899X/769/1/012043>.
- Arasaratnam-Smith, L.A. and Northcote, M. (2017) Community in online higher education: Challenges and opportunities. *The Electronic Journal of E-learning* 15 (2), 188–198.

- Arnold, K.E. and Pistilli, M.D. (2012) Course signals at Purdue: Using learning analytics to increase student success. In S. Dawson and C. Haythornthwaite (eds) *LAK'12: Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 267–270). Association for Computing Machinery. <https://doi.org/10.1145/2330601.2330666>.
- Babb, S., Stewart, C. and Johnson, R. (2010) Constructing communication in blended learning environments: Students' perceptions of good practice in hybrid courses. *MERLOT Journal of Online Learning and Teaching* 6 (4), 735–753.
- Bailini, S. (2020) *El feedback interactivo y la adquisición del español como lengua extranjera*. Mimesis.
- Batlle, J. (2021) 'Muy bien' as a transition token in teacher–student interactions in the Spanish as a foreign language classroom. *System* 97 (2), 1–12. <https://doi.org/10.1016/j.system.2020.102438>.
- Batlle, J. and Murillo Wilstermann, I. (2018) Learner initiative in the Spanish as a foreign language classroom: Implications for interactional development. *Hacettepe University Journal of Education* 33, 113–133. <https://doi.org/10.16986/HUJE.2018038799>.
- Batlle, J. and Deal, M. (2021) Teacher epistemic stance as a trouble in foreign language classroom interaction. *Journal of Pragmatics* 176, 15–25. <https://doi.org/10.1016/j.pragma.2021.01.023>.
- Batlle, J. and Suárez, M.M. (2021) An analysis of repair practices in L2 Spanish listening comprehension materials with implications for teaching interactional competence. *Classroom Discourse* 12 (4), 365–385. <https://doi.org/10.1080/19463014.2020.1810724>.
- Bazán Ramírez, A., Martínez Monroy, X.V. and Trejo Urieta, M. (2009) Análisis de interacciones en clases de español de Primer Grado de Primaria. *Revista Interamericana de Psicología* 43 (3), 466–478.
- Benbunan-Fich, R., Hiltz, S.R. and Harasim, L. (2005) The online interaction learning model: An integrated theoretical framework for learning networks. In S.R. Hiltz and R. Goldman (eds) *Learning Together Online: Research on Asynchronous Learning Networks* (pp. 19–37). Lawrence Erlbaum Publishers.
- Bueno-Alastuey, M.C. (2011) Perceived benefits and drawbacks of synchronous voice-based computer-mediated communication in the foreign language classroom. *Computer Assisted Language Learning* 24 (5), 419–432.
- Bueno-Alastuey, M.C. (2013) Interactional feedback in synchronous voice-based computer-mediated communication: Effect of Dyad. *System* 41 (3), 543–559.
- Canale, G. (2019) *Technology, Multimodality and Learning: Analyzing Meaning Across Scales*. Palgrave Macmillan.
- Carbajal-Carrera, B. (2021) Mapping connections among activism interactional practices and presence in videoconferencing language learning. *System* 99, 1–15.
- Carpenter, J.P., Tur, G. and Marín, V.I. (2016) What do US and Spanish pre-service teachers think about educational and professional use of Twitter? A comparative study. *Teaching and Teacher Education* 60, 131–143. <https://doi.org/10.1016/j.tate.2016.08.011>.
- Cerezo, L. (2021) Corrective feedback in computer-mediated versus face-to-face environments. In H. Nassaji and E. Kartchava (eds) *The Cambridge Handbook of Corrective Feedback in Second Language Learning and Teaching* (pp. 494–519). Cambridge University Press. <https://doi.org/10.1017/9781108589789.024>.
- Cestero Mancera, A.M. (2000) *Los turnos de apoyo conversacionales*. Universidad de Cádiz.
- Comas-Quinn, A., de los Arcos, B. and Mardomingo, R. (2012) Virtual learning environments (VLEs) for distance language learning: Shifting tutor roles in a contested space for interaction. *Computer Assisted Language Learning* 25 (2), 129–143. <https://doi.org/10.1080/09588221.2011.636055>.
- Council of Europe (2020) *Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume*. Council of Europe.
- Dracos, M. (2018) Teacher talk and Spanish subject personal pronouns. *Journal of Spanish Language Teaching* 5 (1), 1–15. <https://doi.org/10.1080/23247797.2018.1459276>.

- Dziuban, C.D., Picciano, A.G., Graham, C.R. and Moskal, P.D. (2015) *Conducting Research in Online and Blended Learning Environments: New Pedagogical Frontiers*. Routledge.
- Fayed, I. and Cummings, J. (eds) (2021) *Teaching in the Post-COVID-19 Era. World Education Dilemmas, Teaching Innovations and Solutions in the Age of Crisis*. Springer.
- Finkelstein, J.E. (2006) *Learning in Real Time: Synchronous Teaching and Learning Online*. Wiley.
- García Cabrero, B., Márquez, L., Bustos, A., Miranda, G.A. and Espíndola, S. (2008) Análisis de los patrones de interacción y construcción del conocimiento en ambientes de aprendizaje en línea: Una estrategia metodológica. *Revista Electrónica de Investigación Educativa* 10 (1), 1–19.
- Garrison, D.R. and Vaughan, N.D. (2008) *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. Wiley.
- Gironzetti, E., Lacorte, M. and Muñoz-Basols, J. (2020) Teacher perceptions and student interaction in online and hybrid university language learning courses. In M. Planelles, A. Foucart and J.M. Licerias (eds) *Current Perspectives in Language Teaching and Learning in Multicultural Contexts* (pp. 507–539). Thomson Reuters-Aranzadi.
- González Argüello, M.V. (2010) La interacción en el aula de español como lengua extranjera: Discurso generado por el alumno. *Lenguaje y Textos* 32, 105–111.
- González Argüello, M.V. (2015) El discurso didáctico en el aula de ELE: ¿Sabemos cómo hablamos cuando hablamos en clase? In F. Herrera and N. Sans (eds) *La formación del profesorado de español* (pp. 115–123). Difusión.
- Hall, J.K. and Walsh, M. (2002) Teacher–student interaction and language learning. *Annual Review of Applied Linguistics* 22, 186–203.
- Hampel, R. (2007) New literacies and the affordances of the new media: Using audiographic computer conferencing for language learning. In W. Schneider (ed.) *Kooperation & Steuerung. Fremdsprachenlernen und Lehrerbildung mit digitalen Medien. Gießener Beiträge zur Fremdsprachendidaktik* (pp. 33–53). Narr.
- Hampel, R. and Stickler, U. (2005) New skills for new classrooms: Training tutors to teach languages online. *Computer Assisted Language Learning* 18 (4), 311–326. <https://doi.org/10.1080/09588220500335455>.
- Hampel, R. and Hauck, M. (2006) Computer-mediated language learning: Making meaning in multimodal virtual learning spaces. *JALT-CALL Journal* 2 (2), 3–18.
- Hampel, R. and Stickler, U. (2012) The use of videoconferencing to support multimodal interaction in an online language classroom. *ReCALL* 24 (2), 116–137.
- Hampel, R. and Stickler, U. (2015) Transforming teaching: New skills for online language. In R. Hampel and U. Stickler (eds) *Developing Online Language Teaching Research-Based Pedagogies and Reflective Practices* (pp. 63–77). Palgrave Macmillan.
- Hun Lim, D., Morris, M.L. and Kupritz, V.W. (2007) Online vs. blended learning: Differences in instructional outcomes and learner satisfaction. *Journal of Asynchronous Learning Networks* 11 (2), 27–42.
- Jackson, M.J. and Helms, M.M. (2008) Student perceptions of hybrid courses: Measuring and interpreting quality. *Journal of Education for Business* 84 (1), 7–12.
- Kato, Y. and Dalsky, D. (2019) Interaction in the language classroom: A systems approach. In A. Tajino (ed.) *A Systems Approach to Language Pedagogy* (pp. 121–132). Springer.
- Lee, L. (2001) Online interaction: Negotiation of meaning and strategies used among learners of Spanish. *ReCALL* 13 (2), 232–244.
- Lee, L. (2016) Autonomous learning through task-based instruction in fully online language courses. *Language Learning & Technology* 20 (2), 81–97.
- Lee, L. (2021) Exploring self-regulated learning through flipped instruction with digital technologies: An intermediate Spanish course. In C. Fuchs, M. Hauck and M. Dooly (eds) *Language Education in Digital Spaces: Perspectives on Autonomy and Interaction* (pp. 39–59). Springer.
- Martin-García, A.V. (ed.) (2020) *Blended Learning: Convergence between Technology and Pedagogy*. Springer Nature.

- Martín-Monje, E. and Borthwick, K. (2021) Researching massive open online courses for language teaching and learning. *ReCALL* 33 (2), 107–110. <https://doi.org/10.1017/S0958344021000094>.
- Mehring, J. and Leis, A. (eds) (2018) *Innovations in Flipping the Language Classroom: Theories and Practices*. Springer Nature.
- Meskill, C. and Anthony, N. (2015) *Teaching Languages Online* (2nd edn). Multilingual Matters.
- Moore, M. (1989) Three types of interaction. *American Journal of Distance Education* 3 (2), 1–7.
- Muñoz-Basols, J. and Fuertes Gutiérrez, M. (2025) Interaction in virtual learning environments. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 160–188). Multilingual Matters.
- Muñoz-Basols, J., Neville, C., Lafford, B.A. and Godev, C. (2023) Potentialities of applied translation for language learning in the era of artificial intelligence. *Hispania* 106 (2), 171–194. <https://doi.org/10.1353/hpn.2023.a899427>.
- Murray, M., Pérez, J., Geist, D. and Hedrick, A. (2013) Student interaction with content in online and hybrid courses: Leading horses to the proverbial water. *Informing Science: The International Journal of an Emerging Transdiscipline* 16, 99–115.
- Picciano, A.G., Dziuban, C.D. and Graham, C.R. (eds) (2014) *Blended Learning: Research Perspectives*. Routledge.
- Pikhart, M. and Botezat, O. (2021) The impact of the use of social media on second language acquisition. *Procedia Computer Science* 192, 1621–1628. <https://doi.org/10.1016/j.procs.2021.08.166>.
- Pleines, C. (2020) Learning through vicarious participation in online learning tutorials. EdD thesis, The Open University. <https://doi.org/10.21954/ou.ro.000114ea>.
- Reinke, W.M. and Herman, K.C. (2016) Bridging the gap: Using the brief student–teacher classroom interaction observation to inform classroom practices. *Assessment for Effective Intervention* 42 (1), 43–45.
- Scolari, C. (2008) *Hipermediaciones. Elementos para una Teoría de la Comunicación Digital Interactiva*. Gedisa.
- Strawbridge, T. (2021) Modern language: Interaction in conversational NS–NNS Video SCMC eTandem exchanges. *Language Learning & Technology* 25 (2), 94–110.
- Suhre, C., Winnips, K., De Boer, V., Valdivia, P. and Beldhuis, H. (2019) Students' experiences with the use of a social annotation tool to improve learning in flipped classrooms. In J. Domènech, P. Merello, E. de la Poza, D. Blazquez and R. Peña-Ortiz (eds) *HEAD'19. 5th International Conference on Higher Education Advances* (pp. 955–964). Universitat Politècnica de València.
- Sutherland, K.S., Conroy, M.A. Vo, A., Abrams, L. and Ogston, P. (2016) An initial evaluation of the teacher–child interaction direct observation system: Measuring teacher–child interaction behaviors in classroom settings. *Assessment for Effective Intervention* 39 (1), 12–23.
- Sylvén, L.K. and Sundqvist, P. (2017) Computer-assisted language learning (CALL) in extracurricular/extramural contexts. *CALICO Journal* 34 (1), i–iv. <https://doi.org/10.1558/cj.31822>.
- Tu, C.H. and McIsaac, M.S. (2002) An examination of social presence to increase interaction in online classes. *The American Journal of Distance Education* 16 (3), 131–150.
- van Lier, L. (1996) *Interaction in the Language Curriculum: Awareness, Autonomy and Authenticity*. Longman.
- van Lier, L. (1998) The relationship between consciousness, interaction and language learning. *Language Awareness* 7 (2–3), 128–145. <https://doi.org/10.1080/09658419808667105>.
- van Lier, L. (2004) *The Ecology and Semiotics of Language Learning – A Sociocultural Perspective*. Springer.

- Varo Domínguez, D. and Cuadros Muñoz, R. (2013) Twitter y la enseñanza del español como segunda lengua. *RedELE* 25. <https://idus.us.es/handle/11441/63450>.
- Vygotsky, L. (1979) *El desarrollo de los procesos psicológicos superiores*. Crítica.
- Yada, A., Tolvanen, A., Malinen, O.-P., Imai-Matsumura, K., Shimada, H., Koike, R. and Savolainen, H. (2019) Teachers' self-efficacy and the sources of efficacy: A cross-cultural investigation in Japan and Finland. *Teaching and Teacher Education* 81, 13–24.
- Yang, S.J. and Yi, Y. (2017) Negotiating multiple identities through eTandem learning experiences. *CALICO Journal* 34 (1), 97–114. <https://doi.org/10.1558/cj.29586>.
- Yanguas, I. (2010) Oral computer-mediated interaction between L2 learners: It's about time! *Language Learning & Technology* 14 (3), 72–93.

8 Assessment and Feedback in Virtual Learning Environments

Sonia Bailini

8.1 Introduction and Key Concepts

Assessment is an integral part of the teaching–learning process. In the field of foreign language (FL) or second language (L2) acquisition, it involves collecting information about the learner’s knowledge in order to evaluate their proficiency in their target language. The type of information collected may vary depending on the competence being assessed, which is why the tests used to gather linguistic data often come in different formats. Depending on its **purpose**, assessment usually falls into one of three categories: **diagnostic assessment**, which aims to analyze a learner’s proficiency to assign them to the course that best suits their needs; **performance assessment**, used to determine whether the learner has met the expected objectives within a certain timeframe or learning phase; and **certificative assessment**, which focuses purely on results, disregarding the teaching–learning process (e.g. the DELE (Diplomas de Español como Lengua Extranjera) and SIELE (Servicio Internacional de Evaluación de la Lengua Española) certification systems for Spanish). In addition to the categories mentioned above, **formative assessment** is often contrasted with **summative assessment**. Formative assessment takes place continuously (e.g. every trimester) and is integrated into the teaching–learning process with active learner participation. Summative assessment marks the end of a teaching process or phase (e.g. at the end of a course) and assigns a grade to evaluate the extent to which the learner has achieved the objectives laid out in the program or curriculum (Council of Europe, 2020; Council of Europe (MCER), 2002: chap. 9; Puig, 2008). Additionally, the score or grade involved in summative assessment must typically meet a series of criteria: linguistic accuracy, fluency, consistency and cohesion, appropriateness of register, vocabulary, etc. Consequently, its function tends to be more social than pedagogical, since it determines whether the learner meets the requirements necessary to pass a certain level or phase.

Another relevant distinction, which is related to the type of data collected, can be made between **quantitative** assessment, which arises from quantified objective tests that are usually numerical in nature, and **qualitative** assessment, which is based on observations, descriptions and reports, whose numerical formulation requires the information obtained to be coded. Traditionally, as noted by Pastor Cesteros (2003: 508): ‘greater credibility is usually attributed to the first type, due to its presumed “scientific” nature. However, we cannot underestimate the information obtained from the second, since it often proves to be extremely enlightening’. Formative assessment is process based and tends to be qualitative, while summative assessment is results based and is preferably quantitative. Finally, depending on the type of activity being assessed, a distinction can be made between **direct assessment**, which evaluates the learner’s performance at the exact time they take an exam, and **indirect assessment**, which evaluates a particular skill retrospectively, for instance, in a writing test. The notion of direct and indirect assessment is also associated with two more types. On the one hand, there is **subjective assessment**, understood as the evaluation of the quality of a performance, and on the other, there is **objective assessment**, which is characteristic of indirect tests where there is only one correct option for each item being evaluated (Table 8.1).

Moving on to **feedback**, this concept refers to the response given to a learner’s oral or written production in their target language. It can

Table 8.1 Assessment typologies

Type of assessment	What does it assess?	When?
<i>Diagnostic</i>	Initial competences	At the beginning of a course
<i>Performance</i>	The achievement of learning objectives within a certain timeframe	At the end of a learning phase
<i>Certificative</i>	Results and grades based on predetermined requirements	According to an institutional calendar established by the certifying entity
<i>Formative</i>	The results and the process necessary to achieve them	Regularly throughout a course
<i>Summative</i>	The achievement of a curriculum’s objectives	At the end of a course
<i>Direct</i>	A learner’s performance at a particular time	During a test
<i>Indirect</i>	A learner’s skills assessed retrospectively	While grading a test
Type of assessment	With what criteria?	How?
<i>Quantitative</i>	Numerical scores	Closed-ended questions
<i>Qualitative</i>	Value judgements	Open-ended questions
<i>Subjective</i>	The quality of a performance	Open-ended questions
<i>Objective</i>	Criterion of right or wrong	Closed-ended questions

be provided either orally or in writing, and it can focus on all mistakes (**unfocused** or comprehensive) or only those related to certain language categories (**focused** or selective). It can also be **direct/explicit** when it provides the correct version or **indirect/implicit** when it indicates a mistake without revealing the solution. Finally, it can either take place between a learner and the instructor or among peers. Today, feedback is often provided through technology tools. In such environments, it is defined as ‘the post-response information provided through online means’ (Lv *et al.*, 2021: 643) and referred to as **e-feedback**. However, it is important to distinguish between **technology-mediated e-feedback**, which occurs when both the synchronous and asynchronous tools through which the feedback is provided are perceived as means that facilitate interaction between human beings, and **computerized or automated e-feedback**, which is when the tools are seen as interfaces that interact with the user directly (Table 8.2).

Table 8.2 Feedback typologies and modalities

Type of feedback and modalities	
<i>Unfocused/comprehensive</i>	All mistakes
<i>Focused/selective</i>	Only certain linguistic aspects
<i>Direct/explicit</i>	Corrects the mistake and offers the correct version
<i>Indirect/implicit</i>	Indicates the mistake but does not offer the correct version
<i>Technology-mediated</i>	When the interaction between the individuals giving and receiving feedback is carried out through technology tools
<i>Computerized or automated</i>	When feedback is provided automatically through technology tools

The purpose of the feedback conditions its typology. If it is associated with a diagnostic or summative assessment, the grade and value judgement are, at the same time, forms of feedback on the learner’s performance. In these contexts, the grade assigned and the feedback itself correspond to the same piece of data and respond to a comparative criterion that organizes the results of a group of learners regarding the same test. On the other hand, when provided in the context of formative assessment, it can be understood as a learning tool and become part of the didactic activities proposed in a foreign language classroom, with the aim of stimulating the learner’s awareness of and reflection on the language.

8.2 From Assessment in Traditional Contexts to Virtual Environments

For a long time, assessment has been associated with the act of measuring an individual’s position within a group and assigning a grade, ‘largely overlooking the ideas of representativeness and congruence with educational objectives’ (Escudero Escorza, 2003: 13). The transition from

this view of assessment to its conception as a process that determines the extent to which the objectives established in a curriculum have been met is attributed to Ralph Winfred Tyler (see Madaus, 2004). From this perspective, it is essential to define what will be assessed, what tools will be used and how the results will be interpreted. Therefore, assessment is no longer understood as merely a measurement: it now involves making a value judgement on the information collected. In this regard, the successes and failures of the learner are also related to the type of education they have received. The need to determine what will be evaluated before creating a test, the importance of the formative role of assessment and attention to quality are basic principles rooted in Tyler's theory (1969). These principles align with contemporary trends in educational assessment, as will become evident below. For example, Stufflebeam and Zhang (2017) propose the **CIPP model**, which outlines the four core ideas on which assessment should be based. These are the **context** (C) in which it takes place, the **input** (I) **elements and resources**, the **process** (P) that must be followed to achieve the objective established and the **product** (P) obtained. In this regard, assessment is a multidimensional process that encompasses various factors, including the teacher, content, means, learning experiences and organization.

On this basis, assessment techniques can vary, leading to a proliferation of both qualitative and quantitative assessment models. Within these models, two methodological trends can be identified: those that continue to understand assessment as a process associated with finding the degree of congruence between test results and pre-established learning objectives, and those that view assessment as a decision-making process based on the information collected. Furthermore, the importance of collaboration and negotiation between all those involved in the assessment is emphasized, becoming an integral part of the teaching–learning process. This is because the formative role of assessment stands out alongside its summative one, while qualitative judgement is highlighted alongside the quantitative kind. These trends are evolving in the 21st century, and new models put forth evaluative practices that provide for **authentic assessment tasks** (Ashford-Rowe *et al.*, 2014; Boud & Soler, 2016; Dann, 2014). These resemble professional scenarios, offer feedback on processes rather than just on results and actively involve learners (Ibarra-Sáiz *et al.*, 2020; Nicol *et al.*, 2014; Rowe, 2017). This entails training these learners so that they can acquire self-assessment skills, so that they can make judgements on their own performance and that of their peers (Boud & Soler, 2016; Rodríguez-Gómez & Ibarra-Sáiz, 2015).

In the field of FL/L2 acquisition, there has been interest in feedback both in the interactionist and sociocultural areas. Although with varying focal points, both areas pay attention to its formative dimension (Bailini, 2020; Bitchener & Ferris, 2012; Nassaji & Kartchava, 2017). So far, the

main aim of research on feedback has been to measure its effectiveness by comparing typologies, techniques and modalities. Studies that have focused on comparing **direct and indirect feedback** consider that the first is more useful in the short term, while the second is more efficient in the long term (Elola *et al.*, 2017; Ferreira Cabrera & Oportus Torres, 2018; Van Beuningen *et al.*, 2008). Its degree of effectiveness depends on the learner's proficiency level, and there seems to be a higher capacity for understanding and assimilating feedback from the intermediate level onwards. Additionally, direct feedback has a stronger impact on beginners, while indirect feedback seems to influence advanced learners to a greater extent (Bitchener & Ferris, 2012: 150–151; Ellis, 2009). In virtual environments involving **automated e-feedback**, similar to what happens in the case of **selective vs. comprehensive e-feedback**, the choice between the direct and indirect kind is associated with the type of tool used. For example, Shintani (2016) and Shintani and Aubrey (2016) compare the use of direct vs. indirect and technology-mediated asynchronous vs. synchronous e-feedback, while Crosthwaite (2017) investigates indirect e-feedback provided by the instructor in a data-driven learning context.

With earlier studies there were contradictory findings, which were partly due to methodological issues (Guénette, 2007). Today data collection protocols and analysis methodologies have become more robust and rigorous. As a result, there are no longer doubts about the positive impact of feedback on foreign language learning (Bitchener & Storch, 2016; Ellis, 2010; Ferris, 2010; Heift, 2019; Hyland & Hyland, 2019; Kang & Han, 2015; Storch, 2010; Van Beuningen, 2010).

An interesting aspect is that information and communication technologies (ICTs) not only allow for the provision of feedback both synchronously and asynchronously but they also promote the combined use of different tools, such as video calls and learning management systems (LMS) for **synchronous e-feedback**, and shared documents (*Google Docs*, *Onedrive*, *Dropbox*) for the **asynchronous** type. Some studies show that synchronous e-feedback facilitates the understanding of its asynchronous counterpart (Ene & Upton, 2018).

Research on **automated e-feedback** has focused on the development and testing of software capable of providing personalized responses that are consistent with the learner's answers. The evolution of this line of research has led to the development of **intelligent tutoring systems** (ITS, or e-tutors), which can vary depending on the type of feedback they offer: (1) **traditional** ones, which compare the learner's answers with those in a database of possible responses; (2) **smart** ones, which use natural language processing techniques; and (3) **flexible** (learner-modeled) ones, which contain algorithms that analyze the input and offer personalized responses (Cerezo *et al.*, 2014; Van Der Kleij *et al.*, 2015). However, although the use of automated writing evaluation

(AWE) software has become much more widespread in recent years, its effectiveness is limited because it only detects mistakes related to grammar rules (Chong, 2017; Mehrabi-Yazdi, 2018; O'Neill & Russell, 2019). Furthermore, as noted by Benítez (2019), the main pitfall is that this type of software does not allow for the evaluation of a text's rhetorical quality, originality or the appropriateness of the register, to name just a few critical points. Finally, the eye-tracking functions offered by technology could contribute to shedding light on the time that learners dedicate to the feedback they receive and, to some extent, provide us with information on how they process it (Godfroid, 2020).

Research on **ICT-mediated e-feedback**, on the other hand, has explored the interactive potential of digital tools. Among those that have generated the most interest are screencasting (Ali, 2016; Cunningham, 2018; Ghosn-Chelala & Al-Chibani, 2018), wikis, blogs (Aslan & Ciftci, 2018; Xu & Yu, 2018) and file share softwares (Rassaei, 2019; Shintani 2016; Shintani & Aubrey 2016), in addition to learning management systems, such as *Blackboard* and *Moodle*. In this context, interest has been focused on identifying to what extent channel changes can affect feedback, keeping in mind variables such as the complexity of the proposed task, the time the learner takes to complete it and the modality (Cerezo *et al.*, 2014; Ziegler, 2016). Finally, social networks have significantly increased peer review opportunities. However, despite its pedagogical role, some studies note that this type of e-feedback tends to focus more on content than form, due to the inherent nature of Web 2.0, where creativity takes the spotlight (Chwo, 2015). In this vein, Storch (2017) suggests that, for peer review-derived e-feedback to focus on form too, learners must receive relevant training from their instructor.

In conclusion, technology tools possess great potential, which has yet to be fully exploited. Recent research has shown that, while automated e-feedback does prove effective, it is less so than feedback provided by a person who shares the same learning environment, and even less so than feedback offered by the instructor (Lv *et al.*, 2021). Subsequently, this suggests that mediated e-feedback extends the potential of traditional feedback, while automated e-feedback still does not fully and adequately meet didactic needs.

8.3 Research on Assessment and E-Feedback

The most recent trends in the field of assessment highlight the challenge of integrating it with the use of ICTs, adapting to the specific needs of using technologies. The transition to virtual teaching prompted by COVID-19 led to the transfer of assessment and feedback practices to such environments, posing the challenge of how to effectively make use of online resources for both summative and formative assessment. Based on Golonka *et al.*'s (2014) classification of **language learning technology**

tools, those that can also prove useful for assessment and e-feedback are mainly classified into three groups. One group consists of **classroom-based technologies**, which include screencasting apps, such as *TechSmith Capture*, and learning management systems (LMS), such as *Blackboard*, which include various tools with different functions (forums, wikis, portfolios, resources for creating different types of tests and exams, question banks, resources to organize group work, video calls, teaching material repositories, etc.). A second group includes useful resources for **self-assessment and autonomous feedback**, such as language use reference corpora (e.g. CORPES XXI), electronic dictionaries, voice recognition programs, e-tutors (ITS) and automated writing evaluation (AWE) software, such as *Grammarly* and *Criterion*. A third group consists of **collaborative online resources** such as social networks, internet forums and blogs, as well as videoconference apps (*Zoom*, *Cisco Webex* and *Teams*, among others). It is important to keep in mind that the main uses associated with these platforms have evolved over time. Such is the case of *Zoom*, which started out as a videoconference app. During the COVID-19 pandemic, however, it became established as the main online teaching tool in numerous educational systems (Kohnke & Moorhouse, 2022).

The next section focuses on three aspects related to assessment and e-feedback in virtual environments: (1) how the change of context impacts exams; (2) the advantages and limitations of ICTs for creating written tests; and (3) the potential of technology tools for formative feedback.

8.3.1 Online exams

The transfer of assessment to a virtual environment raises questions about what dynamics must be modified both in terms of how exams are conducted (space, necessary devices, supervision, etc.) and the type of tests, their duration and the tools needed to create and assess them. Regarding the first point, the physical context in which the assessment takes place makes a significant difference. An online exam taken in a computer lab with both educators and learners present is not the same as an exam taken remotely. Inherently, exams are official acts that require all parties involved to behave transparently, from identification before taking the test to adhering to a code of academic and intellectual integrity. Furthermore, as documents that serve to test a person's knowledge at a specific time in their learning journey, they are also a practice subject to a series of pre-established conditions. In the case of virtual environments, the **type of exam** significantly affects the environment in which it takes place. On the one hand, for oral exams we can use videoconference systems (*Blackboard Collaborate Ultra*, *Teams*, *Zoom* and *Cisco Webex*, among others), which allow us to recreate a similar context to

in-person assessment. On the other hand, for online written exams the change in environment makes it harder to verify that the individual is taking the test without the help of others, that they are not using unauthorized devices or tools and that they are sticking to authorized reference materials. Moreover, the development of chatbot-type artificial intelligence (AI) systems, such as *ChatGPT*, which are capable of generating coherent and accurate texts about any topic with a good level of critical reasoning, makes it difficult, if not impossible, to detect whether a text has been written by a human or a machine. Tools of this kind impose a radical change both in the way exams are developed and in the attitudes with which learners approach and educators assess them.

While it may be true that academic dishonesty only reflects the behavior of a minority, to prevent situations that are not in line with the ethical code of intellectual integrity, it is essential to raise awareness among learners about the principles of this code across schools and universities. It is also especially important to emphasize the values of dialogue, commitment, respect, responsibility, integrity and honesty, to foster attitudes that are in line with each institution's expectations. Even so, there is still a risk. Consequently, it might be necessary to implement a kind of monitoring system to replace, as far as possible, the supervision that would occur in traditional exam settings. Since **anti-plagiarism software** (*Viper*, *Turnitin*, *Plagium* and *Dupli Checker*, among others) does not reliably succeed in detecting AI-generated texts (Díaz Arce, 2023; Susnjak, 2022), it is essential to use **proctoring apps**, such as *Respondus Lockdown Browser*. These programs prevent learners from accessing unauthorized external content using other applications simultaneously or printing texts. These apps tend to include a monitoring function that records the user's movements while taking the exam, using a color code to flag suspicious behaviors (e.g. looking away, the presence of someone else, the absence of an individual in front of the screen, prolonged pauses, etc.). As an alternative, this automated monitoring function can be replaced by asking learners to join a video call (via *Teams*, *Zoom*, *Cisco Webex*, etc.) while taking a written exam on a learning management system such as *Blackboard*. In this way, it would only be necessary to maintain the function that blocks access to external resources. However, this would only be viable with a reduced number of learners, since videoconference programs tend to limit the number of users who can be viewed at once.

These issues are much less frequent when the exam is taken **online but in a physical setting**, such as a computer lab. In such cases, the use of proctoring systems can be limited to preventing access to unauthorized websites during the exam. Additionally, the instructor can provide immediate technical support as and when needed. The advantages of taking exams online in a physical setting are more evident, although the exact degree of control over the authenticity of the learner's performance

is still linked to the **type of test** in question. While it is low in tests with closed-ended questions (cloze, true/false, multiple choice, matching, etc.), it can be much higher in open-ended tests (essays, translations, summaries, etc.), although this does depend on the type of questions asked. The more specific, contextualized and personalized, the greater the likelihood that the answers will be trustworthy and authentic.

Finally, taking an **exam online remotely** limits the support the instructor can offer the learner, including clarifications, instructions and help with using the necessary devices, apps or resources. Instrumental competence, understood as the learner's ability to navigate technology tools, has an impact on the tests they take. While it is true that today we are increasingly surrounded by digital devices in our daily lives, this does not guarantee that learners will be able to transfer their competence in mastering these resources to educational contexts, nor does it ensure that they are aware of the **importance of certain technological aspects** in an activity that will be assessed. In particular, these include: the correct use of spelling (accents, capitalization, punctuation marks); adherence to basic rules of interaction in virtual settings (contextualizing the information requested or provided; using the different resources properly, e.g. understanding that emails are not chat channels, following thematic threads in a forum rather than opening a new one for each contribution and managing turn-taking); following instructions on how to upload files to a platform; and using the right device according to the type of test being taken (while a cell phone might cover the basic needs for an oral test, it is not appropriate for a written exam).

These considerations make it clear that the transfer of assessment practices to virtual environments has a profound effect on how they are managed. The next section analyzes the advantages and limitations of certain technological tools when it comes to creating written tests and exams.

8.3.2 Technology for the creation of written tests

Before delving into the advantages and limitations of ICTs when it comes to creating written exams, it is necessary to distinguish between tests involving **open- and closed-ended questions**, regardless of the competence and knowledge to be assessed. This is because these can vary depending on the institution where they are carried out, the learner's proficiency level and the objectives of the course curriculum or program. Generally speaking, **grammatical competence** is usually assessed through closed-ended questions (multiple choice, true/false, matching, item ordering, gap-fills, etc.), while **writing competence** tends to be evaluated with open-ended tests that provide a topic to expand on within a particular genre (a complaint letter, an opinion article, etc.). **Listening or reading comprehension** can be assessed either with a

closed-ended question test or an open-ended one, where learners write a text summarizing the audio or written content. In the first case, the test would typically be based on recordings or videos, while in the second it would involve texts.

Learning management systems (e.g. *Blackboard*) make it possible to create closed question banks (pools) for specific language content and topics. These can be grouped by category (pronouns, verb tenses and moods, periphrasis, etc.), proficiency level (A1, A2, B1, etc.) or question blocks that increase in difficulty. In turn, this allows for the creation of tests with different questions of the same type for each exam, with the option to randomize them for every participant. Moreover, these question banks can be updated from time to time, making it possible to use them in multiple exam sessions, even if certain learners have to retake a test. In fact, the larger the question bank, the less likely it is for the system to select the same questions for a given exam. Not only this, but they can also be selected using various types of filters.

Especially in the case of **continuous assessment**, a useful feature on these platforms is that both specific tests and their results can be archived and stored over a period of time. This makes it easier to track a learner's progress or regressions. Additionally, both the complete test and its result can be shared and, in this case, the instructor can decide how much and what type of automated feedback to provide. They may choose to display only the final result (summative assessment) with no feedback, show just the wrong answers (with or without their solution) or present the wrong answers with a brief, general indication of the topic the learner should revise to find the solution (e.g. 'verb agreements'). From this perspective, closed-ended question tests – whether they focus on grammar, listening comprehension or vocabulary – can also be used for self-assessment, as a mock exam or even for diagnostic purposes when determining which group a learner should be assigned to. Moreover, they serve as an efficient assessment system for large groups because scores are calculated automatically and partial percentages are also provided (e.g. in answers where there are multiple correct options). In this regard, there is a proportional investment of time and energy by the instructor. While creating a question bank is an intense and complex task, the need for manual grading is eliminated.

It is useful to point out **two significant limitations** when it comes to creating, assessing and providing e-feedback for tests with closed-ended questions. The first limitation has to do with questions that require the learner to fill in one or more gaps in a sentence or text. In such cases, when preparing the question, it is necessary to decide what answers are considered acceptable or not. Therefore, it is essential to have a clear idea of what is being assessed in a specific test. For instance, if in a grammar test on verb tenses the learner writes the correct form but the word contains a typo, the system will grade it as wrong. However,

if the instructor were to grade that same test, perhaps they would not let it affect the final score or attribute the same importance to it. Consequently, it is worth noting that, although gap-fill questions are commonly included in grammar tests and are considered a valid way to assess this aspect of linguistic proficiency, their reliability could be affected by how the system processes the answers. The second limitation is that these tests do not provide detailed automated e-feedback. This means that their effectiveness depends on the learner's attentiveness and ability to understand the feedback, especially when they only have access to the wrong answers.

Technology tools facilitate the creation of written tests with open-ended questions that require either brief or long answers. Additionally, their multimedia features make it easier to include diagrams, pictures, graphs, videos, audio recordings, tables and links that can serve as input material for writing tasks. Even so, their **assessment via automated e-feedback** still comes with certain limitations. Automatic writing assessment systems are not reliable because they can only detect mistakes related to basic grammar rules and rely on semantic criteria for lexical analysis. Therefore, they are unable to review aspects such as register appropriateness, consistency, cohesion, adherence to textual conventions and communicative effectiveness (Benítez, 2019). Furthermore, if the learner took the writing test remotely, it could be necessary to use an anti-plagiarism system (*Viper*, *Turnitin*, *Plagium* and *Dupli Checker*, among others) to check the text's authenticity. Despite these shortcomings, an advantage of digital tools is that they facilitate the creation of tests involving case studies or role play, aligning more with recent assessment models (Ashford-Rowe *et al.*, 2014; Boud & Soler, 2016; Dann, 2014) that advocate for evaluation practices that simulate authentic activities in professional contexts. This would entail including among the assessment criteria all the stages that led to the task's completion. For instance, the learner would need to indicate the sources they consulted, any difficulties they encountered and how they overcame them. In this way, the test completion process would become more transparent and could reduce the risk of plagiarism. Finally, in many university contexts translation tests are still used. The transfer of this activity to virtual environments and the enhanced quality of machine translations has increased the risk of them not reflecting the learner's true skills but, rather, their ability to use *Google Translate* or *Reverso Context*, to name a few of the most popular tools. If the exam takes place remotely, proctoring systems in no way guarantee that the learner is not using another device to perform a machine translation (e.g. their cell phone) to then copy the text manually in the exam. Another aspect worth considering is the fact that it is very difficult to prove that a translation has been copied. This is because machine translators are regularly updated and, in many cases, the work they

provide is acceptable. The only way to ensure the validity and reliability of such exams is for them to take place online in a physical setting, using a proctoring system that blocks access to unauthorized external sources. However, it is useful to recall that, in the case of large groups, this method is rather unrealistic. This is because it requires, aside from suitable infrastructure in the testing environment, additional staff for supervision. Not only this, but several versions of the same exam must also be prepared, one for each group, to prevent the sharing of content with learners who have yet to take the test.

8.3.3 E-feedback: Automation and multimodality

The virtual environment brings with it **new ways to give and receive e-feedback** that are related to the interaction opportunities offered by ICTs. Technology-mediated e-feedback is multimodal because it materializes through electronic interfaces that enable humans and machines to interact in an increasingly natural way. In fact, it can be provided in a multimedia format, combining images, direct speech, written texts, audio files and video recordings. For example, oral feedback on a written text, which would traditionally be given in a face-to-face tutorial, can be provided over a video call with screensharing and it can be recorded as an audio file accompanying the text. Another option, thanks to screencasting, is for the instructor to record their screen while they review and offer feedback on a text. This type of feedback covers many bases, with its only disadvantage being the lack of interaction opportunities (see Chapter 7 of this book). Despite this, it can be very helpful for the learner since they can listen to it or watch it as many times as they need to refer to specific aspects. Without a doubt, not only has feedback taken on a multimodal and multimedia dimension thanks to file sharing, chat channels, wikis, blogs, discussion forums and e-portfolios, but it has also increased in amount (Elola & Oskoz, 2017; Hyland & Hyland, 2019).

Among the **benefits of e-feedback**, Choi (2016) and Bakla (2020) point out, in addition to its multimodal and multimedia nature, the potential for data storage and reuse, user friendliness, immediacy and the increased interaction opportunities provided by technology tools. However, although the transmission channel has changed and a much more diverse range of tools has become available, in mediated e-feedback contexts the techniques used remain the same. Following a criterion that goes from the most implicit to the most explicit, oral techniques continue to be based on emphatic repetitions, requests for clarification, elicitation, reformulations, explicit corrections and metalinguistic explanations with or without examples. Written techniques, on the other hand, consist of graphic indicators, error codes, strikethroughs, additions, reformulations, explanations, comments and usage examples.

In virtual environments, written e-feedback could implement the use of electronic review features (e.g. in Word or PDF files), which allow the user to highlight the text with different colors, add comments, track their changes and even link a mistake to a website that offers examples of correct usage. In addition to the techniques mentioned above, which can be transferred to technology-mediated online communication environments, it is useful to recall those inherent to automated e-feedback contexts, which are based on the notions of verification and elaboration. While verification simply involves indicating whether an answer is right or wrong, elaboration implies providing feedback that guides the learner towards the correct response. In the context of automated e-feedback through intelligent tutoring systems (ITS), alongside traditional techniques (Table 8.3), which are still in use, innovative systems are being experimented with, offering a sort of metalinguistic e-feedback that promotes self-correction or elicits the correct answer from the learner. The ultimate aim of these systems is to simulate, as far as possible, interaction conditions among peers or between instructor and

Table 8.3 Automated e-feedback techniques

Technique	Explanation	Typology	Function
No feedback	Only indicates the score achieved for a test	–	Diagnostic
Error flagging	Indicates the wrong answers but does not offer the right ones	Implicit	Diagnostic
Knowledge-of-response	Indicates the right and wrong answers with no further information	Implicit	Diagnostic
Answer-until-correct	Allows the learner to see the right answer but does not offer any additional information	Implicit	Formative
Hints/Cues/Prompts	Guides the learner through questions, additional information or examples to reach the solution, without offering the right answer	Implicit and elaborated	Formative
Topic-contingent feedback	The feedback redirects the learner to the parts of the text that contain the information necessary to formulate the right answer	Implicit and metalinguistic	Formative
Bug-related feedback	Offers information about one-off mistakes; does not provide the right answer but promotes self-correction	Implicit	Formative
Informative tutoring	Indicates the mistake, offers recommendations and suggests strategies to guide the learner towards the right answer without providing it outright	Implicit	Formative
Knowledge-of-correct-response	Indicates whether the answer is right or wrong and also offers the solution	Explicit	Diagnostic
Response-contingent feedback	Offers explanations for the right and wrong answers	Explicit and metalinguistic	Formative
Attribute-isolation	Allows the learner to check whether the answer is right or wrong and offers additional information about the question's key aspects	Explicit and metalinguistic	Formative

Sources: Mason and Bruning (2001: 5–6); Shute (2008: 160).

learner. For instance, within the framework of computerized dynamic assessment, automated incremental e-feedback systems are currently being developed, moving from implicit to explicit formats in the context of oral and written comprehension tests. With this type of e-feedback, the test score not only indicates whether the answer is correct or not but also indicates the quantity of e-feedback required by the learner. These two levels of feedback allow for a clearer assessment of foreign language proficiency, while also providing relevant information about how to consistently guide teaching efforts to help the learner achieve the established learning objectives (Kamrood *et al.*, 2019; Poehner & Lantolf, 2013; Poehner *et al.*, 2015; Zhang & Lu, 2019).

8.4 Recommendations for Practice

When exploring the potential and limitations of a technology tool, whether for creating tests to assess any competence or for providing the learner with useful e-feedback, it is important to consider that the **means** should adapt to our needs, not the other way around. Therefore, it is essential to be aware of which tool is better suited for the creation of a specific test and of how to make the most of the potential of ICTs when it comes to providing e-feedback that will be able to catch the learner's attention, as this is the first step to ensure the learner is motivated to make use of it.

8.4.1 Types of tests and tools for assessment

Linguistic and communicative competence is assessed based on activities involving oral and written comprehension and expression, interaction and mediation – that is, the ability to interpret or translate (Council of Europe, 2020). The object of the assessment determines the test typology and the selection of the most appropriate tools (Table 8.4). Learning management systems (LMS) offer a **wide range of question types** that can be classified according to how 'open' or 'closed' the answer should be, which directly impacts how the software generates the results. Closed-ended questions include formats such as true/false, matching, sentence ordering, cloze, multiple choice and multiple response. The main difference between these last two is that there can be more than one correct option among several possibilities. In such cases, the grade generated by the system accurately reflects the learner's performance. Another type of semi-closed question is the gap-fill exercise. This format may involve a single sentence or a longer text with several spaces throughout. In this context, it is important to anticipate learners' potential responses, and to include them in the list of acceptable or unacceptable answers (see section 8.3.2). Since it is practically impossible to anticipate all the possible mistakes a learner could make and the rigidity

Table 8.4 Assessment, test typologies and tools

What is being assessed?	Type of test	Tool
Listening comprehension	<ul style="list-style-type: none"> • Test with closed-ended questions • Test with open-ended questions with brief answers 	Audio or video file + test uploaded to LMS platforms
Writing comprehension	<ul style="list-style-type: none"> • Test with closed-ended questions • Test with open-ended questions with brief answers 	Text for comprehension (in any format) + test on LMS platform
Grammatical competence	<ul style="list-style-type: none"> • Test with closed-ended questions 	LMS platform based on a question bank
Written expression	<ul style="list-style-type: none"> • Essay based on an input (audio, visual or written) 	Attached file to be downloaded and uploaded to the LMS platform or sent via email to the learners
Oral expression	<ul style="list-style-type: none"> • Open-ended questions on a topic specified in the program • Presentation of content or a project completed by the learner 	Video call Video call
Interaction	<ul style="list-style-type: none"> • Spontaneous dialogue or conversation among peers or between learner and instructor based on a set of instructions (role play) 	Video call
Mediation (translation)	<ul style="list-style-type: none"> • Text to be translated from language A to B 	Attached file to be downloaded and uploaded to the LMS platform or sent via email to the learners; bilingual and monolingual electronic dictionaries

of automatic grading does not leave room for nuances in the relevance of a particular error, the options are as follows: (1) educate learners on the importance of checking their answers; (2) review the results of each test, not just the final score; or (3) disregard this aspect and accept that the rigidity of the system could affect the assessment's reliability.

Open-ended questions can require either 'brief answers', where learners must reformulate a given piece of content using a limited number of characters, or an 'essay-type response', which allows for a more generous character count. There is also the option to upload the task instructions as a file on the platform. This way, learners can download them on their device and upload their answers on completing the test. An important aspect to consider for any activity involving gap-fills or writing is to ensure that learners have activated the target language's keyboard and are familiar with its use.

A central topic in the context of virtual exam management is the **availability and duration of each test**. Regarding the first aspect, it is essential to decide how many times a learner can retake the same test, the order in which they should complete the different parts and how much time should be dedicated to each one. Regarding the second aspect, accurately calculating the duration of each test minimizes the probability that learners will have enough time to look up solutions using unauthorized resources. These decisions depend on the **purpose of the**

assessment. If it is diagnostic, summative or certificative, learners should only be able to take each test once, unless, of course, they encounter any technical issues. Furthermore, they should follow a specific order and the test should close automatically when time is up. Learning management systems tend to include a clock feature that allows learners to keep track of how much time they have left. If, on the other hand, the test in question has self-assessment purposes or is a mock exam, the learner could be allowed to retake it multiple times. As for the clock feature, while it could still be activated, the learner could be allowed to finish at their own pace. This would give them the opportunity to compare their time management skills with the test's specific time restrictions. In the context of remote listening comprehension tests, it is important to recall that the instructor cannot check whether the learner is adhering to the instructions about how many times they can listen to the audio or watch the video. Therefore, calculating the test's total duration and its automatic closure once time is up, is essentially the only way to ensure that the learner follows these instructions.

Speaking tests via video call are rather straightforward, excluding any technical issues that may arise if the participants' network connections are unstable or too weak, and any limitations when it comes to non-verbal communication and potential sources of background distraction in the participants' home settings. In fact, these tests even have certain benefits. In the first place, they can be scheduled to prevent long waiting times for learners before their turn. Second, several devices can be used, including cell phones, as long as the right app is installed. Finally, they allow for screensharing, which can be useful in a speaking exam to display, for instance, video input to prompt oral interaction or a file to support a presentation (e.g. a PowerPoint slideshow or a text document). Video calls offer an interactional setting that allows the instructor to assess, on the one hand, the learner's spontaneous conversation skills regarding a specific topic and, on the other, their ability to present pre-prepared content. As a result, they are a viable alternative to in-person speaking exams.

