

Planning and Curriculum

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Introduction: About This Book

ABOUT THIS BOOK

The Planning and Curriculum Course was designed for teacher candidates in the teacher education program in the School of Education at the University of West Florida. Teacher candidates will learn basic planning and instructional skills in preparation for teaching. The materials in this book were selected with the intention of giving an overview of lesson planning.

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CHAPTER 1

Chapter 1: Overview of Planning

- Purpose of Education
- Why do we teach?
- Planning: Why do we plan?
- Backwards Design

Before We Read

Before reading, spend some time thinking about the different decisions that teachers make every day as they plan their classes. The materials teachers choose, how they organize a class, what is emphasized or not, and what choices are offered to the students all shape the student experience. To be an engaged teacher, it is important to build reflective practices and make informed and deliberate instructional choices. Think about your favorite

experiences in school. What choices did the educators make that contributed to your experience?

Questions for Consideration

As you read, consider these essential questions: What are the goals of education? How does the experience of the students impacted by what is written or missing in the curriculum? What hidden lessons are we teaching students? In what ways are we, as educators, shaping our schools and communities through our curricular and instructional choices?

THE PURPOSE OF EDUCATION

The purpose of education is a fundamental question that guides the design and implementation of educational programs. However, there is no single answer to the question of what the purpose of education is and what curriculum should be. In this chapter, we will explore three major categories of curriculum that reflect different emphases on the purpose of curriculum: the learner-centered curriculum, the society-centered curriculum, and the knowledge-centered curriculum.

As you read these next sections, think about your definition of education. While it is practical to categorize educational approaches, remember that these emphases are not mutually exclusive or incompatible. In practice, educators adopt a combination or balance of approaches.

WHY TEACH?

Why do teachers teach is a rather simple question. However, the question What is a teacher?, must be addressed first. Merriam-Webster's definition of a teacher is "one whose occupation is to instruct" (Merriam-Webster, 2008, para. 1). While this definition showcases one aspect of being a teacher, teachers offer so much

more to the class than just instructing students, they offer themselves. A better, more collective definition of a teacher is someone who “yearns to help children learn, watch them grow, and make a meaningful difference in the world” (Teacher Support Network, 2007, para. 2). This definition is most likely the main reason why individuals pursue teaching as a career. As a teacher, one can touch the hearts of the young and open their minds to tap their thirst for knowledge.

THE ROAD AHEAD

Becoming a teacher is a lengthy process. The process is different depending on the state. For example, in the State of Michigan, you will have to obtain a Bachelor’s Degree, as well as pass certification tests. In Florida, there are several pathways to becoming a certified teacher. However, most involve having a Bachelor’s Degree and passing a certification exam, especially in the area you plan to teach.

For more information on Certification Access: [Florida Educator Certification](#)

Planning and Curriculum is one of the required courses that you must take for the Elementary Education Program at the University of West Florida. If you have not done so already, you will need to decide on the level you wish to teach, Elementary or Secondary, as well as your academic subject major(s) and minor(s).

TEACHER’S SALARIES ACROSS THE US

Teaching often requires long hours and comes with a flat rate of pay. Teacher salaries depend on the state and school district in which the teacher is instructing. Private schools, parochial schools, and charter schools, in general, tend to have lower pay scales. The reason is they may not have the same revenue base as the public schools. However, educators may choose to teach in these

schools because of the schools' philosophy, religious preferences, or a variety of other reasons. Regardless of the reason, most educators will agree they went into teaching because they have the desire to spread knowledge, and/or to watch children reach their full potential.

PASSION

There are multiple factors in deciding to become a teacher. For one, it is a healthy alternative to other professions. Research has found that about twice as many teachers truly enjoy their work, as opposed to those who have careers in marketing, IT, and accounting (TDA, In Summary, para. 1). Work is not truly work if it is enjoyed. A teacher's passion, along with the intrinsic motivation to be lifelong learners, can directly affect their students by influencing the motivation, engagement, and energy within the classroom. This same passion helps teachers try new approaches to teaching and learning in order to enhance and support the learning of all of their students.

Love

Beyond passion, another reason that teachers teach is simply for the love of teaching. As stated by (Liston & Garrison, 2003) Love is a "creative, critical, and disruptive force in teaching and learning." A teacher who loves his or her job will be a better teacher and have a greater impact on the students he or she influences. Classroom efforts to manage, instruct, and direct groups of twenty to thirty students frequently require feelings for others and an intuition that connects teacher to student and to subject matter (Liston & Garrison, 2003). For the new teacher, the multiple tasks entailed in this activity can be overwhelming. (Liston & Garrison, 2003) For the experienced teacher, they can seem almost unconscious (Liston &

Garrison, 2003). Most teachers truly have passion for what they do, but they also have a love for it as well.

Creativity Is Key



“Every person is unique and the challenge is to find fun ways to guide individuals to learn and understand what they are interested in learning” (B. Anders, personal communication, February 2, 2008). There are many ways to be creative in the classroom, whether it is using projects, videos, and presentations, but what if the creativity stemmed from the teacher?

Being creative is important in teaching, for the students are the audience. No one knows this better than entertainers, who are creative and use their ingenuity to bring to life rather dull aspects of education. This in and of itself is talent, and there are those who devote themselves to that. Paul Keogh, a Modern Languages teacher, had always aspired to be an entertainer, however, he

chose teaching as his profession instead. He does not regret this choice; he's always got someone to perform for. He equated teaching to entertainment, but more importantly, he remarks, "I love to see them growing personally, socially and academically" (TDA, Paul Keogh, Modern Languages teacher, para. 3). This statement itself encompasses the point of education, for there cannot be growth without learning.

The Rewards

The rewards received by being a teacher are different than those received by someone like a salesman, for example. If a salesman is doing well, he makes his quota, and he then earns his monetary bonus. It is possible that he receives a plaque to hang behind his desk stating that he was the number one salesman for this period in time. Teachers' rewards are not so tangible, but rather, "They are rewarded more by witnessing their students succeed and follow their dreams than by any plaque " (Daily Egyptian, 2005, para. 7). A group of school teachers who had participated in a study that looked into why teachers taught in high challenge schools, jointly agreed that what their students achieve under their instruction was reward enough for all the time that they devote to their students. "Student achievement was another reward the teachers discussed as a reason for staying. When their students were successful, the teachers felt incredibly rewarded." (Morris, 2007, pg 58). The reward teachers receive is a feeling, and feelings are more special and memorable than gold and silver plaques hung stoically on a wall proclaiming an individual's success. For teaching, it is not about what the teachers can achieve, but what they can get their students to achieve, and through their students, reflects a teacher's greatest achievement.