8.4.2 E-feedback and functions of assessment

The variables that must be considered to decide what kind of e-feedback to offer and what resources should be used depend on the feedback's purpose and the type of test. When it comes to summative assessment involving closed-ended questions, e-feedback can be automated, since it is the sum of right and wrong answers calculated by the software. In such cases, it is possible to choose between providing only the score thresholds to let the learner know whether they passed or failed a specific test, and allowing them to see which answers they got wrong. However, when it comes to mock exams or self-assessment, **e-feedback options** that promote self-correction can be activated, such as

error signaling, indicating right and wrong answers, showing the correct answer when the learner's answer is wrong, providing a brief comment to guide the learner towards the solution or even providing information that can redirect to a link encouraging further research on the topic (see Table 8.3). In the context of **written comprehension**, a type of e-feedback that redirects wrong answers to the place in the text where the learner can find the information needed to reach the solution can be used. Finally, when it comes to diagnostic assessment, to determine the learner's competence level it may be enough to provide feedback that simply includes the level they have been assigned to.

Tests with open-ended questions, however, require the provision of mediated e-feedback: that is, it must be provided by the instructor using ICTs as vehicles for its transmission, understanding and subsequent implementation. In summative assessment contexts, e-feedback is usually accompanied by a grade and tends to be offered when the outcome is negative. In general, it involves the instructor explaining the areas of the learner's work that do not meet the necessary requirements for passing. In such cases, although video calls, thanks to their spatial-temporal flexibility, appear to simplify this task compared to in-person tutorials, their use is not without risks. For instance, the learner may take screenshots or photos of the exam being reviewed, or record the instructor's comments without authorization. In certificative assessment contexts and university exams in many countries, learners are not allowed to reproduce such a document in any way. Of course, this risk does not exist in face-to-face settings.

However, when working in continuous assessment contexts and dealing with performance tests, e-feedback serves a formative purpose. It can be provided in written form, such as via email or a file shared on a cloud platform, or orally, as via a video call or screen recording. Additionally, the feedback can be given either synchronously or asynchronously. Recording an audio file while reviewing a learner's work and then sending it along with the text allows the learner to independently review the feedback point by point. On the one hand, this encourages the learner to pay closer attention to the feedback provided and, on the other, it reduces the time that the instructor would need to spend on the same text if the review were done in writing.

Other **useful resources for providing formative e-feedback** include screensharing features and chat channels available in video call applications. While screensharing allows for easy commenting on work or projects, chat channels enable the instructor to note down aspects related to the feedback they want to give without interrupting the learner. Additionally, after discussing it orally, the instructor can also send the feedback in writing so that the learner can reflect on it in their own time. Furthermore, the chat can be used to provide examples and recommend links or references for the learner to research specific topics independently

later on. Video calls are also a useful resource for tutorials and can be very productive when providing incremental feedback. This is because they allow for synchronized recording of both oral interactions and chat content, as well as for the collection of data that can be used for research purposes or as a topic for reflection in a subsequent class or tutorial.

Some studies suggest that learners perceive receiving e-feedback in diverse modalities and formats as more effective and positive. Among digital formats, they prefer recordings because they are more detailed and personalized (Aslan & Ciftci, 2018; Chong, 2019; Delante, 2017; Ryan *et al.*, 2019). Furthermore, in line with new sustainable assessment models, ICTs are a useful resource for combining both instructor and peer feedback on written texts. For example, this feedback may be provided through forums, shared portfolios and collaborative writing platforms (Martín Alonso & Martín Leralta, 2012; Mohamadi, 2018).

As a final consideration, it is important to remember that providing feedback in digital format – both orally and in writing – requires paying even closer attention to the language used (Lazar & Ryder, 2018). This is because the prosodic, kinesic and proxemic features that tend to accompany feedback in face-to-face settings are more limited in virtual environments. For instance, audio recordings preserve prosodic features but not the gestures that accompany them. Likewise, various meanings can be attributed to a pause that is heard but not seen. Here, it is useful to recall that the process of receiving feedback is, intrinsically, a potential threat to the learner's public image, in that it affects how they may wish to portray themselves in a given context. On one hand, there is the desire for recognition of one's merits (**positive image**) and, on the other hand, the desire to not have one's freedom of action limited (**negative image**) (Goffman, 1967). This freedom of action is understood as agency: that is, the ability to decide how much attention to give to the feedback in question and which aspects of it to focus on. Therefore, the task of providing feedback requires educators to use a series of politeness strategies (Brown & Levinson, 1987 [1978]) in order to protect the learner's public image. Now, if this is already a critical point in face-to-face interaction contexts, the reproducibility of digital feedback and the ease with which it can be disseminated in virtual environments increase the risk of the learner perceiving that their public image is under threat. This is why it is always essential to adjust the amount of feedback to the learner and their objectives, since it may not be processed in the same way by the person receiving it and may have a positive or negative impact on affective variables such as motivation (see Chapter 5 of this book).

8.5 Conclusions and Future Lines of Research

The restrictions imposed by COVID-19 accelerated the transition to online and remote assessment systems. In turn, this had a significant

impact on the management and administration of exams, the criteria for test creation and the use of ICTs for providing feedback. Some of the direct implications of this scenario had to do with how to make use of digital tools to create reliable and viable tests, and how to provide useful and effective e-feedback, whether automated or mediated, through these resources.

Thus, one of the main challenges for the future lies in the development of intelligent tutoring systems (ITS), especially in relation to dynamic assessment, so that, through the collection of user data and behavior patterns, they become increasingly capable of offering detailed, incremental and circumstantial feedback. The challenge also involves finding ways to reconcile the threat to intellectual integrity in exams, posed by the sudden emergence of ‘intelligent virtual assistants’ such as *ChatGPT* with their potential to provide personalized feedback. Furthermore, it is necessary to consider the ability of users to get the most out of these tools and use them efficiently (Muñoz-Basols *et al.*, 2023; Ocaña Fernández *et al.*, 2019). Another important aspect is for assessment and feedback to be linked to their purpose as well as to the expectations and needs of both educators and learners alike. Educators require more training to use these resources with greater security and confidence and to adapt their use to didactic needs. Learners need to become familiar with the use of these tools in educational contexts, too. However, there also needs to be a change in the educator–learner relationship. Without undermining the role that each plays, this change should be based on respect and mutual trust, as well as on the promotion of values such as intellectual integrity, creativity, reasoning and constructive criticism. For learners, this involves viewing an exam as an ‘opportunity to test themselves’ and to show what they have learned. For educators, they should perceive it as a way to assess the learners’ ability and competence through an evaluation that considers their performance as a reliable testimony of the knowledge acquired.

8.6 Annotated Additional Reading

Bordón T. and Liskin-Gasparro, J.E. (2015) The assessment and evaluation of Spanish. In M. Lacorte (ed.) *The Routledge Handbook of Hispanic Applied Linguistics* (pp. 258–274). Routledge.

Based on the assessment criteria for competences in Spanish as a foreign language in the international context, this chapter analyzes the key topics regarding the reliability of tests, the role of technology tools in their design and the social impact of the assessment process.

Loncar, M., Schams, W. and Liang, J.S. (2021) Multiple technologies, multiple sources: Trends and analyses of the literature on technology-mediated feedback for L2 English writing published from 2015 to 2019. *Computer Assisted Language Learning* 36 (4), 722–784. <https://doi.org/10.1080/09588221.2021.1943452>.

This is a highly up-to-date and well-structured review of research in the field of e-feedback.

References

- Ali, A.D. (2016) Effectiveness of using screencast feedback on EFL students' writing and perception. *English Language Teaching* 9 (8), 106–121. <http://dx.doi.org/10.5539/elt.v9n8p106>.
- Ashford-Rowe, K., Herrington, J. and Brown, C. (2014) Establishing the critical elements that determine authentic assessment. *Assessment & Evaluation in Higher Education* 39 (2), 205–222. <https://doi.org/10.1080/02602938.2013.819566>.
- Aslan, E. and Ciftci, H. (2018) Synthesizing research on learner perceptions of CMC use in EFL/ESL writing. *CALICO Journal* 36 (2), 100–118. <https://www.jstor.org/stable/26816875>.
- Bailini, S. (2020) *El feedback interactivo y la adquisición del español como lengua extranjera*. Mimesis.
- Bakla, A. (2020) A mixed-methods study of feedback modes in EFL writing. *Language Learning and Technology* 24 (1), 107–128. <https://doi.org/10.125/44712>.
- Benítez, R.A. (2019) Reflexiones y percepciones sobre la evaluación automatizada del discurso escrito. *Enunciación* 2, 227–240. <https://doi.org/10.14483/22486798.14311>.
- Bitchener, J. and Ferris, D.R. (2012) *Written Corrective Feedback in Second Language Acquisition and Writing*. Routledge.
- Bitchener, J. and Storch, N. (2016) *Written Corrective Feedback for L2 Development*. Multilingual Matters.
- Boud, D. and Soler, R. (2016) Sustainable assessment revisited. *Assessment & Evaluation in Higher Education* 41 (3), 400–413. <https://doi.org/10.1080/02602938.2015.1018133>.
- Brown, P. and Levinson, S.C. (1987 [1978]) *Politeness: Some Universals in Language Usage*. Cambridge University Press.
- Cerezo, L., Baralt, M., Bo-Ram, S. and Leow, R.P. (2014) Does the medium really matter in L2 development? The validity of CALL research designs. *Computer Assisted Language Learning* 27 (4), 294–310. <https://doi.org/10.1080/09588221.2013.839569>.
- Choi, Y. (2016) Writing strategies in the process of L2 computer-mode academic writing with the use of multiple resources. *English Teaching* 71, 3–28. <https://doi.org/10.15858/engtea.71.3.201609.3>.
- Chong, I. (2017) Reconsidering teacher, peer, and computer-generated feedback. *TESOL Journal* 8 (4), 886–893. <https://doi.org/10.1002/tesj.334>.
- Chong, S.W. (2019) College students' perception of e-feedback: A grounded theory perspective. *Assessment & Evaluation in Higher Education* 44 (7), 1090–1105. <https://doi.org/10.1080/02602938.2019.1572067>.
- Chwo, G.S.M. (2015) Empowering EIL learning with a Web 2.0 resource: An initial finding from the Cross Campus Storybird Feedback Study. *Computers & Education* 84, 1–7. <https://doi.org/10.1016/j.compedu.2015.01.004>.
- Council of Europe (2002) *Marco común europeo de referencia para las lenguas aprendizaje, enseñanza, evaluación*. Ministerio de Educación, Cultura y Deporte [Ministry of Education, Culture and Sport], Anaya and Cervantes Institute.
- Council of Europe (2020) *Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume*. Council of Europe.
- Crosthwaite, P. (2017) Retesting the limits of data-driven learning: Feedback and error correction. *Computer Assisted Language Learning* 30 (6), 447–473. <https://doi.org/10.1080/09588221.2017.1312462>.
- Cunningham, K.J. (2018) APPRAISAL as a framework for understanding multimodal electronic feedback: Positioning and purpose in screencast video and text feedback in ESL writing. *Writing & Pedagogy* 9 (3), 457–485. <https://doi.org/10.1558/wap.31736>.
- Dann, R. (2014) Assessment as learning: Blurring the boundaries of assessment and learning for theory, policy and practice. *Assessment in Education: Principles, Policy & Practice* 21 (2), 149–166. <https://doi.org/10.1080/0969594X.2014.898128>.

- Delante, N.L. (2017) Perceived impact of online written feedback on students' writing and learning: A reflection. *Reflective Practice* 18 (6), 772–804. <https://doi.org/10.1080/14623943.2017.1351351>.
- Díaz Arce, D. (2023) Inteligencia artificial vs. Turnitin: Implicaciones para el plagio académico. *Revista Cognosis* VIII (1), 15–25.
- Ellis, R. (2009) A typology of written corrective feedback types. *ELT Journal* 63 (2), 97–107. <https://doi.org/10.1093/elt/ccn023>.
- Ellis, R. (2010) A framework for investigating oral and written corrective feedback. *Studies in Second Language Acquisition* 32, 335–349. <https://www.jstor.org/stable/44488131>.
- Elola, A.I. and Oskoz, A. (2017) Writing with 21st-century social tools in the L2 classroom: New literacies, genres, and writing practices. *Journal of Second Language Writing* 36, 52–60. <https://doi.org/10.1016/j.jslw.2017.04.002>.
- Elola, A.I., Mikulski, M. and Buckner, T.E. (2017) The impact of direct and indirect feedback on the development of Spanish aspect. *Journal of Spanish Language Teaching* 4 (1), 61–74. <https://doi.org/10.1080/23247797.2017.1315267>.
- Ene, E. and Upton, T.A. (2018) Synchronous and asynchronous teacher electronic feedback and learner uptake in ESL composition. *Journal of Second Language Writing* 41, 1–13. <https://doi.org/10.1016/j.jslw.2018.05.005>.
- Escudero Escorza, T. (2003) Desde los tests hasta la investigación evaluativa actual. Un siglo, el XX, de intenso desarrollo de la evaluación en educación. *RELIEVE* 9 (1), 11–43.
- Ferreira Cabrera, A. and Oportus Torres, R. (2018) Procesamiento cognitivo del Feedback Correctivo Escrito indirecto en los errores preposicionales en ELE. *Boletín de Filología* 53 (1), 83–108. <http://dx.doi.org/10.4067/S0718-93032018000100083>.
- Ferris, D. (2010) Second language writing research and written corrective feedback in SLA. *Studies in Second Language Acquisition* 32 (2), 181–201. <https://doi.org/10.1017/S0272263109990490>.
- Ghosn-Chelala, M. and Al-Chibani, W. (2018) Screencasting: Supportive feedback for EFL remedial writing students. *The International Journal of Information and Learning Technology* 35 (3), 146–159. <https://doi.org/10.1108/IJILT-08-2017-0075>.
- Godfroid, A. (2020) *Eye Tracking in Second Language Acquisition and Bilingualism. A Research Synthesis and Methodological Guide*. Routledge.
- Goffman, E. (1967) *Interaction Ritual: Essays on Face-to-Face Behavior*. Anchor Books.
- Golonka, E.W., Bowles, A.R., Frank, V.M., Richardson, D.L. and Freynik, S. (2014) Technologies for foreign language learning: A review of technology types and their effectiveness. *Computer Assisted Language Learning* 27 (1), 70–105. <https://doi.org/10.1080/09588221.2012.700315>.
- Guénette, D. (2007) Is feedback pedagogically correct? Research design issues in studies of feedback on writing. *Journal of Second Language Writing* 16 (1), 40–53. <https://doi.org/10.1016/j.jslw.2007.01.001>.
- Heift, T. (2019) A longitudinal observation of technology-mediated feedback for L2 learners of German. *ITL - International Journal of Applied Linguistics* 170 (2), 154–179. <https://doi.org/10.1075/itl.19009.hei>.
- Hyland, K. and Hyland, F. (2019) *Feedback in Second Language Writing: Contexts and Issues*. Cambridge University Press.
- Ibarra-Sáiz, M.S., Rodríguez-Gómez, G., Boud, D., Rotsaert, T., Brown, S., Salinas-Salazar, M.L. and Rodríguez-Gómez, H.M. (2020) El futuro de la evaluación en la educación superior. *RELIEVE* 26 (1), 1–6. <https://doi.org/10.7203/relieve.26.1.17323>.
- Kamrood, A.M., Davoudi, M., Ghaniabadi, S. and Reza Amirian, S.M. (2019) Diagnosing L2 learners' development through online computerized dynamic assessment. *Computer Assisted Language Learning* 34 (1), 1–30. <https://doi.org/10.1080/09588221.2019.1645181>.
- Kang, E.Y. and Han, Z. (2015) The efficacy of written corrective feedback in improving L2 written accuracy: A meta-analysis. *The Modern Language Journal* 99 (1), 1–18. <https://doi.org/10.1111/modl.12189>.

- Kohnke, L. and Moorhouse, B.L. (2022) Facilitating synchronous online language learning through Zoom. *RELC Journal* 53 (1), 296–301. <https://doi.org/10.1177/0033688220937235>.
- Lazar, G. and Ryder, A. (2018) Speaking the same language: Developing a language-aware feedback culture. *Innovations in Education and Teaching International* 55 (2), 143–152. <https://doi.org/10.1080/14703297.2017.1403940>.
- Lv, X., Ren, W. and Xie, Y. (2021) The effects of online feedback on ESL/EFL writing: A meta-analysis. *Asia-Pacific Education Researcher* 30 (6), 643–653. <http://dx.doi.org/10.1007/s40299-021-00594-6>.
- Madaus, G.F. (2004) Ralph W. Tyler's contribution to program evaluation. In M.C. Alkin (ed.) *Evaluation Roots: Tracing Theorist's Views and Influences* (pp. 69–79). Sage.
- Martín Alonso, B. and Martín Leralta, S. (2012) Webcef: Herramienta 2.0 para la evaluación colaborativa del español oral. In C. Hernández González, A. Carrasco Santana and E. Álvarez Ramos (eds) *La red y sus aplicaciones en la enseñanza-aprendizaje del español como lengua extranjera* (pp. 303–313). ASELE/Universidad de Valladolid.
- Mason, B. and Bruning, R. (2001) *Providing Feedback in Computer-Based Instruction: What the Research Tells Us*. Center for Instructional Innovation University of Nebraska-Lincoln. <http://dwb.unl.edu/Edit/MB/MasonBruning.html>.
- Mehrabi-Yazdi, O. (2018) Short communication on the missing dialogic aspect of an automated writing evaluation system in written feedback research. *Journal of Second Language Writing* 41, 92–97. <https://doi.org/10.1016/j.jslw.2018.05.004>.
- Mohamadi, Z. (2018) Comparative effect of online summative and formative assessment on EFL student writing ability. *Studies in Educational Evaluation* 59, 29–40. <https://doi.org/10.1016/j.stueduc.2018.02.003>.
- Muñoz-Basols, J., Neville, C., Lafford, B.A. and Godev, C. (2023) Potentialities of applied translation for language learning in the era of artificial intelligence. *Hispania* 106 (2), 171–194. <https://doi.org/10.1353/hpn.2023.a899427>.
- Nassaji, H. and Kartchava, E. (2017) *Corrective Feedback in Second Language Teaching and Learning: Research, Theory, Applications, Implications*. Routledge.
- Nicol, D., Thomson, A. and Breslin, C. (2014) Rethinking feedback practices in higher education: A peer review perspective. *Assessment & Evaluation in Higher Education* 39 (1), 102–122. <https://doi.org/10.1080/02602938.2013.795518>.
- Ocaña Fernández, Y., Valenzuela Fernández, L.A. and Garro Aburto, L.L. (2019) Inteligencia artificial y sus implicaciones en la educación superior. *Propósitos y Representaciones* 7 (2), 536–568.
- O'Neill, R. and Russell, A. (2019) Stop! Grammar time: University students' perceptions of the automated feedback program *Grammarly*. *Australasian Journal of Educational Technology* 35 (1), 42–56. <https://doi.org/10.14742/ajet.3795>.
- Pastor Cesteros, S. (2003) La evaluación del proceso de aprendizaje de segundas lenguas. In M.V. Reyzábal Rodríguez (ed.) *Perspectivas teóricas y metodológicas: Lengua de acogida, educación intercultural y contextos inclusivos* (pp. 503–514). Community of Madrid.
- Poehner, M.E. and Lantolf, J.P. (2013) Bringing the ZPD into the equation: Capturing L2 development during computerized dynamic assessment (C-DA). *Language Teaching Research* 17 (3), 323–342. <https://doi.org/10.1177/1362168813482935>.
- Poehner, M.E., Zhang, J. and Lu, X. (2015) Computerized dynamic assessment (C-DA): Diagnosing L2 development according to learner responsiveness to mediation. *Language Testing* 32 (3), 337–321. <https://doi.org/10.1177/0265532214560390>.
- Puig, F. (2008) *El Marco común europeo de referencia, el Portfolio de las lenguas y la evaluación en el aula*. *marcoELE* 7, 78–91.
- Rassaei, E. (2019) Computer-mediated text-based and audio-based corrective feedback, perceptual style and L2 development. *System* 82, 97–110. <https://doi.org/10.1016/j.system.2019.03.004>.
- Rodríguez-Gómez, G. and Ibarra-Sáiz, M.S. (2015) Assessment as learning and empowerment: Towards sustainable learning in higher education. In M. Peris-Ortiz

- and J.M. Merigó Lindahl (eds) *Sustainable Learning in Higher Education. Developing Competencies for the Global Marketplace* (pp. 1–20). Springer.
- Rowe, A.D. (2017) Feelings about feedback: The role of emotions in assessment for learning. In D. Carless, S.M. Bridges, C.K.Y. Chan and R. Glofcheski (eds) *Scaling up Assessment for Learning in Higher Education* (pp. 159–172). Springer.
- Ryan, T., Henderson, M. and Phillips, M. (2019) Feedback modes matter: Comparing student perceptions of digital and non-digital feedback modes in higher education. *British Journal of Educational Technology* 50 (3), 1507–1523. <https://doi.org/10.1111/bjet.12749>.
- Shintani, N. (2016) The effects of computer-mediated synchronous and asynchronous direct corrective feedback on writing: A case study. *Computer Assisted Language Learning* 29 (3), 517–538. <https://doi.org/10.1080/09588221.2014.993400>.
- Shintani, N. and Aubrey, S. (2016) The effectiveness of synchronous and asynchronous written corrective feedback on grammatical accuracy in a computer-mediated environment. *The Modern Language Journal* 100 (1), 296–319. <https://doi.org/10.1111/modl.12317>.
- Shute, V.J. (2008) Focus on formative feedback. *Review of Educational Research* 78, 153–189. <https://doi.org/10.3102/0034654307313795>.
- Storch, N. (2010) Critical feedback on written corrective feedback. *International Journal of English Studies* 10 (2), 29–46. <https://doi.org/10.6018/ijes/2010/2/119181>.
- Storch, N. (2017) Peer corrective feedback in computer-mediated collaborative writing. In H. Nassaji and E. Kartchava (eds) *Corrective Feedback in Second Language Teaching and Learning* (pp. 66–79). Routledge.
- Stufflebeam, D. and Zhang, G. (2017) *The CIPP Evaluation Model*. Guilford Press.
- Susnjak, T. (2022) ChatGPT: The end on online exam integrity? <https://doi.org/10.48550/arXiv.2212.09292>.
- Van Beuningen, C. (2010) Corrective feedback in L2 writing: Theoretical perspectives, empirical insights, and future directions. *International Journal of English Studies* 10 (2), 1–27. <https://doi.org/10.6018/ijes/2010/2/119171>.
- Van Beuningen, C., de Jong, N.H. and Kuiken, F. (2008) The effects of direct and indirect corrective feedback on second language learners' written accuracy. *International Review of Applied Linguistics* 156, 279–296.
- Van Der Kleij, F.M., Feskens, R. and Eggen, T. (2015) Effects of feedback in a computer-based learning environment on student's learning outcomes: A meta-analysis. *Review of Educational Research* 85 (4), 475–511. <https://doi.org/10.3102/0034654314564881>.
- Xu, Q. and Yu, S. (2018) An action research on computer-mediated communication (CMC) peer feedback in an EFL writing context. *The Asia-Pacific Education Researcher* 27 (3), 207–216. <https://doi.org/10.1007/s40299-018-0379-0>.
- Zhang, J. and Lu, X. (2019) Measuring and supporting second language development using computerized dynamic assessment. *Language and Sociocultural Theory* 6 (1), 92–115. <https://doi.org/10.1558/lst.31710>.
- Ziegler, N. (2016) Synchronous computer-mediated communication and interaction. A meta-analysis. *Studies in Second Language Acquisition* 38 (3), 553–586. <https://doi.org/10.1017/S027226311500025X>.

Part 3
Implementing Technology
Resources

9 Hybrid and Online Teaching and the Flipped Classroom

Robert Blake, Lillian Jones and Cory Osburn

9.1 Types of Resources and Characteristics

Traditionally, a large proportion of educators perceived technology-mediated language teaching as a deficient practice when compared to the learning experience in a face-to-face classroom setting (Blake, 2013: 137–138; Conrad, 2004; Mercader & Gairín, 2020). However, the 2020 pandemic brought about a very different reality: the teaching profession did not question the effectiveness of virtual language teaching but, rather, made instrumental use of this medium, with its multiple challenges and imperfections, to move forward. Despite this experience, we still lack sufficient guidelines and frameworks that allow for a comprehensive, or even partial, use of technology, especially considering that language instructors need to rely on digital tools for their daily tasks. Therefore, this chapter aims to provide an overview of how to make the most of digital environments, serving as a guide for teaching professionals.

As a starting point, it is useful to **consider three general questions**:

- (1) What goals are pursued when teaching an L2, regardless of the format?
- (2) What resources do learners and technology contribute to the learning process?
- (3) What is the most appropriate way to teach online in order to meet the objectives established for a given course?

To answer the **first question** – What goals are pursued when teaching an L2, regardless of the format? – it is helpful to refer to the ideas put forth by Laurillard (2002: 23), since they highlight the importance of viewing teaching as a **rhetorical activity** that encourages learners to change their perception of the world based on formal and experiential

knowledge acquisition. These principles are strikingly reminiscent of Dewey's educational philosophy (1938) and his concept of 'learning by doing'; in other words, something very akin to task-based teaching (Willis & Willis, 2007). In the field of second language acquisition (SLA), this **interactionist approach** (e.g. Gass, 1997; Long, 1981; Long & Robinson, 1998; Mackey *et al.*, 2012) emphasizes the importance of exchanges between learners and native speakers that stimulate language development through an active, dialectal and transformative process. This way, **experiential knowledge**, as discussed by Laurillard (2002), is expanded by communicating in the language (learning by doing) and interacting with other speakers. It is, therefore, a process that gradually incorporates **formal knowledge** (new structures) through **experiential knowledge** (task-based practice) into the classroom environment.

Regarding the **second question** – What resources do learners and technology contribute to the learning process? – designing any technology-mediated language course requires the **strategic consideration of two aspects**: the **human** aspect and the **technological** aspect. The human aspect of all learners contributes **six inherent features** that guide the learning process and, consequently, are directly related to the design of an online course (Blake & Guillén, 2020):

- (1) *homo loquens*: we are born to speak languages and knowledge reaches us through this skill, whether in our L1 or L2;
- (2) *homo analyticus*: we analyze our experiences with the world both implicitly, without realizing it, and explicitly through rules, formulae, models, analyses and explanations;
- (3) *homo socius*: we are social beings and live by interacting with each other;
- (4) *homo faber*: we use tools to interact with the world and acquire new experiences;
- (5) *homo ludens*: play is an important and everyday part of behavior; and
- (6) *homo fabulans*: we establish and express our identity by (re)telling and listening to stories.

Homo fabulans is the main feature in the context of language teaching. Once the learner is capable of fluently articulating and narrating their personal and professional stories (as well as conversing with other speakers), linguistic expression becomes part of their experiential foundation and, subsequently, determines a new **multilingual identity** (Kramsch, 2009). In fact, this should be the primary goal in any L2 course: getting the learner to tell their own stories fluently, in their own words, as well as to participate in other speakers' narratives actively and critically. Telling stories always requires considering the intended audience and adjusting communication accordingly, with all

the linguistic, pragmatic, cultural and, therefore, cognitive implications that come with this task. In this way, **formal knowledge** of the L2 merges with the speaker's own practices, as per the process outlined by Laurillard (2002).

Regarding the **technological** aspect of question (2), the available resources depend on the type of course being designed. Various words can be used to describe the different digital formats (e.g. virtual, distance, asynchronous, synchronous, blended, hybrid and flipped classroom, among others). In fact, it is interesting to note that there is no consensus on the exact meaning of each term (Blake, 2013: 131–134; Blake & Guillén, 2020: 15–17), with 'blended', 'hybrid' and 'flipped classroom' being particularly difficult to distinguish. This is because they all refer to a mix of in-person and virtual teaching, essentially making for a combined learning model (Picciano *et al.*, 2014).

Regarding the **third question** – What is the most appropriate way to teach online in order to meet the objectives established for a given course? – it is necessary to consider how *homo faber* makes use of the computer as a learning tool; that is, whether computer-assisted language learning (CALL) takes place or whether it is simply used as a means to connect with other speakers. This affects the way in which the virtual language learning process unfolds. The term **tutorial CALL** is used to describe situations where the **learner interacts independently with the materials**, while **social CALL** (Blake, 2018) refers to situations in which **computers are used as a means to connect with other speakers**.

It is also essential always to consider the different interaction modalities: **synchronous** and **asynchronous**. Although synchronous interactions, such as videoconferences via platforms such as *Zoom*, *Skype*, *Teams* or *Connect*, are associated with *homo socius* since they provide personal contact, asynchronous activities make it possible to organize learning with more flexibility, generating less anxiety in the context of virtual learning (see van der Zwaard & Bannink, 2014). As is to be expected, each tool and modality offers a range of benefits and disadvantages that vary greatly depending on the specific circumstances and curriculum design (see Chapters 7 and 12 of this book).

9.2 State of the Art

While it is possible to track how the use of digital tools has evolved (Blake, 2013: 49–54; Blake & Guillén, 2020: 109; Kern & Warschauer, 2000), illustrating the evolution of online language teaching proves to be challenging. Before 2020, there were few online L2 courses available, and hardly any studies had been conducted to assess the effectiveness, successes and needs of the various virtual teaching formats (Blake, 2011; Nicolson *et al.*, 2011). However, several general characteristics of online courses can be described from a pedagogical perspective.

Broadly speaking, **tutorial CALL** is often used to promote learning of the more formal, structural aspects of an L2, therefore activating *homo analyticus*. On the other hand, **social CALL** fosters communication and better satisfies the needs of *homo socius*. Both approaches complement each other and provide essential components for an online course.

From a historical perspective, in the early days of online teaching in the 1960s, asynchronous activities were fundamental to courses. One example of this is the groundbreaking PLATO (Programmed Logic/Learning for Automated Teaching Operations) project at the University of Illinois (Blake, 2013: 50). Essentially, it was a computer program that offered users various activities to learn vocabulary and grammar through translation exercises. In fact, PLATO offered more than 70 hours of activities for learners, corrective and diagnostic feedback, as well as a grammar and spellchecker (Blake & Guillén, 2020).

Throughout the 1980s, the field of technology-mediated learning experienced remarkable growth thanks to the popularization of personal computers. From a technical point of view, the concept of hypertext and the organization of multimedia materials in a nonlinear manner were developed, not only within the framework of computer-assisted instruction (CAI) but also based on the creation of resources known as **CALL** (Blake & Guillén, 2020) or **TELL** (technology-enhanced language learning; Román-Mendoza, 2018). More recently, one of the most significant developments in the field of online language teaching has been the combination of **social CALL** and synchronous learning (Yanguas, 2010; Ziegler, 2016).

Early experiments with virtual classes often included the terms *distance teaching* or *asynchronous learning networks*. They mainly consisted of asynchronous activities and tutorials, often involving telephone conversations and the mailing of materials (Mayadas, 1997). Nowadays, massive open online courses (MOOCs) are perhaps the closest equivalent to this model, since they are typically asynchronous and, as their name suggests, cater to an unlimited number of participants. The term ‘distance’ is harder to define today in the context of widespread global connectivity.

Interactionist researchers, such as Long (1981) and Long and Robinson (1998), among others, have criticized this format. They believed that the exercises, often mechanical and of a ‘drill and kill’ nature, which were frequently included in **tutorial CALL**, placed too much emphasis on formal linguistic aspects (e.g. verbal morphology), instead of focusing on understanding the message and other communicative functions. For a long time, this negative perception of **tutorial CALL** led many educators to disregard distance learning courses as an equivalent to in-person programs and, therefore, as an appropriate learning opportunity (see Hubbard & Bradin Siskin, 2004, for an analysis supporting **tutorial CALL**). However, nowadays, its role within

the overall framework of online courses is well recognized (Hubbard & Bradin Siskin, 2004). Learners need to practice new structures (DeKeyser, 2005), and especially new forms, without having to struggle with the cognitive burden demanded by spontaneous communication. Further down the line, in small group chats (see section 9.3.6), there will be plenty of opportunities to use this new content and its corresponding vocabulary in a more natural and communicative way, integrating them into the learners' expressive practice as storytellers or *homo fabulans*.

Conversely, hybrid or blended language courses have always been more widely accepted since they involve a synchronous, in-person component. Allen and Seaman (2010, 2014) praise this format as offering the best of both worlds: face-to-face human contact (*homo socius*), which serves as motivation for many learners (Arispe & Blake, 2012), and all the technological advantages and online resources that **tutorial CALL** can provide.

The **flipped classroom** format, which is related to hybrid teaching, has emerged as a curriculum innovation, despite the relative lack of studies that analyze the extent of its effectiveness for learning (Bishop & Verleger, 2013; Jia *et al.*, 2021). Within the **flipped classroom** model, the idea is for course materials and selected exercises to be sent to learners through various digital platforms outside the classroom, with the expectation that they will study this content before class. These materials may be provided through videos, pre-recorded digital presentations, lectures or other digital resources that cover the vocabulary and grammar content to be worked on. The learner then studies this formal content at home through the learning management system (LMS) or virtual learning environment (VLE) and attends class ready to participate actively. Therefore, the **flipped classroom** concept requires learners to first familiarize themselves with class materials (e.g. explicit grammar explanations and repetitive practice of linguistic forms) and then to prioritize communication and the application of this content during class. In other words, the **flipped classroom** model seeks to free the instructor from the burden of having to present all the **formal content** in order to be able to prioritize communication with learners during contact hours.

In fact, both the autonomous processing – whether active or passive – of new linguistic forms as well as the communicative classroom activities are part of an integral process for learning an L2. Both components complement each other because some cognitive consolidation of phonetics and morphology is necessary before producing what Swain (2000) calls **forced output**, which occurs in communicative exchanges, whether digital or face-to-face. Learners, as *homo analyticus*, benefit from both presentation methods: the explicit analysis provided by the instructor and the **tutorial CALL** materials (Norris & Ortega, 2000). L2 learners do not have the same amount and

level of exposure to the language as an L1 speaker during childhood. Therefore, they need help when it comes to noticing certain linguistic aspects, which favors **explicit instruction**. The act of **noticing new structures** (see Schmidt, 1990) is particularly important. Consequently, the design of an online course should take advantage of the dual capacity of *homo analyticus* through both the explicit and implicit presentation of material.

Ultimately, online language teaching is neither defined by the use of specific tools nor by reliance on a single modality. The idea is to consistently use the most engaging aspects of the digital environment, combined with tasks, activities, grammar presentations, and exercises to practice new vocabulary. Learners should also be offered a wide range of opportunities to interact in the L2 (Hampel, 2006), driven by their great desire to be both *homo fabulans* and *homo socius*. In this way, learners can gradually improve their skills by benefiting from both **tutorial** and **social CALL** (Blake & Guillén, 2020: 17).

9.3 Research, Curriculum Design and Teaching Practices

9.3.1 Virtual group/class meetings

The principles that guide a well-designed in-person class can also serve to inform the development of an online one, although the two formats may not be entirely equivalent (Blake & Shiri, 2012: 230–231). It is evident that a non-interactive and uninspiring class, even with the addition of technology, remains ineffective, especially if the digital tools used are not conducive to the learning process. Technology can have a **positive impact** on learners' attitudes and participation levels, but educational success requires more than just its presence in the curriculum (Chun, 2016: 104; Felix, 2008: 154; Gironzetti *et al.*, 2020).

With this in mind, it is useful to analyze certain aspects of **online synchronous classes**. For instance, in a videoconference involving both the instructor and learners in a course, the **chat** feature can be used (or a separate Google document opened alongside the videoconference) to encourage learners to take part in a brainstorming activity without interrupting the flow of the presentation. This allows for the collection of observations, reactions and questions, or for the assessment of understanding. Managing learners' comments while maintaining the flow of the class may not only pose a challenge for the instructor but also the learners themselves. This skill can only be acquired through practice, but efficient use compensates for the learning curve, as it can help to increase learners' interest. This is particularly important because, ultimately, they play a role in guiding the synchronous class with their own questions and comments. Doing the same in a face-to-face classroom setting is much more challenging: these interventions

can disrupt the flow of the class and even lead to friction and awkward moments among participants (Chun, 2016: 99–100).

From the instructor's point of view, **managing a synchronous class** is no easy task, since, among other aspects, it requires them (1) to focus their attention, through the screen, on the learners who are speaking; (2) to tend to the chat; (3) to check whether someone has virtually raised their hand; and (4) to keep an eye on participants who are not paying attention. These skills require specific training and technical support at the institutional level.

Once the instructor is familiar with the videoconferencing environment, they can incorporate other tools, such as those for conducting **surveys**. These tools have the potential to transform the virtual classroom into a more interactive space. Similarly, online word processors can serve as an open and shared **virtual whiteboard** or a collaborative writing space, where each participant can contribute information, ask questions or leave comments. All these elements provide useful information for the instructor that can later be analyzed as a class. This creates an environment where the learners are the ones to produce the 'raw material' that feeds the class, making their contribution to a constructive dialogue about learning clear and significantly reducing anxiety levels (see Chapter 8 of this book). These functions are already integrated into many platforms, which greatly facilitates their use. If the instructor decides to use these types of tools, it is important to adapt them to the class in question and to schedule an adjustment period for the learners to get accustomed to using them, as with any other tool that is incorporated into teaching.

The synchronous modality also offers the opportunity to use authentic materials and texts (e.g. pictures as visual stimuli, videos, songs, etc.) via the screen sharing function (Chun, 2016: 101). Learners can write and draw on the screen, depending on each activity's requirements, in turn promoting engagement. When the instructor encourages the learners to make notes on the shared screen, the information they provide reveals what they know and what aspects they notice. This technique also increases interaction during online classes (see Chapter 7 of this book).

If the session is recorded, the content can be used as an additional support resource. This makes it possible to present the content in a repeated and spaced manner (Fariás *et al.*, 2014: 23; Hulstijn, 2003; Xu, 2016: 119), while also allowing the instructor to build a solid foundation, serving as a useful repository to showcase successful past experiences to learners and support vicarious students (Pleines, 2020).

9.3.2 Tutorial CALL for vocabulary

Recently, lexical knowledge has become a focal point in theoretical frameworks in the field of language acquisition, with a special emphasis

on the use of lexical chunks, such as collocations or idiomatic and formulaic language (Ellis, 2016; Higuera & Pérez-Serrano, 2017; Wood, 2010). Nation (2006) and Schmitt and Schmitt (2014) estimate that advanced learners should know between 3000 and 5000 of the most commonly used words. Indeed, this is a difficult goal to achieve in just two or three years of study (Blake, 2020). Schmitt (2010) highlights the importance of being exposed to a new word between 6 and 12 times for it to become ingrained in one's memory. Schütze (2017) suggests teaching vocabulary accompanied by sounds, pictures, anecdotes and emotional connections using spaced repetition.

Tutorial CALL is a particularly suitable resource for teaching vocabulary, since it facilitates the agile combination of associative elements in a multimedia format, in a spaced and repetitive manner (Nation, 2021). However, FL/L2 instructors should keep in mind that learners need this kind of explicit practice not only in the first year but also throughout the acquisition process (Blake, 2020; Schmitt, 2010; Webb & Nation, 2017). Simply telling learners to study and memorize word lists at home is not enough: they also need to practice them with exercises and then use them in oral and written communicative activities to ensure long-term retention.

In the case of Spanish, for example, there are plenty of digital tools for learning vocabulary (Cruz Piñol, 2015), ranging from the use of digital corpora to online applications that also provide possible usage contexts (Abad Castelló & Álvarez Baz, 2021). In the online language courses at the University of California, Davis, since 2013, vocabulary has been taught using a template designed with the *Adobe Captivate* program, including definitions, pictures, sounds, and activities that require learners to type out the new words.

When teaching vocabulary, it is also essential to incorporate new words systematically across all digital activities in the online course, that is, the chats, video recordings and writing tasks used for a specific topic during a lesson.

9.3.3 Tutorial CALL for grammar and the flipped classroom

In a language course today, whether face-to-face or online, the traditional lecture format for teaching grammar, accompanied by translation exercises, does not meet all the learners' needs. However, placing little emphasis on grammar, as suggested by Krashen and Terrell (1983) in the **natural approach**, implies disregarding topics and skills inherent to L2 learning. Therefore, explicit explanations about how the language works are indeed relevant for an online L2 course. In fact, researchers have settled the issue: grammar explanations can be highly beneficial for language learning (DeKeyser, 1998; Norris & Ortega, 2000), especially if they are brief, precise, clear and straightforward

(MacWhinney, 1997), since learners already have to focus on these new structures as well as vocabulary.

The concept of the **flipped classroom** (Turan & Akdag-Cimen, 2020) stems from recognizing the importance of providing learners with the course materials – for example, grammar explanations – so that they can review and study them before class. Through pre-recorded video explanations, the **flipped classroom** model supports dedicating more in-person or synchronous classroom time to communicative activities that put the acquired knowledge into practice. The presentation of grammar topics in technology-mediated environments also allows learners to review the content whenever they like. For example, online Spanish courses within the University of California system (Blake & Zyzik, 2016: 143) feature the following components for each grammar topic:

- (1) graphs or tables that clearly expose the topic's formal aspects, where key points are highlighted using different colors to help learners focus on the most important information;
- (2) explanations that complement the tables and graphs;
- (3) a video, featuring the instructor or someone else, highlighting only the main content, leaving the details for written explanations or synchronous interactions;
- (4) audio recordings that emphasize information about the topic from a contrastive point of view;
- (5) follow-up tasks focused on the topic and vocabulary for that lesson, with self-correction to facilitate this learning stage.

In the **flipped classroom** approach to presenting grammar topics, it is essential to pace the information provided. Therefore, it is also worth noting that crafting brief, precise and clear explanations is no easy task, since the instructor must focus on the most important aspects depending on the learners' level, saving more subtle linguistic details for the synchronous session.

9.3.4 Tutorial CALL for teaching culture

The use of the flipped classroom model is not only limited to grammar topics but also extends to teaching cultural themes. In the **flipped classroom** approach, the predominant use of multimedia presentations is accompanied by a wide range of interactive activities and/or short writing tasks, enhancing both written and oral comprehension skills. Furthermore, plenty of authentic materials of all types and difficulty levels can be found online, covering a wide range of topics from general overviews up to current events. These resources can be collected over time and integrated into the curriculum.

Even so, it is important to avoid reading these materials in a traditional manner, that is, simply decoding the written content. This

is because reading, broadly speaking, also involves deciphering the language conveyed through images and videos (Kern & Develotte, 2018), as well as through any other multimodal components. The challenge for L2 learners lies in interpreting both the literary and cultural conventions of the language. This means that the learner must understand the pragmatic norms expressed by the set of texts, in addition to the images presented with or without linguistic support. This is what Kramsch (2011) calls developing a new **symbolic competence**: that is, being able to interpret the cultural symbols commonly used within the L2 community. For instance, the mental representation of the Spanish verb *pasear* in English ('to walk'; 'to stroll') is not fully equivalent. While in English it is more commonly associated with the idea of exercising, in Spanish *pasear* describes more of a social activity.

There are tools available to support language instructors when it comes to presenting cultural and pragmatic content (see Blyth & Sykes, 2020). YouTube is perhaps the most accessible and up-to-date digital resource, not only due to the sheer volume of topics available on this platform but also because learners can upload their own videos. The platform also provides the option to automatically add subtitles to a video created by a learner and then store it on their account. Videos can also be used as informal learning tools and, therefore, as a strategy for language exposure and listening comprehension practice (Winke *et al.*, 2010).

Annotations can be added to any video via applications that allow users to insert pauses, questions, comments, glosses and comprehension checks, making the experience much more interactive and boosting learning. Some programs even allow users to look up unknown words while reading online and automatically generate flashcards based on previous searches.

Blyth (2013) also recommends reading digital texts collaboratively using the *eComma* platform. Each learner contributes by typing comments in the margin of the text, where they can discuss, ask questions and voice opinions about their interpretations, aiming to form a small community of readers.

The list of tools available to language instructors will surely continue to expand and evolve rapidly with the emergence of new technological innovations, pedagogical ideas and a greater presence of artificial intelligence in the educational sector (see Chapter 13 of this book). Educators must adapt to these changes with the support of their institution, their colleagues and the learners themselves, all of whom play a crucial role in using technology in education effectively.

9.3.5 Video recordings

Many smartphone users watch and even create personal videos on a daily basis. Without a doubt, these devices already have a direct impact

on informal learning due to their ease of use and the wide range of opportunities they offer for language exposure. Additionally, there are many free platforms for creating and editing videos, and certain learning environments even offer similar tools directly.

Multimodal content, such as videos, can offer many opportunities to practice the language through producing multimedia output, including text, music, audio recordings and physical movement (see Chapter 11 of this book). This digital activity can be either individual or collaborative. If carried out collaboratively, there would need to be a communicative exchange between the participants regarding aspects such as the topic, the script, the vocabulary, the pictures and the *mise-en-scène*. Unlike with other types of technology, it may be the case that many learners are already skilled users of such devices, meaning that the instructor can dedicate more time to planning and achieving learning objectives.

If grammar and vocabulary use is well planned as part of the video recording task, the learners are likely to communicate in the target language during the production process, therefore fulfilling their desire to be *homo fabulans*. The instructor can intervene in the process by, for instance, reviewing the script beforehand to provide corrections and suggest useful phrases, or by leveraging mistakes as a tool to diagnose the learners' needs and draw attention to specific linguistic aspects.

In this way, integrating video production into the language learning process can stimulate not only individual output but also interactions in the L2 when working collaboratively. As Swain (2000: 99) points out, forced output combines the stage of understanding semantics and vocabulary with the syntactically accurate expression of ideas. The reception of this output provokes a series of reactions from the listeners, which then turn into feedback and new input to foster the development of the learners' budding linguistic abilities. In other words, video recordings become a beneficial communicative act, without provoking the anxiety that live conversations may cause (see Chapter 6 of this book).

Additionally, video production requires learners to strike a balance between linguistic accuracy and complexity. As noted by Skehan (1998, 2003) in his **trade-off hypothesis**, learners grapple with these two inversely related concepts: accuracy is easy with simple constructions but difficult to achieve with more complex ones. With their still limited proficiency in the L2, learners cannot, cognitively speaking, achieve high levels of both these qualities by themselves. However, in contrast to Skehan (1998, 2003), Robinson (2011) believes that certain tasks can stimulate both accuracy and complexity, as long as the pedagogical design and different stages of the project are well thought out and organized.

Producing a video in an L2, especially when done collaboratively, encourages learners to focus on accuracy without losing sight of the

complexity of their message or the story they want to tell. The idea is to choose a story, appropriate vocabulary, grammar structures that facilitate communication, lexical collocations that bring the script to life, correct pronunciation, gestures and other communicative components for each scene. Finally, learners must also decide what pictures and cultural objects to use to support the scene. Before recording the final version of the video, the learners should rehearse the script several times (an effective scaffolding strategy for language learning). Video production also allows learners to experiment with different text genres, since they can record short plays, advertisements, interviews, news reports, weekly videoblogs, transcriptions and even subtitles for YouTube or live stories via social media.

Ultimately, encouraging learners to produce videos, especially as part of a collaborative task-based project, brings together multiple aspects that are ideal, pedagogically speaking, for language development in a social context that resembles a fun, playful activity. In other words, this draws from the potential offered by *homo ludens* and *homo socius*.

9.3.6 Small-group chats

Small-group chats through platforms such as *Zoom* are fundamental to online courses. This is because they give learners the chance to synchronously practice and develop their written, oral and comprehension skills. That said, it is important to keep in mind that certain activities, such as **gap tasks**, may end up feeling more intense in a small-group chat session than in a face-to-face classroom setting, in that it is harder to not participate (Morris & Blake, 2022). Similarly, any questions sent via the chat function must be answered promptly before continuing the conversation. As a result, participants provide each other with mutual feedback (Fuente, 2003: 47–50; Leiser, 2008: 214–215; Schütze & Weimer-Stuckmann, 2011: 461). Depending on the type of activity, the instructor can decide whether they wish to guide the learners or not, since they are the ones actively interacting during the knowledge exchange.