WHY DO TEACHERS TEACH?

To address the opening question, “Why do teachers teach?”, the answer is simple; “They teach for the love of children and to contribute to the well-being of all of us” (Teachers are Important, 1998, para. 4). It is something inside them. It is a drive, a force, a passion, a talent that they wish to dispel upon his or her students in order to watch them succeed. Choosing to be a teacher is not for the money, as a teacher’s monetary compensation is hardly adequate given all that they give to their students. Becoming a teacher is almost like heeding a calling. It is not for the light at heart, but rather, for those who love children and people, who have a passion for education, and who love to share in that passion. Teachers yearn to see the burning desire to learn, and love to see the excitement of discovery, and that, is why teachers teach.

WHAT MAKES A GOOD TEACHER?

There are many qualities and characteristics that make up a good teacher. Engaging, caring, and innovative are some things that may come to mind. According to Dr. Richard M. Reis, a professor and executive director at Stanford University, the top priority of teachers should be that they want to be good teachers. In his article, he stated that as teachers, “we respect students who really try, even if they do not succeed in everything they do, so they will respect us, even if we are not as good as we want to be” (Reis, 2007). Your future students will know that you want to be a good teacher if you strive to become one. There are many opinions on what goes into a good teacher, but only you can implement the characteristics in your own teaching career.

One of these many characteristics is developing a positive disposition. Disposition is the attitudes and beliefs we have about learning. Your disposition is evident in your philosophy of education. One very important disposition to have is the belief that

all students can learn. You must truly believe that every student can learn! Of course, what they learn, how they learn, and the rate at which they learn will vary, but they ALL can learn.

When we have a positive disposition regarding learning, we can then foster that disposition in our students. We want them to develop a “Growth Mindset”. This is the belief that they can learn anything, but they recognize it will take time and work to do so. We want them to be strong and never give up. We want them to believe in themselves and their abilities; to do so, however, they will have to experience success, and it will be up to us to support them and help them experience that success.

Teaching is a lifelong process; our continued growth in both our knowledge base and our skills is a key component to our success as teachers. As teachers, we will never have an end to our education. It is a must that we continue to attend workshops, seminars, take classes, etc., to keep ourselves up to date on the latest in education and further develop our teaching skills. You wouldn’t want to go to a doctor who hadn’t been back to a class or seminar since they graduated and we don’t want teachers in the classroom who haven’t done that either. Be active! Seek out educational opportunities. It’s not too early to begin now! Look for conferences, workshops, and such that you can attend. You don’t have to wait until you have a teaching certificate to engage in these educational opportunities. In order to maintain certification, you will be required to take additional college courses and attend conferences, etc. Start thinking now about what you want your Masters to be. You will be working towards this matter as you take classes to maintain certification.

In our profession, we often speak of “effective teachers”. You will see this term in the media when the discussion centers around teachers and what is happening in classrooms. You will also hear it when there is a discussion of how to evaluate teachers. Effective teachers make a difference in students’ lives and use a variety of strategies to reach their students. Teachers set up productive

classrooms and they work to see that every student is successful. Students have identified these as characteristics of effective teachers.

- Push students to learn
- Maintain orderly classrooms
- Are willing to help
- Explain until everyone understands
- Vary classroom activities
- Try to understand students

There are four terms we will be using them throughout the semester:

1. **General Pedagogy:** This refers to the general beliefs a teacher has in regards to education and teaching. It is a teacher's philosophy.
2. **Content Knowledge:** This means knowing the content that you are teaching. You will never know everything, but you must have a firm mastery of the content in order to teach it to others.
3. **Pedagogical Content Knowledge:** This refers to knowing how to teach your content. It is knowing the order to teach materials, such as teaching number recognition and one-to-one correspondence before teaching addition. It is also knowing what activities and assignments to present for a given concept.
4. **Knowledge of Learners and Learning:** Teachers must have a solid understanding of how learning takes place, what students need in order to learn, and how best to support their learning. On top of this, teachers must know the students in their classroom and what works for each

of them.

Add these terms to your vocabulary list. We will refer to these throughout the semester and you will want to know them as a professional.

If you talk to any educator, you will get a variety of ideas on what professionalism is. You will develop your own ideas; however, professionalism should include:

- Making students your first priority
- Creating a productive learning environment for every student
- Continuing your own education
- Avoiding gossip and speaking ill of students (You have probably heard some of the talk in the teacher's lounge about students.)
- Accepting responsibility for mistakes you make and working to correct them.
- Accepting and respecting each student and their families
- Maintaining open communication with students (and families)
- Collaborating with colleagues
- Providing students with timely feedback on assignments

For some, teaching is an overwhelming task. We are all given different talents and interests, and that's what "makes the world go around." However, this career is a challenge. As teachers, we have many responsibilities and expectations placed upon us. Everyone will have an opinion on what we do, and they may not always agree with what we do. We are responsible, first and foremost, to our students!

We do have a responsibility to keep parents informed of their

child's progress. We also need to look for ways to involve parents in our classrooms. Many teachers feel this is one of the biggest challenges they face. Busy schedules, attitudes, and indifference about education and parental/teacher expectations make it difficult. Newsletters, emails, phone calls, a classroom website, and parent/teacher conferences are all ways we can pass along information to parents. Please don't fall into the trap of believing that parents don't necessarily care about their child because you don't see them as much as you would like to. Many of them care very much about their child's success in your classroom and what is going on at school; however, life circumstances, pressures, and demands on their time may affect the amount of attention they can give you and their child.

Remember, you will not be teaching within a bubble. You will have colleagues within your school and district to work and collaborate with. As in any working relationship, keep the lines of communication open. Maintain an open mind in discussions. Just because you do things differently than a colleague, doesn't mean they don't have an idea that will work just as well as yours, or better. Get yourself involved in school and district committees and activities. Attend school board meetings, so you know about the decisions being made that will affect your work in the classroom. It will also make you aware of the community's feelings in regards to the work you do.

Your professional reputation begins now!

Now is the time to begin thinking like a teacher, by taking responsibility for your learning. Your reputation begins with your college coursework. Attend class regularly and arrive and leave at the designated times. Read the work that is assigned and be prepared for classes. Turn your work in on time and be certain you have done your best to meet the expectations of the assignments. Make sure to plan well. Don't wait until the last minute to complete

assignments or study for tests. Seek out additional information or help for things you do not understand, and do not be afraid to ask questions. These are all practices that will carry over into your professional role as a teacher.

WHY DO TEACHERS LEAVE THE PROFESSIONS?

Teacher attrition has been on the rise for the past two decades, and it is no surprise that it has become a major concern. (Brooks-Young, 2007). Every year, approximately one-third of the nation's teaching force turns over, and the retention rate of new teachers after five years is only sixty-one percent. (Kersaint, 2007). Researchers believe teacher shortages are caused not by lack of interest in teaching, but by too many teachers leaving the profession (Williby, 2004). What must be addressed are the factors affecting teachers' decisions to leave, the effects on the students and schools of low teacher retention, and the possible solutions to increase teacher retention.

Factors Influencing Teacher Turnover

According to Smithers and Robinson, there are five main reasons for teachers leaving the profession: workload, new challenges, school situations, salary, and personal circumstances. Among those five main reasons, workload was the most important factor in affecting teacher turnover, while salary was the least important (Smithers & Robinson, 2003).

Workload

Being a teacher is not an easy job. Teachers must teach their students, as well as complete paperwork, lesson plans, assessments, etc., and at times this can be overwhelming. There is an increase on assessment and accountability of teachers, which

means there is an emphasis on testing, evaluation, and passing state standards. Teachers are required to teach to state standards and for their students to pass standardized tests, adding another requirement to be placed upon teachers. Also, many times, teachers are expected to sponsor a club or activity on top of everything else they must do. This means spending more time at school working. Meeting these requirements and juggling these tasks can be hard and frustrating, especially for new teachers with little experience.

New Challenges

New challenges often cause new, inexperienced teachers to leave the profession. For the most part, their first few years in the classroom are spent trying to get organized, get a grasp on the pace of teaching the material, and learn how to effectively manage a classroom. Disruptive or troublesome students can make a teacher's job that much more difficult by having to deal with the students and in some cases having to take disciplinary actions.

The inclusion of special needs students also poses an additional challenge for teachers. Many do not receive adequate training for working with the various special needs that may be present in their classroom. If you have the chance to take courses that will add to your knowledge and skills in regards to this population of students, do so. It may delay your graduation a semester, but it will be well worth it once you are in the classroom.

School Situations

School situations encompass many different things. It can be how the school is run, who runs the school, what type of programs are available to teachers, geographical setting of the school, and much more. Geography can play a major role in affecting a teacher's decision on whether to leave the profession. In rural settings, the

main reasons for teachers leaving were due to cultural differences, geography (i.e. being too far away from a city or town), and professional isolation (Williby, 2004). For urban settings, the reasons for leaving were an emphasis on overseeing extracurricular activities and whether they were teaching at an at-risk school. How the school is run is also another factor causing teachers to leave. A lack of administrative support is damaging to a teacher's self-esteem, poor facilities cause teachers to become frustrated, and insufficient mentoring leaves the teacher with nowhere to look for advice, and ultimately causes teachers to leave.

Personal Circumstances

Since teaching requires a lot of time and effort, sometimes personal circumstances can affect a teacher's decision on whether or not to leave. The most common personal circumstance that causes teachers to leave is family. This encompasses everything from pregnancy, spending more time with family, and taking care of family. For women who get pregnant while teaching, they may find it more cost-effective to leave and become a stay-at-home mother (Kersaint, 2007). For other teachers, quality time with their family and taking care of their family is very important and the workload of being a teacher doesn't allow them much time to do this. Age is also another personal circumstance that causes teachers to leave. Typically, it is younger teachers or older teachers approaching retirement that usually leave the teaching profession. For older teachers, there is a direct correlation with early retirement and pension-plans. (Ingersoll, 2001). This means that it is more likely for an older teacher to retire if they have a pension plan.

Effects of Teacher Turnover

For the school systems, teacher turnover is a fiasco. It drains

resources, diminishes teacher quality, undermines the ability to close the gap of student achievement, and is financially burdening. (NCTAF, 2007). Resources are drained due to the need for experienced teachers to train and mentor new teachers. Financially, schools are suffering from teacher turnover because of the cost of recruiting, hiring, advertising, and providing incentives (Harris & Adams, 2007). Ultimately, the effects of teacher turnover on the school systems directly impacts the students; the financial cost of teacher turnover takes money away from other projects that could be beneficial to the students. The quality of teachers hired directly impacts student learning and student achievement, and the school community and effectiveness can be destroyed. The effects of teacher turnover are astounding, not only for the school systems, but for the students as well. Teacher turnover can have a negative effect on student learning. According to the National Commission on Teaching and America's Future, inexperienced teachers are noticeably less effective than senior teachers. These new, inexperienced teachers passing in and out of the school systems can have an emotional and physiological effect on students and student learning.

Boosting Teacher Retention

So now the question is, "What can be done to boost teacher retention?" Teachers leave the profession for several reasons from lack of administrative support to poor facilities to low pay. There are several steps schools can take to boost teacher retention.

To retain teachers that are inexperienced, schools can implement a well-organized induction program. This type of program would include mentoring and peer review evaluations. This allows teachers an outlet for help and instruction, as well as advice on how to improve performance. These types of programs also prepare teachers on what to expect and how to effectively do their job. Studies show that teachers who receive intensive

mentoring are less likely to leave than those who receive little to no mentoring. (Williby, 2004).

In Macomb County, the Macomb Intermediate School District offers a “New Teacher’s Academy.” This is a series of workshops aimed to support teachers in their first years of teaching. This is a great way to network with other teachers and gain support and ideas.

Other ways to boost teacher retention include new administrative and organizational strategies. Since workload is the major reason for teachers leaving the profession, strategies such as job sharing or part-time work may be more appealing to some teachers, or time to get work done during the school day through extended planning time, etc.

Hiring incentives are also another way to boost teacher retention. Although salary is not the biggest force driving teachers away from the profession, incentives would give them more of a reason to stay. These incentives include: hiring bonuses, health insurance, pension plans, and higher salaries.