9.3.7 Digital writing

Every human being, as a *homo fabulans*, feels a strong emotional connection to their personal stories which, in turn, promotes linguistic development in a language course (see Chapter 11 of this book). Elola and Oskoz (2017, 2019) note that digital writing genres (e.g. blogging or online diaries) serve as suitable settings for self-expression and the exploration of a new **multilingual identity** (Huhtala & Lehti-Eklund, 2010; Kramsch, 2006; Oskoz & Elola, 2018). Some activities to integrate writing into an online course may involve:

- designing peer review workshops through videoconferencing platforms;
- facilitating collaborative writing in small or large groups, both synchronously and asynchronously, using online word processors;
- maintaining discussion forums, anonymous or not, through a virtual learning environment;
- designing tasks for learners to create scripts or subtitles for multimedia content.

9.4 Conclusion and Future Lines of Research

Online FL/L2 courses generally take place both synchronously and asynchronously and must include a combination of **social CALL** and **tutorial CALL**. Furthermore, as outlined in this chapter, the success of any online or hybrid teaching effort greatly depends on the competence, creativity and capability of the instructor when it comes to designing tasks that foster interactions in the target language. In this regard, one learns to design meaningful tasks through experience, as well as by observing other instructors at work. When reviewing the aspects that remain to be researched within the framework of virtual environments, online teaching and the flipped classroom approach, the **following questions** come to mind:

- What are the benefits of **presenting vocabulary through multimedia formats** when it comes to fostering retention?
- What are the advantages of teaching grammar through **spaced learning**?
- In synchronous classes, how should **learner correction** be handled (Yilmaz, 2012; Ziegler, 2018)?
- How does digital writing contribute to the creation of a **multilingual identity**?
- How can **videogames** (Peterson, 2013) and **virtual reality** (see Thorne *et al.*, 2021) be integrated into FL/L2 curricula (see Chapter 12 of this book)?

The constant innovation affecting digital tools will surely inspire new research topics related to virtual teaching. In practice, the different formats available, whether in-person or digital, share the same pedagogical goals. As noted by Laurillard (2002), the instructor is responsible for creating an online course that prepares the learner to integrate both **experiential** and **formal knowledge**. Therefore, the curriculum must consider both the learners' experiences as well as the distinctive aspects of the new language. Every learner aspires to be a *homo fabulans*, that is, a **multilingual storyteller**, in their L2. Fortunately, there is no single way to set up an online FL/L2 course: rather, there are multiple paths, each mediated through experience.

9.5 Annotated Additional Reading

Cro, M.A. (2020) *Integrating the Digital Humanities into the Second Language Classroom*. Georgetown University Press.

This work focuses on several relatively unexplored areas, including the implementation of multimedia practices in the multicultural classroom. Questions regarding cultural competence are addressed alongside topics such as the relative effectiveness of strategies for integrating technology-mediated learning.

Hinkelman, D. (2018) *Blending Technologies in Second Language Classrooms* (2nd edn). Palgrave Macmillan.

This book presents an overview of the history of CALL and the hybrid learning paradigm. Topics such as the evolution of technology-mediated teaching, the metaphors that underpin it, as well as its principles and consequences are analyzed alongside an assessment of the current need to develop digital competence.

References

- Abad Castelló, M. and Álvarez Baz, A. (2021) Aprendizaje basado en datos en español como lengua extranjera: Ampliando el ámbito. *RILE* 16, 1–20. <https://doi.org/10.17345/rile16.3262>.
- Allen, I.E. and Seaman, J. (2010) *Learning on Demand: Online Education in the United States*. Babson Survey Research Group.
- Allen, I.E. and Seaman, J. (2014) *Grade Change: Online Education in the United States*. Babson Survey Research Group.
- Arispe, K. and Blake, R. (2012) Individual factors and successful learning in a hybrid course. *System* 40 (3), 449–465. <https://doi.org/10.1016/j.system.2012.10.013>.
- Bishop, J.I. and Verleger, M.A. (2013) The flipped classroom: A survey of the research. Paper presented at the 2013 American Society for Engineering Education Annual Conference and Exposition, 23–26 June, Atlanta, Georgia. <https://peer.asee.org/the-flipped-classroom-a-survey-of-the-research>.
- Blake, R. (2011) Current trends in online language learning. *Annual Review of Applied Linguistics* 31, 19–35. <https://doi.org/10.1017/S026719051100002X>.
- Blake, R. (2013) *Brave New Digital Classroom: Technology and Foreign Language Learning* (2nd edn). Georgetown University Press.
- Blake, R. (2018) La ELAO en el marco del enfoque por tareas. *Círculo de Lingüística Aplicada a la Comunicación* 76, 67–80. <http://dx.doi.org/10.5209/CLAC.62498>.
- Blake, R. (2020) Vocabulary and the upper-division language curriculum: The case of non-native and heritage Spanish majors. *L2 Journal* 12 (3), 43–60. <https://doi.org/10.5070/L20048986>.
- Blake, R.J. and Shiri, S. (2012) Online Arabic language learning: What happens after? *L2 Journal* 4 (2), 230–246. <https://doi.org/10.5070/L24212462>.
- Blake, R.J. and Zyzik, E. (2016) *El español y la lingüística aplicada*. Georgetown University Press.
- Blake, R.J. and Guillén, G. (2020) *Brave New Digital Classroom: Technology and Foreign Language Learning* (3rd edn). Georgetown University Press.
- Blyth, C. (2013) *eComma*: An open source tool for collaborative L2 reading. In A. Beaven, A. Comas-Quinn and B. Sawhill (eds) *Case Studies of Openness in the Language Classroom* (pp. 32–42). Research-publishing.
- Blyth, C. and Sykes, J. (2020) Technology-enhanced L2 instructional pragmatics. *Language Learning & Technology* 24 (2), 1–7. <http://hdl.handle.net/10125/44718>.
- Chun, D.M. (2016) The role of technology in SLA research. *Language Learning & Technology* 20 (2), 98–115. <https://doi.org/10125/44463>.
- Conrad, D. (2004) University instructors' reflections on their first online teaching experiences. *Journal of Asynchronous Learning Networks* 8 (2), 31–44. <https://doi.org/10.24059/olj.v8i2.1826>.

- Cruz Piñol, M. (2015) Léxico y ELE: Enseñanza/aprendizaje con tecnologías. *Journal of Spanish Language Teaching* 2 (2), 165–179. <https://doi.org/10.1080/23247797.2015.1105518>.
- DeKeyser, R.M. (1998) Beyond focus on form: Cognitive perspectives on learning and practicing second language grammar. In C. Doughty and J. Williams (eds) *Focus on Form in Classroom Second Language Acquisition* (pp. 42–63). Cambridge University Press.
- DeKeyser, R.M. (2005) What makes learning second-language grammar difficult? A review of issues. *Language Learning* 55, 1–25. <https://doi.org/10.1111/j.0023-8333.2005.00294.x>.
- Dewey, J. (1938) *Experience & Education*. Kappa Delta Pi.
- Ellis, N. (2016) Frequency in language learning and language change. In H. Behrens and S. Pfänder (eds) *Experience Counts: Frequency Effects in Language* (pp. 239–256). Mouton de Gruyter.
- Elola, I. and Oskoz, A. (2017) Writing with 21st-century social tools in the L2 classroom: New literacies, genres, and writing practices. *Journal of Second Language Writing* 36, 52–60. <https://doi.org/10.1016/j.jslw.2017.04.002>.
- Elola, I. and Oskoz, A. (2019) Writing between the lines: Acquiring writing skills and digital literacies through social tools. In N. Arnold and L. Ducate (eds) *Engaging Language Learners through CALL: From Theory and Research to Informed Practice* (pp. 240–266). Equinox Publishing.
- Farías, M., Orrego, R., Obilinovic, K. and Gregersen, T. (2014) Evaluating types and combinations of multimodal presentations in the retention and transfer of concrete vocabulary in EFL learning. *Revista Signos, Estudios de Lingüística* 84, 21–39. <https://doi.org/10.4067/S0718-09342014000100002>.
- Felix, U. (2008) The unreasonable effectiveness of CALL: What have we learned in two decades of research? *ReCALL* 20 (2), 141–161. <https://doi.org/10.1017/S0958344008000323>.
- Fuente, M. (2003) Is SLA interactionist theory relevant to CALL? A study on the effects of computer-mediated interaction in L2 vocabulary acquisition. *Computer Assisted Language Learning* 16 (1), 47–81. <https://doi.org/10.1076/call.16.1.47.15526>.
- Gass, S. (1997) *Input, Interaction, and the Second Language Learner*. Lawrence Erlbaum.
- Gironzetti, E., Lacorte, M. and Muñoz-Basols, J. (2020) Teacher perceptions and student interaction in online and hybrid university language learning courses. In M. Planelles Almeida, A. Foucart and J. M. Licerias (eds) *Current Perspectives in Language Teaching and Learning in Multicultural Contexts* (pp. 507–539). Thomson Reuters-Aranzadi.
- Hampel, R. (2006) Rethinking task design for the digital age: A framework for language teaching and learning in a synchronous online environment. *ReCALL* 18 (1), 105–121. <https://doi.org/10.1017/S0958344006000711>.
- Higueras, M. and Pérez-Serrano, M. (2017) Nuevas tendencias en la adquisición, enseñanza y aprendizaje de las colocaciones. In C. Ainciburu and C. Fernández Silva (eds) *La adquisición de la Lengua Española: Aprendizaje, enseñanza, evaluación. Estudios en homenaje a Marta Baralo Ottonello*. Autores de Argentina.
- Hinkelmann, D. (2018) *Blending Technologies in Second Language Classrooms* (2nd edn). Palgrave Macmillan.
- Hubbard, P. and Bradin Siskin, C. (2004) Another look at Tutorial CALL. *ReCALL* 16 (2), 448–461. <https://doi.org/10.1017/S0958344004001326>.
- Huhtala, A. and Lehti-Eklund, H. (2010) Writing a new self in the third place: Language students and identity formation. *Pedagogy, Culture & Society* 18 (3), 273–288. <https://doi.org/10.1080/14681366.2010.504647>.
- Hulstijn, J.H. (2003) Incidental and intentional learning. In C.J. Doughty and M.H. Long (eds) *The Handbook of Second Language Acquisition* (pp. 349–381). Blackwell Publishing.
- Jia, C., Hew, K.F., Shurui, B. and Huang, W. (2021) Adaptation of a conventional flipped course to an online flipped format during the Covid-19 pandemic: Student learning performance and engagement. *Journal of Research on Technology in Education*. <https://doi.org/10.1080/15391523.2020.1847220>.

- Kern, R. and Warschauer, M. (2000) Theory and practice of networked-based language teaching. In M. Warschauer and R. Kern (eds) *Network-Based Language Teaching: Concepts and Practice* (pp. 1–19). Cambridge University Press.
- Kern, R. and Develotte, C. (eds) (2018) *Screens and Scenes: Online Multimodal Communication and Intercultural Encounters*. Routledge.
- Kramersch, C. (2006) The multilingual subject. *International Journal of Applied Linguistics* 16 (1), 97–110. <https://doi.org/10.1111/j.1473-4192.2006.00109.x>.
- Kramersch, C. (2009) *The Multilingual Subject: What Foreign Language Students Say About Their Experience and Why It Matters*. Oxford University Press.
- Kramersch, C. (2011) The symbolic dimensions of the intercultural. *Language Teaching* 44, 354–367. <https://doi.org/10.1017/S0261444810000431>.
- Krashen, S. and Terrell, T. (1983) *The Natural Approach: Language Acquisition in the Classroom*. Pergamon Press.
- Laurillard, L. (2002) *Rethinking University Teaching* (2nd edn). Routledge.
- Leeser, M. (2008) Pushed output, noticing, and development of past tense morphology in content-based instruction. *The Canadian Modern Language Review* [La Revue Canadienne Des Langues Vivantes] 65 (2), 195–220. <https://doi.org/10.3138/cmlr.65.2.195>.
- Long, M.H. (1981) Input, interaction and second language acquisition. In H. Winitz (ed.) *Native Language and Foreign Language Acquisition* (pp. 259–278). Annals of the New York Academy of Science.
- Long, M.H. and Robinson, P. (1998) Focus on form: Theory, research, and practice. In C. Doughty and J. Williams (eds) *Focus on Form in Classroom Second Language Acquisition* (pp. 15–41). Cambridge University Press.
- Mackey, A., Abbuhl, R. and Gass, S.M. (2012) Interactionist approaches. In S.M. Gass and A. Mackey (eds) *The Routledge Handbook of Second Language Acquisition* (pp. 7–23). Routledge.
- MacWhinney, B. (1997) Implicit or explicit processes. *Studies in Second Language Acquisition* 19, 277–281. <http://www.jstor.org/stable/44488686>.
- Mayadas, F. (1997) Asynchronous learning networks: A Sloan Foundation perspective. *Journal of Asynchronous Learning Networks* 1 (1), 1–16. <https://doi.org/10.24059/olj.v1i1.1941>.
- Mercader, C. and Gairín, J. (2020) University teachers' perception of barriers to the use of digital technologies: The importance of the academic discipline. *International Journal of Educational Technology in Higher Education* 17 (4). <https://doi.org/10.1186/s41239-020-0182-x>.
- Morris, K. and Blake, R. (2022) Harnessing CMC to foster L2 oral communication. In M. González-Lloret and N. Ziegler (eds) *The Routledge Handbook of SLA and Technology* (pp. 148–160). Routledge. <https://doi.org/10.4324/9781351117586-14>.
- Nation, P. (2006) How large a Vocabulary is needed for reading and listening? *The Canadian Modern Language Review* [La Revue Canadienne Des Langues Vivantes] 63 (1), 59–82. <https://doi.org/10.24059/olj.v1i1.1941>.
- Nation, P. (2021) Is it worth teaching vocabulary? *TESOL Journal* 12 (4), 1–9. <https://doi.org/10.1002/tesj.564>.
- Nicolson, M., Murphy, L. and Southgate, M. (eds) (2011) *Language Teaching in Blended Contexts*. Dunedin Academic Press.
- Norris, J.M. and Ortega, L. (2000) Effectiveness of L2 instruction: A research synthesis and quantitative meta-analysis. *Language Learning* 50 (3), 417–528. <https://doi.org/10.1111/0023-8333.00136>.
- Oskoz, A. and Elola, I. (2018) Escritura colaborativa en el siglo XXI. In M. González-Lloret and M. Vinagre (eds) *Comunicación mediada por tecnologías: Aprendizaje y enseñanza de la lengua extranjera* (pp. 20–34). Equinox Publishing.
- Peterson, M. (2013) *Computer Games and Language Learning*. Palgrave Macmillan.
- Picciano, A.G., Dziuban, C.D. and Graham, C.R. (eds) (2014) *Blended Learning: Research Perspectives*. Routledge.

- Plaines, C. (2020) Learning Through vicarious participation in online language tutorials. EdD thesis. The Open University.
- Robinson, P. (2011) Task-based language learning: A review of the issues. *Language Learning* 61 (1), 1–36. <https://doi.org/10.1111/j.1467-9922.2011.00641.x>.
- Román-Mendoza, E. (2018) *Aprender a aprender en la era digital*. Routledge.
- Schmidt, R. (1990) The role of consciousness in second language learning. *Applied Linguistics* 11, 127–158. <https://doi.org/10.1093/applin/11.2.129>.
- Schmitt, N. (2010) Key issues in teaching and learning vocabulary. In R. Chacón-Beltrán, C. Abello-Contesse and M. del Mar Torreblanca-López (eds) *Insights into Non-native Vocabulary Teaching and Learning* (pp. 28–40). Multilingual Matters.
- Schmitt, N. and Schmitt, D. (2014) A reassessment of frequency and vocabulary size in L2 vocabulary teaching. *Language Teaching* 4, 484–503. <https://doi.org/10.1017/S0261444812000018>.
- Schütze, U. (2017) *Language Learning and the Brain: Lexical Processing in Second Language Acquisition*. Cambridge University Press.
- Schütze, U. and Weimer-Stuckmann, G. (2011) Retention in SLA lexical processing. *CALICO Journal* 28 (2), 460–472. <https://www.jstor.org/stable/calicojournal.28.2.460>.
- Skehan, P. (1998) *A Cognitive Approach to Language Learning*. Oxford University Press.
- Skehan, P. (2003) Focus on form, tasks, and technology. *Computer Assisted Language Learning* 16 (5), 391–411. <https://doi.org/10.1076/call.16.5.391.29489>.
- Swain, M. (2000) The output hypothesis and beyond: Mediating acquisition through collaborative dialogue. In J. Lantolf (ed.) *Sociocultural Theory and Second Language Learning* (pp. 97–114). Oxford University Press.
- Thorne, S., Hellerman, L. and Jokonen, T. (2021) Rewilding language education: Emergent assemblages and entangled actions. *The Modern Language Journal* 105 (1), 106–125. <https://doi.org/10.1111/modl.12687>.
- Turan, Z. and Akdag-Cimen, B. (2020) Flipped classroom in English language teaching: A systematic review. *Computer Assisted Language Learning* 33 (5–6), 590–606. <https://doi.org/10.1080/09588221.2019.1584117>.
- van der Zwaard, R. and Bannink, A. (2014) Video call or chat? Negotiation of meaning and issues of face in telecollaboration. *System* 44, 137–148. <https://doi.org/10.1016/j.system.2014.03.007>.
- Webb, S. and Nation, I.S.P. (2017) *How Vocabulary is Learned*. Oxford University Press.
- Willis, J. and Willis, D. (2007) *Doing Task-Based Teaching*. Oxford University Press.
- Winke, P., Gass, S. and Sydorenko, T. (2010) The effects of captioning videos used for foreign language listening activities. *Language, Learning and Technology* 14 (1), 65–86.
- Wood, D. (2010) *Perspectives on Formulaic Language: Acquisition and Communication*. Continuum.
- Xu, F. (2016) Short-term working memory and chunking in SLA. *Theory and Practice in Language Studies* 6 (1), 119–126. <http://dx.doi.org/10.17507/tpls.0601.16>.
- Yanguas, Í. (2010) Oral computer-mediated interaction between L2 learners: It's about time! *Language Learning & Technology* 14 (3), 72–93. <https://doi.org/10.125/44227>.
- Yilmaz, Y. (2012) The relative effects of explicit correction and recasts on two target structures via two communication modes. *Language Learning* 62 (4), 1134–1169. <https://doi.org/10.1111/j.1467-9922.2012.00726.x>.
- Ziegler, N. (2016) Synchronous computer-mediated communication and interaction: A meta-analysis. *Studies in Second Language Acquisition* 38 (3), 553–586. <https://doi.org/10.1017/S027226311500025X>.
- Ziegler, N. (2018) Task modality, noticing, and the contingency of recasts: Insights on salience from multiple modalities. In S.M. Gass, P. Spinner and J. Behney (eds) *Salience in Second Language Acquisition* (pp. 269–290). Routledge.

10 Digital Language Immersion (DLI) and Virtual Exchanges

Carlos Soler Montes and Olga Juan-Lázaro

10.1 Types of Resources and Characteristics

This chapter presents a digital language immersion and virtual exchange project focused on activating sociolinguistic competence, as well as the development of students' intercultural practices. The work reflects on the efforts and initiatives carried out by the international educational community and the language teaching sector. Specifically, these initiatives involve the design of digital scenarios that offer language immersion teaching and learning experiences similar to those that take place in face-to-face settings.

Therefore, we have focused on the acquisition of sociolinguistic and intercultural competence as a key pillar for determining advanced language use, given its natural association with language immersion experiences (Geeslin & Long, 2014: 202). This is because sociolinguistics in particular, as a knowledge and skill dimension for communication, can become 'a space and means of access to the language in its living state' (Fuertes Gutiérrez *et al.*, 2021: 105). Therefore, this case study critically connects with the processes of acquiring sociolinguistic and intercultural competence in Spanish as a FL/L2 through resources designed in virtual learning environments. In turn, these are enriched with pedagogical interventions following an approach oriented towards action and interaction among learners to foster telecollaboration and production in transmedia formats.

The activation and development of sociolinguistic competence in the context of second or foreign language learning is one of the indicators signaling learners' first steps as independent users of their target language. As per the *Common European Framework of Reference for Languages* (CEFR) (Council of Europe, 2020), sociolinguistic competence includes, among other aspects, the knowledge and skills necessary to address the social dimension of language use, as well as the lexical, phonetic and

grammatical differences among social varieties, which are acquired and measured based on a scale of sociolinguistic appropriateness (2020: 136–137). This scale determines the foundations for teaching, learning and assessing sociolinguistic competence in the context of the FL/L2. It is also used to identify which social groups within the communities represented by the target language should be recognized by the students through their language use. Now, as for how learners should be trained in this regard, the decision is up to educators and specialists.

In the American Council on the Teaching of Foreign Languages' (ACTFL) *Performance Descriptors for Language Learners* (2012: 15), no direct reference is made to sociolinguistic competence *per se*. However, the document does mention cultural capacity and awareness associated with advanced levels in the context of social interaction. Furthermore, the Cervantes Institute Curricular Plan, *Plan curricular del Instituto Cervantes* (Instituto Cervantes, 2006), develops and establishes reference levels for Spanish based on the Council of Europe's recommendations in the CEFR (2020). Concerning linguistic variation, its introduction specifically states that 'Spanish is a plural and diverse language' (Instituto Cervantes, 2006: 61). The geographical extent of the Spanish-speaking world and its large number of speakers make it necessary to consider its sociolinguistic complexity when it comes to describing the common language. Therefore, in this roadmap, the most common phonetic and grammatical variation phenomena that can be integrated into Spanish teaching are categorized for the first time through various inventories.

10.1.1 Sociolinguistic content and competences through digital multiformats

Efforts to link social perspectives of language use to the fields of acquisition and learning can be traced back to competence-related descriptions first put forth by Hymes (1995 [1972]), Canale (1983) and Bachman (1990). In the case of Spanish in particular, we already have robust studies that, from different perspectives and degrees of depth, aim to apply the principles of sociolinguistic description to the field of language teaching (Andión-Herrero, 2007, 2008, 2013; Andión-Herrero & Casado Fresnillo, 2014; Fuertes Gutiérrez *et al.*, 2021; Hernández Muñoz *et al.*, 2021; Moreno-Fernández, 2000, 2009, 2010, 2019, 2020; Soler Montes, 2008, 2015, 2017, 2020).

Sociolinguistic content is also clearly associated with the key competences of second language instructors, including the training, skills and attitudes that instructors must possess regarding the language and its instruction. This is to be aware of the language use varieties being taught, while simultaneously raising learners' awareness of this reality through providing diverse language samples (Instituto Cervantes, 2012–2018: 13).

Díaz-Campos and Filimonova (2019) outline a set of guidelines for the integration of sociolinguistics into Spanish teaching, based both on curriculum design and on access to relevant and diverse input options. Through various practical examples aimed at converting awareness about linguistic variation into applicable knowledge, the authors put forth several tasks based on the introduction of new language varieties within authentic contexts. Naturally, this goes hand in hand with the incorporation of different digital elements, including audio files, videos, digital texts and online resources, among others. Moreover, García Aranda *et al.* (2016) mention the creation of a multimedia platform grounded in the field of sociolinguistics for teaching such content using open-access digital resources.

In the age of **digital sociolinguistics** (Holmes & Hazen, 2013) as well as the sociolinguistics of digital languages, involving virtual contexts of use (Friedrich & Diniz de Figueiredo, 2016), it can be expected that the integration of linguistic variation will take place through virtual means that complement and enrich the language model used by instructors. It is likely that this model will mostly adhere to the corresponding standard language of their own linguistic variety and, to some extent, to the predominant linguistic variety in their teaching and learning environment (Andión-Herrero, 2007; Moreno-Fernández, 2000). Moreno-Fernández (2019: 388) highlights the need for sufficient teaching materials to introduce linguistic variation in the classroom. The author highlights how, ‘fortunately’, digital media provide instructors with a wide variety of resources that allow for the direct integration of linguistic diversity and learning based on a broad and flexible understanding of linguistic nature. Indeed, this aligns with advances made in the field of instructional design and digital developments in various formats, including audiovisual corpora, online portals, MOOCs, applications and other recent digital resources that contribute to the development and practice of sociolinguistic competence in a hybrid or virtual context (Hernández Muñoz *et al.*, 2021).

Furthermore, the Cervantes Institute has clearly prioritized the inclusion of explicit sociolinguistic content in its digital materials from the very beginning, in an effort to represent the rich linguistic and cultural diversity of the Spanish-speaking world within its virtual teaching environments. Since their emergence, the *Aula Virtual de Español* online courses, known as *AVE Global* since 2015 (Coto Ordás, 2014; De Basterrechea & Juan-Lázaro, 2006; García Santa-Cecilia & Juan-Lázaro, 2015; Pellerin & Soler Montes, 2012), have stood out for their scientific treatment of the linguistic and cultural variants of Spanish spoken across Spain and Latin America. In fact, they have even developed a specific program ‘that rigorously and systematically includes the different aspects to be addressed regarding the linguistic areas of Spanish and their distribution in the content programs across the

various AVE levels' [Translated from Spanish] (De Basterrechea & Juan-Lázaro, 2005: 10). The *AVE Global* benefitted from the involvement of an advisory team led by Humberto López Morales, who at the time was the secretary-general of the Association of Academies of the Spanish Language (*Asociación de Academias de la Lengua Española*, ASALE).

Other resources, including the digital Spanish learning courses for children *¡Hola, amigos!* created by the Cervantes Institute (Instituto Cervantes, 2011a, 2011b) in collaboration with the Alberta Ministry of Education (Canada), were designed to take full advantage of the different opportunities to include digital sociolinguistic content in a virtual environment. In the case of *¡Hola, amigos!*, the common theme is based on the experiences of nine Spanish-speaking friends. Each of them represents a different variety of Spanish (North American, Mexican, Guatemalan, Salvadoran, Cuban, Peruvian, Chilean, Argentine and European) and serves as a vehicle to introduce sociolinguistic and cultural content related to their regions of origin.

Printed teaching materials, manuals and textbooks also include direct references to sociolinguistic content, whether through the introduction of themes and characters from different Spanish-speaking countries or in sections related to culture and customs. It must be noted, however, that such references are often sparse and unsystematic (Cazorla Vivas, 2017: 152).

All of this clearly indicates how the need for curriculum diversity and input variety within teaching materials aimed at developing students' sociolinguistic competence undoubtedly requires the inclusion of digital content through hybrid approaches. These approaches must promote continuous exposure to linguistic diversity, comprehension, analysis and reflection regarding the different varieties that make up and coexist within the target language. In turn, these varieties are also part of the Spanish-speaking world's linguistic space that is characterized by its pluricentric, plurinormative and polyphonic (PPP) nature (Muñoz-Basols & Hernández Muñoz, 2019: 81).

10.1.2 Language immersion and sociolinguistic competence

Several studies have attempted to measure Spanish instructors' sociolinguistic knowledge of their native language, their attitudes towards the different Spanish varieties (both their own and others) and the language model that should be taught and assessed (Andión-Herrero, 2013; Bárkányi & Fuertes Gutiérrez, 2019; Ortiz-Jiménez, 2019). There are also data available regarding the development of sociolinguistic competence and Spanish learners' opinions on these aspects (Achugar & Pessoa, 2009; Arteaga & Llorente, 2009; Moreno-Fernández, 2010). In all these studies, the connection between positive acceptance and the development of knowledge about linguistic diversity

seems to be logically associated with the international experiences of both instructors and their students (Geeslin & Long, 2014; Regan *et al.*, 2009). Monerris Oliveras (2015), for example, demonstrates how there is a direct link between positive attitudes towards linguistic variation, advanced Spanish proficiency and study abroad programs in Spanish-speaking countries in the case of university students. In fact, these findings coincide with the theories put forth by Pettigrew (1998) suggesting that direct contact and interaction with the target language and culture significantly reduce learners' potential prejudices.

Therefore, it seems that there is an inseparable connection between the development of sociolinguistic competence beyond a certain advanced level of language acquisition, the use of digital materials as a key support for acquisition in the classroom and student trips abroad that foster intercultural language immersion experiences. In fact, these experiences are intertwined in a potential intermediate and hybrid 'third space' from which language learners converse and connect the worlds of their L1 and L2 not only from a purely linguistic perspective but also from a cultural one (Iglesias Casal & Ramos Méndez, 2020: 1).

As shall be explained later in this chapter, the input used in our case study was of a multiformat nature. The aim of this was to promote sociolinguistic competence alongside positive attitudes towards the differences between B2/C1 learners' own culture and the linguistic and cultural wealth of the Spanish-speaking world. The initial hypothesis is that exposure to input through digital immersion with situations involving diverse social groups facilitates and anticipates the cultural acceptance of the target society. Another advantage is that, due to its low cost, digital immersion is accessible to a greater number of learners compared to trips abroad.

The B2 (or advanced) level is also the stage associated with learners' linguistic development in academic and professional contexts. Achieving a B2 level is often a non-negotiable prerequisite for foreign students to be accepted into university degree programs, since it is considered the entrance standard (Harsch, 2018: 103) in many countries. Not only this: it is also associated with student internship programs around the world and the allocation of university mobility grants, such as Erasmus+ funding, for a semester or even a full academic year (Deygers *et al.*, 2018; EACEA, 2010).

10.2 State of the Art

10.2.1 Study abroad programs and virtual exchanges

Study abroad programs (Coleman, 2009; Lafford & Isabelli, 2019), also known as education abroad (Goertler & Schenker, 2021) or year abroad (Salin *et al.*, 2020) programs, have revolutionized the field of

university mobility (Goertler & Schenker, 2021; Lewin, 2009). Language immersion experiences have become an integral part of language learning curricula, complementing the foundational instruction provided by various university institutions (Klee, 2019). This is in line with the ‘within-program study abroad’ model (Coleman, 2009) that is common in many countries with a long tradition of language education (such as the United States or the United Kingdom). Indeed, these experiences have been implemented with great success for decades. As a result, in many universities in these two countries, learners acquire the foundations of their target language intensively during their first two years of study. Then, they spend their third year studying in an immersive context for either a single semester or a full academic year in one of the regions where the language is spoken. Finally, they return to their home institution for their fourth year to complete their studies having acquired a higher or advanced language proficiency level. This pattern may vary depending on university cycles, the institution’s curriculum organization or even the learner’s personal experiences.

Although multiple research studies recognize the value of studying abroad, McManus *et al.* (2014) point out that the fulfillment of these expectations depends on resilience and the implementation of strategic actions, including finding the best way to contribute to the host community (for instance, through conversation exchanges) or developing emotional connections with others. Several studies emphasize difficulties that may arise both when it comes to learners’ adaptation and the environment’s ability to meet their learning needs (for example, the host family or the challenge of developing interpersonal relationships). In turn, these considerations lead to the conclusion that studying abroad is not a ‘magic formula’ for mastering a language (DeKeyser, 2010: 89). These barriers can be of various kinds: they may be personal, financial, social, ideological, interpersonal or interactional. For instance, when in direct contact with the language, learners sometimes struggle to navigate interactions involving a language’s different varieties, the range of registers, different historical perspectives or even certain culinary practices (see Kinginger, 2016: 27).

Telecollaborative pedagogies simulate face-to-face contact and interaction with native speakers through creating social connections with exchange peers and exposing attitudes and discussions about social identity and linguistic variants in both cultures. In fact, FL/L2 learners are able to awaken their linguistic awareness regarding the appropriateness of their interactions and linguistic social identities in real exchanges with native speakers, whether during their stay abroad or via telecollaboration (Kinger, 2016). Without a doubt, these are authentic contexts of intercultural and linguistic exchange which, in the case of virtual environments, also constitute a scientifically verified foundation for the development of digital competence and online intercultural communication skills (Hauck *et al.*, 2020).

In this scenario, **virtual exchanges**, a term that, in recent years, seems to be more prevalent than ‘telecollaboration’ (O’Dowd & O’Rourke, 2019), still await their inclusion in the FL/L2 curriculum, in such a way that their implementation into academic programs does not solely respond to proactive educators’ concerns or convictions about the effectiveness of this methodology (O’Dowd, 2011). However, steps are being taken in the right direction. For instance, the European Commission and EACEA (2020) have developed the following digital credentials to recognize the curriculum and experiential value of participating learners and expert educators when it comes to moderating, energizing and conceptualizing virtual exchanges within the Erasmus+ project (Helm & Van der Velden, 2021): ‘*Erasmus+ Virtual Exchange. Debate Exchange. Participant*’ and ‘*Erasmus+ Virtual Exchange. TEPS (Transnational Exchange Projects) for experienced practitioners. Trainer*’. Similarly, there are also highly relevant projects in the field of telecollaboration, including EVOLVE, *Evidence-Validated Online Learning through Virtual Exchange* (Jager *et al.*, 2021) and EVALUATE, *Evaluating the Impact of Virtual Exchange on Initial Teacher Education: A European Policy Experiment* (EVALUATE Group, 2019).

That said, virtual exchanges alone cannot be proposed as agents of change, since their effectiveness depends entirely on the learning environment in which they take place (Jager *et al.*, 2016: 5). The quality of the communicative exchanges in these virtual contexts is key. With this in mind, Devlieger & Goossens (2007) and Van den Branden’s research group (cited in Müller-Hartman, 2016) refer to three aspects envisioned as concentric circles: the outermost and widest circle represents the safe environment where learners are encouraged to take risks; the second circle symbolizes the meaningful and challenging tasks that learners must complete; and, finally, the central circle is occupied by the instructor, who provides interactive support and guides the learners. With this approach, González-Lloret and Ortega (2014) point out that the mediation of new technologies serves as a facilitator for a task-based learning methodology. This is because it reduces learners’ anxiety regarding failure, increases their motivation to take risks and boosts their creativity when completing tasks. Consequently, it also contributes to the achievement of learning objectives which could, for instance, be demonstrated through the development of an audiovisual product.

Therefore, it is useful to consider how a learning environment could be designed to promote the development of sociolinguistic competence at the level associated with independent language use (B2 and beyond). The exceptional circumstances caused by COVID-19 in 2020, which triggered a search for language immersion alternatives due to travel restrictions, resulted in an increase in what we refer to here as **digital language immersion** (DLI). This model was implemented in various

ways across multiple institutions to mitigate the pandemic's impact on education.

Considering the points discussed previously, a careful selection of multiformat input in a course aimed at explicitly exploring sociolinguistic content, and which also includes telecollaborative language immersion sessions, constitutes a formula with two key elements for the design and implementation of such programs. However, this begs the question: Is this sufficient or even comparable to the linguistic development achieved in face-to-face immersion? As shall be discussed below, the asynchronous interaction setting created in a virtual learning environment, enriched by the two elements mentioned above, serves as a backbone for the virtual meeting curriculum and to expose the learners to reflections, experiences and opinions regarding the sociolinguistic content. This, in turn, leads to the development of their social identity in the target language.

10.2.2 Virtual learning environments (VLEs)

Since the beginning of the 21st century, digital technologies have shaped a society that is constantly evolving and transforming. Relation, information and communication technologies (RICTs), learning and knowledge technologies (LKTs), as well as empowerment and participation technologies (EPTs) require education professionals to be willing to adapt, get creative and experiment in order to make full use of their potential (Juan-Lázaro, 2017). The advantages for lifelong learning are undeniable. These include fostering learner autonomy either through the systematic use of digital material (Juan-Lázaro, 2001, 2010, 2016; Martos & Teruel, 2018) or through the integration of telecollaboration into curricula and study programs (Kannan & Munday, 2018; Little, 2016), as well as providing opportunities for differentiated instruction (De Basterrechea & Juan-Lázaro, 2006; Kamylyis *et al.*, 2016; Redecker, 2020). In fact, more recently, authors such as Munday (2018: 537) have even voiced opinions about 'virtual learning contexts' (often called 'virtual learning environments', VLEs) possibly being 'an even more suitable option' than face-to-face classes. To demonstrate this statement, Munday (2018) explains, for example, that affective factors such as anxiety or shyness in the context of interaction have an effect on these learners' higher participation rates in virtual contexts (see Chapter 6 of this book). The author seems to appreciate technological advancements such as the inclusion of video and audio files in discussion forums, or the possibility of engaging online with native speakers from the outside world relatively easily within the language classroom. Similarly, Navarro Serrano and Juan-Lázaro (2017) demonstrate how interaction opportunities among peers and with the instructor, multiply in an action research project at the Belo Horizonte Cervantes Institute (Brazil) within a blended

learning context. The project also highlights how learners gradually, naturally and spontaneously take on a more active role in the digital classroom that Facebook transformed into (for more on interaction, see Chapter 7 of this book). The virtual environment in which the project took place combined the use of three tools: *AVE Global* digital teaching materials; synchronous classes via group videoconferencing; and a dynamic platform set up on Facebook, enabling the generation of appealing communication dynamics from the user's point of view. As a result, this combination forged a connection between the learning experience and the personal dimension, taking into account that Facebook is one of the most popular social networks in Brazil.

According to Navarro Serrano and Juan-Lázaro (2017), these kinds of ecosystems lead to a meaningful and participatory learning experience by appropriately combining the different elements depicted in Figure 10.1. In the proposal outlined below, the interaction between the three elements is enhanced through a program that focuses on the development of sociolinguistic and intercultural competence. In this regard, we consider, as do several different projects and international organizations (Kampylis *et al.*, 2016; Kluzer & Pujol, 2018; UNESCO, 2019), that teaching practices are moving towards a redesign of physical classrooms and face-to-face learning to incorporate digital

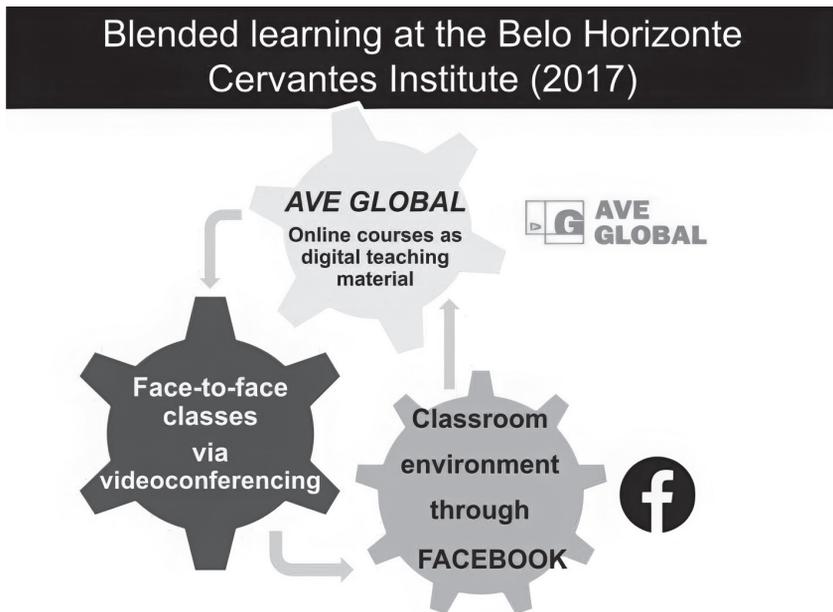


Figure 10.1 Diagram illustrating the main elements in the blended learning course at the Belo Horizonte Cervantes Institute

Source: Adapted from Navarro Serrano and Juan-Lázaro (2017).

technologies. This transformation should also extend to the redesign of online, blended or hybrid pedagogical models, seen as essential for the digital revolution in education (Juan-Lázaro & Alejaldre, 2020). In this way, a full transformation can be achieved (both in terms of space and learning environment), making it possible to refer to digital immersion in enriched virtual settings.

Regarding the conceptualization of the proposal outlined below, the main aspects of mobility programs have been taken into account and the weakest points have been minimized. To this end, the following aspects are emphasized:

- (1) **virtual exchanges** that focus on real-time dialogue among individuals in which participants learn from one another (European Commission & EACEA, 2020);
- (2) the **selection of input and the design of digital teaching materials** that promote reflection on sociolinguistic aspects present in the FL/L2 and that foster the development of learner autonomy; and
- (3) **proposals for interactions** within the group with the instructor, which ultimately lead participants to reflect on and discuss any contrasting or shared aspects between the two cultures, while also supporting a sense of belonging within the group and increasing opportunities for spontaneous interaction among peers.

These elements serve as the backbone for the design of the digital language immersion experience in the context of the virtual learning environment. In Figure 10.2, these elements are illustrated under the

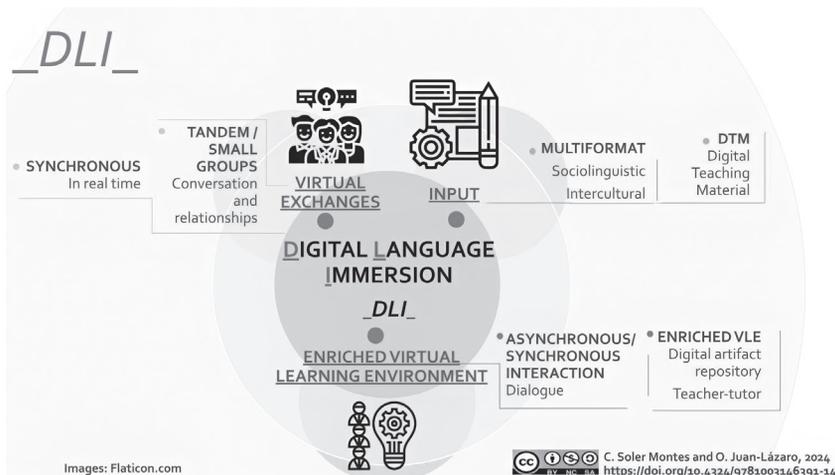


Figure 10.2 Infographic depicting the main elements of digital language immersion (DLI)
Source: Developed by the authors. Images: flaticon.com.

acronym DLI (digital language immersion), drawing inspiration from European digital competence frameworks such as *DigCompEdu* (Redecker, 2020) and *DigCompOrg* (Kampylis *et al.*, 2016).

10.3 Research, Curriculum Design and Teaching Practices

Next, we analyze the process of creating, designing and teaching a course that includes the acquisition of sociolinguistic and intercultural competence as part of an immersion experience in a virtual learning environment. We present the results of analyzing a university pedagogical project in which the in-person immersion experience in Spanish-speaking countries, which usually takes place during the learners' year abroad, was replaced with a virtual language course involving sociolinguistic content and intercultural reflection. This course was enriched with telecollaborative elements and transmedia projects (Scolari, 2018), aiming to recreate the immersive learning experience.

Our goal is to explore paths that lead to DLI and to verify their effectiveness by extending communication beyond the synchronous realm, and by examining other expressive forms and exchanges that help learners to interact in virtual environments while they immerse themselves in the language, culture and technology-mediated interaction. We understand DLI as a second or foreign language acquisition experience in which participation, interaction, learning and discursive negotiation contribute to the construction of learners' social identity in the language. This experience is based on **three pillars**: (1) **virtual exchanges in pairs or small groups** with speakers of the target language; (2) a **selection of multiformat input and digital teaching materials** centered around a curriculum containing sociolinguistic and intercultural content; and (3) a **virtual learning environment in which asynchronous interactions** and interactions on social networks are encouraged, promoting the **design of transmedia elements** in the target culture. The result is an ecosystem in an enriched virtual environment where both asynchronous and synchronous dialogue boosts the development of advanced communicative competence through sociolinguistic and intercultural content.

Our analysis, based on teaching practices and curriculum design through an interdisciplinary lens, includes dimensions such as applied linguistics in teaching Spanish as a foreign language, sociolinguistics, applied technologies in second language teaching, online teaching and instructional design.

The case study is based on the experience conducted within the Hispanic Studies degree at the University of Edinburgh (United Kingdom). In this program, stays abroad are a compulsory part of the curriculum and must last for at least one semester. In addition to this experience, in order to ensure proper monitoring and increased

communication with Spanish students on their compulsory year abroad, an annual online course was created that all learners must take during their third year. These courses were designed based on a common format in the *Blackboard* virtual environment in 2018 and were introduced during the 2018/2019 academic year. Essentially, they are offered as an additional subject completed asynchronously from the various locations where students spend their language immersion year.

In the case of Spanish, the decision was made to design a course that explores the language's sociolinguistic content, while also developing explicit linguistic aspects and strategies for written and oral comprehension, as well as for written academic expression at the C1 level. The course also includes components for individual and shared reflection on intercultural topics, which are more relevant than ever while abroad. As per its initial design as a monitoring and interaction tool for distance learners and as a space to reflect on the language and share travel experiences or stories, this virtual course was made up of four work units that were to be completed on an ongoing basis between September and April. It included videos, lectures, self-correction activities, as well as two interactive reflection activities through tutor-moderated forums, one for sociolinguistic reflection and another for intercultural reflection. Moreover, the course was assessed with a final essay associated with the relevant topics.

This course was carried out as originally planned during the 2018/2019 and 2019/2020 academic years. Following the outbreak of the COVID-19 pandemic in March 2020 and the cancellation of student mobility and the year abroad in 2020/2021, the program for the third year of Spanish studies was reduced to a single option: that is, transforming the existing online Spanish course offered via the virtual learning environment and reinforcing it to create a digital immersion experience. Ultimately, the goal was to guarantee students' continued language acquisition progress at the C1 level, intercultural reflection and authentic, advanced knowledge of Hispanic culture and societies.

The starting objective was to enrich (Dillenbourg *et al.*, 2002) our course to ensure a quality intercultural learning experience for all 119 third-year Spanish students from home.

Among the specific measures taken to enhance our learners' digital immersion experience. The specific measures are listed in Table 10.1.

The analysis of the data at the end of the 2020/2021 academic year reveals how the language immersion environment worked and the actual number of hours dedicated by the learners throughout the year. On average, each learner spent 62.24 hours working in the VLE (approximately three hours of dedication per academic week in 2020/2021). This amounts to a 90% increase compared to the hours dedicated in the previous academic year (2019/2020), during which learners worked for 32.68 hours on average (equivalent to 1.5 hours of work per academic week).

Table 10.1 Enrichment measures for the online course that made up the digital language immersion experience in 2020/2021

2019/2020	2020/2021
Asynchronous online Spanish course worth 20 credits, offered in the virtual learning environment (VLE):	
<ul style="list-style-type: none"> • Sociolinguistic content split into 4 work units • Final essay 	
Language immersion: Language immersion experience through international mobility programs including Erasmus+ student exchanges or similar experiences abroad: <ul style="list-style-type: none"> • Study abroad modality • Work abroad modality 	Digital language immersion: <ul style="list-style-type: none"> • Weekly synchronous classes to practice oral expression as a group • Tutored reading groups • Replacement of Erasmus+ credits with supervised research essays • Conversational tandem program with Spanish universities • Erasmus+ task: telecollaborative group project with students from the Translation Degree program at the University of Granada

Table 10.2 Number of digital language immersion work hours

Work in the virtual learning environment (VLE)	Coordination meetings	Essay tutoring	Synchronous classes	Reading group	e-Tandem	Erasmus task
62	4	4	30	10	20	10

In addition to these asynchronous hours focused on autonomous learning, engaging with the multiformat input (written, oral, audio-visual, mediated), completing self-learning activities and interacting in the forums for each course unit, the plans to enrich the digital immersion experience added a total of 78 hours of synchronous work compared to previous years. In total, this amounted to 140 hours of real-time work, as shown in Table 10.2.

To this it is necessary to add the time dedicated to completing tasks, activities, essays, reading and class preparation throughout the academic year outside the virtual learning environment or asynchronous class schedule. This could amount to, approximately, 300 more hours of work.

On analyzing the hours of work in the virtual environment more closely, it becomes clear, as shown in Figure 10.3, that learners in the 2020/2021 academic year who worked in the digital language immersion context exhibited more organized connection patterns, dedicating more time during the working week. This allowed them to distribute their efforts more evenly to meet task, activity and course unit deadlines, typically set on Fridays or Sundays.