Teacher turnover is a growing problem and must be solved

The reasons for why teachers leave the profession vary from teacher to teacher, but there is no doubt that something must be done to boost teacher retention. Teacher turnover effects student learning, student achievement, and the school systems. The cost is astounding, and new programs and strategies must be developed so teacher retention does not become an even bigger problem than it already is.

Source:

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- Florida Department of Education: <https://www.fldoe.org/teaching/certification/> (Accessed 11/17/2024)
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THE STUDENTS YOU WILL BE TEACHING



We have heard a lot about Millennials (born 1981-1996) and all of the characteristics that go along with this group. However, most students entering college these days are considered Generation Z

(Gen Z). Gen Z is loosely defined as anyone born between 1996 and 2015, "...this group makes up a quarter of the U.S. population and by 2020 will account for 40% of all consumers," (Finch, 2015, np).

Gen Z are currently between 4-24 years old (nearly 74 million in U.S.) and it's safe to say will make up a majority of students in your future classrooms.

This cohort has grown up post 9/11 and in a world of terrorism, recession, racial unrest, corporate scandals and financial insecurity. They have never known a world without access to internet technology and have grown up with iPads and iPhones in their hands. They have the background knowledge to be experienced with digital literacy, but likely do not practice caution in their digital media use. Even though Gen Z spends a lot of time on social media, they seem to be pretty good at deciphering true from false information in record time. Fast Company suggests "Generation Z spends a lot of time on social media... they can sniff out canned or insincere messages in seconds". Your Gen Z students expect honesty and straightforward responses and are often determined to gain these responses, even if they aren't forthcoming.

CHARACTERISTICS OF GEN Z LEARNERS

Gen Z learners have some very unique characteristics that teachers should be aware of. Some of these include that they are:

- The children of Generation X, but may have parents who are Millennials
- Multitaskers
- Concerned with money and job security
- Usually independent
- Loyal, compassionate, and thoughtful
- Responsible and determined

- Value education
- Future focused
- Active volunteers
- Prefer communication through Snap Chat & Instagram instead of email and traditional social media platforms such as Facebook
- Communicate with images (e.g. emojis)
- Use the internet to gain information for school and interests
- Have less face-to-face contact because of smartphones
- Use social media daily to maintain relationships
- More stressed and depressed than previous generations

Supplemental resources:

- [Digital Skills in the Z Generation: Key Questions for a Curricular Introduction in Primary School](#)
- [Generation Z Characteristics and Traits that Explain the Way They Learn](#)
- [Six Defining Characteristics of Generation Z](#)
- [How Generation Z will Change the World According to Experts](#)

PLANNING

Effective teachers must plan effective lessons, which are based on standards. Standards vary depending on the state where you teach. Standards tell teachers the key information that students should understand in specific content areas at varying grade levels. As a teacher, you are responsible for knowing the standards you

are responsible for teaching and planning effective lessons to help students learn the information explained in the standards. An elementary school teacher is responsible for standards in English, math, science, and social studies; a secondary teacher typically specializes in one area, such as history. There are also standards for fine arts, languages, and other areas.

Some states use state-developed standards, while other states adopt the [Common Core State Standards](#). These standards have been an attempt to move the nation closer to a unified set of standards. As of 2021, 41 states, the District of Columbia, four territories, and the Department of Defense Education Activity (DoDEA) have adopted them, with varying degrees of implementation and support at the district levels ([Common Core States Standards Initiative, 2021](#)).

In the State of Florida, the Benchmarks for Excellent Student Thinking (B.E.S.T.) were adopted by the State Board of Education on February 12, 2020, in the areas of Mathematics and English Language Arts (ELA). See Figure 1.1 for a history of changes in standards for students in Florida.

Figure 1.1: History of Statewide Standards in Florida



It is not uncommon to hear a teacher or parent say that they want schools to “cover” curriculum or standards; however, “coverage” is not conducive to deep understanding. Instead, a teacher should review the standards and local curriculum as a part of their planning, with a focus on big, transferable ideas (Wiggins & McTighe, 2005). This is considered depth of material, rather than simply breadth of material.

Standards and curriculum are not the same thing. Standards tell you what to teach; curriculum (and corresponding methods) tells you how to teach. Figure 1.2 compares and contrasts standards and curriculum.

Figure 1.2: A Comparison of Standards and Curriculum



As a teacher, you will have many opportunities to collaborate with your peers to strengthen your teaching practice. One structure for this collaborative work is a Professional Learning Community (PLC).

Sometimes, your school or district will provide lesson plans for you, but more often, you will have the autonomy to make your own lesson plans. Teachers may be part of a Professional Learning Community (PLC) with other teachers in the same grade or content area. During these PLCs, teachers plan together and often look at student assessment data to determine what to further emphasize for students or teach in a different way. They may also have a common book or article to read in the field of education to expand their knowledge of teaching and learning. A teacher of a “special” area or elective subject like music or art might occasionally meet with teachers in other local schools to share information and discuss curriculum, lessons, or assessments. Working with others in planning is a critical skill to learn as a teacher.

One of the most effective planning strategies is Backward Design (Wiggins & McTighe, 2005). Figure 6.2 depicts a backward design planning process. While it is common for new or inexperienced teachers to focus on “filling the time,” or “what” they will teach, backward design involves following these steps:

- Identifying the desired goals and objectives;
- Determining acceptable evidence and assessments; and
- Planning instruction (Wiggins & McTighe, 2005).

This does not mean that a teacher will have the exact final assessment ready before the first day of instruction; however, teachers should have a clear idea of the format of the assessment and know what kinds of questions and content will be on it.

Figure 1.3: Backward Design Process

LESSON PLAN COMPONENTS AND MODELS

Lesson planning is a key component of any effective instruction. Experienced teachers do not usually script their lesson plans; however, many districts will ask even seasoned teachers to turn in lesson plans for the week or month. All lesson plans will contain similar elements, sometimes in a different order.

- **Standards:** Select the specific standards you will teach in this particular lesson. Note that you will often choose one sub-standard, or piece, of a standard to teach, and it may take multiple lessons for students to master the content.
- **Objectives:** State what students will know, understand, and do by the end of the lesson. Objectives can be phrased as “The student will...” or, from a student’s perspective, “I can...”. Content objectives should directly relate to the standards, and language objectives should be included for English Learners.
- **Materials:** List all materials, such as books, resources,

tools, websites, and other items that will be used for the lesson. This assists you with gathering materials so you are prepared to teach the lesson.

- **Procedures:** Break down the lesson into specific steps you will follow. Think of it as programming: you must provide simple, clear steps to achieve the lesson's instructional goals.
- **Differentiation:** Consider how you will adapt your lesson to meet the needs of specific types of learners. For example, how will you support your English Learners, challenge your students who are gifted, or enable a student who struggles with spelling to participate without getting frustrated? Sometimes you may design a lesson around a Universal Design for Learning (UDL) framework, which means you've built these considerations into the plan and do not need to retrofit differentiation strategies later.
- **Assessment:** Explain how you will measure students' progress toward lesson objectives and mastery of selected standards. Make sure you are collecting tangible evidence. More information on assessment will be provided later in this chapter.

Source:

- [Foundations of American Education: A Critical Lens](#)
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CHAPTER 2

Chapter 2: Curriculum

- Curriculum
- Types of Curriculum

CURRICULUM

Before We Read

Before reading, spend some time thinking about the different decisions that teachers make every day as they plan their classes. The materials teachers choose, the way they organize a class, what is emphasized or not, and what choices are offered to the students all shape the student experience. To be an engaged teacher, it is important to build reflective practices and the habit of making informed and deliberate instructional choices. Think about your

favorite experiences in school. What choices did the educators make that contributed to your experience?

Questions for Consideration

As you read, consider these essential questions: What are the goals of education? How is the experience of the students impacted by what is written or missing in the curriculum? What hidden lessons are we teaching students? In what ways are we, as educators, shaping our schools and communities through our curricular and instructional choices?

INTRODUCTION TO CURRICULUM

A simple definition of curriculum would be the subjects and the course of study in a school or college. Curriculum and instruction is an entire sub-field of education. Definitions of curriculum vary. The differences in the definition of curriculum from educator to educator provide clues to the varying stances on education and what it means to be educated. For example, the curriculum may refer to knowledge students are expected to have or may refer to certain skills or competencies students should be able to demonstrate.

Curriculum: The subjects, knowledge areas, and skills that students are expected to learn. The course of study.

Explicit Curriculum: The planned part of the curriculum includes the topics, standards, and learning materials used in a course of study. The word explicit is used to differentiate and contrast it from the hidden curriculum.

Hidden Curriculum: The lessons that arise from the culture of the school and the behaviors, attitudes, and expectations that characterize that culture.

Some educators describe the curriculum as a prescription, a series of interactions, lessons, and topics that ought to be included in an education. This is the most traditional definition of curriculum. A prescriptive curriculum would define bodies of

knowledge and ways that it would be taught to students, serving as a master plan for teachers and administrators. For this group of educators, the curriculum is a series of experiences mapped across the students' journey of growth, preparing them for their adult lives. The mandated and planned part of the curriculum is sometimes referred to as the explicit curriculum. The explicit or planned curriculum refers to the topics and standards covered by a class and perhaps the documents that align with the standards, such as lesson plans, textbooks, and other teaching aids.

An alternative way to look at curriculum is from the students' lived experiences. This more holistic view of the curriculum would include the lessons taught to students both formally and informally. From the student's viewpoint, there is more that is learned in school than in the planned subject areas. The implicit or hidden curriculum refers to the lessons and values that are not explicitly taught but are implied and inferred by the students from the classroom and school culture. The hidden curriculum is taught to students often unconsciously through how instructors interact with students: types of behavior the teacher praises, rewards, admonishments, or classroom dynamics.

Explicit vs Hidden Curriculum

The hidden curriculum can have positive and negative effects on students' learning and development. Social skills, norms, and community values may be positive aspects learned at school. Schools teach our children how to behave in class and are the primary socialization for young people. Positive aspects of this might include social norms for dress, how to speak with authority or persuasively, and how to think critically.

However, the hidden curriculum can also affect students' academic performance and reinforce inequalities. The hidden curriculum can be the place where biases or prejudice are inadvertently passed on. The critical educator must constantly

evaluate their approaches to make sure that their practices align with their educational philosophy. The hidden curriculum is not easy to change because it is unconscious, subtle, and pervasive. It can reinforce stereotypes and inequalities and impact academic performance.

Critical Consciousness

The ability to recognize and analyze systems of inequality and the commitment to take action against these systems.

Paulo Freire and other critical theorists use the term critical consciousness to depict individuals' deep understanding of the world, the ability to identify political and social inequities and their dedication to taking action against those systems. As an educator, having a critical consciousness means regularly inspecting your own practices, the materials you choose, and the way you structure your classes. An Educator must consider what message and lesson they send students.

Imagine a newly certified Social Studies teacher teaching Global History. A Social Studies teacher is certified to teach all history from the beginning of time to the present day, plus other courses like economics, sociology, civics, and government. While many civilizations are included in the curriculum as written by the state, this teacher notices the textbook is much more detailed about the Roman Empire than the Chinese dynasties. Remembering their own History and Social Studies instruction, the educator feels they are at a disadvantage as well because their own teachers didn't spend a lot of time covering the topics. While the new teacher has ideas and resources for how to add to a unit on Rome, they feel less prepared to teach about the cultures of Africa or Asia.

- While this story focuses on Social Studies, each certification area might have its own issues. What type of similar issues about content may come up in other classes?
- What message does it send to students if certain topics

are given unequal time in the school year?

- Do you think that students know when a topic is their teacher's favorite vs something the teacher feels they have to cover?
- What steps could you take to improve this situation?
- What does the hidden curriculum mean to you?

As an education student, you have had the experience of being a student, and very soon, you will be visiting classrooms as an observer. The hidden curriculum has important implications for the socialization of students but also potential for inequalities.

The hidden curriculum can have different aspects, such as cultural expectations, gender inequalities, racial biases, class and social privileges, and other aspects. Reflect on your experience in school, interactions with instructors and other school staff, and in classes.

Consider when hidden messages are embedded into the way content is communicated or taught. In mathematics education, a traditional way of thinking prioritizes the learning and following of the instructor's rules and procedures for a type of problem. Students may be expected to solve all problems of a particular type in a routine way. Students who follow the procedure but get the problem wrong may even receive more points than students who got the right answer but did it a different way. What message may this instructor inadvertently be teaching their students about creativity?

As you consider these questions, think both about your own experiences and your future classroom.