These data reveal how interaction in asynchronous communication contributed to the development of self-regulation skills with systematic and responsible dedication.

Another useful way to validate the success of the chosen format and the ability of both learners and instructors to make the most of the virtual environment and asynchronous digital interaction is to analyze

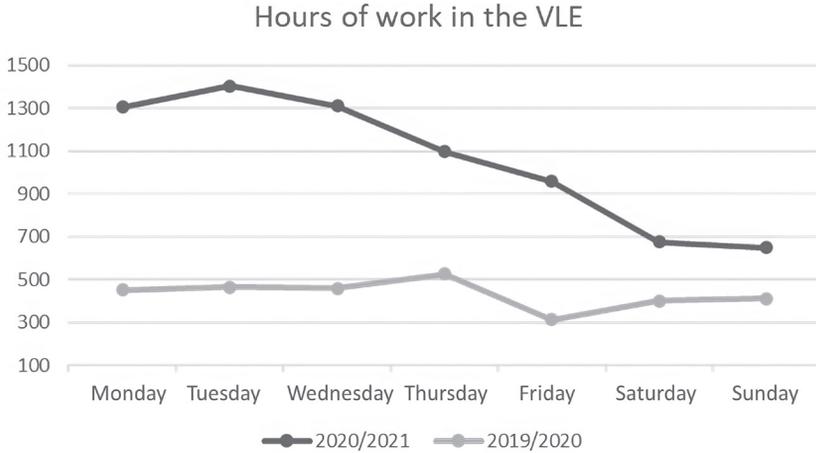


Figure 10.3 Student cohort total number of hours of work in the VLE per academic year ($n = 119$)

the volume of activity in the forums where, for units 1, 2, and 3, two tutor-moderated written interaction and reflection activities were held. The topics discussed in the forums aimed to capture and exemplify both the sociolinguistic and intercultural dimensions that guided the design of the course materials and content. In fact, this is reflected in the forum titles:

Unit 1:

Forum 1: *Mi dialecto y yo* ('My Dialect and Me')

Forum 2: *Anécdotas y malentendidos interculturales* ('Intercultural Anecdotes and Misunderstandings')

Unit 2:

Forum 1: *Cazando acentos* ('Hunting for Accents')

Forum 2: *¿Español neutro?* ('Neutral Spanish?')

Unit 3:

Forum 1: *Cultura con mayúsculas* ('Culture with Capital Letters')

Forum 2: *Mi cultura, tu cultura* ('My Culture, Your Culture')

The data on participation in forum activities are also revealing, demonstrating the effort and motivation of both learners and tutors to boost written interaction and shared reflection compared to previous years. Specifically, the number of written interactions rose from 1086 (or 11 per user, on average) in 2019/2020 to 1670 (or 14 per user, on average) in 2020/2021. The participation curve in the course forums took an

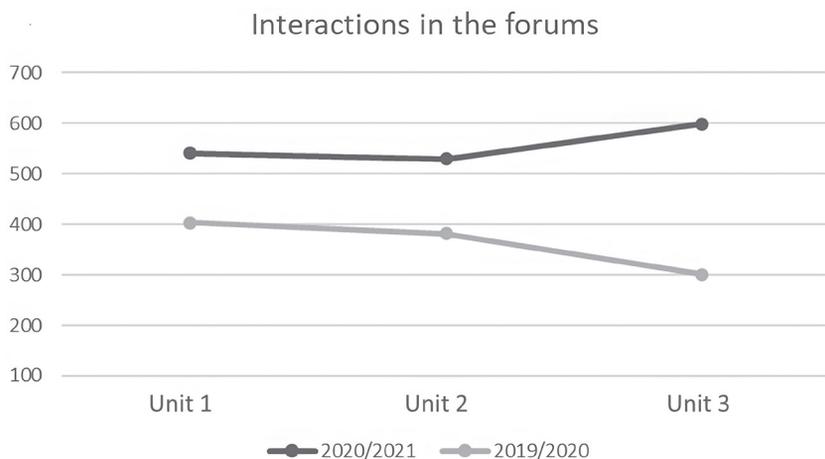


Figure 10.4 Number of interactions in the forums per academic year ($n = 119$)

opposite direction in 2020/2021 compared to 2019/2020, with written interaction in unit 3 increasing by 13% compared to previous units. On the other hand, the data on participation in the course forums in 2019/2020 reveal how the trend went down by 21% (Figure 10.4).

Regarding the learners' interest when it came to choosing a topic for the final assignment, submitted after completing Unit 4, a change in pattern compared to previous years was also detected. There seemed to be a greater interest in complex sociolinguistic and cultural topics approached from a more academic angle (linguistic variation phenomena, history of literature, art, etc.) as opposed to more traditional, accessible or stereotypical sociocultural topics more typical of real immersion contexts (gastronomy, popular festivals, famous figures, traditions, etc.).

After analyzing the various topics proposed for the essays, a shift in trend was clear, as shown in Figure 10.5.

Essays of a more sociocultural nature about music, gastronomy, festivals or Hispanic traditions, which accounted for 76% of the total in 2019/2020, were expanded in 2020/2021 to include cultural (narrative, poetry, painting, architecture) and sociolinguistic essays (phonetic variation phenomena, Spanish vocabulary or grammar, language contact, description of dialects in various Spanish-speaking regions). Despite requiring more research effort due to the need for more specialized sources, these essays accounted for 39% of the total. A possible explanation for this change is likely to do with the content worked on synchronously for the first time that year both in the weekly language and culture classes as well as the Erasmus+ task carried out

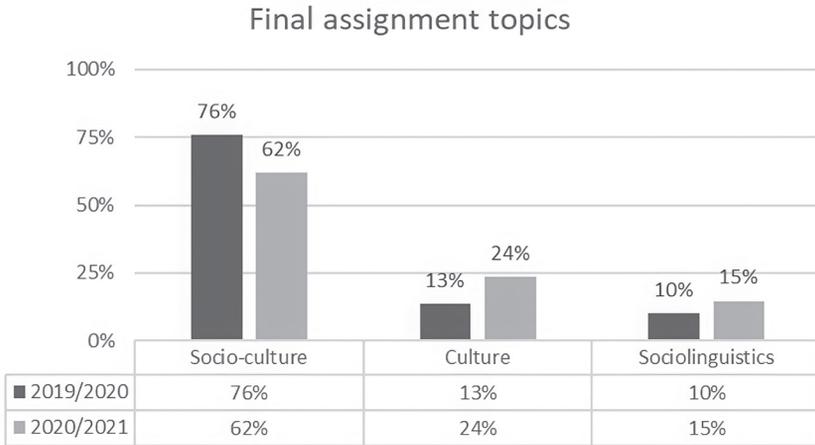


Figure 10.5 Topic selection (%) for the final assignment ($n = 119$)

via telecollaboration with learners from the University of Granada on a topic related to Hispanic sociolinguistics.

The students rated the course and the overall experience very positively. In the evaluation questionnaire administered at the end of the course, the following aspects were rated above 4 points out of 5 (with 1 being the most negative and 5 the most positive): course organization (4.4), achievement of course objectives (4), information and clarity regarding the VLE (4.1), course materials (4.1), workload (4.1), work pace (4.4), assessment methods (4) and ease of use of the VLE (4.6). The overall rating of the responses was 3.9 out of 5.

From a qualitative perspective, concerning the course evaluation, and on analyzing the students' comments based on a prior response categorization, the key aspects of the digital language immersion experience that were viewed most frequently as highly positive are shown in Figure 10.6.

It is clear how, among the best-rated aspects, the synchronous component stands out, in particular the classes (32%), the sociolinguistic and intercultural content (21%) and the teaching team's efforts (21%). The course's asynchronous dimension – that is, the forums (14%) and the multiformat input (5%) – is also highlighted positively on several occasions. Finally, participation in the language tandem and the Erasmus+ task organized in collaboration with the University of Granada were also positively evaluated in surveys administered at various points during the academic year. The students' overall evaluation of the experience also highlighted areas for improvement as well as certain negative aspects related to an adverse social and institutional context, especially regarding the communication of contingency

Best-rated aspects of the course

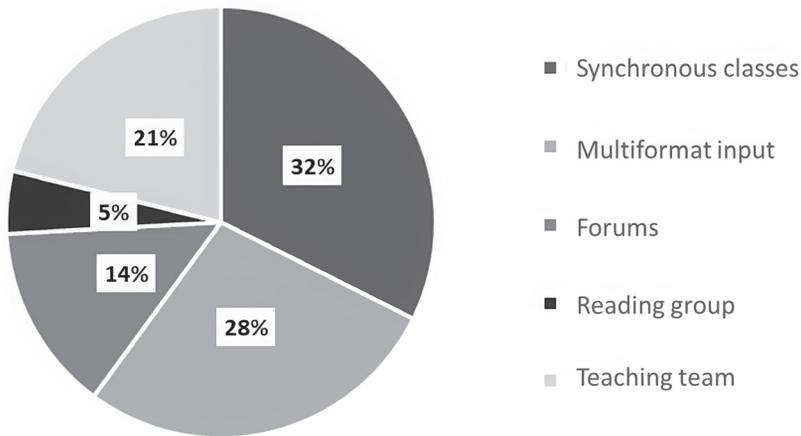


Figure 10.6 Best-rated aspects of the course

measures and the implementation of restrictions throughout the year, the perceived lack of institutional support, as well as the modification of language proficiency assessment criteria, deadlines and extensions. As could be expected, the students were also frustrated with the indefinite postponement of their study trip.

10.4 Conclusion and Future Lines of Research

Three main conclusions can be drawn from our study. Firstly, it is worth noting that it is possible to implement a language immersion experience through virtual means, referred to as **DLI** in this chapter, in order to provide an enriched language learning experience. Secondly, it can be concluded that **DLI**, as planned in this action research project, does indeed work. Furthermore, it involves a higher number of work hours compared to previous courses and experiences and was positively rated by the learners who participated. Thirdly, it is important to note that the development of **sociolinguistic competence** and the study of sociolinguistic content in the target language can be successfully carried out in digital formats, in this way compensating for the real language use component that learners typically acquire in study abroad programs.

As we already know, the development of sociolinguistic competence is related to advanced language proficiency, that is, starting from the **B2** level, as per the **CEFR** (Council of Europe, 2020). Its acquisition is associated with contexts of immersion, such as study abroad experiences, academic immersion with modules taught entirely in the target language and, as put forth in this research, through digital

language immersion (DLI). Within our research, the DLI approach is based on three pillars: (1) **virtual exchanges**; (2) a **selection of multiformat input** and digital teaching materials; and (3) a **virtual learning environment that promotes asynchronous interactions** and the design of **transmedia elements** in the target language.

In the study conducted at the University of Edinburgh in which data from the 2019/2020 and 2020/2021 academic years were compared, it was observed that learners dedicated twice the number of hours to the course, thanks to the enrichment of the materials provided. Learners also exhibited more organized work patterns throughout the week and rated the work pace positively. The input, alongside the digital teaching materials, occupies a prominent place (28%) among the five aspects highlighted by the learners in their final evaluation of the experience (Figure 10.6). Keeping this in mind, the fact that there was an increase in resources in different formats played a key role in capturing the students' attention and keeping them motivated. Synchronous, i.e. real-time, meetings (conversation classes, e-tandem and other available virtual exchanges) were the best-rated aspect (32%) among learners. Furthermore, interactions in the forums increased (Figure 10.4) and there was an upward trend regarding learner participation towards the course's halfway point (opposite trend compared to the previous academic year).

Finally, we consider that virtual exchanges focused on the creation of final products have a highly positive impact and have greatly helped to introduce learners to research in the field of Spanish sociolinguistics. The 2020/2021 academic year will go down in history as the year in which the COVID-19 pandemic crisis led to the redesign of new scenarios in the field of education at the international level. In the context of language teaching, thanks to the efforts and creativity of instructors and experts in designing learning modalities in technological environments, and thanks to the dedication and enthusiasm of learners to seize new opportunities, it was possible to develop and pilot a digital language immersion program.

However, two significant challenges are posed for the future which, in turn, constitute future research avenues within this field. The first challenge appears to be promising. Specifically, it would involve the expansion of this fully online scenario to a hybrid or blended setting where, for instance, synchronous meetings among university students and educators would take place within a face-to-face context. Meanwhile, virtual exchanges with learners from other universities in Spanish-speaking countries would be maintained. Enriched VLEs and the protagonism assigned to learners when it comes to creating transmedia products would continue playing the same leading role as a learning space. The second challenge involves the institutions responsible for incorporating DLI courses into their curricula, thus facilitating immersion in the target language for learners who do not have the

opportunity to travel to places where the language is spoken. It also involves redesigning foreign language programs, taking into account the results revealed in this chapter prior to study trips, since it seems likely that sociolinguistic and intercultural aspects that would improve learners' perceptions towards the target language culture(s) could be anticipated.

To conclude, we would like to point out that, while this case study is framed within a specific university context, both the teaching proposal as well as the methodology and philosophy of the digital language immersion used can be extrapolated to other academic fields (formal education, teacher training, continuing education for adults, heritage language programs, etc.) and to other foreign languages. This opens up opportunities to broaden the scope of DLI through future research, whether theoretical or experimental.

10.5 Annotated Additional Reading

Hernández Muñoz, N., Muñoz-Basols, J. and Soler Montes, C. (2021) *La diversidad del español y su enseñanza*. Routledge.

This is the first publication conceived to reflect on the diversity of Spanish from a critical, interdisciplinary, institutional, applied and international perspective. By analyzing 12 readings, as well as a detailed guide for instructional application, the authors promote the acquisition of knowledge about the language and reveal the intricacies associated with researching the different varieties of Spanish.

Juan-Lázaro, O. and Alejaldre Biel, L. (2020) *Competencias digitales en el aula. Estrategias y modelos de implementación en la enseñanza de idiomas*. enClave-ELE/UDIMA.

This work aims to provide the foundations for language instructors to develop their digital pedagogical competence, presenting the main international conceptual frameworks and reviewing the theoretical assumptions lying beneath the liquid and digital society in which we live. It is contextualized with practical proposals to guide learners in developing their digital competence in the Spanish as a Foreign Language classroom.

References

- Achugar, M. and Pessoa, S. (2009) Power and place: Language attitudes towards Spanish in a bilingual academic community in southwest Texas. *Spanish in Context* 6 (2), 199–223. <https://doi.org/10.1075/sic.6.2.03ach>.
- American Council on the Teaching of Foreign Languages (ACTFL) (2012) *Performance Descriptors for Language Learners*. ACTFL. <https://www.actfl.org/>.
- Andión-Herrero, M.A. (2007) Las variedades y su complejidad conceptual en el diseño de un modelo lingüístico para el español L2/LE. *ELUA* 21, 21–33. <http://dx.doi.org/10.14198/ELUA2007.21.02>.
- Andión-Herrero, M.A. (2008) *Modelo, estándar y norma . . .* conceptos imprescindibles en el español L2/LE. *RESLA* 21, 9–26.
- Andión-Herrero, M.A. (2013) Los profesores de español segunda/lengua extranjera y las variedades: Identidad dialectal, actitudes y prácticas docentes. *Signos. Estudios de Lingüística* 46 (82), 155–189. <http://dx.doi.org/10.4067/S0718-09342013000200001>.
- Andión-Herrero, M.A. and Casado Fresnillo, C. (2014) *Variación y variedad del español aplicadas a E-LE/L2*. Editorial UNED.

- Arteaga, D. and Llorente, L. (2009) *Spanish as an International Language: Implications for Teachers and Learners*. Multilingual Matters.
- Bachman, L. (1990 [1995]) Habilidad lingüística comunicativa. In M. Llobera (ed.) *Competencia comunicativa. Documentos básicos en la enseñanza de lenguas extranjeras* (pp. 105–129). Edelsa.
- Bárkányi, Z. and Fuertes Gutiérrez, M. (2019) Dialectal variation and Spanish language teaching (SLT): Perspectives from the United Kingdom. *Journal of Spanish Language Teaching* 6 (2), 199–216. <https://doi.org/10.1080/23247797.2019.1676980>.
- Canale, M. (1983 [1995]) De la competencia comunicativa a la pedagogía comunicativa del lenguaje. In M. Llobera (ed.) *Competencia comunicativa. Documentos básicos en la enseñanza de lenguas extranjeras* (pp. 63–83). Edelsa.
- Cazorla Vivas, C. (2017) Manuales ELE A1 y variedades del español: Presencia, ausencia y didáctica. In E. Balmaseda, F. García and M. Martínez (eds) *Panhispanismo y variedades en la enseñanza del español L2-LE* (pp. 193–205). Fundación San Millán de la Cogolla/ASELE.
- Coleman, J. (2009) Study abroad and SLA: Defining goals and variables. In A. Berndt and K. Kleppin (eds) *Sprachlehrforschung: Theorie und Empire, Festschrift für Rudiger Grotjahn* (pp. 181–196). Peter Lang.
- Coto Ordás, V. (2014) El *Aula Virtual del Español*: Modelo de «buenas prácticas» para la enseñanza de segundas lenguas a través de Internet. *RedELE. Revista Electrónica de Didáctica del Español Lengua Extranjera* 26. Ministerio de Educación y Formación Profesional (Ministry of Education and Professional Training).
- Council of Europe (2020) *Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume*. Council of Europe.
- De Basterrechea, J.P. and Juan-Lázaro, O. (2005) Influencia de los recursos digitales y los sistemas de comunicación en el modelo de enseñanza de ELE. In J.M. Izquierdo, O. Juan-Lázaro, M.A. Cuenca, R. Prieto, A. Mochón, H. Lim, W. Altmann (eds) *FIAPE, I Congreso internacional: El español, lengua de futuro*. University of Castilla-La Mancha.
- De Basterrechea, J.P. and Juan-Lázaro, O. (2006) La integración de las TIC en la actividad docente: El Aula Virtual de Español. *Monográficos MarcoELE* 10, 21–32.
- DeKeyser, R. (2010) Monitoring processes in Spanish as a second language during a study abroad program. *Foreign Language Annals* 43 (1), 80–92. <https://doi.org/10.1111/j.1944-9720.2010.01061.x>.
- Devlieger, M. and Goossens, G. (2007) An assessment tool for the evaluation of teacher practice in powerful task-based language learning environments. In K. Van den Branden, K. Van Gorp and M. Verhelst (eds) *Tasks in Action. Task-Based Language Education from a Classroom-Based Perspective* (pp. 92–130). Cambridge Scholars Publishing.
- Deygers, B., Zeidler, B., Vilcu, D. and Hamnes Carlsen, C. (2018) One framework to unite them all? Use of the CEFR in European university entrance policies. *Language Assessment Quarterly* 15 (1), 3–15. <https://doi.org/10.1080/15434303.2016.1261350>.
- Díaz-Campos, M. and Filimonova, V. (2019) Sociolinguistics. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2*, (pp. 362–376). Routledge.
- Dillenbourg, P., Schneider, D.K. and Synteta, P. (2002) Virtual learning environments. In A. Dimitracopoulou (ed.) *Proceedings of the 3rd Hellenic Conference 'Information & Communication Technologies in Education'*. Kastaniotis Editions.
- EACEA (Education, Audiovisual and Culture Executive Agency) (2010) *Focus on Higher Education in Europe*. EACEA.
- European Commission and EACEA (Education, Audiovisual and Culture Executive Agency) (2020) *Erasmus+ Virtual Exchange. Intercultural Learning Experiences: 2018–2019 Achievements*. Publications Office of the European Union.

- EVALUATE Group (2019) *Sumario ejecutivo: Principales conclusiones del proyecto de investigación de la política europea EVALUATE sobre los efectos del intercambio virtual en la fase inicial de formación de docentes*. Research-publishing.net.
- Friedrich, P. and Diniz de Figueiredo, E.H. (eds) (2016) *The Sociolinguistics of Digital Englishes*. Routledge.
- Fuertes Gutiérrez, M., Soler Montes, C. and Klee, C.A. (2021) Applied sociolinguistics in Spanish language teaching. *Journal of Spanish Language Teaching* 8 (2), 105–113.
- García Aranda, M.A., Alvar Ezquerro, M., Nuño Álvarez, P., Cazorla Vivas, C. and Arribas Jiménez, C. (2016) *El diccionario como herramienta en el aprendizaje/Enseñanza de lenguas. Creación de una plataforma multimedia*. E-Prints Complutense.
- García Santa-Cecilia, Á. and Juan-Lázaro, O. (2015) La enseñanza del español en línea en el Instituto Cervantes: Nuevas respuestas a la demanda de ‘aprendizaje móvil’. In *El español en el mundo. Anuario del Instituto Cervantes* (pp. 245–263). Instituto Cervantes.
- Geslin, K.L. and Long, A.Y. (2014) *Sociolinguistics and Second Language Acquisition*. Routledge.
- Goertler, S. and Schenker, T. (2021) *From Study Abroad to Education Abroad. Language Proficiency, Intercultural Competence and Diversity*. Routledge.
- González-Lloret, M. and Ortega, L. (2014) Towards technology-mediated TBLT. An introduction. In M. González-Lloret and L. Ortega (eds) *Technology-Mediated TBLT: Researching Technology and Tasks* (pp.1–22). John Benjamins.
- Harsch, C. (2018) How suitable is the CEFR for setting university entrance standards? *Language Assessment Quarterly* 15 (1), 102–108. <https://doi.org/10.1080/15434303.2017.1420793>.
- Hauck, M., Müller-Hartmann, A., Rienties, B. and Rogaten, J. (2020) Approaches to researching digital–pedagogical competence development in VE-based teacher education. *Journal of Virtual Exchange* 3 (SI), 5–35. <https://doi.org/10.21827/jve.3.36082>.
- Helm, F. and Van der Velden, B. (2021) *Erasmus+ Virtual Exchange: Intercultural Learning Experiences: 2020 Impact Report*. European Education and Culture Executive Agency, European Commission, Publications Office of the European Union.
- Hernández Muñoz, N., Muñoz-Basols, J. and Soler Montes, C. (2021) *La diversidad del español y su enseñanza*. Routledge.
- Holmes, J. and Hazen, K. (eds) (2013) *Research Methods in Sociolinguistics: A Practical Guide* (vol 5). Wiley.
- Hymes, D.H. (1995 [1972]) Acerca de la competencia comunicativa. In M. Llobera (ed.) *Competencia comunicativa. Documentos básicos en la enseñanza de lenguas extranjeras* (pp. 27–47). Edelsa.
- Iglesias Casal, I. and Ramos Méndez, C. (2020) Mediación y competencia comunicativa intercultural en la enseñanza del español LE/L2. *Journal of Spanish Language Teaching* 7 (2), 89–98. <https://doi.org/10.1080/23247797.2020.1853368>.
- Instituto Cervantes (2006) *Plan curricular del Instituto Cervantes. Niveles de referencia para el español*. Biblioteca Nueva.
- Instituto Cervantes (2011a) Material didáctico ELE en la plataforma AVE. ¡Hola, amigos! Nuevo curso de español para niños y jóvenes. In *Memoria 2010–2011 del Instituto Cervantes*. Instituto Cervantes.
- Instituto Cervantes (2011b) *¡Hola, amigos! 8 de marzo de 2011* (video). <https://videos.cervantes.es/hola-amigos/>
- Instituto Cervantes (2012–2018) *Las competencias clave del profesorado de lenguas segundas y extranjeras*. Instituto Cervantes.
- Jager, S., Kurek, M. and O’Rourke, B. (2016) New directions in telecollaborative research and practice: Introduction. In S. Jager, M. Kurek and B. O’Rourke (eds) *New Directions in Telecollaborative Research and Practice: Selected Papers from the Second Conference on Telecollaboration in Higher Education* (pp. 1–15). Research-publishing.net.
- Jager, S., Peng, H., Albá Duran, J. and Oggel, G.A. (2021) *Virtual Exchange as Innovative Practice across Europe: Awareness and Use in Higher Education*. EVOLVE Project

- Monitoring Study* 2020. <http://hdl.handle.net/11370/80666684-9024-466a-9968-d13b335cfb6a>.
- Juan-Lázaro, O. (2001) *La red como material didáctico en la clase de E/LE*. Edelsa.
- Juan-Lázaro, O. (2010) Las TIC en el aula de español: La competencia digital y la autonomía del estudiante. *Mosaico, Revista para la Promoción y Apoyo a la Enseñanza del Español* 25, 4–11.
- Juan-Lázaro, O. (2016) La tecnología en el aula y fuera del aula: actitudes y valoraciones del profesor en la integración del Aula Virtual de Español, AVE. Hacia propuestas de mejora continua y renovación. *RedELE, Revista Electrónica de Didáctica del Español Lengua Extranjera* 28, 1–35.
- Juan-Lázaro, O. (2017) Marco para la transformación digital en el aula de ELE. In A.M. Cestero Mancera and I. Penadés Martínez (eds) *Manual del profesor de ELE* (pp. 811–864). Publishing Department, University of Alcalá.
- Juan-Lázaro, O. and Alejalde Biel, L. (2020) *Competencias digitales en el aula. Estrategias y modelos de implementación en la enseñanza de idiomas*. enClaveELE and UDIMA.
- Kampylis, P., Punie, Y. and Devine, J. (2016) *Promoción de un aprendizaje eficaz en la era digital. Un marco europeo para organizaciones educativas digitalmente competentes*. Ministerio de Educación (Ministry of Education).
- Kannan, J. and Munday, P. (2018) New trends in second language learning and teaching through the lens of ICT, networked learning, and artificial intelligence. *Círculo de Lingüística Aplicada a la Comunicación* 76, 13–30.
- Kinginger, C. (2016) Telecollaboration and student mobility for language learning. In S. Jager, M. Kurek and B. O'Rourke (eds) *New Directions in Telecollaborative Research and Practice: Selected Papers from the Second Conference on Telecollaboration in Higher Education* (pp. 19–29). Research-publishing.net.
- Klee, C.A. (2019) Content-based learning and language immersion. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2* (pp. 491–504). Routledge.
- Kluzer, S. and Pujol, L. (2018) *DigComp into Action: Get Inspired, Make It Happen. A User Guide to the European Digital Competence Framework*. (S. Carretero, Y. Punie, R. Vuorikari, M. Cabrera and W. Okeffe, eds). Publications Office of the European Union.
- Lafford, B.A. and Isabelli, C.A. (2019) Study abroad programs. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2* (pp. 505–518). Routledge.
- Lewin, R. (ed.) (2009) *The Handbook of Practice and Research in Study Abroad: Higher Education and the Quest for Global Citizenship*. Routledge.
- Little, D. (2016) Learner autonomy and telecollaborative language learning. In S. Jager, M. Kurek and B. O'Rourke (eds) *New Directions in Telecollaborative Research and Practice: Selected Papers from the Second Conference on Telecollaboration in Higher Education* (pp. 45–55). Research-publishing.net.
- Martos, F. and Teruel, M.J. (2018) Plataformas virtuales en ELE: Análisis y evolución del Aula Virtual de Español (AVE), según creencias de su profesorado. *MarcoELE* 26, 1–16.
- McManus, K., Mitchell, R. and Tracy-Ventura, N. (2014) Understanding insertion and integration in a study abroad context: The case of English-speaking sojourners in France. *Revue française de linguistique appliquée* 2 (2), 97–116. <http://eprints.soton.ac.uk/id/eprint/370164>.
- Moneris Oliveras, L. (2015) Spanish dialectal variation in the foreign language classroom: Students' attitudes, instructors' beliefs and teaching practices, and treatment of variation in textbooks. PhD thesis, University of Alberta.
- Moreno-Fernández, F. (2000) *Qué español enseñar*. Arco/Libros.
- Moreno-Fernández, F. (2009) *La lengua española en su geografía*. Arco/Libros.

- Moreno-Fernández, F. (2010) *Las variedades de la lengua española y su enseñanza*. Arco Libros.
- Moreno-Fernández, F. (2019) Dialectology. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2* (pp. 377–390). Routledge.
- Moreno-Fernández, F. (2020) *Variedades de la lengua española*. Routledge.
- Müller-Hartmann, A. (2016) A task is a task is a task is a task ... or is it? Researching telecollaborative teacher competence development – The need for more qualitative research. In S. Jager, M. Kurek and B. O'Rourke (eds) *Directions in Telecollaborative Research and Practice: Selected Papers from the Second Conference on Telecollaboration in Higher Education* (pp. 31–43). Research-publishing.net.
- Munday, P. (2018) Contextos Virtuales para el aprendizaje. In J. Muñoz-Basols, E. Gironzetti and M. Lacorte (eds) *The Routledge Handbook of Spanish Language Teaching: Metodologías, contextos y recursos para la enseñanza del español L2* (pp. 491–504). Routledge.
- Muñoz-Basols, J. and Hernández Muñoz, N. (2019) El español en la era global: Agentes y voces de la polifonía panhispánica. *Journal of Spanish Language Teaching* 6 (2), 79–95.
- Navarro Serrano, P. and Juan-Lázaro, O. (2017) Las redes sociales como herramienta para la creación de identidad de grupo, gestión de aula y dinamización de los cursos en línea AVE, Aula Virtual de Español, del Instituto Cervantes. In C. Pastor Villalba (ed.) *Actas del III Congreso Internacional SICELE. Investigación e innovación en ELE. Evaluación y variedad lingüística del español* [online]. Instituto Cervantes.
- O'Dowd, R. (2011) Online foreign language interaction: Moving from the periphery to the core of foreign language education? *Language Teaching* 44 (3), 368–380. <https://doi.org/10.1017/S0261444810000194>.
- O'Dowd, R. and O'Rourke, B. (2019) New developments in virtual exchange for foreign language education. *Language Learning & Technology* 23 (3), 1–7. <https://doi.org/10125/44690>.
- Ortiz-Jiménez, M. (2019) Actitudes lingüísticas de los profesores de español en España y Australia hacia las variedades dialectales. *Journal of Spanish Language Teaching* 6 (2), 182–198. <https://doi.org/10.1080/23247797.2019.1668634>.
- Pellerin, M. and Soler Montes, C. (2012) Using the Spanish online resource *Aula Virtual de Español* (AVE) to promote a blended teaching approach in high school Spanish language classrooms. *Canadian Journal of Learning and Technology* 38 (1), 1–22. <https://doi.org/10.21432/T2GW22>.
- Pettigrew, T.F. (1998) Intergroup contact theory. *Annual Review of Psychology* 49 (1), 65–85. <https://doi.org/10.1146/annurev.psych.49.1.65>.
- Redecker, C. (2020) *Marco Europeo para la Competencia Digital de los Educadores: DigCompEdu*. Secretaría General Técnica del Ministerio de Educación y Formación Profesional de España (Technical General Secretariat of the Spanish Ministry of Education and Professional Training).
- Regan, V., Howard, M. and Lemée, I. (2009) *The Acquisition of Sociolinguistic Competence in a Study Abroad Context*. Multilingual Matters.
- Salin, S., Hall, D. and Hampton, C. (eds) (2020) *Perspectives on the Year Abroad: A Selection of Papers from YAC2018*. Research-publishing.net.
- Scolari, C.A. (2018) *Alfabetismo transmedia en la nueva ecología de los medios. Libro Blanco*. Pompeu Fabra University.
- Soler Montes, C. (2008) Evaluación y variación lingüística: La dimensión diatópica de la lengua en la certificación de la competencia de Español Lengua Extranjera. *Monográficos MarcoELE* 7, 122–136.
- Soler Montes, C. (2015) El modelo de lengua en el aula de ELE: Adecuación de la variedad lingüística desde un punto de vista pluricéntrico. In Y. Morimoto, M.V. Pavón Lucero

- and R. Santamaría Martínez (eds) *La enseñanza de ELE centrada en el alumno* (pp. 1237–1244). Carlos III University/ASELE.
- Soler Montes, C. (2017) La variación gramatical y el aprendizaje de los tiempos verbales del pasado en el contexto del español como lengua extranjera. In M.C. Ainciburu (ed.) *La adquisición del sistema verbal del español: Datos empíricos del proceso de aprendizaje del español como lengua extranjera* (pp. 235–266). Peter Lang.
- Soler Montes, C. (2020) Tiempo, aspecto y aprendizaje basado en datos: Consideraciones para la enseñanza del pretérito perfecto compuesto en español. *MarcoELE* 31, 91–118.
- UNESCO (2019) *Marco de competencias de los docentes en materia de TIC UNESCO (versión 3)*. UNESCO.

11 Competencies and Language Digitalization: Podcasts and Digital Stories

Ana Oskoz

11.1 Types of Resources and Characteristics

Both podcasts and digital stories have several potential uses in the field of foreign and second language (FL/L2) teaching. Podcasts have been defined as **recurring digital audio publications** on topics of interest and have the potential to develop **listening comprehension** (Fouz-González, 2019) as well as **oral production** (Fouz-González, 2019; Lord, 2008; Lord & Harrington, 2013). Meanwhile, digital stories are **multimodal narratives**, typically lasting between 2 and 5 minutes, that combine and integrate images, sound and text. They foster **listening comprehension** (Ramírez Verdugo & Alonso Belmonte, 2007) as well as **written and oral production** among learners (Oskoz & Elola, 2014).

As for the benefits of podcasts, these include their ease of access, even independently outside the classroom setting (Godwin-Jones, 2005; Meng, 2005), and their usefulness in helping learners become accustomed to authentic listening contexts (Stanley, 2006). Additionally, thanks to the wide variety of podcasts available, learners can listen to recordings by different speakers, both men and women, with various accents and different ways of pronouncing the target sounds in diverse phonetic contexts (Fouz-González, 2019). Another important aspect when it comes to using podcasts is the vast selection of topics on offer. Consequently, learners can choose those that best suit their tastes and interests, in turn increasing motivation and fostering meaningful learning. In addition to podcasts aimed at the Spanish-speaking community in general, there are specific ones created for Spanish learners. These include *CoffeeBreak Spanish* (beginner to advanced), *A Zero to Hero* (beginner) and *Radio Ambulante* (for more advanced learners). As well as listening to existing podcasts, learners can also create their own from the comfort of their

own homes. Then, they can upload them to class or personal websites and servers to be accessed and shared.

Digital stories, on the other hand, have been used in L2 classrooms for their potential to develop listening (Ramírez Verdugo & Alonso Belmonte, 2007), oral production (Lee, 2014) and written expression (Oskoz & Elola, 2014, 2016b) skills, or even a combination of these skills simultaneously (Castañeda, 2013; Reyes Torres *et al.*, 2012). However, perhaps what is most striking is that learners combine various **semiotic resources** (e.g. linguistic, visual, spatial or auditory) when creating a digital story. Today, learners have several options for creating digital stories thanks to the various programs available. In fact, they can even use their cell phones. Examples of digital stories and projects can be found on *Story Center* (Lambert *et al.*, n.d.), *Intercultural Tales* (Lizarazo *et al.*, 2021) or *Fantales* (interactive fan fiction, see Cornillie & van der Veken, 2017–2019).

An aspect that both podcasts and digital stories share is that learners often become content creators, a point of particular interest in this chapter. First and foremost, since digital stories and podcasts offer the option to include music and images (the latter in the case of digital stories), it is important to consider **copyright laws** and to ensure that no laws are being violated. This is an aspect that undoubtedly needs to be taught and highlighted in the classroom.

Another important factor to take into account is that the integration of these tools can also help learners to develop their **digital skills**. Indeed, the inclusion of these (and other) tools in education is important because, as Ortega (2017) points out, integrating **digital literacy** into learners' lives is a matter of **social justice** (see Chapter 1 of this book). Essentially, it becomes a way to reduce the gap between those who have (the 'haves') and those who do not have (the 'have-nots') broad access to technology. Ortega (2017: 301) goes on to say that, as educators, it is our responsibility to promote the development of '**know-how skills**' and competences to encourage our L2 learners from a variety of cultural and financial backgrounds to take part in **technology uses that empower them socially**. It is not enough for learners to simply know how to use technology for recreational activities: they should also be able to use it for activities related to financial success. Therefore, knowing how to create a digital story or podcast goes beyond the learning objectives in the classroom since, as noted by Lomicka and Lord (2011), it helps learners to become **active members** of an increasingly technological society.

11.2 State of the Art

11.2.1 Origins of podcasts and digital stories

At the beginning of the 21st century, podcasts were considered to be **disruptive technologies** (Godwin-Jones, 2005: 9). Today, however, they

are part of our everyday lives. Looking back, podcasts started out as an exclusive tool for Mac computer enthusiasts and, as stated by Godwin-Jones (2005: 10), they were ‘an esoteric activity by computer geeks for other computer geeks’ that involved a complex process that could only be carried out on a Mac. However, this exclusivity quickly changed, and mainstream media outlets began to use them. Around 2005, podcasts started being used for language learning purposes (Meng, 2005; Stanley, 2006). Today, users can create their podcasts with a voice editor (e.g. *Audacity*) on a computer or cell phone. Then, as long as the file is saved in MP3 format, they can upload them to their websites or blogs.

As for digital stories, these first emerged in the 1990s in Berkeley, California, on *Story Center* (Lambert *et al.*, n.d.). Traditionally, digital stories focused on personal narratives (Lambert, 2012), but current educational uses also include documentaries or stories designed to inform or educate audiences on specific concepts or practices (Lee, 2014; Robin, 2006). Regardless of their focus, digital stories are a form of **self-representation through media** (Hull & Katz, 2006), combining traditional learning methods (e.g. research, writing, interviews) with more innovative techniques (e.g. the inclusion of images, animation, music). As with podcasts, learners can easily upload their digital stories to platforms such as YouTube or post them on their personal websites or blogs.

11.2.2 Theoretical frameworks applied to podcasts and digital stories

Many of the works that have examined how learners can improve their pronunciation using podcasts (Fouz-González, 2019; Lord & Harrington, 2013) use as a starting point the **speech learning model** put forth by Flege (1987, 1995). This model considers that a learner approaches phonemes in the L2 based on the sounds inherent to their first language (L1). If the learner does not manage to establish or relate the sounds to the correct categories in the L2, not only will they perceive them incorrectly but they will also fail to produce them properly. According to Flege (1987, 1995), sounds that are similar in the L1 and L2 will pose difficulties for the learner because the tendency is simply to assimilate the sound of the L2 to the existing category in the L1, rather than accurately distinguishing the phonetic categories in the L2. Conversely, ‘new’ sounds that do not exist in the L1 will cause fewer difficulties since, in this case, there is no point of reference (see Flege, 1987, 1995).

Within this group of studies that focus on pronunciation within the speech learning model, Lord and Harrington (2013) also used the **noticing hypothesis** (Schmidt, 1990) as a starting point. This hypothesis argues that one cannot learn anything that has not been noticed or paid attention to. Although the authors themselves recognize that this

hypothesis refers primarily to morphosyntactic aspects, they consider that the acquisition of pronunciation in an L2 is another area in which noticing is, if not necessary, at least beneficial. In their study, which focused specifically on the sounds /r, ɾ, p, t, k/, Lord and Harrington (2013) analyzed whether learners produced these sounds in a 'more native-like' manner after performing a self-analysis or participating in (learner) communities. They also analyzed how learners reacted to the self-analysis or to other learners' observations. To this end, they asked their learners to record two activities in the form of a podcast every three weeks: a short segment in which they answered several questions, and an activity involving reading aloud a text by the Spanish author Julio Llamazares. Then, the learners in the control group listened to their recordings in order to analyze the strong and weak points in relation to the concepts studied in class. Meanwhile, the learners in the experimental group gave feedback to their classmates instead of performing a self-analysis. Lord and Harrington (2013) observed that, while the learners in both groups made significant improvements throughout the semester in their use of the /r/ sound at the beginning of words, there were no considerable differences in other phonemes. As the authors point out, it is possible that the learners improved in their use of this sound in particular because it does not exist in English (Flege, 1987, 1995).

In the field of learning English as a foreign language, Fouz-González's study (2019) is particularly interesting because, to teach pronunciation, the author combines the use of podcasts produced by the BBC with podcasts created by his learners. Based on the speech learning model and Saito's (2013) recommendation regarding the importance of focusing on form when teaching pronunciation, and following Ranta and Lyster's (2007) pedagogical sequence for pronunciation instruction through podcasts (awareness > practice > feedback), the learners first received clear information about the target sounds. This information included explanations for why these sounds might be problematic for native Spanish speakers and tips for correcting potential pronunciation errors. Second, they participated in a series of activities to identify the target sounds in various BBC podcasts. Third, the learners recorded a short text that contained the sounds in question. Finally, they gave each other feedback. Even though the results of the study were inconclusive (the learners improved in some phonemes but not in others, regardless of whether they participated in the control or experimental group), Fouz-González (2019) suggests that, through focused listening to sounds in podcasts, learners could gradually improve their perceptual representations of the L2 phonological system.

Regarding the studies on Spanish language teaching that focused on digital stories, they mainly followed two theoretical frameworks: activity theory (Leontiev, 1978) and social semiotics theory (Kress, 2003). Several studies framed within **activity theory** (Leontiev, 1978) focused on the

dynamic interrelation between the different elements in an **activity system** (artifacts, subject, rules, community, division of work, object). This way, the tools used (programs, images, language) to create an object (the digital story) affect how learners orient and reorient their actions in relation to the object and the perceived result. For example, the participants in the study conducted by Oskoz and Elola (2014) changed how they perceived the digital story (the object) as they worked on the narration, images and sounds, and as they received feedback from their peers and instructor. Additionally, according to activity theory, an individual's actions can be categorized as automatic operations or processes (unconscious acts) and conscious orientations or processes (planned actions directed towards a distinct objective). In relation to this, in a study comparing the collaborative and individual creation of digital stories, Maqueda (2020) concluded that Spanish learners engaged in conscious operations while performing collaborative tasks in which they guided each other to complete the digital story, and in unconscious operations when the learners created digital stories individually.

Meanwhile, **social semiotics** theory (Kress, 2003, 2009) helps educators to understand the potential of multimodality and resource diversity to promote learning. The creation of digital stories includes a sophisticated integration of resources such as images, sound or text, into the process of semiotic synesthesia (Kress, 2003). Within this theory, there are two critical aspects in the development of the multimodal text in this case, the digital story. The first one is **transformation**, that is, the actions that rearrange and reposition the semiotic resources within a particular mode. In a digital story, for instance, transformation is evident in the process of restructuring a narrative to produce a script, or restructuring the syntax of a text to convey the same meaning in the form of a script. The second aspect is **transduction**, that is, the reorganization of the semiotic resources. This could, for instance, be the transition from written to spoken language or the inclusion of images, music and sound. Although managing all these semiotic resources to create their digital stories can sometimes pose a challenge for learners, Oskoz and Elola (2016a) found that the processes of transformation within modes (e.g. moving from an academic text, such as an essay, to a digital narrative script) and the processes of transduction (e.g. adapting a written narrative to the spoken word) allowed learners to express complex meanings. Additionally, using the process of transduction, in the studies conducted by Oskoz and Elola (2014, 2016a) their learners were able to experiment with the use of pauses, repetitions, voice inflections and images to create transitions that in a traditional essay would have been created with connectors. In a way, in terms of language learning, it may seem contradictory that learners of an L2 simplify their productions and even create shorter sentences (Oskoz & Elola, 2014). However, when creating a digital story, learners must consider how the

text, images and sounds complement each other to create a multimodal narrative (Shin & Cimasko, 2008).

11.3 Research, Curriculum Design and Teaching Practices

11.3.1 Podcasts

Podcasts have been easily adopted in the L2 classroom due to their potential for developing **listening comprehension** and **oral expression**, as mentioned earlier (Ducate & Lomicka, 2009; Fouz-González, 2019; Lee, 2014; Lord, 2008). Furthermore, as will be seen below, previous studies have demonstrated (1) the value of the **feedback** that learners receive on their podcasts when it comes to improving pronunciation; (2) how the use of specific activities can promote learner **autonomy**; and (3) how their sustained use has the potential to **reduce anxiety** (see Chapter 6 of this book).

Perhaps one of the most valued attributes in the context of podcasts is the **feedback** that learners receive both from their peers and their instructor. Lord and Harrington (2013), for instance, asked the participants in their study to get into groups of four or five and listen to their peers' podcasts. Then, they were instructed to provide feedback on their strong points and areas for improvement regarding the phonological concepts taught in class. While it is true that, when the authors compared feedback from the instructor and from other learners, the former proved to be more reliable (since other learners may not always be able to identify specific articulatory issues), the authors also indicated that the comments were comparable (Lord & Harrington, 2013).

Another added benefit of podcasts is that learners can use these tools as they like once they have been taught to discern the different sounds. This, in turn, promotes their **autonomy**. Since, through focused listening to podcasts learners can gradually improve their perceptual representations of the L2's phonological system (Fouz-González, 2019), exercises can be created for learners to autonomously monitor their pronunciation and, over time, incorporate the characteristics of the sounds they hear into their own productions. The participants in the study conducted by Fouz-González (2019), for example, had to find at least 10 words containing the target sounds while listening to a weekly podcast. Then, after listening to some specific segments from the podcasts in question, they were asked to classify similar sounds (e.g. /s/ or /z/ in English). Afterwards, his learners had to record a short text that contained the target sounds and share it for assessment. As suggested by Fouz-González (2019), both **perception** and **production** exercises should help learners discern and autonomously practice sounds in the target language. Additionally, another way for learners to develop

their autonomy is through self-analysis and reflection on their own pronunciation (Lord, 2008; Lord & Harrington, 2013). Following Lord and Harrington's example (2013), after recording and listening to their pronunciation, learners could be asked to identify their strong and weak points regarding the sounds learned in class. In this case, as pointed out by the authors, it is important to provide learners with specific guides on how to self-analyze and what to focus on during the self-assessment at the beginning of the course.

Although the focus of research on podcasts has primarily been on learner autonomy and the impact of feedback, Lord (2008) and Lord and Harrington (2013) also demonstrated that creating podcasts every two or three weeks increased learners' **sense of ownership and authorship**. In turn, this has the potential to **reduce anxiety** and **boost motivation** (see Chapters 6 and 5 of this book, respectively). Similarly, Brennan Juana and Palak (2011), who investigated the use of podcasts to improve Spanish learners' oral expression in the context of secondary education, also asked their learners to create two-minute podcasts once a week. They concluded that not only did their use encourage learners to practice Spanish more often but it also led to a reduction in anxiety and a boost in self-confidence when speaking the target language.

Even though most studies on podcasts in Spanish as an L2 have focused on oral production, this tool can also be used to **develop writing skills**, as demonstrated by Allen and Gamalinda (2021) in a study involving French learners. In their research, Allen and Gamalinda followed a similar model to that of Fouz-González (2019): analyzing podcasts and then creating them. Specifically, their learners examined how podcast creators for *Transfert* (see Carron & Saeptem, 2022), who tell personal stories, presented the topic and used language to narrate their stories. Subsequently, through an elaborate writing process, the learners created their own podcasts.

In the context of teaching practices, what is evident from these studies is the need to integrate the use of podcasts into the class's curriculum design, keeping in mind the **pedagogical objectives** of the course. First, it is important to explain the purpose of the podcast activities: whether it is to help learners recognize sounds in the target language, improve their pronunciation or develop their writing skills. It is also necessary to describe how this purpose will be achieved. In general, all the studies remind us of the need to establish specific steps when introducing podcasts in the classroom.

If the objective of the course is to **improve learners' perception of sounds and pronunciation**, the curriculum could be designed to include both **explicit instruction** of the new sounds and **constant practice**. In this case, the following recommendations should be considered. First, the instructor must present the new sounds explicitly, so that learners can become aware of them. This step, which would be repeated each

time new sounds are introduced, should help them to restructure their representations of the sounds in the L2 (Fouz-González, 2019). Second, learners should complete bi- or tri-weekly activities (since repetition is crucial) that include a variety of tasks such as: (1) reading passages from a book; (2) reflecting aloud on their language learning experiences, especially in terms of their Spanish pronunciation; and (3) tongue twisters focusing on sounds that may be particularly challenging (Lord, 2008). In this process, self-analysis, self-assessment and feedback among peers should be promoted, as mentioned earlier.

Regarding feedback, it is important to ensure that learners provide at least one positive comment and one piece of constructive criticism for each recording they assess. It is also useful, as noted by Lord (2008), for learners to focus their comments purely on pronunciation and especially on the concepts studied in class that are worked on in each of the recordings. The benefit of receiving feedback from peers and engaging in self-analysis is that learners not only focus on their pronunciation but they also achieve ‘greater awareness of and attention to the phonological properties of Spanish which, combined with the metalinguistic focus on pronunciation and the practice analyzing spoken speech, will help them continue to make gains in their own pronunciation’ (Lord, 2008: 376).

If the aim is to create a podcast in which learners narrate a story, as per the study conducted by Allen and Gamalinda (2021), first they must receive an introduction to the podcast genre. With the instructor’s help, they can identify and analyze topics, content, structures and the linguistic elements they need to use to create their stories. Second, they must produce a series of story drafts so that the instructor and other learners can highlight their strengths, provide feedback on areas that require further work and ask specific questions. Finally, once the final draft is ready, learners must record and edit their podcasts.

Despite the benefits of using podcasts in the language classroom, an important aspect to consider is the level at which they are most effective. Lord and Harrington (2013), in line with Skehan’s (1998) recommendations, suggested that advanced learners are better equipped to focus on pronunciation. In fact, most studies mentioned were based on advanced Spanish phonology courses (Lord, 2008; Lord & Harrington, 2013) or involved advanced language learners (Fouz-González, 2019). This does not mean that instructors cannot or should not focus on sounds from the very beginning. It is important, however, to be mindful of beginners’ learning limitations in this regard. Another aspect to consider is that perhaps not all learners, or even instructors, have the knowledge required to create a podcast. Therefore, it may be necessary to dedicate time to train both instructors and learners in the relevant technical aspects, including how to record and upload to the platform of choice (Allen & Gamalinda, 2021). Furthermore, while learners may possess the technical knowledge to create a podcast, it is useful to keep in mind that ‘technical

know-how does not imply pedagogic know-how' (Rosell-Aguilar, 2009: 19–20). As a result, it is essential to explain clearly how the use of podcasts responds to the course's pedagogical objectives.

11.3.2 Digital stories

As in the case of podcasts, research conducted on digital stories serves as a guide to help language instructors implement them in the classroom in order to strengthen learners' writing and oral skills (Lee, 2014; Oskoz & Elola, 2014, 2016a; Ramírez Verdugo & Alonso Belmonte, 2007) as well as their overall digital competence. Furthermore, this research has also revealed the value of **feedback** when it comes to improving production, as well as the impact of **mediation** and **interaction** among learners on written and oral expression in the context of digital stories.

The **feedback** that learners receive is perhaps one of the most valued aspects in digital stories, whether it is from their instructor or peers. In the case of peer feedback, the idea is that learners read and listen to their peers' drafts to provide and receive suggestions to improve their stories (Alameen, 2011) and their use of images and sound (Oskoz & Elola, 2014). This process helps learners to co-construct knowledge while also simulating an external audience beyond the classroom context. In turn, this contributes to the digital story's development.

As seen previously, activity theory has been applied to the study of digital stories due to the relevance of **mediation**, whether through tools (e.g. language, grammar rules) or the collaborative nature of digital story development (e.g. feedback). Oskoz and Elola (2014, 2016a), for instance, pointed out that the interactions of Spanish learners with tools and artifacts played a mediating role in their changing perceptions of digital stories and helped them to think creatively. Therefore, in line with other studies (Maqueda, 2020; Padial, 2020), it can be concluded that the use of these tools had a direct impact on the interrelation among the components of an activity system.

Somewhat related to feedback, the **interaction** that takes place among learners while creating digital stories is of the utmost importance. When working collaboratively, Maqueda (2020) demonstrated that learners collectively participate in the script-writing process while simultaneously selecting images and sounds as well as assisting each other with certain technical aspects. Even when working individually, it is important for learners to have access to their peers' comments. Participants in Oskoz and Elola's research (2014), for example, highlighted how listening to their peers' stories helped them. Additionally, knowing that their peers were going to listen to the recordings and provide feedback motivated them to write interesting stories.

From a pedagogical perspective, when creating digital stories that combine, as mentioned earlier, traditional classroom practices (e.g.

research, writing and interviews) with means of communication to convey ideas (e.g. graphics, animation or music), a careful integration of both components is crucial, taking into account the course's **pedagogical objectives**. Creating digital stories requires a rigorous process in which learners develop the content, combine their written and oral components, include text, images and sound, and refine their final work. As with podcasts, it is necessary to show learners examples to understand what they involve. In this way, they can analyze, for instance, the selection of images or see how the author expands on the story's main theme, narrated from their own point of view. After this initial phase, the creation process can be broken down into several steps (Oskoz & Elola, 2016b). However, while these steps are presented sequentially here, in reality, the process is more creative and cyclical in nature (Castañeda, 2013):

- (1) conducting preliminary research to choose the topic (a personal story, a cultural aspect, etc.) in order to help learners develop the story's content;
- (2) guiding learners' attention towards the linguistic aspects they will need, through in-class explanations and draft revisions. This is so that they not only focus on grammar and vocabulary but also reflect on structural and organizational aspects that will add narrative cohesion and consistency to their texts;
- (3) working on the quality and relevance of the chosen images, encouraging learners to use a combination of images that convey meaning either implicitly or literally to create convincing multimodal metaphors. This is also a good time to address how to use images appropriately and discuss potential copyright issues with images and music;
- (4) recording the scripts;
- (5) creating the digital story, combining all the semiotic resources to which learners have access (e.g. images, music, etc.) and using different tools;
- (6) presenting the digital stories to the rest of the class. This promotes a sense of achievement and motivates learners to refine their final work.

The use of digital stories in the language classroom is not without its challenges. For example, some participants in Maqueda's study (2020) complained that when working collaboratively on their digital stories, their peers did not always show the same level of interest in completing the project and did not participate equally in the process. Additionally, regarding the written production component, educators accustomed to teaching more traditional genres, such as argumentative essays, may question the extent to which creating digital stories can contribute to the development of writing skills. Indeed, the digital story creation process

also requires both instructors and learners to change how they perceive writing.

From the instructor's perspective, the integration of new genres, especially digital ones, requires a fresh outlook on what communication involves, without neglecting other genres that already have their place in the classroom (Elola & Oskoz, 2017). Furthermore, according to the findings of Oskoz and Elola's study (2014), advanced L2 Spanish learners transfer their knowledge of writing conventions to their digital stories. As noted by Koelzer (2017), this reveals that traditional and digital writing approaches share more similarities than differences when it comes to structure. Koelzer (2017) also adds that digital stories could be incorporated into L2 academic writing classrooms to broaden learners' literacy practices, helping them to become competent communicators in the digital age. From the learner's perspective, while some of the participants in Oskoz and Elola's study (2014) accepted the challenge of learning how to combine text (written and oral) with images and sound, others were relieved upon finishing the project. Finally, as with podcasts, alongside combining various semiotic resources, it is essential to learn how to use different programs for creating digital stories. As mentioned earlier, this is precisely why it is necessary to spend time preparing both learners and instructors when it comes to the technical aspects involved in the digital story creation process.

11.4 Conclusion and Future Lines of Research

There is no doubt about the potential of both podcasts and digital stories when it comes to developing one's target language. Through a carefully planned integration of these tools into language courses, they can contribute to the development of oral, writing and listening skills. Furthermore, by implementing these tools in the classroom, we are essentially helping learners acquire the digital skills necessary to succeed not only in the academic realm but also in an increasingly connected professional world.

Despite their growing use in the language classroom, research on podcasts and digital stories is still limited. In the case of Spanish, for instance, most of the studies on podcasts focus on their use for sound recognition and production. With this in mind, it would be useful to conduct studies grounded in social semiotics which, for example, examine how learners produce their own podcasts by combining different semiotic resources (e.g. language and music). Alternatively, from a sociocultural perspective, they could examine the learning that takes place when learners collaboratively develop the script for a podcast or digital story. Additionally, drawing on the work of Allen and Gamalinda (2021), there is a need for studies that focus on podcast creation and that analyze, among other aspects, the writing process

and the integration of different semiotic resources involved in podcast creation. Similarly, it is necessary to conduct further research on the impact of transformation and transduction processes on digital stories.

Without a doubt, both podcasts and digital stories offer multiple pedagogical opportunities that can help us design relevant lessons for L2 learners. Ultimately, it is up to us, as educators, to exploit the full potential of these tools.

11.5 Annotated Additional Reading

Alcantud-Díaz, M. and Gregori-Signes, C. (eds) (2013) *Experiencing Digital Storytelling*. JPM Ediciones.

This is perhaps one of the first books to compile studies and projects involving digital stories in various L2 educational settings. It also provides examples of how to integrate digital stories across different contexts.

Oskoz, A. and Elola, I. (2020) *Digital L2 Writing Literacies. Directions for Classroom Practice*. Equinox.

The authors provide a general description of digital writing in L2 educational contexts. While they do not focus exclusively on digital stories, the authors do emphasize how the inclusion of various semiotic resources is changing the way multimodal composition is approached in the L2 classroom.

References

- Alameen, G. (2011) Learner digital stories in a Web 2.0 age. *TESOL Journal* 2 (3), 355–369. <https://doi.org/10.5054/tj.2011.259954>.
- Allen, H.W. and Gamalinda, S. (2021) Making podcasts in the collegiate French writing course. *CALICO Journal* 38 (1), 1–16. <https://doi.org/10.1558/cj.40912>.
- Babbel (2022) *A Zero to Hero: Learn Spanish* (podcast) Babbel. <https://podcasts.apple.com/us/podcast/a-zero-to-a-hero-learn-spanish/id1485542323>.
- Brennan Juana, M. and Palak, D. (2011) Podcasting as a means of improving Spanish speaking skills in the foreign language classroom: An action research study. *Networks: An Online Journal for Teacher Research* 13 (1), 1–18. <https://doi.org/10.4148/2470-6353.1088>.
- Carron, C. and Saepem, B. (eds) (2022) *Transfert* (podcast). Slate Radio. <https://www.slate.fr/audio/transfert/>.
- Castañeda, M. (2013) ‘I am proud that I did it and it’s a piece of me’: Digital storytelling in the foreign language classroom. *CALICO Journal* 30 (1), 44–62. <https://doi.org/10.11139/cj.30.1.44-62>.
- Coffee Break Languages (2008–2018) *Coffee Break Spanish* (podcast). Radio Lingua Ltd. <https://coffeebreaklanguages.com/category/coffee-break-spanish/>.
- Cornillie, F. and van der Veken, J. (coords) (2017–2019) *FanTALES Project* (website). KU Leuven. www.fantales.eu.
- Ducate, L. and Lomicka, L. (2009) Podcasting: An effective tool for honing language students’ pronunciation? *Language Learning & Technology* 13 (3), 66–86. <http://dx.doi.org/10125/44192>.
- Elola, I. and Oskoz, A. (2017) Writing with 21st-century social tools in the FL classroom: New literacies, genres, and writing practices. *Journal of Second Language Writing* 36, 52–60. <https://doi.org/10.1016/j.jslw.2017.04.002>.
- Flege, J.E. (1987) The production of ‘new’ and ‘similar’ phones in a foreign language: Evidence for the effect of equivalence classification. *Journal of Phonetics* 15, 47–65. [https://doi.org/10.1016/S0095-4470\(19\)30537-6](https://doi.org/10.1016/S0095-4470(19)30537-6).

- Flege, J.E. (1995) Two methods for training a novel second-language phonetic contrast. *Applied Psycholinguistics* 16, 425–442. <https://doi.org/10.1017/S0142716400066029>.
- Fouz-González, J. (2019) Podcast-based pronunciation training: Enhancing FL learners' perception and production of fossilised segmental features. *ReCALL* 31 (2), 150–169. <https://doi.org/10.1017/S0958344018000174>.
- Godwin-Jones, R. (2005) Skype and podcasting: Disruptive technologies for language learning. *Language Learning & Technology* 9 (3), 9–12. <https://dx.doi.org/10125/44026>.
- Hull, G.A. and Katz, M.L. (2006) Crafting an agentive self: Case studies of digital storytelling. *Research in the Teaching of English* 4 (1), 43–81. <https://www.jstor.org/stable/40171717>.
- Koelzer, M.L. (2017) Is it just 'very fun'? Or does it actually help? Digital storytelling in L2 academic writing. Master's thesis, University of Texas.
- Kress, G. (2003) *Literacy in the New Media Age: Literacies*. Routledge.
- Kress, G. (2009) What is a mode? In C. Jewitt (ed.) *The Routledge Handbook of Multimodal Analysis* (pp. 54–67). Routledge.
- Lambert, J. (2012) *Digital Storytelling: Capturing Lives, Creating Community* (4th edn). Digital Diner.
- Lambert, J., Jacobs, W., Weinshenker, D., Spagat, A., Kershaw, R., Sanderson, R. (n.d.) *Story Center* (website). <https://www.storycenter.org/>.
- Lee, L. (2014) Digital news stories: Building language learners' content knowledge and speaking skills. *Foreign Language Annals* 47 (2), 338–356. <https://doi.org/10.1111/flan.12084>.
- Leontiev, A. (1978) *Activity, Consciousness and Personality*. Prentice Hall.
- Lizarazo, T., Muñoz, T. and Orellana, M. (2021) *Intercultural Tales* (website). <https://www.interculturaltales.org/>.
- Lomicka, L. and Lord, G. (2011) Podcasting – Past, present and future: Applications of academic podcasting in and out of the language classroom. In B.R. Faccor and M. Abdous (eds) *Academic Podcasting and Mobile Assisted Language Learning: Applications and Outcomes* (pp. 1–20). IGI Global.
- Lord, G. (2008) Podcasting communities and second language pronunciation. *Foreign Language Annals* 41 (2), 364–379. <https://doi.org/10.1111/j.1944-9720.2008.tb03297.x>.
- Lord, G. and Harrington, S. (2013) Online communities of practice and second language phonological acquisition. *International Journal of Computer-Assisted Language Learning and Teaching* 3 (3), 34–55. <https://doi.org/10.4018/ijcallt.2013070103>.
- Maqueda, C.R. (2020) Heritage and L2 writing processes in individual and collaborative digital storytelling. PhD thesis, Texas Tech University.
- Meng, P. (2005) *Podcasting & Vodcasting: A White Paper, Definitions, Discussions & Implications*. University of Missouri IAT Services. <http://www.tesl-ej.org/ej36/int.pdf>.
- Ortega, L. (2017) New CALL-SLA research interfaces for the 21st century: Towards equitable multilingualism. *CALICO Journal* 34 (3), 283–316. <https://doi.org/10.1558/cj.33855>.
- Oskoz, A. and Elola, I. (2014) Integrating digital stories in the writing class: Towards a 21st-century literacy. In J.G. Guikema and L. Williams (eds) *Digital Literacies in Foreign Language Education: Research, Perspectives, and Best Practices* (pp. 179–200). CALICO.
- Oskoz, A. and Elola, I. (2016a) Digital stories: Bringing multimodal texts to the Spanish writing classroom. *ReCALL* 28 (3), 326–342. <http://doi.org/10.1017/S0958344016000094>.
- Oskoz, A. and Elola, I. (2016b) Digital stories: Overview. *CALICO Journal* 32 (2), 155–173. <https://doi.org/10.1558/cj.v33i2.29295>.
- Padiál, A. (2020) Spanish heritage learners' cognitive approaches to multimodal writing: A multiple case study with digital storytelling. PhD thesis, Texas Tech University.
- Radio Ambulante* (podcast) (2021) <https://radioambulante.org>.

- Ramírez Verdugo, D. and Alonso Belmonte, I. (2007) Using digital stories to improve listening comprehension with Spanish young learners of English. *Language Learning & Technology* 11 (1), 87–101. <https://doi.org/10125/44090>.
- Ranta, L. and Lyster, R. (2007) A cognitive approach to improving immersion students' oral language abilities: The awareness-practice-feedback sequence. In R.M. DeKeyser (ed.) *Practice in a Second Language: Perspectives from Applied Linguistics and Cognitive Psychology* (pp. 141–160). Cambridge University Press.
- Reyes Torres, A., Pich Ponce, E. and Garcia Pastor, M.D. (2012) Digital storytelling as a pedagogical tool within a didactic sequence in foreign language teaching. *Digital Education Review* 22, 1–18.
- Robin, B. (2006) The educational uses of digital storytelling. In C. Crawford, R. Carlsen, K. McFerrin, J. Price, R. Weber and D.A. Willis (eds) *Proceedings of the Society for Information Technology and Teacher Education International Conference, March 19, 2006 in Orlando, Florida* (pp. 709–716). AACE.
- Rosell-Aguilar, F. (2009) Podcasting for language learning: Re-examining the potential. In L. Lomicka and G. Lord (eds) *The Next Generation: Social Networking and Online Collaboration in Foreign Language Learning* (pp. 13–34). CALICO.
- Saito, K. (2013) Reexamining effects of form-focused instruction on L2 pronunciation development: The role of explicit phonetic information. *Studies in Second Language Acquisition* 35 (1), 1–29. <https://doi.org/10.1017/S0272263112000666>.
- Schmidt, R.W. (1990) The role of consciousness in second language learning. *Applied Linguistics* 11 (2), 129–158. <https://doi.org/10.1093/applin/11.2.129>.
- Shin, D.-S. and Cimasko, T. (2008) Multimodal composition in a college ESL class: New tools, traditional norms. *Computers and Composition* 25 (4), 376–395. <https://doi.org/10.1016/j.compcom.2008.07.001>.
- Skehan, P. (1998) *A Cognitive Approach to Language Learning*. Oxford University Press.
- Stanley, G. (2006) Podcasting: Audio on the internet comes of age. *TESL-EJ* 9 (4), 1–7.

12 Digital Ludic Pedagogies (DLP): Videogames, Minigames, Extended Realities and Robots

Luis Cerezo and Joan-Tomàs Pujolà

12.1 Types of Resources and Characteristics

Decades of research have established second language (L2) acquisition as a complex sociocognitive phenomenon that involves the development of multiple competencies, skills, learning strategies and literacies, including two recently recognized ones: digital and ludic literacies. À propos of **digital literacy**, Ortega and Zyzik (2008) noted that it is no longer optional; rather, they argued, it is an ‘ethical imperative’ for teachers to ‘prepare their students for the very real (and indispensable) task of using the L2 in online environments’ (2008: 349). Arguably, similar assertions could be made for **ludic literacy**, given the role of ludic activities in language acquisition (Crystal, 1996) and the generation of culture (Huizinga, 1950), and for the intersection of digital and ludic literacies – **digital ludic literacy** – due to its potential for the development of specialized skills, such as scientific reasoning or leadership (Reinhardt & Thorne, 2019) or even social transformation (McGonigal, 2011).

However, differences in access, training or personal beliefs, among others, have brought about significant disparities in the pedagogies used to promote these literacies in language learning environments (see Chapter 1 of this book on social justice, and Chapter 4 on effective technological practices). To a great extent, the massive online migration triggered by the COVID-19 pandemic pushed many educators to explore new forms of technology-mediated teaching and learning. Digital ludic activities, however, despite generating great interest, remain relatively unexplored. To address this, we initiate our investigation of digital ludic literacy in the L2 classroom with a definition of key concepts, existing resources and their characteristics.

12.1.1 Digital ludic pedagogies (DLPs)

We define **digital ludic pedagogy (DLP)** as the meaningful use of ludic activities for educational purposes through digital devices. These **digital devices** include hardware that can receive, store, process or send digital data, such as computers, tablets, smartphones, smartwatches, headsets and even robots.

As for **ludic activities**, the *Cambridge English Dictionary* defines ‘ludic’ as ‘relating to play or games’. Now, the notions of **play** and **game**, which we will use here interchangeably, are difficult to define (Piaget, 1962: 147). Building on Huizinga (1950), many definitions conceive play as an activity that is voluntary, regulated, temporally and spatially bounded, motivating, unproductive (it has a merely recreational purpose), uncertain (the outcome is unknown) and extraordinary (it transports us to an alternate reality) (for more characteristics, see Govender & Arnedo-Moreno, 2021; Shute & Ke, 2012). Yet, as noted by Hubbard (1991) and Reinhardt (2019), a game does not always adhere to these characteristics. This is due to the intrinsically subjective nature of play, according to which a game is a game only if it is perceived as such. For instance, one game may motivate some but not others, it may be productive (by generating learning), transcend physical boundaries (e.g. *Pokémon GO*, which covers almost the entire globe) or it may never end (e.g. the continuous release of new levels in *Candy Crush*).

Based on this, one might conclude that not all ludic activities can be categorized as games, in the same vein that not all pedagogical activities are considered tasks in **task-based language teaching (TBLT)**. As Cobb and Lovick (2007) noted, pedagogical activities encompass everything that occurs in the classroom, and they can be subdivided into **tasks**, subject to specific criteria (Ellis, 2018), or **exercises**, when these criteria are not met. This classification, however, may prove unproductive. On the one hand, certain task-based approaches set almost unattainable requirements for a task to be considered as such; on the other, even the most exemplary task will inevitably be redefined by the multiple factors it interacts with: the teacher, the learner, the curriculum and the syllabus. Hence, Cerezo *et al.* (2015: 250) suggested replacing this rigid binary distinction between tasks and exercises with a continuum, where **activities** can be categorized as more or less task-like or exercise-like, rather than one or the other exclusively.

Similarly, ludic activities may fall within the ‘game’ category to varying extents. For example, an app such as *Duolingo* fails to meet many of the defining features of a game. As an activity, it is productive (it generates learning), rather certain (results tend to be binary, i.e. ‘right/wrong’) and hardly extraordinary (its decontextualized sentences rarely transport us to alternate realities). It would also be challenging to classify it as a game according to Caillois’ classic taxonomy (1958),

which distinguishes between two main game categories: namely, *ludus* (rule-based games, such as Parcheesi) and *paidia* (exploratory games, like playing with dolls). These categories can in turn combine elements of *agon* (‘competition’, like soccer), *alea* (‘chance’, like the lottery), mimicry (like role-playing games) and *ilinx* (‘vertigo’, like racing). *Duolingo* does not fit into the definitions of *ludus* (there are hardly any rules), *paidia* (it does not allow for much exploration), *alea* (nothing is left to chance) or *ilinx* (no physical or emotional vertigo is generated). However, 40 million people a month use it voluntarily, and some of its users demonstrate high motivation levels (Blanco, 2020). In addition, *Duolingo* does contain certain elements of *agon* (see, for example, its user leagues) and mimicry (users must repeat model sentences).

Returning to our previous discussion on TBLT, Ellis (2018) recently revisited some of its major criticisms. Some have labeled TBLT as an elitist or prescriptive movement where scholars in the ivory tower dictate what language instructors should do in their classrooms. Others have criticized it for neglecting deductive approaches to teaching, thereby promoting what we would call here a Western-centric vision. Reacting to these criticisms, Ellis rejected a single view of TBLT, advocating instead for multiple interpretations. Along these lines, we propose a reassessment of the role that is typically assigned to ‘games’ in the specialized literature. Many scholars underestimate so-called ‘gamification’ through apps such as *Duolingo* (see, among others, Bogost, 2015; Bruckman, 1999; Todd, 2017). Nevertheless, there are multiple learning contexts, teachers, students and curricula. Hence, from an informed eclecticism perspective (Larsen-Freeman, 2000), we advocate for a wide interpretation of DLP, where different types of activities can be effectively used to promote digital ludic literacy in the language classroom, as we discuss in the next section.

12.1.2 Digital ludic activities as a model, aid and channel

The specialized literature typically distinguishes between various language teaching and learning approaches through digital ludic activities, which we would like to question here. To begin with, labels such as ‘game-based’, ‘game-enhanced’, ‘game-informed’ or ‘gamified’ promote a **game-centric vision** in which games (as technically defined above) are conceived as the only option, or in which all ludic activities are loosely and mistakenly labeled as ‘games’; hence our preference for the more encompassing terms **digital ludic activities** and DLPs. Secondly, some classifications have established a ‘**resource-approach correlation**’, according to which the type of resource used determines the teaching approach. For example, scholars talk about ‘game-based’ versus ‘game-enhanced’ learning when educational versus vernacular games are used, respectively, and about ‘game-informed’ or ‘gamified’

learning when existing pedagogical activities are modified with game-related elements (see, for example, Sykes & Reinhardt, 2012). However, this correlation might be somewhat reductive, as pedagogical approaches should be determined by how the learning process is conceived, rather than by the pedagogical resources employed; in other words, teaching approaches should inform the adoption and creation of resources, not the other way around (York *et al.*, 2021). Consequently, in this chapter we distinguish between **three implementations of DLP in the classroom**, depending on the degree of integration of digital ludic activities in the learning curriculum. Specifically, we posit that digital ludic activities may be increasingly implemented as a **model**, **aid** or **channel**:

- (1) **Model.** This approach, also known as **gamification**, draws inspiration from ludic elements in games and applies them to learning experiences. Any pedagogical activity can be gamified by incorporating ludic elements such as game dynamics, mechanics or elements. Boller and Kapp (2017) illustrate these concepts using the popular game *Monopoly*. The game dynamics are the actions needed to achieve the game's goal (e.g. collecting properties); the mechanics are the rules (e.g. earning money upon passing 'Go'); and the elements are the physical or conceptual components that make up the game (e.g. the element of chance materialized through the dice and cards). Overall, the gamification of pedagogical activities is often limited to incorporating structural components that promote competition and extrinsic motivation, such as points, badges, and leaderboards (PBL), at the expense of elements that promote intrinsic motivation such as narrative, strategy or cooperation (see Pujolà & Appel, 2020, and Chapter 5 of this book on motivation and virtual learning).
- (2) **Aid.** Within this approach, digital ludic activities are occasionally implemented to support a traditional curriculum. Drawing inspiration from the three stages of TBLT (pre-task, main task, post-task; see Ellis, 2018), Sykes and Reinhardt (2012) and Reinhardt (2019) proposed organizing digital ludic activities into three phases. In the initial 'briefing' phase, teachers introduce the project objectives and timeline and discuss potential learning strategies. Subsequently, the learners play and complete a series of supporting (analog or digital) activities. This second phase can span several sessions with clearly defined time limits, roles and objectives. Finally, in the 'debriefing' phase, the learners reflect on the experience and how it may have impacted their learning strategies going forward. Two excellent examples of this approach are provided by Chotipaktanasook and Reinders (2018) and deHaan (2019), who document the learning journey of English students through videogames and additional activities over the course of 15 weeks and one year, respectively.

- (3) **Channel.** Finally, digital ludic activities serve as a channel when they are used to deliver all the curriculum learning targets. Implementing this approach is a rather ambitious, costly and rare endeavor, as it implies a radical departure from traditional pedagogical approaches. A pioneering example is provided by the *Quest to Learn* school in New York (Salen *et al.*, 2011), where students learn languages through various ludic activities and resources from the eighth grade onwards.

12.1.3 Videogames, minigames, extended realities and robots

12.1.3.1 Videogames

Videogames can be defined as games (see section 12.1.1) that are viewed through a digital screen. They can be divided into various types. **Ludic videogames** are conceived for entertainment and are publicly accessible. These are also known as **vernacular, intrinsic** or **commercial off-the-shelf (COTS)** games. There are several lists of the most popular ones (e.g. Sundqvist, 2019: 109–113) as well as taxonomies based on criteria such as the game genre (deHaan, 2005) or the number of players (Sundqvist, 2013). According to a survey of 45 gamers conducted by Reinhardt (2019), the game genres perceived as most suitable for language learning include role-play, action–adventure, action, simulation and strategy. Among the most frequently cited ludic videogames in language acquisition studies are so-called massively multiplayer online role-playing games (MMORPG), such as *World of Warcraft (WoW)* (Zheng *et al.*, 2015) and *Guild Wars 2* (Zhao, 2016).

Unlike their ludic counterparts, **serious videogames** do not prioritize entertainment. Rather, they leverage entertainment to raise awareness, persuade, educate or train. They can either be publicly accessible or restricted (Djaouti *et al.*, 2011), and they may receive multiple names, either as a whole (serious games, applied games) or depending on their specific purpose (e.g. edutainment, exergames, advergames, edumarket, militainment or newsgames, referring to games for education, sports, advertising, finance, military training or news dissemination, respectively). There are several published taxonomies, at the macro level (Djaouti *et al.*, 2011, with only 3 criteria), the micro level (Prieto de Lope & Medina-Medina, 2017, with 14 criteria), and specifically for language learning (Patiño & Romero, 2015). Various catalogs are available too, such as those from *Games for Change* and *Serious Game Classification*, although the latter is more partial to minigames (see section 12.1.3.2 below). Some notable examples of serious games for language learning include *Guadalingo*, *Practice Spanish: Study Abroad* and *Tactical Language Training System* (see the Appendix at the end of this chapter for links to these resources and subsequent ones).

Halfway between ludic and serious videogames are so-called purpose-shifting and modified games (Djaouti *et al.*, 2011). **Purpose-shifting**

videogames are games that have been coopted for language learning purposes by adjusting their settings or by providing ancillary pedagogical materials. They can originate from both ludic videogames (e.g. *The Sims*, Ranalli, 2008) and serious videogames (e.g. *Energy City*, Franciosi, 2017). Going one step further, **modified videogames** (or ‘mods’) are those whose source code has been altered. For example, Reinders and Wattana (2014) added new dialogue and quests to the popular MMORPG *Ragnarok Online*, to maximize English language use among their learners.

12.1.3.2 Minigames

Minigames receive the prefix ‘mini’ because they lack most of the defining features of a fully-fledged game (see section 12.1.1). Drawing again on the analogy with TBLT, videogames are to tasks as minigames are to exercises. Patiño and Romero (2015: 37) defined them as activities that ‘allow simple interactions with immediate feedback’. Most of them are oriented towards vocabulary learning and, to a lesser extent, grammar. They typically involve self-correcting recognition, comprehension or controlled production activities (e.g. multiple-choice questions and cloze tests) based on translation, repetition or text–picture matching. There are several online minigame catalogs for language learning, such as *Rockalingua* or *ABCYA*.

Minigames are often offered as part of packs or collections. This is the case with **apps** such as *Rosetta Stone*, *Busuu*, *Babbel*, *Memrise*, *Mondly*, *Mango* or *Drops*, among others, which are generally designed for mobile devices. Their content is usually divided into lessons or modules which users can gradually unlock as they progress in their learning journey. Due to their innovative approaches, certain minigames are particularly noteworthy. These include *Lirica*, which is based on songs; *Lingopie*, an app based on series and movies; *Beelinguapp*, which offers bilingual editions of books and audiobooks; *LinQ*, which helps users read subtitled texts and videos on platforms such as Netflix, YouTube and CNN; *Jiveworld*, which is based on the podcast *Radio Ambulante*; *LingroToGo*, which features information on pragmatics and a vast selection of minigames; and *HelloTalk*, which enables users to engage with native speakers and provide feedback on language use.

12.1.3.3 Extended realities

Extended reality (XR) refers to different immersive technologies that combine the physical world with digitally generated overlays. They hold great potential for second language teaching since they allow for both situated learning and embodied learning, as Pelgrum (2019) and Huang *et al.* (2021) illustrated in their research syntheses.

Through the use of special glasses, **virtual reality (VR)** replaces our real world with fictional ones. Popular examples of VR games include

Half-Life, *Beat Saber* and *The Walking Dead*. In the realm of language acquisition, researchers have explored games like *The House of Languages* (Alfadil, 2020) and *Haunted* (Reitz *et al.*, 2016). In the former, the player is transported to a house where a non-player character (NPC) teaches them the names of different objects. In the latter, pairs of players must exchange physical, spatial and psychological descriptions to distract the NPCs and snatch certain objects from them.

Meanwhile, **augmented reality (AR)** superimposes layers of digital information on the real world. This category includes games such as *Pokémon Go*, *Ingress Prime* and *Zombies, Run!* (exergames with geopositioning). Some of the most popular examples for language acquisition are *Mentira* and *ChronoOps*. In *Mentira* (Holden & Sykes, 2011), the aim is to solve a crime during the prohibition era in Albuquerque by completing jigsaw activities where each player receives a different clue. In *ChronoOps* (Thorne *et al.*, 2021), groups of learners must scout Portland State University and record videos of themselves describing the campus's sustainability initiatives to save the world from an ecological disaster.

12.1.3.4 Robots

Since the 2000s, there has been a growing body of research exploring **robot-assisted language learning (RALL)**. The underlying hypothesis is that robots can facilitate both situated and embodied learning, with several added advantages. On the one hand, robots are often anthropomorphized more than other electronic devices, which can increase motivation; on the other, robots may be perceived as less intimidating than humans, inducing less anxiety (Alemi *et al.*, 2015).

There are several classifications of robots (see examples in Alemi & Bahramipour, 2019, and Engwall & Lopes, 2020). Based on their degree of **autonomy**, robots can be tele-operated (known as 'Wizard of Oz' robots), autonomous (pre-programmed to interact on their own) and transformed (allowing for both options). Based on their degree of **anthropomorphism**, we can distinguish between toy-like robots, face or belly screen robots, humanoid robots and robotic heads. Finally, based on their **role in the classroom**, robots can act as either tutors, teaching assistants, peers/opponents (for the students), learners (if they are the ones receiving training) or social companions (if their role is to engage in non-didactic conversations).

12.2 State of the Art

There are numerous theoretical arguments supporting the implementation of DLPs in language classrooms. For example, Blake and Guillén (2020) emphasized the potential of DLPs to promote the development of *intrinsically human characteristics* (speaking, storytelling, socializing,

analyzing information, playing and using tools). Patiño and Romero (2015) underscored their capacity to cultivate both direct (memory, cognitive, compensatory) and indirect *learning strategies* (metacognitive, affective, social). Additionally, Reinhardt (2019) identified eight *pedagogical affordances* associated with DLPs: contextualized L2 learning; time for L2 use; spaces for sheltered practice; goal-oriented learning and feedback; opportunities for languaging and social collaboration; identity work and play; time/place (in)dependent learning; and autonomous extramural learning. Overall, these constructs can be grouped into **four theoretical approaches** (Cerezo, 2015; Reinhardt, 2019), depending on whether language acquisition is conceived as a **cognitive** (structuralist–behaviorist and psychocognitive approaches), **social** (socio-constructivist approach) or **ecological** phenomenon (a combination of both theoretical approaches).

According to the **structuralist–behaviorist** approach, language acquisition involves the memorization, practice and automation of linguistic structures, either in contrast to the learner’s native language (grammar–translation method) or independently of it (audiolingual method). Feedback, repetition and rewards are key constructs in this approach. As noted by Shortt *et al.* (2021: 14), this approach informs the design of applications such as *Duolingo*, which places a primary focus on the recognition and production of sounds, morphemes and words at the sentence level. However, over time, socialization elements at the textual level have also been incorporated, such as audio lessons, stories, forums or events.

The **psychocognitive approach** attributes a more active role to the learner and their analytical capacity. It conceives learning as an exploratory process resulting from interactions in which the learner understands a percentage of the input (the so-called intake), negotiates what they do not understand, produces output, receives feedback and identifies gaps in their competence. This approach is the foundation for the design of minigames such as *The Gustar Maze* (Cerezo *et al.*, 2016), which uses guided induction to help learners generate, test and automate grammar rules.

Without disregarding psychological aspects, the **socio-constructivist approach** primarily focuses on the social component of language learning. Interaction is not only essential for negotiating what and how to say something; it is also vital in the construction of identities and interpersonal dynamics, as well as the expansion of pragmatic and cultural heritage. An example of the application of this theoretical framework is provided by Sydorenko *et al.* (2019), who analyzed collaborative dialogues among players of the AR game *ChronoOps*.

Finally, the **ecological approach** pays equal attention to the psychological and social aspects of language learning, understanding it as a systematic and dynamic process. This approach also puts

embodied learning at the forefront. Learners interact with each other – both psychologically and physically – with artifacts and with the environment, ‘learning to be’ while learning about the language. Examples of this type of approach can be found in Zheng *et al.* (2015) and Thorne *et al.* (2021), who analyzed learning processes among players of *WoW* and *ChronoOps*, respectively.

12.3 Research, Curriculum Design and Teaching Practices

12.3.1 Incidental, vicarious and intentional vocabulary learning

The vast majority of research syntheses and meta-analyses concur that the main focus of language acquisition studies through DLPs is on vocabulary learning and retention. Specifically, between 43% and 68% of the studies – percentages vary depending on the synthesis consulted – address issues concerning lexical competence (Acquah & Katz, 2020; Dehghanzadeh *et al.*, 2021; Govender & Arnedo-Moreno, 2021; Xu *et al.*, 2020). The prominent role of vocabulary in these studies is such that it has even led to the coining of the term ‘digital game-based vocabulary learning’ (e.g. Zou *et al.*, 2021), and there are specific meta-analyses on the subject (Tsai & Tsai, 2018). Overall, these secondary sources confirm the positive effects of digital ludic activities for vocabulary learning, either as it is (Acquah & Katz, 2020; Dehghanzadeh *et al.*, 2021; Xu *et al.*, 2020; Zou *et al.*, 2021) or compared to various types of traditional instruction (Tsai & Tsai, 2018). However, caution is advised when interpreting these findings, since secondary sources often aggregate different types of digital ludic activities, they comprise primary studies with few details on the comparability of their digital and ‘traditional’ interventions, and they are not impervious to the publication bias towards statistically significant results.

In the realm of ludic videogames, one prominent line of research examines **incidental vocabulary learning** outside the classroom. In a study involving more than 1000 Swedish adolescents, Sundqvist (2019) found that learners who reported spending more hours per week playing videogames demonstrated greater receptive and productive knowledge of English words, especially more complex ones. These learners tended to prefer multiplayer (e.g. *League of Legends*) or massively multiplayer games (e.g. *WoW*). Conversely, the participants who preferred single-player games (e.g. *The Legend of Zelda*) typically spent less time playing, and their vocabulary knowledge did not differ from that of non-players. Sundqvist’s (2019) large-scale study confirms the positive correlation between gaming time and vocabulary learning previously found for children and adolescents. This correlation applies especially to males, due to their greater fondness for videogames (Hannibal Jensen, 2017; Sundqvist & Wikström, 2015). Building upon this, Bytheway (2015)

investigated the strategies that six male gamers used to learn vocabulary while playing *WoW*. Through observations and interviews, she identified 15 strategies – e.g. inferring meanings from context, associating words with images and actions, requesting or providing explanations – and concluded that some of them, such as noticing high-frequency words, are not often appreciated in formal contexts. This last strategy is particularly relevant, as demonstrated by Chen and Hsu (2020) for the game *Slave Trade*. In this experimental study, participants were more likely to learn words that occurred at least six times, along with those that appeared with rich context clues, visual stimuli and other multimodal components (such as subtitles, audio, associated images/actions or meaningful dialogues).

Another emerging line of research examines so-called **vicarious vocabulary learning**; that is, the possibility of learning vocabulary indirectly while observing other learners playing videogames. So far, the results are contradictory. On the one hand, some studies found that players of various videogames recalled significantly fewer words than their observers, immediately after playing and two weeks later (see deHaan *et al.*, 2010, on *Parappa the Rapper 2*, and deHaan & Kono, 2010, on *WarioWare*). Meanwhile, other studies obtained no significant differences between both experimental groups for the videogame *Warcraft III*, both one week later (Ebrahimzadeh, 2017) as well as one and three months later (Ebrahimzadeh & Alavi, 2017). Finally, a third group of studies identified an advantage for the players. In Mohsen (2016), playing the *Virtual Knee Surgery* simulation led to greater immediate vocabulary learning than watching a demo version. Similarly, in Tai *et al.* (2020) players of the *Mondly VR* app outperformed viewers of a demo version in their receptive and productive vocabulary knowledge immediately after the treatment and one week later. One of the factors that might explain these conflicting results is the type of videogame, which can either induce a germane cognitive load (i.e. one that does not divide attention and supports learning) or an extraneous cognitive load (i.e. one that interferes with learning) (Sweller, 2010). For example, in the videogames used by deHaan and Kono (2010) and deHaan *et al.* (2010) (*WarioWare* and *Parappa the Rapper 2*), selecting words was a rather hectic (due to time pressure) and mechanical (not requiring deep linguistic processing) action; hence the edge of the observers, who were freed from this extraneous load.

Moving on to **intentional vocabulary learning**, most studies have assessed the effectiveness of minigames, apps and tutorials. In their research synthesis, Dehghanzadeh *et al.* (2021) included 15 publications based on *WordBricks*, *Duolingo*, *Kahoot!*, *Babbel*, *Jeopardy*, *ClassDojo*, *Lifeline*, *Feelbot* and *Brainscape*. Among these, *Duolingo* is clearly the most widely investigated one, as shown by Shortt *et al.*'s (2021) dedicated research synthesis of 35 studies. Overall, studies demonstrate the effectiveness of these minigames, apps and tutorials for vocabulary

learning. For example, Rachels and Rockinson-Szapkiw (2018) found no significant differences in the amount of elementary Spanish vocabulary learned by children who attended 12 40-minute face-to-face classes and children who played *Duolingo*. This was also the case for Lord (2016) in a similar research design, this time using *Rosetta Stone* with elementary Spanish university students over a semester. Nevertheless, the effectiveness of these resources beyond basic vocabulary recognition or controlled production still requires strong empirical validation. Meanwhile, particularly noteworthy are studies proposing **creative and communicative approaches** to leverage these resources, rather than solely comparing them against traditional teaching modalities.

In an experiment at a Japanese university, Franciosi (2017) tested the effects of playing the simulation game *Energy City* for one hour after studying English vocabulary with *Quizlet* flashcards. The learners who had the opportunity to play the game doubled their use of target words when answering two reflection questions in writing. Using another simulation – *3rd World Farmer* – for half an hour, Franciosi *et al.* (2016) found that, while there were no significant differences between the experimental and control groups when it came to translating words into English one week later, differences did arise 11 weeks later, again in favor of the players. Therefore, it seems that the benefits of supplementing memorization techniques using apps with simulation-based play may manifest more clearly in the long term and in free production activities. Shifting the focus, Bueno-Alastuey and Nemeth (2020) used *Quizlet* as a tool for content creation rather than content dissemination. All participants in their within-subjects study – English learners at a Spanish Official Language School – completed two tasks: creating flashcards using *Quizlet* and recording podcasts based on two lists of idiomatic expressions. Both treatments were equally effective according to receptive and productive measures; however, there was a widespread preference for *Quizlet*, since many learners felt embarrassed to hear their own voices in the podcasts and to have their pronunciation errors exposed to the rest of the group.

Outside of minigames, apps and tutorials, few studies have explored the effects of intentional vocabulary learning through videogames. In two within-subjects studies, Miller and Hegelheimer (2006) and Ranalli (2008) compared the effectiveness of various pedagogical interventions centered around *The Sims* simulation. Pairs and trios of intermediate-level university English learners rotated between three gaming modalities each week. In the first one, players only had access to the game instructions; in the second, they could also freely consult an online dictionary and cultural notes; in the third, they additionally had to consult vocabulary lists and complete multiple-choice exercises before playing the game. In both studies, the third modality yielded the greatest learning after each session, statistically outperforming the second. Similarly, in Hitosugi *et al.* (2014), advanced university Japanese language learners completed

two missions in the game *Food Force*, in two experimental groups. One group had access to a handout with questions including the target words, while the other had to study vocabulary lists before playing the game. Once again, the second group significantly outperformed the first in their vocabulary learning, both immediately after playing and five weeks later. Conversely, Chen and Yang (2013) did not find significant vocabulary learning differences between one group that was encouraged to jot down words while playing the videogame *Bone* and another group that was not. This, according to the authors, might have been due to the fact that only some learners decided to take notes, and even those who did gradually stopped as they focused more on the game. Overall, these studies demonstrate that explicit instruction prior to playing has added benefits for vocabulary learning. However, providing support with supplementary tasks or encouraging learners to apply learning strategies without preparatory consciousness-raising techniques may not be sufficient, as learners may tend to focus primarily on the game.

In the context of XR, there is an emerging body of research demonstrating the effectiveness of VR games for vocabulary learning, either as it is (Reitz *et al.*, 2016) or compared to other methods. Alfadil (2020) found that adolescents who played *House of Languages* for 12 half-hour sessions learned statistically more vocabulary than learners who just attended in-person classes, although no details were provided about what these learners did. Cheng *et al.* (2017), on the other hand, found that both the desktop and VR versions of the game *Crystallize* yielded similar degrees of vocabulary learning. The same result was obtained by Lai and Chen (2021) for the two versions of *Angels and Demigods* in their immediate tests. However, the group that played the VR version did outperform the desktop version group in production tests one week later. These studies thus suggest that the potential benefits of VR may emerge in delayed and more demanding tests. From a theoretical perspective, these benefits may be due to **individualized and situated practice** (compared to in-person instruction) or **embodied learning** (compared to desktop versions of the same game).

Finally, as summarized by van den Berghe *et al.* (2019), various studies have researched the effects of different types of interaction with **robots** – mostly teleoperated – on vocabulary learning. In these studies, participants completed tasks such as reading books with the robots, playing with them or taking on the role of educators and teaching them new words. The data are still sparse and contradictory but they suggest **positive correlations** with the **age** variable (greater effectiveness with older children and adults), the **degree of anthropomorphism** (greater effectiveness when the robot is perceived as more human) and the **robot's expressiveness** (greater effectiveness when the robot is more lively). On the other hand, they suggest a **negative correlation** with the **novelty** variable (the effects decrease over time).

12.3.2 Feedback, guided induction and the persona effect in grammar learning

Teaching or learning grammar is usually considered a necessary and useful, albeit ‘boring’, endeavor (Jean & Simard, 2011). In principle, this should make grammatical instruction an ideal target for DLPs. However, studies on the matter are extremely rare (between 5% and 8% according to the research syntheses by Acquah and Katz, 2020, Govender and Arnedo-Moreno, 2021, and Xu *et al.*, 2020), and most of them barely provide any details about the target structures or activities used.

So far, very few studies have investigated the use of ludic videogames for learning grammatical structures, and those that have are merely observational or non-interventional in nature. In contrast, there is a growing number of experimental studies on minigames, including electronic tutors (see the syntheses by Cerezo, 2014, and by Heift and Schulze, 2015) and conversational agents or chatbots (see the synthesis by Bibauw *et al.*, 2019). Many of these explore the effectiveness of different **types of feedback**, ranging from more explicit or deductive varieties (e.g. those that provide grammatical explanations) to less explicit or inductive ones (e.g. those that involve ‘right/wrong’ answers). The results suggest that more explicit feedback is more effective, especially in the short term (Cerezo, 2014), which is consistent with most meta-analyses of studies on oral interaction (e.g. Li, 2010).

Recently, some studies have started to tackle more complex issues. For example, Cerezo (2010) and Cornillie *et al.* (2017) researched the interaction between the type of feedback and grammatical structure using a simulation game – *Talking to Avatars* – and a hypertext about the history of Coca-Cola, respectively. Both studies found that the advantages of more explicit feedback surfaced more clearly with less complex grammar structures, whose rules learners were developmentally ready to understand. An earlier study by Cornillie *et al.* (2013) is particularly enlightening in this regard, as it used a detective minigame where more explicit feedback was presented optionally. The players who consulted this feedback more often were those with higher prior metalinguistic knowledge; conversely, those who were less prepared to understand the grammar rules chose to consult the rest of the group’s answers directly. Addressing this issue, the study conducted by Cerezo *et al.* (2016) demonstrated that **guided induction** can be a solution to engage *all* learners, not just the most advantaged ones, in an exploratory learning process. Thanks to its scaffolded feedback, players of *The Maze Game* outperformed learners in a traditional deductive class when it came to learning complex Spanish phrases including verbs like *gustar*.