- How does the hidden curriculum impact students' learning, attitude, and behavior?
- How does the hidden curriculum reinforce or challenge mainstream ideas and traditional power relationships?

- How can students and educators transform the hidden curriculum to promote more inclusive and equitable education?

LEARNER-CENTERED CURRICULUM

Learner-Centered Curriculum: An approach to curricular design where student's interests determine the direction and design of the educational experience. Educators customize learning paths for individual students.

The central premise of the learner-centered curriculum entails designing instruction for the student's needs, interests, and abilities. By fostering student engagement, teachers hope to encourage more autonomy in students' own learning, developing their student's talents and potential.

Practitioners of the learner-centered curriculum work hard to individualize instruction and differentiate it for each student, allowing students to have choices in their learning. The learner-centered curriculum values the diversity and uniqueness of each student and seeks to create a supportive and respectful learning environment.

One of the guiding principles of learner-centered curriculum is the doctrine of interest. The doctrine of interest is the idea that students should study what they want to study. In this mindset, the curriculum is built based on the individual student's interest. Proponents of the doctrine of interest argue that forcing students to learn what they aren't interested in is largely a waste of time. Critics contend that to truly embrace the doctrine of interest, the teacher must trust that the students have the ability to choose wisely what will benefit them the most in the future.

The role of the instructor in the learner-centered classroom has multiple responsibilities. They must ensure a learning environment that anticipates students' needs and interests as well as appropriately challenging their abilities. While providing autonomy

in the learning process, the instructor needs to encourage active participation, promote collaboration, and suggest activities that balance the learners' interests.



Explore more: Many educational psychologists and philosophers have contributed to the framework of the learner-centered curriculum. Explore some of the educators that have contributed to this framework.

John Dewey

John Dewey was a major educational reformer and college professor in the early 1900s. He advocated for a progressive educational system. Dewey advocated for education to be a social and collaborative endeavor with hands-on and real-life applications.

Additional Resources on Dewey: [John Dewey: Portrait of a Progressive Thinker | The National Endowment for the Humanities \(neh.gov\)](#)

Maria Montessori Maria Montessori was an Italian physician and educator. She advocated for a method of education that prioritized respecting the individuality of children, independence, and stimulating curiosity. Additional Resources on Montessori [Maria Montessori – Quotes, Theories & Facts \(biography.com\)](#)

Montessori Education: Learner-Centered Curriculum in Practice

Prepared Environment

In Montessori Education, the prepared environment is a classroom with materials and manipulatives that the students can see, select, reach themselves, and begin to explore.

Montessori education is an example of a learner-centered curriculum. It is based on the idea that children are eager to learn. Students at Montessori schools can initiate and direct their own learning in a prepared environment that offers materials and activities based on a variety of interests. In Montessori education,

the prepared environment refers to a learning space with educational activities at the ready, which can be chosen and utilized by the students.

Montessori education emphasizes hands-on learning and real-world skills and allows children to work at their own pace on activities they choose. Montessori education fosters independence, responsibility, and self-discipline, as well as cooperation, collaboration and social skills.

Walking into a Montessori classroom, a guest would not see a teacher in the front of the classroom or children of all the same age. Instead, children would be grouped in similar age ranges, typically 2-3 years apart, and there would be several teachers in the room, who are called guides. Students choose their own hands-on learning activities around the five main topics of Montessori education: Practical Life, Math, Language, Sensorial, and Cultural. Students have long work periods of 2-3 hours where they can work through activity-based lessons, or they have the freedom to move between several activities.

Montessori education prioritizes hands-on manipulatives to aid student learning through experiences. A well-designed Montessori activity integrates hands-on learning, includes multiple domains of knowledge, and integrates them in a holistic way. A student who is interested in the solar system might pick materials off a shelf for themselves. There would be physical manipulatives for them to interact with, such as wood blocks that symbolize the planets or cards with facts and information about each planet. Students would have tasks to do, such as classifying planets in different ways or placing them in order. The instructor would observe the student, try to identify if and when to intervene, and may attempt to give the student a new prompt or challenge to work through with the materials they have chosen.

Critics of Montessori education point to the large cost of running these schools. With one adult per every twelve children, Montessori

schools are often private schools with long waiting lists and expensive tuition.

Project-Based Learning: Learner-Centered Curriculum in Practice

Project Based Learning (PBL)

An approach to education where students learn by completing projects that are designed to mimic real-world situations.

Project Based Learning (PBL) is a method of teaching where students investigate or respond to an authentic problem or question over an extended period of time. Not simply tacking on a project at the end of a unit, practitioners of Project Based Learning carefully design a project so that through completion of the project, students engage with the important knowledge and skills that students need to learn.

A key part of courses that utilize project-based learning is that students work on an authentic or real-world problem. Students may then collaborate to develop what information they need to know and want to know to address the question. This may include working with experts and community members, research, and collaboration. The teacher would help the students create a project plan on how they will collaborate and how they will present their work.

An instructor using a project-based approach would be responsible for working with groups of students. While the students would be expected to come up with the questions, finding resources and applying that information to their project, the instructor would be intervening when necessary, suggesting additional framing questions, aiding students in finding resources, and making sure groups are working well together.

Ill-structured problem

A real-world problem that may not have a clean or simple

solution. Ill-structured problems require students to do research and creative thinking.

Many proponents of project-based learning believe that the public product or presentation is a key factor in the success of project-based learning. The public sharing of projects reinforces the idea that the students are working on real-world problems and that their work is intended for an audience greater than just their own teacher or class.

Project Based Learning can be integrated into a single course or may be used as an opportunity to collaborate between multiple subject areas. Proponents of PBL argue that it encourages students to deal with complex and ill-structured problems, integrate information from multiple sources, and have ownership over their learning. Critics say that PBL takes significant resources and time and that it may lead to missed content or gaps in knowledge due to the time projects require.

SOCIETY CENTERED CURRICULUM

Society-Centered Curriculum: An approach to curricular design where the needs of the society are prioritized. Lessons and subjects are organized ; based on community needs or problems.

Progressive Educational Movement: A movement in educational history that rejected rote learning and recall in favor of experiential learning and authentic tasks.

The society-centered curriculum is based on the idea that education should be designed around societal concerns and community issues. In this approach to education, the purpose of education is centered around the future needs of the community. This approach focuses on preparing students for their roles and responsibilities as citizens and also addresses the problems and challenges that society faces.