In the context of XR, as with ludic videogames, there is still much ground to break. Existing studies are mostly limited to observing the

spontaneous negotiation of grammatical structures during gameplay, a phenomenon that only occurs occasionally at best. Sydorenko *et al.* (2019) found that none of the 32 episodes of linguistic negotiation among *ChronoOps* players focused on grammar. This is by no means surprising, since in many games and communicative activities it is vocabulary rather than grammar that determines progress, and there is a universal preference for negotiating meaning over form (Mackey & Goo, 2007). One possible solution to this issue is prior instruction, as revealed by Reitz *et al.* (2016), where German-speaking learners first completed a series of minigames centered around various English structures (questions, modal verbs and prepositions of movement) and then spontaneously employed them in the VR game *Haunted*.

A growing number of studies demonstrate that interaction with robots – especially in the case of children – can lead to the learning of morphosyntactic rules, including French gender (Kennedy *et al.*, 2016) or Latin declensions (Herberg *et al.*, 2015). Among the most widely studied phenomena is the so-called **persona effect**, according to which the pedagogical effectiveness of robots increases the more social or human-like their behavior is. Hitherto, the results are contradictory. Kennedy *et al.* (2016) did not find an added benefit when their robot called the children by their name, shared ‘personal’ information or asked them questions about the lesson. In contrast, Saerbeck *et al.* (2010) found that the more sociable version of their robotic cat *iCat* led to greater composite learning scores for grammar, vocabulary and pronunciation in the artificial language *Toki Pona*. As noted by Herberg *et al.* (2015), this persona effect may depend on the object of study and whether the robot’s behavior generates positive stress or anxiety. In said study, direct supervision by a robot while the children took a Latin test had a negative impact on learning complex structures and a positive impact for more simple structures. Finally, in a study involving Japanese university students, Khalifa *et al.* (2017) demonstrated that robots can be used productively as conversational models. Learners who had the opportunity to observe conversations between robots during their interaction with them incorporated more complex English constructions, especially those with more advanced proficiency levels.

12.3.3 Curriculum design and teaching practices

York *et al.* (2021: 1170) noted that most studies on DLP focus on three areas: incidental learning through digital ludic activities; the design and development of said activities for intentional learning; and learner preferences. Furthermore, they observed that very few publications address the role of the teacher and how to implement these activities in the classroom. This is a significant gap, especially considering the crucial role of the teacher in the success of DLPs.

Among other things, teachers can enhance DLPs before, during and after gameplay by: (1) selecting appropriate materials (Sykes & Reinhardt, 2012); (2) explaining and scaffolding them to make them accessible and effective (García Botero *et al.*, 2021); (3) supplementing them with instruction and practice so that learners can focus their attention not only on meaning but also form (Ranalli, 2008); (4) enhancing interpersonal communicative experiences (Ibrahim, 2019); (5) compensating for language skills that ludic activities do not boost (Lacasa *et al.*, 2008); and (6) developing 21st-century skills such as innovation, global awareness and critical thinking (deHaan, 2019).

An efficient way to start familiarizing oneself with best practices in DLP is provided by Sykes and Reinhardt's *Language at Play* (2012). This book includes hypothetical situations of what may work and fail in the classroom, as well as possible solutions. We also recommend reading York *et al.*'s *Playing a New Game* (2021), which provides a list of 39 specific actions that teachers can take to promote DLPs (York *et al.*, 2021: 1176) in addition to a compilation of empirical studies on teaching practices (2021: 1177). Of particular note among these is deHaan (2019), as it outlines his work with a student over the course of a year and includes reflections, pedagogical decisions, follow-up work and achieved goals. Finally, from the perspective of *learning by teaching*, Dubreil (2020) describes how students taking a university module created games for learning French.

From a practical perspective, the Appendix at the end of this chapter provides a catalog of reference resources to use and create digital ludic activities. It follows the organization of resources throughout this chapter: videogames, minigames, XR and robots. Given the rapid obsolescence of many websites, we have been careful in our selection of links.

Starting with videogames, we would like to highlight the website *Games2Teach*, which includes lesson plans centered around videogames such as *SimCity* or *Ingress*. Also noteworthy are platforms such as *Construct 3* or *RPG Playground*, which allow users to create videogames of various genres – including role-playing games – without requiring coding expertise.

Moving on to minigames, the *HelloTalk* app stands out due to its affordances for extramural learning. On the one hand, it can help learners interact with native speakers on social networks, and on the other, it can train them in metacognitive skills, by instructing them how to provide and process feedback, thanks to its original methodology. Similarly, tools like Genial.ly offer interesting templates for creating gamified tests, board games and escape rooms. More ambitiously, entire courses can be gamified using learning management systems such as *ClassDojo*, *Classcraft* or *Fantasy Class* (for elementary and secondary school) and *Gradecraft* (for higher education).

In the context of XR, apps like *Mondly VR* can be used to immerse learners in simulated communicative situations, activating situated and

embodied learning. Additionally, more adventurous teachers can create their own VR and AR games using tools such as *CoSpaces Edu*, which features user-friendly block-based coding akin to *Scratch*.

Finally, robots like *Ozobot* can be programmed through mobile apps and used to promote kinesthetic learning, with activities such as tracing routes on a map and scavenger hunts, coded by teachers or even learners themselves, as described by Collado (2017).

12.4 Conclusion and Future Lines of Research

In this chapter, we first justified the role of DLPs in the second language classroom, defining the game/play constructs and proposing ‘digital ludic activities’ as a more inclusive term. Subsequently, we revisited the main classifications of DLPs in the classroom. We argued that some taxonomies may be somewhat reductive, as they establish a resource–approach correlation, and we introduced a new classification based on the increasingly prominent role of digital ludic activities in the curriculum – as a **model**, **aid** and **channel**. We then defined four types of digital ludic resources, and their subtypes: **videogames** (ludic, serious, purpose-shifting, modified), **minigames** (and their collections in apps), **XR** (VR and AR) and **robots** (which vary based on their autonomy, anthropomorphism and role in the classroom). Next, we distinguished between four theoretical approaches to DLP, based on their conception of language acquisition as a primarily **cognitive** (structuralist–behaviorist and psychocognitive approaches), **social** (socio-constructivist approach) or **ecological** phenomenon (a combination of the cognitive and social phenomena), and provided examples of scholarly research structured around these theoretical frameworks.

We also demonstrated that the vast majority of empirical publications on DLP focus on **vocabulary learning and teaching**, identifying several lines of research by resource type. Studies on ludic videogames primarily focus on **incidental vocabulary learning** and demonstrate that high achievement positively correlates with playing time and the range of learning strategies applied. Studies on **vicarious vocabulary learning** indicate that the effects of playing versus observing others play may depend on the nature of the game and whether it induces a germane or extraneous cognitive load. Publications on **intentional vocabulary learning** illustrate creative ways of incorporating apps into the classroom and emphasize the importance of supplementing the use of videogames with explicit instruction and consciousness-raising work. Emerging studies on XR and robots are beginning to reveal their potential for situated and embodied learning.

Our research also suggests that only a minority of studies explores the potential of digital ludic activities for **grammar learning**. Publications on minigames show that explicit **feedback** proves to be

more effective, especially in the short term and for more developmentally accessible grammatical structures. Further, **guided induction** is proposed as a possible solution to reap the benefits of both deductive and inductive instruction. Studies on XR emphasize the added value of explicit instruction, and research on robots suggests that the **persona effect** may depend on the object of study and whether the robot's behavior generates positive stress or anxiety.

Finally, we highlighted a gap in research regarding the teacher's role in the classroom as an agent and mediator of DLPs and we identified theoretical sources for curriculum design as well as practical resources for the creation of digital ludic activities.

Looking into the future, we would like to signal the pressing need for more empirical studies on DLP for teacher training and grammar learning. Due to space constraints, we have not included studies on the acquisition of communicative skills and competencies in this chapter. However, among the existing studies, there is an urgent need to synergize incidental and intentional learning. Lastly, we would like to encourage researchers and educators to explore creative ways to engage learners with low motivation, supplementing extrinsic reward systems with intrinsic motivation strategies that draw on critical thinking, identity expression, creativity and humor.

12.5 Annotated Additional Reading

Peterson, M. and Jabbari, N. (eds) (2022) *Digital Games in Language Learning: Case Studies and Applications*. Routledge.

All nine chapters in this book feature established and emerging voices from a diverse international context engaging in discussions on theoretical and practical issues concerning the use of videogames for language learning.

Ludic Language Pedagogy. Online journal available at: <https://llpjournal.org>. This open-access journal contains research articles, manifestos and teaching and learning materials from leading DLP scholars.

Appendix: Videogames, minigames, extended realities and robots

Videogames

- List of the most popular videogames:
 - Sundqvist (2019)
 - Govender and Arnedo-Moreno (2021)
- Catalogs of game-related activities:
 - *Games2Teach* (<https://games2teach.uoregon.edu/download/classroom-activities/>)
- Catalogs of serious videogames:
 - *Games for Change* (<http://www.gamesforchange.org/games>)
 - *Serious Game Classification* (<https://serious.gameclassification.com/>)

- Selection of serious videogames:
 - *Guadalingo* (<https://edinumen.es/guadalingo>)
 - *Practice Spanish: Study Abroad* (<https://www.mheducation.com/highered/blog/2024/05/practice-spanish-study-abroad-promotional-video.html>)
 - *Tactical Language Training System – TLTS* (<https://www.29palms.marines.mil/training/magftcsims/tlts/>)
- Platforms for creating videogames:
 - *Bitsy* (<https://bitsy.org>)
 - *Construct 3* (<https://www.construct.net>)
 - *RPG Playground* (<https://rpgplayground.com>)
 - *Scratch* (<https://scratch.mit.edu>)
 - *Twine* (<https://twinery.org>)

Minigames and apps

- List of minigames and apps for language learning:
 - Dehghanzadeh *et al.* (2021)
 - Jueru *et al.* (2020)
- Minigame catalogs:
 - *ABCYA* (<https://www.abcya.com/games>)
 - *Rockalingua* (<https://rockalingua.com/games>)
- Selection of apps:
 - *Lirica* (<http://www.lirica.io>)
 - *Lingopie* (<https://lingopie.com>)
 - *Beelinguapp* (<https://beelinguapp.com>)
 - *LinQ* (<https://www.lingq.com>)
 - *Jiveworld* (<https://www.jiveworld.com>)
 - *Lingro ToGo* (available on the App Store and Google Play)
 - *HelloTalk* (<https://www.hellotalk.com>)
- Tools to create gamified activities:
 - *Kahoot!* (<https://kahoot.com>)
 - *Socrative* (<https://www.socrative.com>)
 - *Quizlet* (<https://quizlet.com>)
 - *Quizizz* (<https://quizizz.com>)
- Tools to create minigames:
 - *Cerebriti* (<https://www.cerebriti.com>)
 - *EDUCAplay* (<https://www.educaplay.com>)
 - *Genial.ly* (<https://www.genial.ly>)
 - *Wordwall* (<https://wordwall.net>)
 - *LearningApps.org* (<https://learningapps.org/createApp.php>)
- Learning management systems to create gamified courses:
 - *ClassDojo* (<https://www.classdojo.com>)
 - *Classcraft* (<https://www.classcraft.com>)
 - *Fantasy Class* (<https://fantasyclass.app>)
 - *Gradecraft* (<https://www.gradecraft.com>)

Extended realities

- List of VR and AR games for language learning:
 - Huang *et al.* (2021)
- Selection of VR games:
 - *House of Languages VR* (<http://www.fox3d.com/games>)
 - *Mondly VR* (<https://www.mondly.com/vr>)
- Platforms for creating VR or AR games:
 - *CoSpaces Edu* (<https://cospaces.io>)
 - *Unity* (<https://unity.com>)
 - *Unreal Engine* (<https://www.unrealengine.com>)

Robots

- List of robots used for language learning:
 - Randall (2020)
- Programmable robots:
 - *Ozobot* (<https://ozobot.com>)

References

- Acquah, E.O. and Katz, H.T. (2020) Digital game-based L2 learning outcomes for primary through high-school students: A systematic literature review. *Computers and Education* 143, 1–19. <https://doi.org/10.1016/j.compedu.2019.103667>.
- Alemi, M. and Bahramipour, S. (2019) An innovative approach of incorporating a humanoid robot into teaching EFL learners with intellectual disabilities. *Asian-Pacific Journal of Second and Foreign Language Education* 4 (1), 1–22. <https://doi.org/10.1186/s40862-019-0075-5>.
- Alemi, M., Meghdari, A. and Ghazisaedy, M. (2015) The impact of social robotics on L2 learners' anxiety and attitude in English vocabulary acquisition. *International Journal of Social Robotics* 7 (4), 523–535. <https://doi.org/10.1007/s12369-015-0286-y>.
- Alfadil, M. (2020) Effectiveness of virtual reality games in foreign language vocabulary acquisition. *Computers & Education* 153, 1–13. <https://doi.org/10.1016/j.compedu.2020.103893>.
- Bibauw, S., François, T. and Desmet, P. (2019) Discussing with a computer to practice a foreign language: Research synthesis and conceptual framework of dialogue-based CALL. *Computer Assisted Language Learning* 32 (8), 827–877. <https://doi.org/10.1080/09588221.2018.1535508>.
- Blake, R. and Guillén, G.A. (2020) *Brave New Digital Classroom: Technology and Foreign Language Learning*. Georgetown University Press.
- Blanco, C. (2020) *Duolingo Language Report: Global Overview*. Duolingo. <https://blog.duolingo.com/global-language-report-2020/>.
- Bogost, I. (2015) Why gamification is bullshit. In P.W. Steffen and S. Deterding (eds) *The Gameful World: Approaches, Issues, Applications* (pp. 65–79). Cambridge University Press.
- Boller, S. and Kapp, K. (2017) *Play to Learn: Everything You Need to Know about Designing Effective Learning Games*. ATD Press.
- Bruckman, A. (1999) Can educational be fun? *Game Developers Conference* 99, 75–79.
- Bueno-Alastuey, M.C. and Nemeth, K. (2020) Quizlet and podcasts: Effects on vocabulary acquisition. *Computer Assisted Language Learning* 35 (7), 1–30. <https://doi.org/10.1080/09588221.2020.1802601>.

- Bytheway, J. (2015) A taxonomy of vocabulary learning strategies used in massively multiplayer online role-playing games. *CALICO Journal* 32 (3), 508–527. <https://doi.org/10.1558/cj.v32i3.26787>.
- Caillois, R. (1958) *Les Jeux et Les Hommes: Le Masque et Le Vertige*. Gallimard.
- Cerezo, L. (2010) Talking to avatars: The computer as a tutor and the incidence of learner's agency, feedback, and grammatical form in SLA. Ph.D. thesis, Georgetown University.
- Cerezo, L. (2014) Beyond hybrid learning: A synthesis of research on e-tutors under the lens of SLA theory. In F. Rubio and J.J. Thoms (eds) *Hybrid Language Teaching and Learning: Exploring Theoretical, Pedagogical and Curricular Issues* (pp. 50–66). Heinle, Cengage Learning.
- Cerezo, L. (2015) Theoretical approaches to CALL research: Toward a psycholinguistic perspective. In R.P. Leow, L. Cerezo and M. Baralt (eds) *A Psycholinguistic Approach to Technology and Language Learning* (pp. 23–46). Mouton de Gruyter.
- Cerezo, L., Moreno, N. and Leow, R.P. (2015) Psycholinguistically motivated CALL activities. In R.P. Leow, L. Cerezo and M. Baralt (eds) *A Psycholinguistic Approach to Technology and Language Learning* (pp. 243–257). Mouton de Gruyter.
- Cerezo, L., Caras, A. and Leow, R.P. (2016) The effectiveness of guided induction versus deductive instruction on the development of complex Spanish 'gustar' structures: An analysis of learning outcomes and processes. *Studies in Second Language Acquisition* 38, 265–291. <https://doi.org/10.1017/S0272263116000139>.
- Chen, H.H. and Yang, T.C. (2013) The impact of adventure video games on foreign language learning and the perceptions of learners. *Interactive Learning Environments* 21 (2), 129–141. <https://doi.org/10.1080/10494820.2012.705851>.
- Chen, H.-J. and Hsu, H.-L. (2020) The impact of a serious game on vocabulary and content learning. *Computer Assisted Language Learning* 33 (7), 811–832. <https://doi.org/10.1080/09588221.2019.1593197>.
- Cheng, A., Yang, L. and Andersen, E. (2017) Teaching language and culture with a virtual reality game. In G. Mark and S. Fussell (eds) *CHI '17: Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 541–549). Association for Computing Machinery.
- Chotipaktanasook, N. and Reinders, H. (2018) A massively multiplayer online role-playing game and its effects on interaction in the second language: Play, interact and learn. In B. Zou and M. Thomas (eds) *Handbook of Research on Integrating Technology into Contemporary Language Learning and Teaching* (pp. 367–389). IGI Global.
- Cobb, M. and Lovick, N. (2007) The concept of foreign language task: Misconceptions and benefits in implementing task-based instruction. In National Foreign Language Resource Center (NFLRC) (ed.) *2nd International Conference on Task-Based Language Teaching*. University of Hawai'i at Manoa.
- Collado, E. (2017) Robots as language learning tools. *Learning Languages* 22 (2), 28–31.
- Cornillie, F., Lagatie, R., Vandewaetere, M., Clarebout, G. and Desmet, P. (2013) Tools that detectives use: In search of learner-related determinants for usage of optional feedback in a written murder mystery. In P. Hubbard, M. Schulze and B. Smith (eds) *Learner-Computer Interaction in Language Education: A Festschrift in Honor of Robert Fischer* (pp. 22–45). CALICO.
- Cornillie, F., Van Den Noortgate, W., Van den Branden, K. and Desmet, P. (2017) Examining focused L2 practice: From in vitro to in vivo. *Language Learning & Technology* 21 (1), 121–145. <https://dx.doi.org/10.10125/44598>.
- Crystal, D. (1996) Language play and linguistic intervention. *Child Language Teaching and Therapy* 12 (3), 328–344. <https://doi.org/10.1177/026565909601200307>.
- deHaan, J. (2005) Learning language through video games: A theoretical framework, an evaluation of game genres, and questions for future research. In S.P. Schaffer and M.L. Price (eds) *Interactive Convergence: Critical Issues in Multimedia* (pp. 229–239). Interdisciplinary Press.

- deHaan, J. (2019) Teaching language and literacy with games: What? How? Why? *Ludic Language Pedagogy* 1, 1–57. https://doi.org/10.55853/llp_v1Art1.
- deHaan, J. and Kono, F. (2010) The effect of interactivity with *WarioWare* minigames on second language vocabulary learning. *Journal of Digital Games Research* 4 (2), 47–59. https://doi.org/10.9762/digrj.4.2_47.
- deHaan, J., Reed, W.M. and Kuwada, K. (2010) The effect of interactivity with a music video game on second language vocabulary recall. *Language Learning & Technology* 14 (2), 74–94. <http://dx.doi.org/10125/44215>.
- Dehghanzadeh, H., Fardanesh, H., Hatami, J., Talaei, E. and Noroozi, O. (2021) Using gamification to support learning English as a second language: A systematic review. *Computer Assisted Language Learning* 34 (7), 934–957. <https://doi.org/10.1080/09588221.2019.1648298>.
- Djaouti, D., Alvarez, J. and Jessel, J.P. (2011) Classifying serious games: The G/P/S model. In P. Felicia (ed.) *Handbook of Research on Improving Learning and Motivation through Educational Games: Multidisciplinary Approaches* (pp. 118–136). IGI Global.
- Dubreil, S. (2020) Using games for language learning in the age of social distancing. *Foreign Language Annals* 53 (2), 250–259. <https://doi.org/10.1111/flan.12465>.
- Ebrahimzadeh, M. (2017) Readers, players, and watchers: EFL students' vocabulary acquisition through digital video games. *English Language Teaching* 10 (2), 1–18.
- Ebrahimzadeh, M. and Alavi, S. (2017) Readers, players, and watchers: Short- and long-term vocabulary retention through digital video games. *International Journal of Applied Linguistics & English Literature* 6 (4), 52–62.
- Ellis, R. (2018) *Reflections on Task-Based Language Teaching*. Multilingual Matters.
- Engwall, O. and Lopes, J. (2020) Interaction and collaboration in robot-assisted language learning for adults. *Computer Assisted Language Learning* 35 (5–6), 1–37. <https://doi.org/10.1080/09588221.2020.1799821>.
- Franciosi, S. (2017) The effect of computer game-based learning on FL vocabulary transferability. *Journal of Educational Technology & Society* 20 (1), 123–133. <http://www.jstor.org/stable/jeductechsoci.20.1.123>.
- Franciosi, S.J., Yagi, J., Tomoshige, Y. and Ye, S. (2016) The effect of a simple simulation game on long-term vocabulary retention. *CALICO Journal* 33 (3), 355–379. <https://doi.org/10.1558/cj.v33i2.26063>.
- García Botero, G., Botero Restrepo, M.A., Zhu, C. and Questier, F. (2021) Complementing in-class language learning with voluntary out-of-class MALL. Does training in self-regulation and scaffolding make a difference? *Computer Assisted Language Learning* 34 (8), 1013–1039. <https://doi.org/10.1080/09588221.2019.1650780>.
- Govender, T. and Arnedo-Moreno, J. (2021) An analysis of game design elements used in digital game-based language learning. *Sustainability* 13, 1–26. <https://doi.org/10.3390/su13126679>.
- Hannibal Jensen, S. (2017) Gaming as an English language learning resource among young children in Denmark. *CALICO Journal* 34 (1), 1–19. <https://doi.org/10.1558/cj.29519>.
- Heift, T. and Schulze, M. (2015) Tutorial computer-assisted language learning. *Language Teaching* 48 (4), 471–490. <https://doi.org/10.1017/S0261444815000245>.
- Herberg, J.S., Feller, S., Yengin, I. and Saerbeck, M. (2015) Robot watchfulness hinders learning performance. In *24th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)* (pp. 153–160). Neurological Therapeutic Medical Robot, PARO. <https://doi.org/10.1109/ROMAN.2015.7333620>.
- Hitosugi, C.I., Schmidt, M. and Hayashi, K. (2014) Digital game-based learning (DGBL) in the L2 classroom: The impact of the UN's off-the-shelf videogame, *Food Force*, on learner affect and vocabulary retention. *CALICO Journal* 31 (1), 19–39. <https://doi.org/10.11139/cj.31.1.19-39>.
- Holden, C. and Sykes, J. (2011) Leveraging mobile games for place-based language learning. *International Journal of Game Based Learning* 1 (2), 1–18. <https://doi.org/10.4018/ijgb.2011040101>.

- Huang, X., Zou, D., Cheng, G. and Xie, H.A. (2021) Systematic review of AR and VR enhanced language learning. *Sustainability* 13, 1–30. <https://doi.org/10.3390/su13094639>.
- Hubbard, P. (1991) Evaluating computer games for language learning. *Simulation and Gaming Journal* 22, 220–223. <https://doi.org/10.1177/1046878191222006>.
- Huizinga, J. (1950) *Homo Ludens: A Study of the Play-Element in Culture*. Beacon Press.
- Ibrahim, K. (2019) Foreign language practice in simulation video games: An analysis of game-based FL use dynamics. *Foreign Language Annals* 52 (2), 335–357. <https://doi.org/10.1111/flan.12388>.
- Jean, G. and Simard, D. (2011) Grammar teaching and learning in L2: Necessary, but boring? *Foreign Language Annals* 44 (3), 467–494. <https://doi.org/10.1111/j.1944-9720.2011.01143.x>.
- Jueru, T., Ferrão, S., Vitória, F. and Ferrão Silva, R. (2020) Gamification for technology-enhanced language learning (TELL): Success factors of gamified language learning platform design. *Revista Iberoamericana de Informática Educativa* 31, 54–69.
- Kennedy, J., Baxter, P., Senft, E. and Belpaeme, T. (2016) Social robot tutoring for child second language learning. In C. Bartneck, Y. Nagai, A. Paiva and S. Sabanovic (eds) *11th ACM/IEEE International Conference on Human-Robot Interaction (HRI)* (pp. 231–238). Institute of Electrical and Electronic Engineers.
- Khalifa, A., Kato, T. and Yamamoto, S. (2017) Measuring effect of repetitive queries and implicit learning with joining-in-type robot assisted language learning system. In O. Engwall and J.D. Lopes (eds) *7th ISCA Workshop on Speech and Language Technology in Education (SLaTE 2017)* (pp. 13–17). Computer Science Bibliography.
- Lacasa, P., Martínez, R. and Méndez, L. (2008) Developing New literacies using commercial videogames as educational tools. *Linguistics and Education* 19, 85–106. <https://doi.org/10.1016/j.linged.2008.02.001>.
- Lai, K.-W. and Chen, H.-J. (2021) A comparative study on the effects of a VR and PC visual novel game on vocabulary learning. *Computer Assisted Language Learning*, 1–34. <https://doi.org/10.1080/09588221.2021.1928226>.
- Larsen-Freeman, D. (2000) *Techniques and Principles in Language Teaching*. Oxford University Press.
- Li, S. (2010) The effectiveness of corrective feedback in SLA: A meta-analysis. *Language Learning* 60, 309–365. <https://doi.org/10.1111/j.1467-9922.2010.00561.x>.
- Lord, G. (2016) Rosetta Stone for language learning. *IALLT Journal of Language Learning Technologies* 46 (1), 1–35. <https://doi.org/10.17161/iallt.v46i1.8552>.
- Mackey, A. and Goo, J.M. (2007) Interaction research in SLA: A meta-analysis and research synthesis. In A. Mackey (ed.) *Input, Interaction and Corrective Feedback in L2 Learning* (pp. 379–452). Oxford University Press.
- McGonigal, J. (2011) *Reality is Broken: Why Games Make us Better and How They Change the World*. Jonathan Cape.
- Miller, M. and Hegelheimer, V. (2006) The SIMs meet ESL: Incorporating authentic computer simulation games into the language classroom. *Interactive Technology and Smart Education* 3 (4), 311–328. <https://doi.org/10.1108/17415650680000070>.
- Mohsen, M.A. (2016) The use of computer-based simulation to aid comprehension and incidental vocabulary learning. *Journal of Educational Computing Research* 54 (6), 863–884. <https://doi.org/10.1177/0735633116639954>.
- Ortega, L. and Zyzik, E. (2008) Online interactions and L2 learning: Some ethical challenges for L2 researchers. In S. Magnan Pierce (ed.) *Mediating Discourse Online* (pp. 331–355). John Benjamins.
- Patiño, A. and Romero, M. (2015) Identifying pedagogical uses of serious games for learning English as a second language. In A. De Gloria (ed.) *Games and Learning Alliance. GALA 2014. Lecture Notes in Computer Science* (pp. 31–43). Springer.
- Pelgrum, M. (2019) Mobile AR trails and games for authentic language learning. In Y.A. Zhang and D. Cristol (eds) *Handbook of Mobile Teaching and Learning* (pp. 1229–1244). Springer.

- Piaget, J. (1962) *Play, Dreams and Imitation*. Norton.
- Prieto de Lope, R. and Medina-Medina, N. (2017) A comprehensive taxonomy for serious games. *Journal of Educational Computing Research* 55 (5), 629–672. <https://doi.org/10.1177/0735633116681301>.
- Pujolà, J.T. and Appel, C. (2020) Gamification for technology-enhanced language teaching and learning. In M. Kruk and M. Peterson (eds) *New Technological Applications for Foreign and Second Language Learning and Teaching* (pp. 93–111). IGI Global.
- Rachels, J.R. and Rockinson-Szapkiw, A.J. (2018) The effects of a mobile gamification app on elementary students' Spanish achievement and self-efficacy. *Computer Assisted Language Learning* 31 (1–2), 72–89. <https://doi.org/10.1080/09588221.2017.1382536>.
- Ranalli, J. (2008) Learning English with the sims: Exploiting authentic computer simulation games for L2 learning. *Computer Assisted Language Learning* 21 (5), 441–455. <https://doi.org/10.1080/09588220802447859>.
- Randall, N. (2020) A survey of robot-assisted language learning (RALL). *ACM Transactions on Human-Robotic Interaction* 9 (1), 1–36. <https://doi.org/10.1145/3345506>.
- Reinders, H. and Wattana, S. (2014) Can I say something? The effects of digital game play on willingness to communicate. *Language Learning & Technology* 18 (2), 101–123.
- Reinhardt, J. (2019) *Gameful Second and Foreign Language Teaching and Learning: Theory, Research, and Practice*. Palgrave Macmillan.
- Reinhardt, J. and Thorne, S.L. (2019) Digital literacies as emergent multifarious repertoires. In N. Arnold and L. Ducate (eds) *Engaging Language Learners Through CALL: From Theory and Research to Informed Practice* (pp. 208–239). Equinox.
- Reitz, L., Sohny, A. and Lochmann, G. (2016) VR-based gamification of communication training and oral examination in a second language. *International Journal of Game-Based Learning* 6 (2), 46–61. <https://doi.org/10.4018/IJGBL.2016040104>.
- Saerbeck, M., Schut, T., Bartneck, C. and Janse, M. (2010) Expressive robots in education: Varying the degree of social supportive behavior of a robotic tutor. In E. Mynatt, G. Fitzpatrick, S. Hudson, K. Edwards and T. Rodden (eds) *CHI '10: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1613–1622). Association for Computing Machinery.
- Salen, K., Torres, R., Wolozin, L., Rufo-Teppe, R. and Shapiro, A. (2011) *Quest to Learn: Developing the School for Digital Kids*. MIT Press.
- Shortt, M., Tilak, S., Kuznetcova, I., Martens, B. and Akinkuolie, B. (2021) Gamification in mobile-assisted language learning: A systematic review of *Duolingo* literature from public release of 2012 to early 2020. *Computer Assisted Language Learning*, 1–38. <https://doi.org/10.1080/09588221.2021.1933540>.
- Shute, V.J. and Ke, F. (2012) Games, learning, and assessment. In D. Ifenthaler, D. Eseryel and X. Ge (eds) *Assessment in Game-Based Learning* (pp. 43–58). Springer.
- Sundqvist, P. (2013) The SSI model: Categorization of digital games in EFL studies. *European Journal of Applied Linguistics and TEFL* 2 (1), 89–104. <https://doi.org/10.14705/rpnet.2013.000166>.
- Sundqvist, P. (2019) Commercial off-the-shelf games in the digital wild and L2 learner vocabulary. *Language Learning & Technology* 23 (1), 87–113. <https://doi.org/https://doi.org/10.125/44674>.
- Sundqvist, P. and Wikström, P. (2015) Out-of-school digital gameplay and in-school L2 English vocabulary outcomes. *System* 51, 65–76. <https://doi.org/10.1016/j.system.2015.04.001>.
- Sweller, J. (2010) Element interactivity and intrinsic, extraneous and germane cognitive load. *Educational Psychology Review* 22, 123–138. <https://doi.org/10.1007/s10648-010-9128-5>.
- Sydorenko, T., Hellermann, J., Thorne, S.L. and Howe, V. (2019) Mobile augmented reality and language-related episodes. *TESOL Quarterly* 53 (3), 712–740. <https://doi.org/10.1002/tesq.507>.

- Sykes, J.M. and Reinhardt, J. (2012) *Language at Play: Digital Games in Second and Foreign Language Teaching and Learning*. Pearson.
- Tai, T.-Y., Chen, H.H.-J. and Todd, G. (2020) The impact of a virtual reality app on adolescent EFL learners' vocabulary learning. *Computer Assisted Language Learning*, 1–26. <https://doi.org/10.1080/09588221.2020.1752735>.
- Thorne, S., Hellermann, J. and Jakonen, T. (2021) Rewilding language education: Emergent assemblages and entangled actions. *The Modern Language Journal* 105 (1), 106–125. <https://doi.org/10.1111/modl.12687>.
- Todd, A. (2017) Why gamification is malarkey. *The Morning Watch: Educational and Social Analysis* 44 (1–2), 1–7.
- Tsai, Y.-L. and Tsai, C.-C. (2018) Digital game-based second-language vocabulary learning and conditions of research designs: A meta-analysis study. *Computers and Education* 125, 345–357. <https://doi.org/10.1016/j.compedu.2018.06.020>.
- van den Berghe, R., Verhagen, J., Oudgenoeg-Paz, O., van der Ven, S. and Leseman, P. (2019) Social robots for language learning: A review. *Review of Educational Research* 89 (2), 259–295. <https://doi.org/10.3102/0034654318821286>.
- Xu, Z., Chen, Z., Eutsler, L., Geng, Z. and Kogut, A. (2020) A scoping review of digital game-based technology on English language learning. *Educational Technology Research and Development* 68 (3), 877–904. <https://doi.org/10.1007/s11423-019-09702-2>.
- York, J., Poole, F.J. and deHaan, J.W. (2021) Playing a new game: An argument for a teacher-focused field around games and play in language education. *Foreign Language Annals* 54 (4), 1164–1188. <https://doi.org/10.1111/flan.12585>.
- Zhao, J. (2016) L2 languaging in a massively multiplayer online game: An exploration of learner variations. *International Journal of Computer-Assisted Language Learning and Teaching* 6 (4), 1–17. <https://doi.org/10.4018/IJCALLT.2016100101>.
- Zheng, D., Bischoff, M. and Gilliland, B. (2015) Vocabulary learning in massively multiplayer online games: Context and action before words. *Educational Technology Research and Development* 63 (5), 771–790. <https://doi.org/10.1007/s11423-015-9387-4>.
- Zou, D., Huang, Y. and Xie, H. (2021) Digital game-based vocabulary learning: Where are we and where are we going? *Computer Assisted Language Learning* 34 (5–6), 751–77. <https://doi.org/10.1080/09588221.2019.1640745>.

Epilogue: New Technology-Mediated Scenarios

13 Opportunities for Artificial Intelligence (AI) in Language Teaching and Learning

Javier Muñoz-Basols and Mara Fuertes Gutiérrez

13.1 The Emergence of ChatGPT: A Paradigm Shift in Education

The release of ChatGPT in November 2022 marked a ground-breaking change in the accessibility to generative artificial intelligence (AI). As a **large language model** (LLM), this chatbot is essentially a tool that uses a corpus comprised of vast amounts of text (a total of 300 billion words) sourced from books, newspaper articles, Wikipedia, blogs and other websites (Teubner *et al.*, 2023), to generate content and perform certain tasks. OpenAI's decision to make ChatGPT-3 available to the general public, paired with its ease of use, led to the gradual spread of this technology tool across various sectors of society around the world, acquiring 100 million users in just two months (UNESCO, 2023: 3). Due to its ability to simulate human behavior in conversation, answer any question or generate text in a matter of seconds, starkly different opinions emerged regarding the potential social and educational effects of this technology (Popp, 2023: 22, 24). In certain countries, such as Italy, its use was initially blocked, as it was thought to be in breach of data protection laws (Buj, 2023). Meanwhile, in other countries, such as the United States, task forces were created at universities to explore potential ways to integrate this new tool into the development of learners' digital competences (Baber *et al.*, 2022). The impact of this chatbot was practically instant, as demonstrated by a study conducted at the University of Cambridge in April 2023 which found, just five months after its launch, that 47% of the student body had already used this tool (Sleator & Hennessey, 2023).

Despite ChatGPT's potential when it comes to processing natural language as effectively as humans, and sometimes doing so even better, AI prototypes and applications have been part of our daily lives for

decades, not only in professional settings but also in education and everyday communication. Some examples include:

- (1) **messaging apps** (WhatsApp, Slack, etc.): they use predictive text to offer suggestions as users type;
- (2) **search engines** (Google, Bing, etc.): they apply AI algorithms to understand users' searches and provide suggestions or corrections;
- (3) **email platforms** (gmail, hotmail, etc.): they use AI algorithms to correct words, finish sentences and suggest answers or reactions;
- (4) **word processors** (Microsoft Word, Google Docs, etc.): they correct grammar and spelling and also offer suggestions through predictive text technology;
- (5) **online grammar checkers** (Grammarly, Ginger, etc.): integrated in browsers and word processors, they provide real-time suggestions to improve users' grammar, punctuation and style;
- (6) **machine translators** (DeepL, Google Translate, etc.): they use neural networks and advanced algorithms;
- (7) **writing assistants** (ProWritingAid, Wordtune, etc.): they analyze vast amounts of text and help the user improve their grammar, writing style and readability;
- (8) **voice assistants** (Siri, Amelia, etc.): they perform searches, transcribe speech to text, act as virtual assistants or voice-controlled devices (accessibility), or serve as security authentication devices, among other functions.

However, unlike the tools and apps that the general public was already familiar with, what really changed our way of perceiving the impact of AI is the fact that ChatGPT is a **text generator**. It is a user-friendly tool with a straightforward interface, where users can ask questions and copy large volumes of text. Its value lies in the speed with which it processes natural language and establishes instant communication, a speed to which no human can aspire. To generate text, the tool can **thoroughly analyze and understand linguistic parameters**, while also ensuring the **coherence** and logical order of the different parts as well as the **consistency** or internal connection of the information.

Among the aforementioned AI prototypes, the evolution of this technology can be illustrated through two particular cases. Firstly, **machine translators** were not originally capable of translating anything beyond simple phrases. As a result, when it came to translating text involving idioms or metaphors (e.g. *pull out all the stops*), or polysemous words or terms with different meanings (e.g. *bow: a knot with two loops, the front part of a ship, a weapon used by archers*, etc.), the tool generated literal results that had nothing to do with the context in question. Their gradual improvement as neural machine translators has significantly increased their sophistication (Muñoz-Basols,

2019: 315). Thanks to the enhancement of generative AI, these translators are currently capable of not only recognizing literal meaning but also of identifying a wide variety of idiomatic or metaphorical usage and offering versions tailored to a specific register (informal, formal or academic). In fact, the sophistication of these tools continues to increase as millions of users feed them with linguistic sequences on a daily basis; in other words, artificial intelligence thrives on interaction with humans to improve its ability to respond.

Secondly, for the past decade, we have been interacting with **speech recognition technology** such as Alexa, Google Assistant or Siri. The main uses of these tools include searching for information (e.g. *Hey, Google, what's the weather going to be like today?*) or requesting specific tasks (e.g. *Hey, Google, turn on the lights*). In contrast to these devices, what is novel about generative AI chatbots like ChatGPT is that they can process complex questions, find detailed information, generate text models and implement user feedback, since they operate based on neural networks (Pascual, 2023). Another advantage offered by ChatGPT is **personalized interaction**. In the case of language learning, this can have a positive impact from a motivational perspective, among other factors, due to its ease of use at the technological and interactive level (Belda-Medina & Calvo-Ferrer, 2022) or due to the ability of chatbots to promote ludic or gamified learning (Mayer, 2014). Current voice assistants, on the other hand, often cannot answer a question if a speaker deviates excessively from sentence logic. This is also the case if a statement is pronounced incorrectly or if the question lacks sufficient contextual information. In contrast, ChatGPT is able to understand a written message even if words or letters are missing, for instance, as a result of typing too quickly. In short, thanks to the use of **big data**, this chatbot is capable of processing and interpreting a message even if it is incomplete or contains typos or grammar mistakes. Table 13.1 illustrates the potential roles, functions and implementations of ChatGPT in education.

Although it does not appear in Table 13.1, it is in this context of neural networks, education and language learning that a key aspect arises regarding the potential of **deep learning**-based AI. Specifically, it is the ability to generate unlimited grammatically correct and entirely meaningful statements (in those languages for which the tool has been sufficiently developed), as well as the capacity to interact with this information on different levels and for different purposes. Compared to other chatbots that use **machine learning** (based on probabilistic and statistical models), this positions next-generation chatbots like ChatGPT as technology tools that allow for **continuous exposure** to the L2 with **instant** and **personalized feedback** (see Chen *et al.*, 2021). These functions would be impossible to emulate, with the same level of immediacy and depth in language processing, in a traditional language

Table 13.1 Examples of roles, functions and implementations of ChatGPT in education

Role	Description	Example of implementation
Possibility engine	AI generates alternative ways of expressing an idea.	Students write queries in ChatGPT and use the Regenerate response function to examine alternative responses.
Socratic opponent	AI acts as an opponent to develop an argument.	Students enter prompts into ChatGPT following the structure of a conversation. Teachers can ask students to use ChatGPT to prepare for discussions.
Collaboration coach	AI helps groups to research and solve problems together.	Working in groups, students use ChatGPT to find information to complete tasks and assignments.
Guide on the side	AI acts as a guide to navigate physical and conceptual spaces.	Learners use ChatGPT to generate content for classes (e.g. discussion questions) and advice on how to learn specific concepts.
Personal tutor	AI tutors each student and gives immediate feedback on progress.	ChatGPT provides personalized feedback to students based on information provided by students or teachers (e.g. test scores).
Co-designer	AI assists throughout the design process.	Teachers ask ChatGPT for ideas about designing or updating a curriculum (e.g. rubrics for assessment) and/or focus on specific goals (e.g. how to make the curriculum more accessible).
Exploratorium	AI provides tools to play with, explore and interpret data.	Teachers provide basic information to students who write different queries in ChatGPT to find out more. ChatGPT can be used to support language learning.
Study buddy	AI helps the student reflect on learning material.	Students explain their current level of understanding to ChatGPT and ask for ways to help them study the material. ChatGPT could also be used to help students prepare for other tasks (e.g. job interviews).
Motivator	AI offers games and challenges to extend learning.	Teachers or students ask ChatGPT for ideas about how to extend students' learning after providing a summary of the current level of knowledge (e.g. quizzes, exercises).
Dynamic assessor	AI provides educators with a profile of each student's current knowledge.	Students interact with ChatGPT in a tutorial-type dialogue and then ask ChatGPT to produce a summary of their current state of knowledge to share with their teacher/for assessment.

Source: UNESCO (2023: 9).

class. Another advantage of this technology lies in its ability to provide corpus-based **language models** at any time and from any device, expanding learning opportunities beyond the language classroom.

The introduction of AI represents a **paradigm shift** in language teaching and learning. Among the tools available today, one of the most immediate aspects is to consider chatbots like ChatGPT as part of a new dimension of interaction with the target language. As will be discussed below, this fourth dimension, spearheaded by generative AI (Muñoz-Basols & Fuertes Gutiérrez, 2025), constitutes a source of language exposure for learners as well as an opportunity for language instructors to guide their educational and pedagogical practices both within and beyond the classroom.

13.2 AI-mediated Interaction: A Fourth Dimension for Learning an L2

To understand the relationship of this new technology to language teaching and learning, it is important to distinguish between two independent yet interrelated concepts: artificial intelligence (AI) and natural language processing (NLP). On the one hand, **artificial intelligence** is the general term. It was first coined around 1950 in order to identify machines that could perform functions that were more complex than routine tasks (UNESCO World Commission on the Ethics of Scientific Knowledge and Technology, 2019: 3). Today, it is used to describe the creation of intelligent systems or machines capable of simulating real and plausible conversations (though not necessarily reliable). This technology is based on algorithms that enable **task automation** (Chaudhry & Kazim, 2022). In other words, the machine performs tasks inherent to human intelligence, such as language comprehension, problem-solving or decision-making.

On the other hand, **natural language processing** is a subfield of AI that handles linguistic interaction between humans and machines. Today, it is based ‘more on *brawn* (computational power) than on *brain* (grammatical analysis)’ (Boden, 2016: 61). That is, it relies more on **computational power** to process vast amounts of big data across multiple usage contexts than on a **probabilistic approach to grammatical analysis**, as was the case with statistical machine translation (SMT). This type of machine translation, which was based on probabilistic models that prioritized neither context nor fluency in communication, was used until the arrival of **neural machine translation (NMT)** in 2014 (Sutskever *et al.*, 2014). Indeed, neural machine translation is the model that prevails today. NLP focuses on the development of models and algorithms that enable a machine to understand, interpret and generate human language with logical meaning in various tasks, such as machine translation, speech recognition or response generation through text. In other words, while **NLP focuses specifically on how human language is processed** in specific tasks and applications within an AI environment, **AI involves the design and development of intelligent systems**. However, it is important to keep in mind that there is no single way to define AI; this is because its **definition evolves** alongside its technology (Gonsalves, 2017). Today, UNESCO defines it as a technology that is ‘potentially capable of imitating or even exceeding human cognitive capacities, including sensing, language interaction, reasoning and analysis, problem solving, and even creativity’ (UNESCO World Commission on the Ethics of Scientific Knowledge and Technology, 2019: 3).

Through a bibliometric analysis of publications on AI and language teaching between 2000 and 2019, Huang *et al.* (2023) identified a series of fundamental recurring themes in specialized literature on the

subject. Firstly, the study highlights the **application of AI to reinforce the acquisition** of the four traditional skills in the following order: writing, reading comprehension, speaking and listening comprehension. Furthermore, it is also used to support the development of two central aspects of language learning: **vocabulary** and **grammar**. Secondly, the various **benefits of using AI** are mentioned, such as personalized learning, the ability to adapt to learners' individual needs and the opportunity for additional and unlimited practice in such environments. Finally, the study addresses certain **educational challenges**, including the reliability of AI, the acceptance of this technology and its ethical use by educators and learners (Gómez Soler & Tecedor, 2025), as well as a series of **social challenges**, such as general accessibility (Dooly & Comas-Quinn, 2025) and privacy (Boden, 2016: 163).

Now, if indeed there is a **new dimension** in communication associated with the integration of this type of technology into language learning, it is **interaction**. AI offers opportunities that support the teaching–learning process since it constitutes a novel and unlimited way to interact with two **fundamental aspects** in the field of acquisition: **language exposure** and **personalized practice opportunities**. In fact, study abroad programs are based on this very premise: improving language proficiency requires meaningful exposure and the development of interactional competence at both the linguistic and intercultural level (Strawbridge, 2023a, 2023b). Although AI cannot entirely replace these in-person experiences, AI-powered tools can facilitate contact with the target language and create learning opportunities.

Therefore, it is necessary to understand the **teacher ↔ AI ↔ learner** relationship as a new dimension for interaction (see Muñoz-Basols & Fuertes Gutiérrez, 2025). With this in mind, to the three traditional types of interaction – (1) learner ↔ teacher, (2) learner ↔ learner and (3) learner → content or materials (Moore, 1989: 1) – we must add a **fourth: AI-driven tool (e.g. a chatbot) ↔ teacher + AI-driven tool (e.g. a chatbot) ↔ learner**. Even though it is still too early to say how educators and learners will interact with this technology (e.g. objectives, frequency and tasks), it is clear that it will provide opportunities to enhance language acquisition and consolidation.

In line with what has been discussed so far, it is possible to identify at least **three main areas** where sustained interaction with AI will have a profound impact: (1) language contact opportunities; (2) adaptation to different learning profiles; and (3) the analysis and systematization of linguistic material.

13.2.1 Language contact opportunities

AI-driven tools provide **continuous access to corpus-based linguistic material**, which is constantly growing and being updated. This access

facilitates the creation of scenarios to practice different aspects related to a variety of communicative contexts or potential interlocutors in the target language, ranging from informal conversations to job interviews. Similarly, it allows for the incorporation of the multimodal dimension (text, image and sound) (Mayer, 2021), from textuality in various genres (Del Rey Quesada, 2021) and orality – for example, through speech recognition (contributing to the improvement of pronunciation and fluency) – to the enhancement of visual memory through the use of images. Indeed, this can make learning much more memorable, meaningful and longlasting. These language contact opportunities can also have a positive impact on motivation (Cerezo & Yanguas, 2025). This is because they provide access to a wide variety of communicative learning situations that can be tailored to any context and level, while also paying attention to language use in line with the learner’s interests and needs.

13.2.2 Adaptation to different learning profiles

One of the contributions of AI to the field of language acquisition is its ability to provide **personalized learning** opportunities, optimizing aspects such as pace, approaches, objectives, content and learning activities according to the individual needs and interests of each learner (US Department of Education, 2017, cited in Chen *et al.*, 2021: 201). Furthermore, this technology is able to tailor information to the specific requirements for each interaction. For instance, learners can ask a generative AI chatbot like ChatGPT to summarize, rephrase or explain the information they need in simple and less technical terms. This adaptability also enables the provision of immediate feedback by expanding on the presented information or by answering specific questions using language that is both grammatically correct and stylistically suitable. By adapting to the user, assessments can be tailored to specific learning profiles. Additionally, the tool can recommend supplementary language practice resources.

13.2.3 Analysis and systematization of linguistic material

AI enables the analysis and systematization of linguistic material, which is very useful when it comes to **raising learners’ linguistic awareness**.

Through natural language processing, recurring or absent linguistic patterns can be identified in a text. Systematic use of this technology – through the design of specific activities such as translation, rewriting texts or modifying register, textual typology (see Muñoz-Basols & Pérez Sinusía, 2021) or the communicative context – can contribute to expanding the learner’s lexical repertoire by exposing them to new

vocabulary and reinforcing their grammar skills, achieved through the recognition of various language patterns and stylistic alternatives. Ultimately, interaction with this technology provides opportunities for **systematic practice** and exposure to a wide range of **conversational and textual patterns in the L2**.

To integrate AI into education, it is important to consider both the characteristics of the teaching context in which it is to be used, as well as the components and steps necessary to implement AI pedagogically and ethically into the field of language learning. With this in mind, the aim is to combine learning profiles, language contact and the systematization of linguistic material to get the most out of the integration of this technology into second language teaching and learning.

13.3 The IMI+ Framework for the Implementation of AI at Curriculum Level

Currently, we lack methodological approaches and large-scale validated experimental studies to understand how to fully integrate generative AI into L2 teaching practices. In relation to Spanish teaching, for instance, one of the first theoretical proposals for the implementation of AI is the **IMI+ framework** developed by Muñoz-Basols *et al.* (2023: 176) in a Special Issue of the academic journal *Hispania*, published by the American Association of Teachers of Spanish and Portuguese (AATSP). The aim of this framework, in the context of AI-driven machine translation tools, is to implement **applied translation**. In other words, the idea is to seek ‘the integration of translation in L2 education with an understanding of its multimodal and interactive nature in communication’ (Muñoz-Basols *et al.*, 2023: 171).

Beyond translation, the IMI+ framework is a versatile and adaptable model that can guide the implementation of generative AI into other areas or components of language teaching. The framework takes the form of a pentagon and includes, on the one hand, **five awareness-raising elements** to meet the needs of the teaching–learning context and, on the other, **five action components**, conceived as essential steps to guide the instructor in the implementation, development and management of AI (Figure 13.1).

The **five awareness-raising elements** address the particularities of AI as a new technology in the educational domain (Table 13.2).

Once these elements have been reflected upon and, therefore, the potential of AI in a given educational setting has been considered, the **five action components** (3 + 2), conceived as specific steps in the **IMI+ framework**, help to guide the implementation of AI (Table 13.3).

The **five awareness-raising elements** and the **five action components** described in the **IMI+ framework** (Muñoz-Basols *et al.*, 2023) serve as a starting point to guide language instructors when it comes to integrating

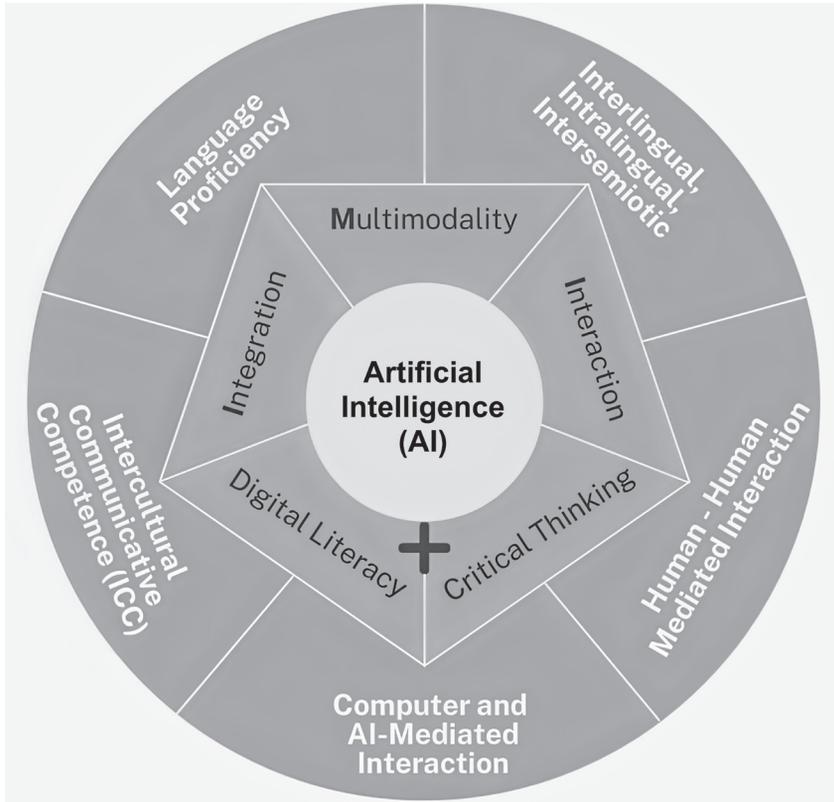


Figure 13.1 IMI+ framework (Integration, Multimodality and Interaction + Digital Literacy and Critical Thinking)

Source: Adapted from Muñoz-Basols *et al.* (2023: 176).

Table 13.2 Awareness-raising elements in the IMI+ framework (Muñoz-Basols *et al.*, 2023: 176) to consider AI

1. **Linguistic competence.** → **Identifying** how AI can contribute to the development of linguistic knowledge in a given context;
2. **Intralinguistic, interlinguistic, intersemiotic.** → **Planning** the integration of AI at the intralinguistic (internal study of the same language), interlinguistic (comparative or contrastive study of different languages) and intersemiotic levels (relationship between sign systems beyond verbal language, e.g. facial expressions, body language, onomatopoeia or emoticons);
3. **Technology-mediated human-to-human interaction.** → **Analyzing** prior needs in technology-mediated human interaction, including access to resources, personalized learning and feedback, opportunities to interact in the target language, individual or collaborative language practice or continuous learning over a given period of time from a longitudinal perspective;
4. **Technology- and AI-mediated interaction.** → **Comparing** the similarities and differences between technology-mediated human-human interaction and AI-mediated interaction to identify how the latter can meet or reinforce additional needs;
5. **Intercultural Communication Competence (ICC).** → **Expanding** the use of AI to enhance the acquisition of pragmatic and intercultural competences, thanks to its ability to generate communicative contexts and textual models in any modality (e.g. narrative, descriptive, expository, argumentative, academic, journalistic, advertising, legal-administrative, scientific-technical, etc.).

Table 13.3 Action components in the IMI+ framework (Muñoz-Basols *et al.*, 2023: 176) to implement AI

The **first three components** focus on **planning** and **development**:

1. **Integration.** → **Implementing** AI into the curriculum as an additional learning tool;
2. **Multimodality.** → **Combining** the potential of AI-driven technology in its different modalities (text, image and sound) to enhance the teaching–learning process;
3. **Interaction.** → **Designing** activities and tasks that promote interaction in order to get familiar with the use of AI as an integral part of the educational process.

+

The **two additional components** focus on the **evaluation** and **optimization** of the AI-mediated teaching–learning process:

4. **Digital literacy.** → **Providing training** in the competent and ethical use of AI-driven technology tools.
5. **Critical thinking.** → **Developing** the cognitive process of formulating one’s own value judgements and promoting logical reasoning when compiling, analyzing and evaluating information provided by AI tools.

AI into L2 education. However, as users of linguistic material, it is important to keep in mind that, although AI uses natural language processing, the generator of this information is a machine. Therefore, it is essential to critically evaluate its suitability and acceptability: in other words, it is crucial to foster a critical mindset (Hadley & Boon, 2023) to analytically and reflectively assess the material provided. Ultimately, it is necessary to integrate AI in a way that does not deprive learners of acquiring skills that are key in the development of 21st-century citizens (World Economic Forum, 2016, cited in UNESCO, 2021: 33), including ingenuity, self-efficacy, self-regulation, metacognition, and critical and independent thinking.

13.4 Immediate AI Opportunities: Informal Learning, Learner Autonomy and (Self-)Assessment

Due to its constant evolution, it is difficult to predict how the **integration of AI** will impact language teaching and learning (see Huang *et al.*, 2021, for a review of the advantages and disadvantages of using chatbots in this field). However, some immediate applications of this technology can be glimpsed in three key areas for language acquisition, where it is expected to have a profound impact: **informal (or incidental) learning, learner autonomy** and **(self-)assessment**.

Before addressing these applications, it is worth mentioning the need to schedule the implementation of AI in the language classroom **in line with learning objectives**, as well as to clearly establish its function, whether that is to facilitate learning, serve as a guide or analyze and solve problems (Kukulska-Hulme *et al.*, 2021: 24; see Table 13.1). This implementation should be carried out according to the principles governing the use of technology in the language classroom (Fryer *et al.*, 2020; Mayer, 2017), such as creating a favorable and positive atmosphere when it comes to implementing technological devices or resources (Sun *et al.*, 2022: 7). It is also essential to prevent the so-called **novelty**

effect associated with the use of AI (Fryer *et al.*, 2017: 466), since the presence of these tools in the classroom can lead to a short-term spike in learner motivation due to their ludic nature (Mayer, 2014). However, this affective variable may decrease over time, especially when it comes to speaking skills.

13.4.1 Informal learning

Informal (or incidental) language learning refers to activities performed either consciously or unconsciously outside formal educational settings that result in an improvement of proficiency in an additional language (see, among others, Dressman, 2020: 2). A large part of informal language learning takes place **through technology** (Rosell-Aguilar *et al.*, 2017: 3), using tools such as audiovisual media, videogames, apps, virtual reality and social networks, among others (Cerezo & Pujolà, 2025; Oskoz, 2025). AI plays a fundamental role in the configuration of these tools. For instance, it is used to develop algorithms that recommend specific content (in certain languages and linguistic varieties) to users on social networks. This, in turn, can have a positive impact on how a learner interacts with other users of their target language, while also improving their intercultural competence.

Various language learning apps use **AI-generated algorithms** to tailor the learning experience to each user and determine the difficulty level of the exercises proposed (Kharwal *et al.*, 2022; Settles & Meeder, 2016). The most advanced tools also have **speech recognition systems** that correct pronunciation or facilitate its acquisition by asking the user to repeat a statement if it is not understood. These features enable the automatic creation of personalized learning roadmaps tailored to the needs of each learner. Regarding chatbots, recent research reveals that their use can lead to the acquisition of basic communication skills in the target language (Dokukina & Gumanova, 2020: 544–545). However, further empirical studies are needed to confirm this hypothesis which, in any case, is only valid for languages in which the tools' design is sophisticated enough. Finally, AI can also be applied in informal language learning through apps that provide **subtitles for audiovisual content**, offering learners various advantages (see González Ortega & Mañas Navarrete, 2020; Muñoz-Basols, 2019).

13.4.2 Learner autonomy

The use of AI can also contribute to the development of language **learner autonomy**. According to UNESCO (2021: 33), this is one of the most immediate scenarios for the impact of this technology on education. Among its benefits, it is important to highlight how AI can enhance communication skills in the target language. For instance, the

use of chatbots is not limited to oral interaction. As noted by Sharples and Pérez (2022), chatbots can also be used to practice **creative writing**, through activities where the learner and the tool work together to write a story, as well as to develop other reflective skills such as **critical reading** or **reasoning**. Other applications of AI in autonomous learning include participating in **digital language immersion** opportunities (Soler Montes & Juan-Lázaro, 2025), resolving queries and receiving immediate personalized feedback. All these benefits help the learner to move forward in their learning journey (Kukulska-Hulme *et al.*, 2021: 23), adapting to their pace. They are also in line with various current educational trends, which lean towards the automation of learning processes (see Dukukina & Gumanova, 2020). According to Ellis (2022), AI can also assist language learners in managing the acquisition of certain **cross-disciplinary content**. While such content is rarely addressed in the language classroom, it is nonetheless useful for navigating academic settings. For example, in the context of higher education, Ellis (2022) refers to the use of assistants to create bibliographic references or to manage anti-plagiarism systems.

With regard to chatbots, Dokukina and Gumanova (2020: 544–545) emphasize a series of general advantages related to autonomous language learning. For instance, they offer the possibility of learning at a **personalized pace**, or even in small, fragmented blocks, as well as the opportunity to repeat and practice specific content as many times as necessary without experiencing anxiety or shame, which could occur in a classroom setting (Bárkányi, 2025). Ultimately, chatbots provide a safe learning environment free from expectations and judgement, which is, without a doubt, beneficial for learning (Dokukina & Gumanova, 2020: 544–545; Kukulska-Hulme *et al.*, 2021: 23). In this regard, AI has the potential to play a central role in the design of more accessible and inclusive language learning programs (Mizza & Rubio, 2025). That said, it is also important to ensure that the gap between those who have access to AI tools and those who do not is not widened.

In order to get the most out of all these opportunities, learners must become familiar with the functionalities and limitations of the tools they use and, to the extent possible, receive guidance on what tasks and activities enrich the use of this technology. Otherwise, if learners use AI without a clear objective, the learning process may be compromised.

13.4.3 (Self-)assessment

AI offers numerous benefits in the context of **(self-)assessment**. For instance, learners can use these tools to measure their progress or to revise and prepare for assessments, while educators can save time when it comes to designing and personalizing tests, grading papers and preparing feedback (Kukulska-Hulme *et al.*, 2021: 25; also see Bailini, 2025).

However, the implementation of AI into assessment practices is perhaps among the most concerning aspects for the educational community. Specifically, it is perceived as a threat to certain types of traditional assessments, such as essays, since several studies show that tools like ChatGPT or *advinci-003* can produce texts that achieve high grades (Uchendu *et al.*, 2021; Yeadon *et al.*, 2023). Another aspect to consider, as noted by Sharples (2022), is that if teachers also use AI for **grading**, none of the agents involved in the teaching and learning process actually benefits from the assessment processes.

In the field of language teaching, improper use of AI can especially affect writing tasks that learners prepare independently to then submit to the instructor. In response to this situation, educators might choose to limit assessment to tests that do not involve technology, as is the case, for example, in certification exams. This said, it should be noted that meeting this condition is not always feasible (for instance, distance education currently has no choice but to rely on technology for evaluation). However, this would mean forgoing the great opportunities offered by AI in the field of assessment. To mitigate this deficiency, **assessment tools** can be designed where AI is used to accompany learners. For example, learners could be asked to correct a text generated by a machine translator to subsequently discuss the errors detected. Alternatively, as suggested by Sharples (2022), learners could be provided with various AI-generated text models and asked to make improvements. Sharples (2022) also points out that these tools are not specifically designed for academic purposes. As a result, they have certain limitations that can in turn be exploited in educational contexts to design assessments.

One of the main criticisms of ChatGPT is that, while it does generate coherent statements, they are sometimes false or fabricated. In the context of AI models, these are known as **hallucinations** (see Bang *et al.*, 2023), and they may be related to factors such as the lack of a solid knowledge foundation, the inability to verify information in real time, data scarcity or the absence of sufficient context to generate accurate and relevant answers. In other disciplines, it may be easier to identify text generated by a chatbot. However, in the field of language teaching – where language content prevails – this is not always possible, since learners are often asked to produce texts based on imaginary scenarios in which factual accuracy is irrelevant (e.g. writing a letter or telling a story). As suggested in the **IMI+ framework** (Muñoz-Basols *et al.*, 2023) described above, one possible solution involves designing assessment questions that promote critical thinking and logical reasoning, so that learners can provide new, original information in their answers based on the given material. Another interesting skill that may be taught in the future is how to use language to pose questions that maximize communication and that consequently lead to the best possible response from an AI-powered tool.

13.5 Conclusion and Future Lines of Research

The debate on how to manage generative AI-driven tools like ChatGPT may initially lead to reinforcing the **human vs. machine** dichotomy as antagonistic elements. However, ‘all applications of AI in education should enhance, not threaten, what it means to be fully human’ (UNESCO, 2021: 27). AI as a new dimension for second language learning offers an endless array of pedagogical opportunities (Tuomi, 2018: 32), turning it into another **mediating technology** for learning. This is especially relevant due to, on the one hand, its **ability to transform teaching** as a new tool that is available for both educators and learners alike and, on the other, its **potential to enhance learning** by extending it beyond traditional settings, providing more opportunities for language exposure, continuous practice and interaction in the L2. However, **the way educators respond** to the challenges and opportunities presented by this technology will have a direct impact on its integration in the classroom (Sharples & Pérez, 2022). Therefore, in order to tackle any potential challenges, Sharples (2022: 1123) encourages teachers and learners to come together to explore the **practical and ethical issues** posed by the use of AI in education (also see Fyfe, 2022). Ultimately, as per UNESCO’s recommendations, it is essential to address ‘the responsible and ethical use of AI technologies in teaching, teacher training and e-learning, among other issues, to enhance opportunities and mitigate the challenges and risks involved in this area’ (UNESCO, 2022: 34).

Since the Gothenburg Summit held in November 2017, the European Union has been working on **three priority areas that will be impacted by AI** over the next few years: first, making better use of **digital technology** for teaching and learning; second, developing **digital competences and skills** that are relevant to digital transformation; and finally, improving education through **data analysis and prediction**. Technology advances driven by this technology will not only impact teaching: they will also influence how institutions operate and how educational policies are designed (Tuomi, 2018: 2). Therefore, it is important to consider what **role AI will play** in terms of **three fundamental aspects** that underpin language teaching and learning, as well as the field of education as a whole: **curriculum design, teaching practices and the creation and selection of materials** (Blake *et al.*, 2025; González-Lloret, 2025). As with any technology, the implementation of AI will require an adjustment period. However, it is clear that both educators and learners – perhaps now more than ever before, given that AI adds a **new interactional dimension** (Muñoz-Basols & Fuertes Gutiérrez, 2025) to the educational setting – will need to once again step out of their technology comfort zones (Muñoz-Basols, 2019: 299). This process will also require adapting this new technology to today’s learning methods (Mayer, 2022), which

will involve not only using AI efficiently and ethically (Pareto Boada *et al.*, 2021) but also getting the most out of this resource as part of the learning and professional development process – ‘a critical set of issues with which the AI-in-education community needs to fully engage’ (UNESCO, 2021: 27).

In future empirical studies in the field of second language acquisition, it will be necessary to address various questions regarding the impact of AI. However, these will surely be closely related to the **planning, personalization** and **implementation** (PPI model) of technology-mediated language teaching (see the PPI model in the introduction to this book; Muñoz-Basols *et al.*, 2025). Therefore, it will be essential to consider AI as a technology that generates innovation and transformation when it comes to planning curriculum needs, as a facilitator of personalized teaching and learning, as well as a tool for implementing activities and resources that can promote both linguistic and intercultural competence in additional languages.

Acknowledgements

For the completion of this chapter, Javier Muñoz-Basols has received funding from the program of the Spanish Ministry of Universities (Ministerio de Universidades del Gobierno de España) as a Beatriz Galindo Distinguished Senior Researcher (Investigador Distinguido Sénior Beatriz Galindo) (BG22/00099) and from the projects *Hacia una diacronía de la oralidad/escrituralidad: variación concepcional, traducción y tradicionalidad discursiva en el español y otras lenguas románicas (DiacOralEs)* (PID2021-123763NA-I00) funded by MCIN/AEI/10.13039/501100011033 y por FEDER, EU; *DEFINERS: Digital Language Learning of Junior Language Teachers (TED2021-129984A-I00)* funded by MCIN/AEI/10.13039/501100011033 and by the European Union (NextGenerationEU/PRTR); *‘OralGrab. Grabar vídeos y audios para enseñar y aprender’* (‘Recording Videos and Audios to Teach and Learn’) (PID2022-141511NB-I00), funded by the Spanish State Research Agency and the Spanish Ministry of Science and Innovation (Agencia Estatal de Investigación/Ministerio de Ciencia e Innovación del Gobierno de España).

Mara Fuertes Gutiérrez has received funding from the project ‘Language Acts and Worldmaking’ (AH/N004655/1) of the Arts and Humanities Research Council of England.

Both authors would like to thank the Hispanex program (order CUL/2912/2010) for its support in funding the open access publication of this book. We are also grateful to the Association of Hispanists of Great Britain & Ireland (AHGBI) for their Development Award and to The Open University for additional funding for this project. This publication follows the principles of the Budapest Open Access Initiative (BOAI)

and the National Open Science Strategy (Estrategia Nacional de Ciencia Abierta, ENCA 2023-2027) (Spanish Ministry of Science and Innovation, 2023), which highlight the importance of open science and accessibility to research.

References

- Baber, H., Fanea-Ivanovici, M., Lee, Y.-T. and Tinmaz, H. (2022) A bibliometric analysis of digital literacy research and emerging themes pre- and during the COVID19 pandemic. *Information and Learning Sciences* 123 (3–4), 214–232. <https://doi.org/10.1108/ILS-10-2021-0090>.
- Bang, Y., Cahyawijaya, S., Lee, N., Dai, W., Su, D., Wilie, B., Lovenia, H., Ji, Z., Yu, T., Chung, W., Do, Q.V., Xu, Y. and Fung, P. (2023) A multitask, multilingual, multimodal evaluation of ChatGPT on reasoning, hallucination, and interactivity. <https://doi.org/10.48550/arXiv.2302.04023>.
- Bailini, S. (2025) Assessment and feedback in virtual learning environments. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 189–212). Multilingual Matters.
- Bárkányi, Z. (2025) Anxiety and virtual learning. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 137–159). Multilingual Matters.
- Belda-Medina, J. and Calvo-Ferrer, J.R. (2022) Using chatbots as AI conversational partners in language learning. *Applied Sciences* 12 (17), 8427. <https://doi.org/10.3390/app12178427>.
- Blake, R., Jones, L. and Osburn, C. (2025) Hybrid and online teaching and the flipped classroom. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching. From Social Justice to Artificial Intelligence* (pp. 215–231). Multilingual Matters.
- Boden, M.A. (2016) *AI: Its Nature and Future*. Oxford University Press.
- Buj, A. (2023) Italia bloquea el uso de ChatGPT por no respetar la ley de protección de datos. *La Vanguardia*, 31 March. <https://www.lavanguardia.com/tecnologia/20230331/8868073/italia-prohibe-chatgpt-respetar-legislacion-datos.html>.
- Cerezo, L. and Pujoà, J.-T. (2025) Digital ludic pedagogies (DLP): Videogames, minigames, extended realities and robots. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 270–293). Multilingual Matters.
- Cerezo, L. and Yanguas, Í. (2025) Motivation and virtual learning. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 111–136). Multilingual Matters.
- Chaudhry, M.A. and Kazim, E. (2022) Artificial intelligence in education (AIED): A high-level academic and industry note 2021. *AI and Ethics* 2, 157–162. <https://doi.org/10.1007/s43681-021-00074-z>.
- Chen, X., Zou, D., Xie, H. and Cheng, G. (2021) Twenty years of personalized language learning. *Educational Technology & Society* 24 (1), 205–222. <https://www.jstor.org/stable/26977868>.
- Del Rey Quesada, S. (2021) Lo marcado y lo no marcado en la cadena de variedades: Apuntes para una nueva propuesta. In T. Gruber, K. Grübl and T. Scharinger (eds) *Was bleibt von kommunikativer Nähe und Distanz? Mediale und konzeptionelle Aspekte sprachlicher Variation* (pp. 205–238). Narr.
- Dokukina, I. and Gumanova, J. (2020) The rise of chatbots – New personal assistants in foreign language learning. *Procedia Computer Science* 169, 542–546. <https://doi.org/10.1016/j.procs.2020.02.212>.

- Dooly, M. and Comas-Quinn, A. (2025) Access to technology and social justice. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 21–42). Multilingual Matters.
- Dressman, M. (2020) Introduction. In M. Dressman and R. Sadler (eds) *The Handbook of Informal Language Learning* (pp. 1–12). Blackwell.
- Ellis, E. (2022) The potential of artificial intelligence in assessment feedback. *The Times Higher Education*, 31 August. <https://www.timeshighereducation.com/campus/potential-artificial-intelligence-assessment-feedback>.
- Fryer, L.K., Ainley, M., Thompson, A., Gibson, A. and Sherlock, Z. (2017) Stimulating and sustaining interest in a language course: An experimental comparison of chatbot and human task partners. *Computers in Human Behavior* 75, 461–468. <https://doi.org/10.1016/j.chb.2017.05.045>.
- Fryer, L.K., Coniam, D., Carpenter, R. and Lăpușneanu, D. (2020) Bots for language learning now: Current and future directions. *Language Learning & Technology* 24 (2), 8–22. <https://doi.org/10.10125/44719>.
- Fyfe, P. (2022) How to cheat on your final paper: Assigning AI for student writing. *AI and Society*. <https://doi.org/10.1007/s00146-022-01397-z>.
- Gómez Soler, I. and Tecedor, M. (2025) Virtual teachers' beliefs, attitudes and competence. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 61–83). Multilingual Matters.
- Gonsalves, T. (2017) *Artificial Intelligence. A Non-Technical Introduction*. Sophia University Press.
- González-Lloret, M. (2025) Curriculum planning and development in virtual environments. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 43–60). Multilingual Matters.
- González Ortega, B. and Mañas Navarrete, I. (2020) Efectos de los subtítulos intralingüísticos y los subtítulos bilingües aumentados sobre el aprendizaje incidental de vocabulario en español como lengua extranjera. *RILEX. Revista sobre investigaciones léxicas* 3 (2), 125–163. <https://doi.org/10.17561/rilex.3.2.5808>.
- Hadley, G. and Boon, A. (2023) *Critical Thinking*. Routledge.
- Huang, W., Hew, K.F. and Fryer, L.K. (2021) Chatbots for language learning – Are they really useful? A systematic review of chatbot-supported language learning. *Journal of Computer Assisted Language Learning* 38, 237–257. <https://doi.org/10.1111/jcal.12610>.
- Huang, X., Zou, D., Cheng, G., Chen, X. and Xie, H. (2023) Trends, research issues and applications of artificial intelligence in language education. *Educational Technology & Society* 26 (1), 112–131. [https://doi.org/10.30191/ETS.202301_26\(1\).0009](https://doi.org/10.30191/ETS.202301_26(1).0009).
- Kharwal, A., Umrotkar, N., Godambre, V., Kolekar, U. and Badgujar, V. (2022) Spaced repetition based adaptive e-learning framework. In L. Troiano, A. Vaccaro, N. Kesswani, I. Díaz Rodríguez and I. Brigui (eds) *Progresses in Artificial Intelligence & Robotics: Algorithms & Applications. ICDLAI 2021. Lecture Notes in Networks and Systems*. Springer. https://doi.org/10.1007/978-3-030-98531-8_3.
- Kukulska-Hulme, A., Bossu, C., Coughlan, T., Ferguson, R., FitzGerald, E., Gaved, M., Herodotou, C. et al. (2021) *Innovating Pedagogy 2021: Open University Innovation Report 9*. Open University.
- Mayer, R.E. (2014) *Computer Games for Learning*. MIT Press.
- Mayer, R.E. (2017) Using multimedia for e-learning. *Journal of Computer Assisted Learning* 33, 403–423. <https://doi.org/10.1111/jcal.12197>.
- Mayer, R.E. (2021) *Multimedia Learning* (3rd edn). Cambridge University Press.
- Mayer, R.E. (2022) Instructional media and instructional methods in digital language learning: Are we asking the right questions? *Bilingualism: Language and Cognition* 25 (3), 396–397. <https://doi.org/10.1017/S1366728921000559>.

- Mizza, D. and Rubio, F. (2025) Effective technological practices and diversity. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 84–108). Multilingual Matters.
- Moore, M. (1989) Three types of interaction. *The American Journal of Distance Education* 3 (2), 1–7.
- Muñoz-Basols, J. (2019) Going beyond the comfort zone: Multilingualism, translation and mediation to foster plurilingual competence. *Language, Culture and Curriculum* 32 (3), 299–321. <https://doi.org/10.1080/07908318.2019.1661687>.
- Muñoz-Basols, J. and Pérez Sinués, Y. (2021) *Developing Writing Skills in Spanish* (2nd edn). Routledge.
- Muñoz-Basols, J., Neville, C., Lafford, B.A. and Godev, C. (2023) Potentialities of applied translation for language learning in the era of artificial intelligence. *Hispania* 106 (2), 171–194. <https://doi.org/10.1353/hpn.2023.a899427>.
- Muñoz-Basols, J. and Fuertes Gutiérrez, M. (2025) Interaction in virtual learning environments. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 160–188). Multilingual Matters.
- Oskoz, A. (2025) Competences and language digitalization: Podcasts and digital stories. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 256–269). Multilingual Matters.
- Pareto Boada, J., Román Maestre, B. and Torras Genís, C. (2021) The ethical issues of social assistive robotics: A critical literature review. *Technology in Society* 67, 101726. <https://doi.org/10.1016/j.techsoc.2021.101726>.
- Pascual, M.G. (2023) Geoffrey Hinton: ‘Si hay alguna forma de controlar la inteligencia artificial, debemos descubrirla antes de que sea tarde’. *El País*, 7 May. <https://elpais.com/tecnologia/2023-05-07/geoffrey-hinton-si-hay-alguna-forma-de-controlar-la-inteligencia-artificial-debemos-descubrirla-antes-de-que-sea-tarde.html>.
- Popp, T. (2023) Alien minds, immaculate bullshit, outstanding questions. College in the age of ChatGPT. *The Pennsylvania Gazette*, May/June. <https://thepenngazette.com/alien-minds-immaculate-bullshit-outstanding-questions/>.
- Rosell-Aguilar, F., Beaven, T., and Fuertes Gutiérrez, M. (eds) (2017) *Innovative Language Teaching and Learning at University: Integrating Informal Learning into Formal Language Education*. Research-publishing.net. <https://doi.org/10.14705/rpnet.2018.22.9782490057108>.
- Settles, B. and Meeder, B. (2016) A trainable spaced repetition model for language learning. In K. Erk and N.A. Smith (eds) *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics* (pp. 1848–1858). Association for Computational Linguistics.
- Sharples, M. (2022) Automated essay writing: An AIED opinion. *International Journal of Artificial Intelligence in Education* 32, 1119–1126. <https://doi.org/10.1007/s40593-022-00300-7>.
- Sharples, M. and Pérez, R.P. (2022) Original essays written in seconds: How ‘transformers’ will change assessment. *The Times Higher Education*, 4 July.
- Sleator, L. and Hennessey, M. (2023) Almost half of Cambridge students admit they have used ChatGPT. *The Times*, 21 April. <https://www.thetimes.co.uk/article/cambridge-university-students-chatgpt-ai-degree-2023-rnsv7mw7z>.
- Soler Montes, C. and Juan-Lázaro, O. (2025) Digital language immersion (DLI) and virtual exchanges. In J. Muñoz-Basols, M. Fuertes Gutiérrez and L. Cerezo (eds) *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 256–269). Multilingual Matters.
- Song, D. and Lee, J. (2014) Has Web 2.0 revitalized informal learning? The relationship between Web 2.0 and informal learning. *Journal of Computer Assisted Learning* 30 (6), 511–533. <https://doi.org/10.1111/jcal.12056>.

- Strawbridge, T. (2023a) The relationship between social network typology, L2 proficiency growth, and curriculum design in university study abroad. *Studies in Second Language Acquisition*. <https://doi.org/10.1017/S0272263123000049>.
- Strawbridge, T. (2023b) The effect of 'at home' network communication, off-site travel, and extracurricular activity on longitudinal social network development in study abroad. *System* 117, 1–13. <https://doi.org/10.1016/j.system.2023.103119>.
- Sun, H.L., Sun, T., Sha, F.Y., Gu, X.Y., Hou, X.R., Zhu, F.Y. and Fang, P.T. (2022) The influence of teacher–student interaction on the effects of online learning: Based on a serial mediating model. *Frontiers in Psychology* 13, 1–10. <https://doi.org/10.3389/fpsyg.2022.779217>.
- Sutskever, I., Vinyals, O. and Le, Q.V. (2014) Sequence to sequence learning with neural networks. *Advances in Neural Information Processing Systems* 27.
- Teubner, T., Flath, C.M., Weinhardt, C., van der Aalst, W. and Hinz, O. (2023) Welcome to the era of ChatGPT *et al.* The prospects of large language models. *Business & Information Systems Engineering* 65, 95–101. <https://doi.org/10.1007/s12599-023-00795-x>.
- Tuomi, I. (2018) *The Impact of Artificial Intelligence on Learning, Teaching, and Education. Policies for the Future* (M. Cabrera, R. Vuorikari and Y. Punie, eds). EUR 29442 EN. European Union. <https://doi.org/10.2760/12297>, JRC113226.
- Uchendu, A., Ma, Z., Le, T., Zhang, R. and Lee, D. (2021) TURINGBENCH: A benchmark environment for Turing test in the age of neural text generation. In M.-F. Moens, X. Huang, L. Specia and S. Wen-tau Yih (eds) *Findings of the Association for Computational Linguistics: EMNLP 2021* (pp. 2001–2016). Association for Computational Linguistics.
- UNESCO (2021) *AI and Education: Guidance for Policy-makers*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000376709>.
- UNESCO (2022) *Recommendation on the Ethics of Artificial Intelligence*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000381137>.
- UNESCO (2023) *ChatGPT: An Artificial Intelligence in Higher Education*. UNESCO. Document code: ED/HE/IESALC/IP/2023/12.
- UNESCO World Commission on the Ethics of Scientific Knowledge and Technology (2019) *Preliminary Study on the Ethics of Artificial Intelligence*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000367823>.
- US Department of Education (2017) *Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update*. US Department of Education. <https://tech.ed.gov/files/2017/01/NETP17.pdf>.
- World Economic Forum (2016) *New Vision for Education: Fostering Social and Emotional Learning through Technology*. World Economic Forum. <https://www.weforum.org/reports/new-vision-for-education-fostering-social-and-emotional-learning-through-technology/>.
- Yeadon, W., Inyang, O.B., Mizouri, A., Peach, A. and Testrow, C.P. (2023) The death of the short-form physics essay in the coming AI revolution. *Physics Education* 58 (3), 35027.

Thematic and Onomastic Index

- AATSP (The American Association of Teachers of Spanish and Portuguese) 304
- ABCYA 275, 287
- access: open; to information and communication; to the Internet; recommendations 7, 8, 11, 23, 27, 32, 45, 52, 63, 65, 75, 78, 85, 93, 123, 126, 130, 150, 167, 172, 176, 201, 202, 233, 262, 263, 310
- accessibility 2, 6, 10, 14, 22, 32, 33, 35, 86, 99, 178, 181, 184, 297, 298, 302, 312
- Acosta-Ortega, L. 176, 180, 183
- Acquah, E. O. 278, 282
- ACTFL *see* American Council on the Teaching of Foreign Languages 49, 57, 62, 77, 84, 85, 233
- active learning xiii, 102, 164
- Active Reading Software (ARS) 96
- Active Worlds* 122
- Actively Learn* 100
- activity 53, 54, 91, 95, 97, 114, 115, 117, 123, 142, 149, 153, 160, 163, 170, 173, 174, 175, 177, 179, 190, 197, 199, 203, 226, 244, 245, 259, 271
- activity theory 259, 260, 264
- adaptations 2, 93
- ADDIE (Analysis-Design-Development-Integration-Evaluation) model 8, 44, 49, 52, 55, 89
- administrators 32, 37, 48, 76
- Adobe* 222
- Adolphs, S. 126, 130
- AI, *see* Artificial Intelligence 2, 5, 7, 10, 26, 183, 186, 196, 224, 297–311
- Alejaldre Biel, L. 241
- Alexa* 56, 299
- Alfadil, M. 276, 281
- Al-Hoorie, A. H. 112, 118, 119, 130
- Allen, H. W. 47, 89, 219, 262, 263, 266
- Alonso Belmonte, I. 256, 257, 264
- alpha tests 55
- Amelia* 298
- American Association of Teachers of Spanish and Portuguese (AATSP) 304
- American Council on the Teaching of Foreign Languages (ACTFL); Distance Learning Mentoring Special Interest Group; Diversity and Inclusion in World Language Teaching & Learning; Performance Descriptors for Language Learners; 21st Century Skills Map; World-Readiness Standards for Learning Languages (National Standards in Foreign Language Education Project and ACTFL) 49, 62, 77, 84–5, 86, 87, 90, 233
- Americans with Disabilities Act (The) 86
- AMTB (Attitude/Motivation Test Battery) 116, 117, 119, 121, 124, 126
- analysis: context; learner; linguistic; materials; needs; participants xi, xii, xiv, 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 22, 25, 26, 29, 31, 32, 34, 43, 44, 48, 49, 50, 52, 53, 54, 56, 57, 58, 61, 63, 64, 65, 66, 68, 70, 71, 74, 75, 77, 86, 87, 89, 90, 99, 101, 119, 120, 121, 123, 126, 128, 137, 143, 144, 147, 148, 149, 150, 152, 153, 160, 161, 164, 165, 166, 168, 172, 176, 180, 192, 193, 217, 218, 219, 227, 235, 241, 242, 243, 298, 301, 302, 303, 310
- Andión-Herrero, M. A. 233, 234, 235
- Angels and Demigods* 281
- anti-plagiarism 196, 199, 308

- anxiety: definition; strategies for
 alleviating; speaking; instruments
 for measuring; foreign languages; in
 LMOOCs xi, 6, 7, 8, 9, 10, 11, 22, 28,
 34, 35, 49, 62, 64, 85, 86, 87, 90, 91,
 96, 102, 121, 122, 137, 138, 139, 140,
 141, 143, 144, 147, 150, 155, 160, 166,
 170, 171, 177, 204, 217, 225, 233, 237,
 239, 250, 261, 262, 270, 276, 283, 286,
 301, 308
- Appel, C. 112, 273
- applications (apps); for self-study; for
 socialized reading; for messaging;
 for proctoring or surveillance xiv,
 2, 10, 24, 33, 46, 53, 63, 84, 95, 96,
 97, 98, 99, 100, 124, 126, 127, 129,
 139, 178, 195, 196, 197, 205, 222,
 224, 234, 272, 275, 277, 279, 280,
 284, 285, 297, 298, 301, 306, 307,
 308, 310
- approach: ecological; natural; socio-
 constructivist; psychocognitive;
 structuralist-behaviorist; teaching 3,
 6, 7, 9, 21, 29, 30, 31, 35, 49, 51, 54,
 64, 65, 78, 85, 86, 92, 98, 117, 119,
 121, 122, 126, 152, 153, 162, 164, 168,
 169, 172, 176, 177, 181, 193, 196, 200,
 216, 219, 222, 223, 227, 232, 238, 249,
 272, 273, 274, 276, 277, 278, 285, 297,
 298, 301, 303, 306
- Arasaratnam-Smith, L. A. 162, 164
- Arispe, K. 84, 219
- Arnedo-Moreno, J. 271, 278, 282, 286
- ARS (Active Reading Software) 96
- Artificial Intelligence (AI): definition;
 examples of roles, functions, and
 implementations; future lines
 of research; incorporation at
 the curriculum level; generative;
 interaction mediated by;
 opportunities; practical and ethical
 problems; benefits of the use of xii,
 1, 2, 5, 6, 10, 11, 22, 24, 26, 27, 28,
 29, 32, 37, 45, 46, 49, 50, 51, 54, 56,
 58, 62, 63, 64, 65, 67, 76, 78, 92, 93,
 94, 96, 97, 100, 102, 118, 129, 151,
 152, 154, 162, 165, 170, 171, 182,
 183, 194, 196, 200, 206, 219, 220,
 224, 225, 227, 235, 239, 241, 248,
 249, 250, 266, 267, 270, 277, 285,
 297, 299, 300, 301, 302, 303, 304,
 305, 306, 308, 309, 310
- ASALE (Association of Spanish Language
 Academies) 235
- Ashford-Rowe, K. 192, 199
- Aslan, E. 194, 206
- assessment, *see* assignments 3, 4, 6, 8, 9,
 12, 44, 46, 50, 54, 72, 80, 138, 167,
 168, 170, 171, 175, 176, 178, 181, 189,
 190, 191, 192, 194, 195, 196, 197, 199,
 202, 203, 204, 205, 207, 220, 228, 247,
 281, 300, 309
- assignments: automation of; group; online;
 practical; tasks; projects 53, 97, 124,
 129, 175, 192, 271, 277, 300, 308,
 310
- assistant 299
- Association of Spanish Language
 Academies (ASALE) 235
- asynchronous individual reading/listening
 areas 93, 94, 95, 96, 101
- asynchronous learning networks 218
- asynchronous mode 44, 55, 63, 91, 92, 93,
 94, 95, 96, 97, 101, 139, 141, 143, 150,
 155, 160, 161, 217
- Attitude/Motivation Test Battery (AMTB)
 116, 117, 119, 121, 124, 126
- attitudes; online teacher attitudes:
 definition; online teaching; current
 research xiii, 3, 4, 5, 8, 9, 10, 12, 22,
 27, 29, 44, 47, 48, 61, 62, 63, 64, 65,
 66, 68, 69, 70, 71, 72, 73, 74, 75, 78,
 80, 81, 85, 87, 96, 113, 118, 137, 138,
 163, 164, 166, 168, 170, 171, 176, 195,
 215, 218, 220, 222, 227, 233, 235, 242,
 270, 271, 272, 301
- Aubrey, S. 101, 123, 129, 193, 194
- Audacity* 258
- augmented reality 30, 31, 95, 276
- Aula Virtual del Español (AVE)* 74
- Automated Writing Evaluation (AWE)
 193–5
- automated feedback 198
- automation of tasks 301
- autonomous learning 84, 90, 91, 94, 99,
 142, 165, 244, 308
- AVE Global* 234, 235, 240
- Babbel* 275, 279
- Babson Research Group* 3
- Bahari, A. 111, 112, 119, 120
- Bailini, S. 6, 9, 153, 177, 184, 189, 192,
 308
- Bárkányi, Z. 6, 9, 122, 124, 137, 139, 149,
 235, 308
- Bax, S. 91, 111
- BBC 2* 1, 46, 259
- Beat Saber* 276
- Beelinguapp* 275, 287
- behaviorism 115

- beliefs: attitudes and competences of the virtual teacher; definition; electronic survey; on the virtual teaching; toward online teaching; current research xiii, 1, 3, 4, 5, 8, 9, 10, 12, 22, 27, 29, 44, 47, 48, 61, 62, 63, 64, 65, 66, 68, 69, 71, 72, 73, 74, 75, 78, 79, 80, 81, 85, 87, 88, 89, 96, 113, 114, 118, 137, 148, 155, 168, 170, 171, 194, 215, 217, 222, 227, 234, 242, 270, 271, 272, 301
- Benini, S. 112, 126
- Benítez, R. A. 194, 199
- beta testing 55
- Bibauw, S. 56, 282
- bilingual identity 28, 36, 101, 203
- Bing* 298
- Bischoff, M. 274, 278
- Bitchener, J. 192, 193
- Bitsy* 287
- Blackboard* 47, 80, 194, 195, 196, 198, 243
- Blackboard Collaborate Ultra* 195
- Blackwell, T. L. 87, 95
- Blake, R. 3, 9, 84, 92, 141, 215, 216, 217, 218, 219, 220, 222, 223, 226, 276, 310
- blended learning 4, 141, 239, 240
- blogs 45, 162, 181, 194, 195, 200, 258, 297
- Bode, P. 22, 32
- Boden, M. A. 301, 302
- Bodnar, S. C. 119, 120
- Boettcher, J. V. 51, 55
- Bolívar, A. 21, 24, 32
- Bone* 281
- Boo, Z. 113, 117, 118, 119
- Borg, S. 61, 62, 66
- Boud, D. 192, 199
- Brainscape* 279
- breakout rooms 174, 177, 179, 180, 182
- Brown, C. 192, 199
- Brown, K. L. 45, 120, 127, 128, 129
- Bueno-Alastuey, M. C. 168, 280
- Busuu* 275
- CAI (Computer-Assisted Instruction) 218
- CALICO* xi, xiii, 45, 52, 77
- CALL (Computer-Assisted Language Learning) xii, xiii, 112, 217
- Canals, L. 64
- Canvas* 47, 80
- Captive* 222
- Carey, L. 89, 90
- Castañeda, M. 257, 265
- CEFR (Common European Framework of Reference for Languages) 90, 141, 232
- Center for Analysis and Research 3
- Center for Applied Special Technology 85, 86, 87, 88, 95
- Cerebriti* 287
- Cerezo, L. 3, 5, 6, 8, 10, 121, 165, 193, 194, 271, 277, 282, 303, 307
- challenges 2, 3, 7, 27, 51, 66, 68, 69, 71, 72, 73, 75, 79, 118, 123, 128, 139, 150, 176, 181, 207, 215, 249, 265, 300, 302, 310
- Chao, C. 62, 64, 75
- Chapelle, C. 3, 48
- chatbots; see also *ChatGPT* 56, 183, 282, 299, 300, 306, 307, 308
- ChatGPT* 5; main criticisms; examples of roles, functions and implementations 5, 183, 196, 207, 297, 298, 299, 300, 303, 309, 310
- ChatGPT-3* 297
- chats: in small groups; recommendations for 4, 9, 32, 52, 55, 63, 65, 75, 85, 93, 126, 150, 151, 152, 172, 173, 176, 179, 202, 219, 222, 226
- Chen, H. H. 281
- Chen, H.-J. 279, 281, 299, 303
- Chen, J. C. 45, 120, 127, 128, 129
- Chen, M. H. 120, 127
- Chen, X. 281, 299, 303
- ChronoOps* 276, 277, 278, 283
- Chun, D. M. 220, 221
- Ciftci, H. 194, 206
- Çiftçi, Y. E. 29, 46
- CIPP Model (Context, Input, Process and Product) 192
- Cisco Webex* 195, 196
- Clark, K. 27
- Classcraft* 284, 287
- ClassDojo* 24, 279, 284, 287
- classrooms: flipped; hybrid; management; platforms for digital classroom learning; technologies specific to the; teacher competences in virtual classrooms; virtual 2, 4, 5, 6, 9, 11, 27, 34, 44, 84, 111, 123, 130, 164, 169, 182, 215, 217, 219, 222, 223, 227, 240, 257, 266, 272, 276
- CLIL (Content and Language Integrated Learning) see Content and Language Integrated Learning (CLIL) 48, 49
- CNN 275
- Cobb, M. 271
- Cocemfe* 22
- CoffeeBreak* 256
- cognition 61
- cognitive movement 115
- cognitive presence 51, 55, 166, 182
- cognitive situated period 116