The society-centered curriculum shares many aspects with the learner-centered curriculum. Both could be classified as part of

the progressive educational movement, a reaction to earlier knowledge-centered approaches that prioritized education. Both learner-centered approaches and society-centered approaches seek to focus education on the whole person, making it more democratic, and empowering students.

While the learner-centered curriculum emphasizes the individual agency of students, the society-centered curriculum emphasizes collective well-being and the needs of the community. The society-centered curriculum targets societal issues and trends. Practitioners that favor a society-centered approach may state among their goals preparing students to be engaged citizens and prepared to interact with their government, may focus on leadership, advocacy, and teamwork as key parts of their classroom, or may emphasize subjects and topics where they see a need or shortage of workers.



Explore More: Many educational psychologists and philosophers have contributed to the framework of the society-centered curriculum. Explore some of the educators that have contributed to this framework.

Paulo Freire

Paulo Freire was a Brazilian educator and a leading scholar of critical pedagogy. His book, *Pedagogy of the Oppressed*, was published in 1968 and outlined a new relationship between teachers and students, with students acting as co-creators of

knowledge. Freire believed that education and critical thinking were the essential foundation of democratic societies.

bell hooks

bell hooks was an educator and social critic. She is best known for applying critical theory to the American education system. As a black feminist and educator, hooks wrote about the influences of race, capitalism, and gender on the educational system. Her 1994 book, *Teaching to Transgress: Education as the Practice of Freedom*, reflected on her time in segregated black schools and her time at integrated schools. hooks describes her time in all-black schools as joyful and her time at integrated schools as traumatic, challenging educators to understand how the school culture could be oppressive for students. bell hooks was born Gloria Jean Watkins. She took on the name bell hooks, which was her great-grandmother's. She chooses not to capitalize her name to focus on the message, not the person.

[Teaching to Transgress – Books – Act Build Change](#)

FREIRE'S BRAZIL: SOCIETY-CENTERED CURRICULUM FOR SOCIETAL CHANGE

Freire's philosophy on education was a direct reaction to the historical context of Brazil in the 1970s. At this time, Brazil was a third world country in the original meaning of the term, meaning that they were not directly aligned with either the United States or the Soviet Union during the Cold War. From 1964 to 1985, Brazil was under a military dictatorship that saw gradual democratization, eventually leading to a new democratic constitution and government in 1988.

Working as an educator during those times of change, Freire saw education as a means to overcome all types of oppression: political, economic, and intellectual. The goal of his pedagogies was the

intellectual liberation of both the oppressed from the colonialist and capitalist social structures. He hoped education would change people's mentalities and processes so that a truly democratic society could emerge. Freire warned that an uneducated society would be susceptible to misinformation and that democracy would be fragile if the population made decisions based on emotional thinking rather than critical thinking.

To Freire, education should empower the people to:

- Discuss the real problems of their time and come up with solutions.
- To empower students to reevaluate constantly using scientific and systematic methods.
- To view themselves as part of and in conversation with their society.
- To assume a critical attitude towards the world and, in doing so, be prepared to change it.

To underscore the differences between his model of education, which sees students as partners in the classroom and emphasizes the knowledge each student brings to the table, Freire derisively used the phrase "the banking model of education" to describe past practices. In the banking model of education, students are treated as empty vessels, needing to be filled with information. Freire believed this mindset reinforced racist colonial attitudes. In *The Pedagogy of the Oppressed*, he wrote about an alternative, which was to respect student knowledge, to include their voice in the curriculum, and to empower them. Freire's pedagogy is a criticism and reaction to colonialism where only the dominant culture's ideas, literature, and ways of understanding are valued. Critical pedagogies roots are, then, an act of decolonial resistance to colonialism and oppression

KNOWLEDGE CENTERED CURRICULUM

Knowledge-Centered Curriculum

An approach to curricular design that is subject-based and aims to teach students disciplinary knowledge.

The goal of the knowledge-centered curriculum is to teach all students a broad range of subjects that are considered essential. In a knowledge-centered approach, there is a canon of agreed-upon essential knowledge or skills that are scaffolded across the educational experience. Traditionally, students are taught a variety of disciplines separately, including science, mathematics, the humanities, and art.

The knowledge-centered approach is deeply rooted in traditional educational philosophies. The focus is on skills and facts from academic subjects. Although there may be some interdisciplinary work, the majority of the time is spent working with teachers who are themselves specialists in one area or another. Proponents of the knowledge-centered curriculum believe that a foundation in math, science, literature, and history is the best preparation for life because the broad skill set will allow the educated person to adapt to multiple environments. While the academic curriculum isn't opposed to career training, proponents of the knowledge-centered curriculum prefer that specific career training comes after high school, and students are not identified and tracked into groups who will go to college and those who will go directly into the workforce. This is because the advocates for the knowledge-centered curriculum believe that broad exposure to academic disciplines is the goal. The argument is that a well-educated and well-rounded person is adaptable and prepared for the future.

Textbooks as curriculum

One example of a knowledge-centered curriculum is the textbook. Modern textbooks consist of a multitude of learning materials,

multimedia, question banks, supplementary resources, and teacher guides. A giant industry, three or four leading companies produce the majority of textbooks in the United States. Many of the curricular battles play out in what is included in the textbook. There has been a drive to make sure more diverse voices are present in all textbooks to try to make sure students are exposed to a wide variety of cultures. This push for inclusion has also prompted a backlash from parent groups and lawmakers who feel that a progressive agenda is being pushed on students.

While there are legitimate fears of over-standardization and teachers being forced to use scripted or canned curricula, textbooks have been a ubiquitous part of most American schools. Textbooks have strengths. They are organized and supply a structure and sequence for complex subject matters. Teacher certifications can be very broad, and instructors can find themselves teaching several subjects and will likely not have the time to assemble resources of the appropriate difficulty and scope for their students.

Critical teachers must be aware of the strengths and limitations of textbooks. Part of building a critical consciousness is being aware that textbooks may contain biased coverage of certain topics, may not have problem-solving or higher-level activities for students, and may limit students' exposure to a wide variety of resources because the textbook becomes the single source of information. Expert teachers make informed choices with their text, including when to use it, when to supplement it with outside resources, and how to structure class with or without it.



Explore More:

Many Educational Psychologists and Philosophers have contributed to the framework of the Knowledge-Centered Curriculum. Explore some of the educators that have contributed to this framework.