- collaboration 3, 32, 34, 35, 46, 88, 91, 94, 97, 98, 99, 128, 164, 172, 192, 235, 247, 277, 300
- Comas-Quinn, Anna 3, 5, 7, 21, 34, 63, 65, 74, 75, 165, 302
- Common European Framework of Reference for Languages (CEFR) 90, 141, 232
- communication: access to; apprehension to; technology-mediated xi, xii, xiii, 1, 2, 3, 5, 6, 7, 9, 12, 13, 21, 22, 23, 24, 28, 29, 30, 32, 33, 34, 35, 37, 43, 44, 46, 48, 49, 50, 54, 55, 56, 75, 78, 88, 91, 93, 94, 98, 112, 121, 123, 126, 130, 138, 139, 141, 143, 144, 146, 148, 149, 153, 154, 155, 162, 163, 165, 166, 167, 172, 176, 179, 180, 191, 193, 200, 201, 204, 215, 216, 218, 219, 223, 226, 232, 237, 240, 242, 243, 244, 247, 265, 266, 270, 295, 298, 301, 302, 304, 305, 307, 309, 311
- community: online learning communities: communities of practice 21, 27, 28, 32, 36, 47, 49, 50, 51, 54, 55, 64, 75, 76, 77, 78, 88, 91, 92, 94, 98, 111, 113, 128, 150, 151, 152, 162, 224, 232, 237, 256, 260, 309, 311
- competence: Intercultural Communicative Competence (ICC); of the virtual teacher; digital; teacher digital; digital teaching; in the virtual classroom; written; grammatical; and digital skills; current research; linguistic xiii, 5, 8, 9, 10, 12, 22, 24, 25, 27, 29, 33, 34, 50, 44, 47, 55, 61, 62, 63, 64, 65, 75, 76, 78, 79, 85, 86, 87, 90, 91, 103, 114, 117, 118, 121, 126, 128, 130, 141, 160, 168, 178, 189, 197, 202, 203, 207, 221, 224, 227, 237, 240, 241, 242, 249, 257, 264, 266, 277, 297, 301, 305, 310
- Complex Dynamic Systems Theory (CDST) 116, 118
- Computer Assisted Language Instruction 77
- Computer-Assisted Language Instruction Consortium (CALICO) 77
- Computer-Assisted Language Learning (CALL) xii, xiii, 112, 217
- Connect* 49, 96, 100, 113, 217, 236
- connectivism 116, 118
- connectivity 22, 27, 28, 33, 179, 218
- Conrad, R. 51, 55
- Construct* 3 284, 287
- Content and Language Integrated Learning (CLIL) 48
- content: language teaching through; sociolinguistic content 2, 48, 160, 170, 233, 234, 235, 239, 242, 243, 244, 248, 302
- context, analysis of 52
- continuous learning 140, 305
- Cooperative Learning Technologies (CLT) 5
- Cope, J. 137
- Cornillie, F. 257, 282
- CoSpaces Edu* 285, 288
- Costa, P. 22, 26,
- Council of Europe 26, 87, 90, 141, 160, 168, 189, 202, 232, 248
- COVID-19 1, 3, 43, 47, 51, 56, 65, 79, 80, 81, 139, 162, 194, 195, 206, 238, 243, 249, 270
- Coworking* 129
- Criterion* 190, 195
- critical thinking 30, 37, 120, 284, 286, 305, 306, 309
- Crystallize* 281
- Csizér, K. 117
- culture: teaching; horizontal cultures; vertical cultures 161, 223
- CultureTree* TV 36
- curriculum: curriculum development; in virtual environments; decolonization of; curriculum design; technology curriculum integration; evaluation of the; incorporation of AI into the curriculum; recommendations for; gamified courses 6, 7, 8, 9, 12, 43, 62, 64, 66, 76, 85, 92, 98, 152, 153, 154, 160, 161, 190, 193, 195, 201, 206, 242, 247, 249, 310
- curriculum design: in virtual environments; digital stories; Digital Linguistics; podcasts; recommendations for learning design; instructional design 6, 7, 8, 9, 10, 12, 43, 51, 62, 64, 66, 76, 85, 92, 98, 152, 153, 154, 160, 161, 165, 176, 178, 193, 195, 210, 206, 234, 242, 256, 257, 258, 259, 260, 261, 264, 265, 266, 267, 310
- curriculum development: *see* curriculum 85
- customization 88, 94, 100
- Dann, R. 192, 199
- De Basterrechea, J. P. 234, 235, 239
- Deci, E. L. 114, 117
- DeepL* 298
- deep learning 299
- deHaan, J. 273, 274, 279, 284
- Dehghanzadeh, H. 278, 279, 287
- DeKeyser, R. M. 219, 222, 237

- Dell, C. A. 87, 95
 Dell, T. F. 87, 95
 Desmet, P. 56
 demotivation 117
 Devine, J. 239, 240, 242
 dialogue: spaces for 28
 Dick, W. 89, 90
DigCompEdu (European Framework for the Digital Competence of Educators) 62, 64, 75, 242
DigCompOrg 242
 digital: communication; divide; immersion; periodicals; portfolios 22, 23, 27, 29, 32, 37, 97, 176, 236, 241, 243, 244
 digital communication 176
 digital divide 22, 23, 25, 27, 29, 32, 37
 digital immersion, *see* immersion 236, 241, 243, 244
 Digital Language Immersion (DLI), *see* immersion 9, 232, 238, 241, 242, 244, 247, 249, 250, 308
 Digital Ludic Pedagogy (DLP) 271
 digital sociolinguistics 234
 digital stories: examples; future lines of research; research on; theoretical frameworks applied to; narrative multimodal; origins of; podcasts as; creation process 10, 11, 12, 37, 51, 56, 63, 78, 102, 129, 154, 182, 206, 227, 248, 256, 257, 258, 259, 260, 264, 265, 266, 267, 285, 310
 Dillenbourg, P. 243
 Ding, Y. 125
 Diniz de Figueiredo, E. H. 234
 discussion, forums of 98, 128, 141, 142, 149, 200, 227, 239
 devices: voice recognition; digital devices 31, 46, 56, 183, 195, 197, 271
 digital cultural integrity 29
 digitalization: linguistic 10, 256
 digital literacy 3, 27, 36, 50, 52, 127, 128, 257, 270, 305, 306
 digital writing 226, 227, 266
 discussion forums 98, 128, 141, 142, 149, 200, 227, 239
 Distance Learning Mentoring Special Interest Group (ACTFL) 77
 diversity 8, 11, 30, 84, 85, 86, 87, 89, 90, 93, 96, 102, 234, 235, 260
 Dizon, G. 56
 Djaouti, D. 274
Doblele 36
 Dodge, K. A. 27
 Dokukina, I. 307, 308
 Dooly, M. 3, 7, 21, 26, 29, 51, 302
 Dörnyei, Z. 113, 114, 115, 116, 117, 118, 119, 126, 130, 141, 154
Dropbox 193
Drops 275
 DU (Universal Design) 86
 Ducate, L. 261
Duolingo 33, 124, 125, 271, 272, 277, 279, 280
Dupli Checker 196, 199
 EACEA (Education, Audiovisual and Culture Executive Agency) 236, 238, 241
 Ebrahimzadeh, M. 279
eComma 224
 Edelen-Smith, P. 86, 87, 89, 102
EdPuzzle 99, 100
 education: with technology; about technology; technology in; technology for 6, 8, 10, 12, 22, 24, 26, 32, 34, 36, 37, 43, 44, 45, 51, 61, 84, 85, 98, 112, 120, 128, 129, 144, 224, 304, 306, 310
EDUCAplay 287
 education abroad 236
EDUCAUSE 3
Edutec-e, electronic journal of educational technology 36
E-eleando 36
 effect: redundancy; novelty; persona 10, 87, 111, 281, 282, 283, 286, 306
 e-feedback: asynchronous; automated; global; computerized; research on; ICT-mediated; recommendations for; useful resources to offer; selective; synchronous; techniques; advantages of 9, 32, 44, 52, 75, 91, 93, 94, 95, 96, 101, 119, 126, 139, 141, 143, 150, 155, 160, 161, 172, 176, 191, 193, 194, 195, 198, 199, 200, 201, 202, 204, 205, 206, 207, 217, 218, 249
 e-learning 44, 310
 Ellis, R. 92, 193, 222, 271, 272, 273, 308
 Elola, A. I. 92, 193, 200, 226, 256, 257, 260, 264, 265, 266
 email 138, 203, 205, 298
ENACT - Learn Language Through Culture 29
The Endangered Languages Project 236
 embodied learning 275, 276, 278, 281, 285
 empowerment 5, 6, 23, 150, 239
Energy City 275, 280
 engagement 84, 88, 100, 101, 113, 114, 115, 121, 127, 170, 171
 English, B. 29
 ecological approach 277

- environments; virtual environments;
 evaluation and feedback in; future
 research directions; hours of work;
 in the DLI; interaction in; curriculum
 planning and development in PLLEs
see Participatory Environment for
 Language Learning 5, 6, 7, 8, 9, 12,
 28, 43, 53, 56, 61, 62, 64, 66, 76, 92,
 98, 152, 153, 154, 165, 167, 191, 193,
 195, 197, 199, 201, 206, 227, 237, 242,
 243, 244, 245
- ERASMUS+ 236, 238, 244, 246, 247
- errors: management of; monitoring of 7,
 9, 11, 154, 155, 161, 182, 259, 280,
 304, 309
- escape rooms 284
- eTandem 162
- e-tutors 193, 195
- EuroCatering* 47
- European Association of Computer
 Assisted Language Learning
 (EuroCALL) 77
- European Commission 25, 33, 238, 241
- European Framework for the Digital
 Competence of Educators
 (DigCompEdu) 62
- European Union 13, 29, 44, 50, 184, 310, 311
- evaluation; performance; self-evaluation;
 certification; continued; qualitative;
 quantitative; diagnostic; dynamics;
 automated; direct; in virtual
 environments; (self-)evaluation;
 formative; functions of; tools for;
 indirect; research about; e-feedback;
 CIPP model; negative, fear of;
 objective; recommendations for;
 subjective; summative; types 3, 7, 8,
 9, 10, 12, 23, 25, 32, 43, 46, 51, 52,
 54, 55, 58, 63, 64, 65, 66, 75, 76, 85,
 87, 88, 89, 92, 93, 94, 96, 98, 114, 116,
 119, 120, 121, 123, 124, 126, 127, 137,
 138, 139, 143, 149, 150, 152, 153, 154,
 160, 163, 172, 176, 177, 179, 183, 189,
 190, 191, 192, 193, 194, 195, 196, 198,
 199, 200, 201, 202, 204, 205, 206, 207,
 218, 233, 240, 242, 243, 247, 273, 277,
 306, 309
- EVALUATE (Evaluating the Impact of
 Virtual Exchange on Initial Teacher
 Education: A European Policy
 Experiment) 238
- EVOLVE (Evidence-Validated Online
 Learning through Virtual Exchange)
 238
- exams 58, 167, 195, 197
- exercises 141, 173, 218, 220, 271, 300
- experiential 65, 215, 216, 227, 238
- extended reality 10, 11, 26, 275
- Facebook* 76, 129, 240
- Fantales* 257
- Fantasy Class* 284, 287
- feedback: automated; computerized; direct;
 explicit; global; immediate; implicit;
 indirect; peer feedback; personalized;
 negative; technology-mediated;
 recommendations for; types and
 modalities; *see also* e-feedback 36,
 45, 50, 55, 98, 111, 119, 128, 153, 162,
 169, 181, 190, 191, 193, 195, 197, 198,
 200, 201, 202, 206, 219, 220, 222, 259,
 261, 262, 264, 275, 282, 285, 299, 300,
 303, 308
- Feelbot* 279
- Felix, U. 112, 220
- Ferris, D. 192, 193
- Finkelstein, J. E. 162
- flashcards 224, 280
- Flege, J. E. 258, 259
- Flipgrid* 51
- FlipGrid Shorts* 100
- flipped classroom 9, 11, 44, 164, 217, 219,
 222, 223, 227
- flow 115, 127
- Focusmate* 129
- Food Force* 281
- Foreign Language Classroom Anxiety
 (FLCA) 137, 143
- Fornara, F. 51
- fóruns 52, 63, 95, 152, 162, 181, 195,
 277
- Fouz-González, J. 256, 258, 259, 261, 262,
 263
- Franciosi, S. 275, 280
- François, T. 56
- Fryer, L. K. 306, 307
- Fuertes Gutiérrez, M. 2, 5, 9, 10, 13, 21, 35,
 37, 183, 184, 232, 233, 235, 297, 300,
 302, 310, 311
- FutureLearn* 141, 142, 143
- Gacs, A. 3, 78
- Gamalinda, S. 262, 263, 266
- games; boardgames; consensual game
 rules; minigames; videogames; virtual
 or augmented reality 10, 11, 28, 30,
 31, 46, 53, 95, 120, 127, 130, 227, 270,
 271, 272, 273, 274, 275, 276, 277, 278,
 279, 280, 281, 282, 283, 284, 285, 286,
 287, 288, 300

- Games for Change* 274, 286
Games2Teach 284
 gamification 10, 272, 273
 gaming 25, 123, 130, 278, 280
 García Botero, G. 124, 125, 127, 130, 284
 García Cabrero, B. 165, 166, 182
 Gardner, Robert 113, 116, 119, 124, 137
 Garrison, D. R. 98, 163
 Gass, S. 216
 Geeslin, K. L. 232, 236
 Generative Artificial Intelligence 183, 297
 generator: text 298
Genial.ly 284, 287
 Ghanizadeh, A. 26, 28
 Gilliland, B. 274, 278
Ginger 298
 Giralt, M. 112, 126
 Gironzetti, E. 3, 61, 63, 64, 74, 77, 139, 163, 220
The Global Storybooks 36
Global Story Bridges 30
Gmail 298
 Godwin-Jones, R. 3, 29, 84, 256, 257, 258
 Goertler, S. 2, 3, 236, 237
 Golonka, E. 112, 194
 Gómez Soler, I. 3, 8, 61, 65, 302
 González Argüello, M. V. 169, 177
 Gonzalez, C. 27, 29
 González-Lloret, M. 4, 8, 43, 44, 50, 54, 238, 310
Google 45, 54, 220, 287, 298, 299
Google Assistant 299
Google Classroom 74, 80
Google Docs 193, 298
Google Drawing 100
Google Drive 97
Google Forms 77
Google Sites 97
Google Translate 199, 298
Google Workspace for Education 95, 97
 Gordon, D. T. 87, 100
 Govender, T. 271, 278, 282, 286
Gradecraft 284, 287
 Graham, C. R. 99
 grammar checkers 298
 grammar: learning 282, 285, 302
Grammarly 195, 298
 Gregersen, T. S. 137, 153
 Grgurović, M. 3, 48
 group brainstorming areas 93, 94, 95
 groups: chat in; feedback from; virtual meeting from 176, 179, 193, 220, 239, 242, 260, 261, 263
Guadalingo 274, 287
 Guided induction information 10, 277, 282, 286
Guild Wars 2 274
 Guillén, A. 33, 216, 217, 218, 220, 276
 Gumanova, J. 307, 308
The Gustar Maze 277

Half-Life 276
 hallucinations 309
 Hampel, R. 6, 64, 75, 138, 160, 161, 167, 179, 220
 Harrington, S. 256, 258, 259, 261, 262, 263
 Hauck, M. 98, 149, 179, 237
Haunted 276, 283
 He, D. 141, 151
 Heift, T. 193, 282
 Hellermann, J. 46, 277, 283
HelloTalk 275, 284, 287
 Helm, F. 29, 238
 Henry, A. 112, 114, 126
 Hernandez Muñoz, N. 233, 234, 235
 Herrington, J. 192, 199
 Hew, K. F. 219
 Higher Education Academy, The 35
 Hinkelman, D. 4
Hispania 304
 Historical perspective 24, 32, 115, 218, 237
 Hiver, P. 115, 118, 141
¡Hola, amigos! (Instituto Cervantes) xii, xiii, 233, 235
 homework gap 1
homo analyticus 216, 218, 219, 220
homo faber 216, 217
homo fabulans 9, 216, 219, 225, 226, 227
homo loquens 216
homo ludens 216, 226
homo socius 216, 217, 218, 219, 220, 226
 Horwitz, E. K. 137, 138, 149
 Horwitz, M. B. 137, 138
Hotmail 298
House of Languages 276, 281, 288
 Hsiao, T.-Y. 120, 127
 Huang, W. 275, 288, 306
 Huang, X. 275, 288, 301, 306
 Hubbard, P. 51, 52, 112, 218, 219, 271
 Hulstijn, J. H. 4, 221
 humor 99, 150–53, 286
 Hyland, F. 193, 200
 Hyland, K. 193, 200

iCat 283
 ICT (Information and Communication Technologies) 6, 9, 23, 193
 identity 45, 216, 226, 227
 idiodynamics 119, 123, 127, 129

- IMI+ framework 183, 304, 305, 306, 309
- immersion: assessment; curriculum
 design; interactions in forums; main elements; measures; research; teaching practices; three pillars; working hours xi, 6, 9, 11, 12, 32, 35, 44, 49, 50, 54, 72, 76, 85, 119, 127, 141, 160, 167, 168, 172, 182, 189, 190, 191, 192, 194, 198, 199, 202, 204, 217, 220, 234, 240, 241, 242, 246, 249, 261, 262, 278, 283, 284, 286, 300, 308, 310
- implementation 1, 2, 7, 8, 50, 51, 52, 55, 89, 118, 121, 205, 237, 300, 304, 306, 311
- incidental learning 283, 306
- indirect/implicit feedback 191
- Inequality 7, 23, 24, 26, 37
- informal learning 10, 56, 118, 224, 225, 306, 307
- Information and Communication Technologies (ICT) 6, 9, 23, 193, 239
- ingenuity gap 37
- Ingress Prime* 276
- Intelligent Tutorial Systems (ITS) 195
- Instagram* 51
- Instituto Cervantes; *AVE Global*; *¡Hola, amigos!*; *Plan Curricular del Instituto Cervantes* xii, xiii, 233, 234, 235, 240
- instruction 125, 130, 220, 262
- INTEF (Marco de Referencia de la Competencia Digital Docente)* 25
- Integrity 29, 196
- intentional learning 10, 283, 286
- interaction: asynchronous; definition; external influencing factors; in forums; in language learning; in virtual environments; mediated by AI; mediated by technology; oral; personalized; strategies for creating dynamic interactions; synchronous; recommendations for; types; written xii, 1, 3, 7, 8, 9, 12, 22, 32, 43, 45, 46, 49, 51, 52, 55, 62, 64, 66, 75, 76, 85, 91, 92, 93, 94, 95, 96, 98, 111, 120, 121, 126, 129, 138, 140, 141, 149, 150, 152, 153, 154, 155, 160, 161, 162, 163, 165, 167, 170, 171, 176, 177, 178, 180, 181, 182, 183, 190, 191, 193, 197, 201, 202, 203, 204, 206, 207, 239, 242, 245, 256, 264, 270, 282, 299, 300, 301, 302, 303, 305, 306, 307, 308, 311
- intercultural communication xii, xiii, 3, 237, 305
- Intercultural Tales* 257
- Internet: easy access to 45
- involvement 235
- Isbell, D. 112, 123, 127
- ITU 1, 23
- Jahedizadeh, S. 26, 28
- Jakonen, T. 91, 227, 270, 276, 278
- Jaschik, S. 63, 74
- Jauregi, K. 122, 129
- Jeopardy* 279
- Jones, L. 91–2, 258
- Jordan, K. 47, 140, 142
- Kahoot!* 128, 287
- Kampylis, P. 239, 240, 242
- Katz, H. T. 258, 278, 282
- Katz, V. S. 25, 27
- Keramida, A. 138, 152
- Kern, R. 217, 224
- Klee, C. 237
- Kohnke, L. 129, 195
- Kozma, R. 26, 35
- Kramsch, C. 45, 216, 224, 226
- Krashen, S. 152, 222
- Kress, G. 259, 260
- Kruk, M. 122, 123, 129
- Kukulska-Hulme, A. 306, 308
- Kuwada, K. 279
- L2 (second language) 48, 119, 189, 256, 270
- Lacorte, M. 64
- Lai, C. 124, 128, 281
- Lamb, M. 112, 126
- Language Learning Orientation Scale (LLOS) 117
- Language Learning & Technology 52
- Large Language Model (LLM) 297
- Latent Class Analysis (LCA) 66
- Laurillard, D. 215, 216, 217, 227
- LCA, *see* Latent Class Analysis 66, 68
- League of Legends* 278
- learning by teaching 284
- learning by doing 216
- learners: analysis of; autonomy; surveys; strategies for; assessment of 2, 3, 10, 24, 50, 64, 86, 87, 89, 91, 93, 94, 101, 112, 113, 114, 117, 121, 122, 123, 124, 127, 130, 150, 151, 152, 154, 178, 181, 202, 220, 221, 239, 241, 243, 261, 262, 276, 306, 307
- learning: analytics; asynchronous; digital classroom; centers; communities of; customized; design; environments; error management in; grammar; incidental; informal; mediated by technology; networks; of languages;

- online; Participatory Learning Environments (PLE); personalized; profiles; planning; platforms; remote; situated; speech; synchronous; task-based language teaching; Virtual Learning Environments (VLE); vicarious; vocabulary xii, 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 26, 32, 44, 48, 50, 51, 52, 53, 54, 55, 56, 85, 86, 87, 89, 90, 93, 95, 96, 101, 118, 141, 146, 150, 151, 160, 161, 162, 164, 176, 181, 189, 193, 198, 217, 218, 219, 221, 224, 225, 227, 232, 238, 239, 240, 241, 242, 278, 279, 282, 283, 285, 299, 301, 302, 303, 305, 306, 307
- learning analytics 181
- Learning and Knowledge Technologies (LKT) 239
- LearningApps.org* 287
- learning centers 93, 94
- Learning Management Systems (LMS) 47, 193, 195, 202
- Lederman, D. 63, 74
- Lee, L. 3, 99, 165, 181, 257, 258, 261, 264
- The Legend of Zelda* 278
- languages: learning; teaching; opportunities; second language (L2) xii, 1, 5, 22, 27, 28, 30, 37, 48, 49, 51, 52, 58, 76, 85, 92, 93, 102, 112, 117, 118, 123, 137, 138, 140, 150, 160, 161, 163, 165, 180, 182, 183, 189, 193, 194, 217, 218, 222, 225, 226, 232, 233, 237, 248, 258, 260, 263, 270, 274, 275, 277, 287, 288, 299, 300, 302, 304, 307, 308, 310
- Leow, R. P. 3, 5, 271, 277
- LessonUp* 24
- Lifeline* 279
- Lingopie* 275, 287
- Lingro ToGo* 46, 275, 287
- linguistic immersion, *see* immersion 12
- linguistic landscapes 31
- LinQ* 275, 287
- listening: asynchronous individual listening 28, 93, 94, 95, 96, 101, 126, 127, 197, 256, 261
- literacy: digital, *see also* digital literacy 3, 27, 36, 50, 52, 127, 128, 257, 270, 305, 306
- Little, D. 91, 239
- The Living Tongue Institute for Endangered Languages 36
- LLM (Large Language Model) 297
- LLOS (Language Learning Orientation Scale) 117
- LMOOCs (Language Massive Open Online Courses); anxiety in; self-efficacy; interaction in 9, 66, 68, 81, 114, 116, 117, 120, 122, 139, 140, 141, 143, 144, 146, 148, 149, 154, 165, 167, 306
- LMS (Learning Management Systems) 47, 193, 195, 198, 202
- Lochmann, G. 276, 281, 283
- Lomicka, L. 51, 257, 261
- Long, A. Y. 232, 236
- Long, M. H. 92, 216, 218
- Loom* 99, 100
- López Ferrero, C. 176, 180
- Lord, G. 51, 256, 257, 258, 259, 261, 262, 263, 280
- Lucidchart* 95, 96
- Lv, X. 191, 194
- Machine learning 299
- MacIntyre, P. D. 115, 118, 123, 137
- Mackey, A. 216
- Mahmoodi, M. H. 112, 114, 117, 119, 130
- Malissa, M. M. 47, 48
- Maloney, J. 112, 123, 127
- management: academic; learning; classroom 32, 47, 154, 155, 161, 169, 182, 193, 194, 195, 196, 198, 202, 204, 219, 284, 287
- Mango* 275
- Maqueda, C. R. 260, 264
- Martínez, E. 23
- Martín-Monje, E. 140, 165
- materials: access; analysis; systematization; creation; selection; development 8, 27, 29, 45, 49, 51, 52, 53, 54, 126, 160, 164, 167, 178, 217, 219, 241, 242, 247, 249, 302, 303, 310
- Mateva, G. 62, 75
- Mayer, R. E. 299, 303, 306, 307, 310
- The Maze Game* 282
- meaning 10, 32, 92, 164, 225
- Melchor-Couto, S. 138, 149
- Memrise* 275
- Meng, P. 256, 258
- Mentira* 276
- mentors 76
- Meo, G. 89, 93
- messaging 129, 139, 298
- metacognitive instruction xi, 5, 123, 125, 126, 130
- Methodology: current research; project-based research 7, 8, 27, 43, 44, 46, 47, 48, 54, 65, 85, 87, 118, 127, 142, 168, 238, 250, 284

- Meyer, A. 87, 100
 MFQ (Motivational Factors Questionnaire) 117
Microsoft Word 298
 mimicry 272
Mindmeister 95, 96
Minecraft 53
 minigames 10, 11, 120, 270, 274, 275, 277, 279, 280, 282, 284, 285, 286, 287
 Mizza, D. 6, 8, 84, 308
 MMORPGs 274, 275
Mobile radio 256, 275
 models: ADDIE; CIPP; PPI; speech learning model; SAM; *DigCompEdu* model (*European Framework for the Digital Competence of Educators*); linguistic models; PPI (Planning, Personalization, Implementation); socio-educational; Successive Approximation Model 1, 2, 7, 8, 26, 44, 49, 52, 55, 62, 64, 75, 89, 116, 120, 192, 242, 258, 259, 262, 311
 mode: asynchronous teaching-learning mode; synchronous teaching-learning mode 161, 162
Mondly VR 279, 284, 288
 monitoring 153, 177, 242, 243
 MOOCs (Massive Open Online Courses), see LMOOCs 47, 139, 140, 165, 218
Moodle 24, 47, 74, 80, 139, 194
 Moore, M. 160, 164, 183, 302
 Moreno, N. 3, 271, 277
 Moreno-Fernandez, F. 233, 234, 235
 motivation; components; definition; dynamic; extrinsic; historical perspectives; intrinsic; motivational labels; research on; profiles; situated; strategies; and technology 26, 44, 53, 72, 84, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 124, 126, 127, 129, 130, 141, 143, 151, 163, 166, 176, 237, 262, 273, 281, 286, 301, 304
 Motivational Factors Questionnaire (MFQ) 117
 motivational profiles 126
 multilingualism: benefits; origins; research on; teaching practices; theoretical frameworks xi, 10, 11, 13, 26, 32, 37, 50, 52, 77, 119, 150, 161, 167, 172, 182, 200, 220, 240, 242, 257, 261, 278, 283, 284, 302, 310
 multimodality 200, 305, 306
 Munday, P. 140, 239
 Muñoz-Basols, J. 2, 5, 46, 64, 153, 183, 207, 235, 298, 300, 302, 303, 304, 305, 306, 307, 309, 310, 311
 Murphy-Judy, K. A. 53
 Murray, L. 99, 112, 126, 164
 National Foreign Language Resource Center (NFLRC) 49
 National Standards in Foreign Language Education Project (U.S.) 86, 90
 natural approach 222
 Natural Language Processing (NLP) 301
 Navarro Serrano, P. 239, 240
 needs: analysis of psychological needs; needs analysis; technological needs 33, 44, 50, 57, 62, 90, 115, 116, 118, 128, 129, 197
 negotiation of meaning 92, 177
 Nelson, B. K. 98
Netflix 275
 NFLRC (National Foreign Language Resource Center) 49
 Nielson, K. 50, 141
 Nieto, S. 22, 32
 Noels, K. A. 114, 117
 Norris, J. M. 219, 222
 Northcote, M. 162, 164
 objectives: learning; realistic observations among teachers 43, 53, 55, 89, 90, 112, 123, 127, 160, 192, 202, 225, 238, 257, 306
 O'Dowd, R. 3, 29, 46, 238
 online: assessment; communities; learning; teaching 3, 4, 44, 47, 51, 54, 61, 62, 63, 64, 65, 66, 72, 78, 80, 81, 91, 151, 155, 166, 195, 189, 190, 191, 192, 194, 198, 199, 204, 215, 218, 227, 242, 261, 300
 online exams: distance learning; research on 9, 44, 76, 77, 90, 119, 141, 167, 194, 218, 195
 Online Learning Consortium 3
OpenAI 297
OpenCourseWare 47
 open science 12, 13, 14, 184, 312
 opportunities 10, 27, 51, 58, 92, 302, 306
 oral expression 31, 46, 140, 142, 144, 203, 261, 264
 oral production 11, 97, 139, 142, 144, 149, 154, 161, 168, 179, 256, 257, 262
 O'Rourke, B. 92, 238
 Ortega, L. 3, 27, 115, 180, 219, 222, 238, 257, 270

- Osburn, C. 9, 215
 Oskoz, A. 3, 10, 92, 200, 226, 256, 257, 260, 264, 265, 266, 307
 output: modified 92, 121, 137, 165, 182, 195, 219, 225, 273, 274, 275, 285
 Ozobot 285, 288
- patience 51, 152, 153
Padlet 51, 95
 Paesani, K. 62, 65, 74, 75, 78
 Papi, M. 117, 118, 141
Parappa the Rapper 279
 Participatory Learning Environments (PLE) 85
 participation 121, 128, 165, 181
 Patiño, A. 274, 275, 277
Pear Deck 100
 Pedagogical Design (PD) 85
 pedagogy: curriculum design; Pedagogical Design (PD); Digital Ludic Pedagogy (DLP); research on; teaching practices; telecollaborative pedagogy 6, 11, 32, 35, 85, 160, 161, 168, 217, 220, 234, 242, 261, 262, 271, 278, 283, 286, 310
 peer feedback 181, 206, 264
 Pellerin, M. 91, 234
 Perez, R. P. 308, 310
 performance: evaluation 8, 44, 52, 54, 55, 89, 138, 189, 190, 306
 Performance Descriptors for Language Learners (ACTFL) 233
 period: abroad; cognitive-situated; process-oriented; psychosocial; sociodynamic period; technological 116, 117, 118, 236, 237, 287
 persona effect 10, 282, 283, 286
 personalized learning 55, 302, 303, 305, 307
 perspective: dynamic; historical 26, 115, 118, 137
Perusall 129, 181
 Peterson, M. 227
 Pew Research Center 23
 Picciano, A. G. 98, 163, 217
 plagiarism 199
Plagium 196, 199
Plan Curricular del Instituto Cervantes (PCIC) 233
 planning 2, 7, 44, 89, 305, 306, 311
 platform: learning; email 53, 66, 138, 197, 203, 205, 298
 Planning, Personalization, Implementation model (PPI) 1, 2, 5, 7, 8, 50, 52, 311
 PLATO (Programmed Logic/Learning for Automated Teaching) 218
 Player Experience of Need Satisfaction (PENS) 130
 Pleines, C. 152, 168, 221
 podcasts 10, 12, 33, 95, 127, 139, 256, 257, 258, 259, 261, 262, 263, 264, 265, 266, 267, 280
Pokémon Go 271, 276
 Poole, F. J. 273, 283, 284
 Poorvu Center for Teaching and Learning 89
Porta_ELE 36
 portfolios 52, 195
 post-tests 121, 140, 142, 146, 148
PowerPoint 65, 204
 PPI Model 7, 311
 practice(s): cognitive; efficient; essential; individualized; situated; systematized; teaching; technological 8, 10, 11, 13, 29, 32, 37, 50, 55, 77, 78, 84, 102, 117, 150, 161, 164, 167, 172, 182, 220, 240, 242, 261, 262, 270, 277, 278, 281, 283, 284, 304, 310
 presence: cognitive; social; teaching 51, 55, 98, 99, 117, 162, 163, 164, 165, 166, 182, 277, 285
 pre-tests 121, 140, 142, 146
 privacy 129, 302
 process oriented period 117, 118
 processors: development of; word processing 45, 100, 221, 227, 298, 301
 proctoring 196, 199, 200
 profiles: learning; motivational 126, 302, 303, 304, 306
 production: oral; written 11, 97, 142, 149, 154, 161, 165, 168, 190, 256, 257, 262, 265
 profile 7, 8, 12, 69, 85, 126, 300, 302, 303, 304
 pronunciation 96, 144, 146, 154, 163, 174, 182, 226, 258, 259, 261, 262, 263, 280, 283, 303, 307
ProWritingAid 298
 project(s): collaborative; digital; ERASMUS+; group; PLATO; practical 46, 80, 92, 93, 94, 95, 97, 127, 129, 218, 236, 238, 244, 246, 247
 psychocognitive approach 277, 285
 Pujolà, J.-T. 5, 10, 270, 273, 307
 Punie, Y. 239, 240, 242
- Quest to Learn* 274
Quizlet 280, 287
Quizziz 287
- Ragnarok Online* 275
 Ralabate, P. K. 87
 Ramírez Verdugo, D. 256, 257, 264
 Ranalli, J. 275, 280, 284
 Rao, K. 86, 87, 89, 83, 102

- Razavi, A. 26, 28
- reading: asynchronous individual reading; critical reading; socialized reading applications 29, 93, 94, 95, 96, 101, 178, 308
- reality: augmented; extended; virtual 10, 11, 26, 30, 31, 56, 95, 97, 138, 227, 270, 274, 275, 276, 286, 288, 307
- ReCALL* 45, 52
- recommendations 9, 10, 32, 52, 63, 65, 75, 78, 85, 93, 126, 130, 150, 167, 172, 176, 201, 202, 233, 259, 262, 263, 310
- resources: collaborative; digital; online 52, 127, 164, 195, 219, 224, 234
- Redecker, C. 62, 64, 75, 239, 242
- redundancy, effect of 87
- Reed, W. M. 273, 274, 279, 284
- reflection: activities; critical; facilitating spaces for; guided; social 52, 77, 91, 128
- Reinders, H. 91, 111, 112, 126, 273, 275
- Reinhardt, J. 28, 270, 271, 273, 274, 277, 284
- Reitz, L. 276, 281, 283
- relatedness 114, 117, 121, 126, 128, 130
- Ren, W. 191, 194
- research: collaboration; contributions; development; framework; future lines of research; on assessment and e-feedback; on histories; on interaction in virtual environments; on motivation; on online testing; on Digital Ludic Pedagogy (DLP); on podcasts; recommendations for ongoing research 9, 10, 11, 27, 34, 37, 45, 47, 49, 51, 53, 56, 63, 64, 65, 78, 87, 91, 97, 102, 112, 116, 118, 119, 129, 153, 154, 182, 194, 206, 227, 248, 262, 266, 271, 273, 285, 301, 303, 306, 310
- Respondus Lockdown Browser* 196
- Reverso Context* 199
- Robinson, P. 87, 216, 218, 225
- robots 10, 11, 270, 274, 276, 281, 283, 284, 285, 286, 288
- Rockalingua* 275, 287
- role-play 274
- Romero, M. 274, 275, 277
- Rosa, J. 21, 22
- Rose, D. 86, 87
- Rosell-Aguilar, F. 264, 307
- Rosetta Stone* 275, 280
- RPG Playground* 284, 287
- Rubio, F. 6, 8, 84, 308
- Russell, V. 194
- routes: interdisciplinary 11, 242
- Ryan, R. M. 114, 117, 130, 206
- Ryan, S. 115, 141
- Sakai* 47
- SAM (Successive Approximations Model) 89
- Santoyo, A. 32, 23
- Savaş, P. 29, 46
- scaffolding: examples; strategies 45, 74, 84, 87, 91, 96, 99, 100, 101, 128, 177, 226, 284
- Schindler, L. A. 126, 128, 129
- Schmidt, R. 48, 220, 258
- Schütze, U. 222, 226
- Schwartz, L. 85, 102
- Scovel, T. 85, 102
- Scratch* 4, 285, 287
- screencasts 99
- search engines 298
- Second Life* 46, 122, 129, 138
- second language (L2) 48, 189, 270
- Second Language Acquisition (SLA) 111, 216
- social semiotics 259, 260, 266
- Serious Game Classification* 274, 286
- services: messaging 22, 77, 129, 139, 298
- Sharples, M. 141, 308, 309, 310
- Shelley, M. 3, 48
- Shintani, N. 101, 193, 194
- Shortt, M. 277, 279
- Shute, V. J. 201, 271
- Siemens, G. 118, 123
- SimCity* 284
- The Sims* 275, 280
- Siri* 56, 298, 299
- situated motivation 120
- situated practices 281
- Skehan, P. 225, 263
- Skype* 217
- Slack* 298
- SLA (Second Language Acquisition) 111, 216
- Slave Trade* 279
- SMART goals 127
- Sociolinguistics: digital 234
- social networks 95, 129, 194, 195, 240, 242, 284, 307
- social justice 21, 257
- social presence 51, 98, 99, 121, 163, 164, 166, 182
- sociodynamic period 118
- Socratic* 287
- software: anti-plagiarism; idiodynamic 127, 196
- Sohny, A. 276, 281, 283
- Sokolik, M. 140, 150
- Soler, R. 192, 199
- Soler Montes, C. 2, 9, 232, 233, 234, 308
- stage fright 150
- Stanley, G. 256, 258

- Statement of Principles on Diversity and Inclusion in Language Teaching* (ACTFL) 49, 62, 76, 77, 84–5, 233
- Stickler, U. 6, 64, 75, 160, 161, 179
- St John, M. 90
- Stockwell, G. 111, 112, 126
- Storch, N. 45, 193, 194
- Story Center* 257, 258
- Strawbridge, T. 2, 29, 162, 168, 302
- structuralist–behaviorist approach 277
- study abroad, *see* period abroad 236, 237, 244, 248, 274, 287
- Successive Approximation Model 89
- Sundqvist, P. 56, 161, 274, 278, 286
- support 100, 150, 162
- survey 66
- Survey Monkey* 77
- Swain, M. 92
- Sydorenko, T. 46, 277, 283
- Sykes, J. 224, 276
- Sykes, J. M. 273, 284
- Sylvén, L. K. 56, 161
- system 117, 119, 260
- System* 52
- Talking to Avatars* 282
- Tanners, A. 86, 87
- Tashevska, S. 62, 75
- task-based language teaching (TBLT) 44, 48, 271
- task(s): assignments; warm-up; choose among types; digital; gamified; digital games; recommendations; reflective; rhetoric; information gap; task-based language teaching (TBLT) 44, 48, 52, 151, 179, 215, 271, 272, 300, 308
- teacher: beliefs, attitudes, and attitudes; competences; cognition; practices; teacher/researcher collaboration; training; talk; virtual 8, 11, 12, 25, 28, 29, 51, 52, 61, 62, 63, 64, 65, 66, 69, 73, 75, 80, 91, 113, 150, 161, 166, 177, 182, 220, 233, 242, 250, 261, 278, 283, 286, 299, 310
- teacher talk 166, 169, 177, 182
- teaching: accessible; teacher beliefs and attitudes; culture; distance; environments; examples; explicit; of languages; hybrid; mediated by technology; motivation and; online; practices; training; virtual xxii, 1, 8, 11, 12, 29, 44, 47, 61, 62, 63, 65, 72, 73, 78, 86, 89, 124, 138, 155, 164, 191, 201, 217, 218, 219, 220, 223, 234, 227, 242, 262, 276
- Teams* 195, 196, 217
- technological competence; technology competence 33, 128
- technology empowerment 5–7
- technological period 118, 129
- technological practices 270
- Technology for Language Teaching and Learning* (Facebook group) 76
- TechSmith Capture* 195
- technology: access to; communication mediated by; competence; education with; education about; emerging; examples; Empowerment and Participation Technologies (EPT); for education; feedback mediated by; in education; information and communication; learning and knowledge; motivation; teaching mediated by; integration of; tools; recommendations; uses of 4, 5, 6, 7, 8, 9, 23, 24, 26, 30, 33, 34, 36, 37, 45, 50, 52, 63, 64, 72, 84, 95, 111, 115, 118, 119, 122, 123, 162, 163, 165, 191, 193, 194, 239, 299, 304, 306
- technology-mediated language learning xii, 27, 28
- TEISEL - Technologies for Second Language Research* 36
- telecollaboration 10, 29, 237, 238
- TELL (Technology-Enhanced Language Learning) 218
- tests: alpha; beta testing; closed-ended; mini-tests; online exams; open-ended; oral; post-tests; pre-tests; technology for the elaboration of; types of; written 4, 9, 55, 96, 121, 140, 142, 143, 146, 148, 173, 190, 195, 197, 199, 202
- text generators 298
- theory of self-determination 114, 116, 117, 126, 130
- theory of social semiotics 259, 260
- theory; activity; Complex Dynamic Systems Theory (CDST); post-Darwinian theories; self-determination; social semiotics 114, 115, 116, 117, 118, 126, 130, 259, 260, 264, 266
- text(s): generators; processors; digital texts; written 4, 9, 91, 95, 45, 101, 141, 195, 197, 199, 200, 206, 224, 234, 298
- Thang, S. M. 127
- 3rd World Farmer* 280
- Thorne, S. L. 91, 227, 270, 276, 278
- Toki Pona* 283

- Toolkit 152, 154
 Torres, K. M. 138, 149
 translation: applied translation; machine
 translation 199, 301, 304
 translanguaging 154
Transfert 262
 Tseng, W.-T. 120, 127
 Tsiplakides, I. 138, 152
 Tu, C. H. 98, 163
 Tuomi, I. 310
 Turner, J. E. 138, 149
Turnitin 196, 199
 tutor: personal; virtual 300
 tutorials 167, 168, 169, 172, 173, 174, 175,
 177, 206, 218, 279, 280
Twine 287
Twitter 51, 128
 typing assistant 224, 299

 UNESCO 22, 23, 28, 240, 297, 300, 301,
 306, 307, 310, 311
 United Nations 1, 21, 86
 United Nations Department of Economic
 and Social Affairs 21, 23, 28
 United Nations Women 23
 Universal Design (UD) 86
 Universal Design for Learning (UDL) 8, 85,
 86, 94
 US Department of Education 47, 52, 303
 Ushioda, E. 114, 117, 119, 130

 Vallejo, C. 21, 26, 30
 Van Beuningen, C. 193
 van Lier, L. 92, 160, 161
 variability 85, 89, 100, 102
 vicarious learning 10, 278, 279, 285
 video 46, 62, 91, 92, 122, 123, 139, 153,
 161, 193, 195, 196, 200, 203, 204, 205,
 206, 223, 226, 239
videoblogs 226
 videoconferencing 122, 221, 227, 240
 videogames; ludic; modified; serious
 videogames 10, 11, 92, 95, 127, 130,
 163, 182, 195, 227, 270, 271, 272, 273,
 274, 275, 278, 279, 280, 282, 284, 285,
 286, 287, 299, 307
 video recordings 97, 99, 200, 222, 224, 225
 Vinagre Laranjeira, M. 51
Viper 196, 199
Virtual Knee Surgery 279
 virtual classroom 63–4, 85, 128, 178, 218,
 221
 virtual exchanges 9, 29, 46, 232, 236, 238,
 241, 242, 249
 virtual learning community 92

 Virtual Learning Environment (VLE) 219
 virtual reality 30, 56, 95, 97, 138, 227, 275,
 307
 virtual spaces 46, 74
 virtual teaching 1, 63, 65, 80, 89, 155, 194,
 217, 227, 234
 virtual worlds 122, 129
 Vitanova, A. 62, 75
 vocabulary: learning 10, 28, 50, 53, 120,
 124, 128, 144, 146, 189, 198, 218, 219,
 221, 222, 223, 225, 265, 278, 279–81,
 283, 285, 302, 304
VoiceThread 95, 97
Voxy 47
 voice assistants 298, 299
 Vygotsky, L. S. 91, 160

 Wabash National Study of Liberal Arts
 Education 89
 Wagner, D. A. 26, 35
 Wailehua, C. U. 86, 87, 89, 102
The Walking Dead 276
Warcraft III 279
WarioWare 279
 Warschauer, M. 25, 26, 217
WebCT 47
WhatsApp 129, 152, 298
 White, C. 5, 85, 91
Wikipedia 297
 wikis 45, 95, 121, 129, 181, 194, 195, 200
Wimba Voice Board 139
 Winstead, L. 26, 29
Wizer 24
WordBricks 279
Wordtune 298
Wordwall 287
 work areas 93, 94, 99, 101
 workshop
 World Economic Forum 306
World of Warcraft (WoW) 274
*World-Readiness Standards for Learning
 Languages* (National Standards in
 Foreign Language Education Project
 and ACTFL) 86, 90
 writing: activities to integrate;
 assessments; assistants; developing;
 production; teaching; tests 10, 27, 35,
 44, 45, 50, 53, 57, 64, 80, 81, 89, 126,
 128, 139, 153, 161, 165, 167, 190,
 225, 226, 256, 261, 265, 266, 277,
 298, 303, 308, 309
 Wu, J. 119

 Xie, Y. 191, 194
 Xu, Z. 99, 194, 221, 278, 282

Yanguas, Í. 92, 123, 179, 218,
303

Yelp 54

York, J. 273, 283, 284

Yousefi, M. 112, 114, 119, 130

YouTube 36, 224, 226, 275

A Zero to Hero 256

Zheng, D. 274, 278

Ziegler, N. 194, 218, 227

Zombies, Run! 276

Zoom 53, 74, 129, 195, 196, 217, 226

Zyzik, E. 3, 223, 270

This volume offers a rich overview of current research and teaching strategies for the integration of technology into language teaching and learning. It introduces the Planning, Personalization and Implementation (PPI) methodological framework to support educators in engaging with the theoretical foundations and innovative practices that should guide the incorporation of technology into their teaching practices. While Spanish language teaching is used as an example, the recommendations can be applied to any language learning contexts. The 13 chapters address a broad range of themes including accessibility, curriculum design, teacher attitudes, motivation, anxiety and feedback, and offer guidance on using digital tools such as podcasts, gamification and artificial intelligence. Written by an international group of scholars, this book serves as a roadmap for language professionals to effectively incorporate technology into any learning environment, whether face-to-face, hybrid or online.

This book will be available as an open access publication under a CC BY NC ND licence.

“A timely addition to the growing scholarship on the impact of digital culture and technology on language education. This collection of essays by leading language specialists provides both crucial theoretical context and a well-structured practical framework for applying insights across a range of topics from assessment, virtual worlds, gamified learning, digital storytelling, access and inclusivity, to a critical engagement with AI. It will be invaluable to anyone considering the future of language teaching and learning in a rapidly changing and increasingly media-inflected pedagogical landscape.”

Paul Spence, King's College London, UK

“This book provides a refreshingly proactive yet comprehensive approach to maximizing the affordances current innovations in technology (e.g. AI) can offer to language teachers. The authors have put together an impressive collection of pertinent topics that include tools to implement a technology-mediated language teaching model. This is an essential resource for any language educator seeking to empower themselves (and their students) in the use of technology to promote learning in the instructed setting.”

Ronald P. Leow, Georgetown University, USA

Javier Muñoz-Basols is a Beatriz Galindo Distinguished Senior Researcher at the University of Seville, Spain, and Honorary Faculty Research Fellow at the University of Oxford, UK. He is the Co-Founder and Editor-in-Chief of the *Journal of Spanish Language Teaching* and President of the Association for the Teaching of Spanish as a Foreign Language (ASELE).

Mara Fuertes Gutiérrez is a Senior Lecturer in Spanish at the Open University, UK. Her recent research and publications focus on sociolinguistics applied to Spanish teaching, teacher training, and distance and online education. She is the Vice President of the Association for the Teaching of Spanish as a Foreign Language (ASELE) and Secretary of the Association of Hispanists of Great Britain and Ireland (AHGBI).

Luis Cerezo is an Associate Professor of Applied Linguistics at the American University, Washington, DC, USA. His research focuses on the teaching of additional languages through videogames, computer-mediated communication, and hybrid and online environments based on guided induction, metacognitive instruction and observational learning. He is also a member of the *CALICO Journal* editorial board.

Cover image: © iStockphoto



This publication has been supported by the Project PID2021-123763NAI00 “Hacia una diacronía de la oralidad/escrituralidad: variación conceptual, traducción y tradición oral discursiva en el español y otras lenguas románicas” (DiacOralEs), MCIN/AEI/10.13039/501100011033/FEDER, UE and the Hispanex program of the Spanish Ministry of Culture.



Translated by Emily Balkwill

Pbk ISBN: 978-1-80041-986-5