E.D. Hirsch Jr.: Essentialism

E.D. Hirsch Jr. was a professor of English at the University of Virginia. Hirsch put forward the idea that knowledge, not

competencies or skills, should be the goal of the curriculum. Hirsch's Core Knowledge Curriculum lays out what he considered to be essential for Americans to possess in common. His 2020 book *How to Educate a Citizen* is a follow-up to his 1987 book *Cultural Literacy: What Every American Needs to Know*.

Mortimer Adler: Perennialism Mortimer Adler is the author of the *Paideia Proposal* (1982), in which he laid out the need for a classical education focused on the perennial or everlasting ideas of the greatest thinkers and philosophers. Adler's approach calls for everyone to study great thinkers like Plato, Aristotle, and Thomas Aquinas.

The Committee of Ten

Standardization of the American High Schools

In 1892, a group of American educators were brought together to make recommendations on the future of high school education. Drawing heavily from colleges and universities and led by the president of Harvard University, the Committee of Ten made recommendations to standardize the high school curriculum. The central part of the recommendation was to create a core curriculum that would prepare students for higher education and the workforce.

The committee's recommendations centered on a core curriculum comprising literature, classical languages, mathematics, science, and history. The recommendations of the committee of ten create a structure for high school that still might feel familiar to students. English, history, math, and science. Math should be taught in a sequence of algebra, geometry, and trigonometry. Science should be taught every year with a year each of practical geography, biology, chemistry, and physics in that order. A major difference between the curriculum of the early 1900s and today

would be the early curriculum's emphasis on classical languages such as Greek and Latin. A high schooler would have taken both Greek and Latin, as well as two modern languages, usually French and German.

The Committee of Ten's work laid the foundation for the structuring of high schools in the United States, setting the precedent for core subjects. While there have been extensive reforms to education over the years, the initial structure recommended by the Committee of Ten is still visible.

The legacy of the committee lives on in a few different ways. The high school schedule still bears a close resemblance to the committee's recommendations, but perhaps the more important and enduring legacy is the idea that every student should take this college preparatory curriculum. An ongoing debate since the release of the Committee of Ten's initial report has been the need to balance standardized curriculums and the need for flexibility and student-centered approaches in modern education.

Advanced Placement (AP) Tests

Each year, more than a million students challenge demanding Advanced Placement tests in high school, hoping to gain college credit for taking an advanced high school course. Run by the organization The College Board, the same organization that runs the SATs, Advanced Placement tests have become a benchmark by which students and schools are judged. These high-stakes exams are marketed towards high schoolers and their parents as a way to show rigor in their high school education and a way to stand out in the college admission process.

To be able to teach an AP Course at a high school, the school must apply to the College Board, submit a detailed curriculum outlining alignment to the AP test, and choose a textbook that the College Board has approved. AP Courses are available in math,

science, history, english, world languages, and a newer capstone program in research methodology.

Students in AP Courses are challenged with a broad curriculum that includes all the topics typically taught in a college introductory course. Critics of the AP Exams have said that AP courses focus too much on a wide breadth of materials but lack the time to do a deep and thorough analysis of individual topics.

The number of AP courses taught and how the students score on them feature prominently in how American high schools are compared to each other in ratings, such as the US News ratings of High Schools. School administrators attach letters in their student college applications stating how many advanced courses are available at their institutions. 35% of high school students who graduated in 2022 took at least 1 AP course, and college credit for high school courses has continued to grow as a trend and expectation in the American High School experience.

The International Baccalaureate (IB) Diploma Program

The International Baccalaureate Organization is a non-profit educational organization based out of Switzerland. Since the 1960s, the IB Diploma program has been utilized in international schools to cater to the families of multinational corporations, military families, and mobile groups. In the United States, IB diploma programs are often used as an accelerated learning opportunity for exceptional students.



The major domains of the IB Program model.

The IB Program consists of coursework in 6 main areas: Language, Second Language, Individuals and Societies, Mathematics or Computer Science, Experimental Sciences, and The Arts. In addition to the coursework, all students take a required Theory of Knowledge Course, have to do experiential learning through their Creativity Action Service requirement and do an independent research project or extended essay of 4,000 words.

The purpose of the IB diploma is to have an internationally recognized qualification that could be recognized all over the world, to have an international intellectual framework, to educate the

whole person, and to develop inquiry and thinking skills. The IB diploma is recognized and well regarded, with similar prestige for graduates as those who score highly on Advanced Placement or AP tests through the College Board. A major difference between the IB programs and Advanced Placement programs is that the AP Tests are single high-stakes tests, while in the IB program, testing is integrated throughout the school year, with external graders used to rate students and the schools.

For a high school to participate in the IB Diploma program, administrators and teachers must be certified by the IB Organization, attend additional professional development, and continue their education.

Advocates for the use of the IB program and its high standards praise the international focus, rigor, and emphasis on critical thinking and research. Critics bring concerns about the demanding nature of the IB curriculum and stress on students.

Unlearning Box

A substitute teacher was supposed to give an assessment while the classroom teacher was away, but one student refused to take the test. “He started yelling and walked out of the room, saying he wasn’t going to take this test that the teacher left for him. He kept saying that he was supposed to have questions read aloud to him, but that isn’t fair, and I wasn’t going to do it!” Sometimes we think that fairness means everyone is treated the same way, but in reality, “fairness” involves meeting the needs of different students. In this example, the student had an IEP accommodation that allowed him to have tests read aloud to him. When considering planning, instruction, and assessment, sometimes treating all students the same is actually quite unfair since students have different learning needs and strengths

TYPES OF CURRICULUM

You have had some kind of experience with schooling, whether it was homeschool, private school, public school, or some combination of those. No matter the setting where you learned, someone decided what you would learn. This is the curriculum. It reaches far beyond the textbooks that you might have used or the novels that you read. It even includes things that are unstated.

There are different kinds of curriculum, including the explicit curriculum, implicit curriculum, and null curriculum. Explicit curriculum is the state, district, and schools’ formal accounting of what they teach. Another term for explicit curriculum is formal curriculum. The explicit or formal curriculum is often laid out in standards or other curricular materials. Implicit curriculum, or informal curriculum, involves hidden messages that students learn from schooling that aren’t specifically in the standards and possibly aren’t even explicitly taught.

Different Types of Curriculum	
Explicit Curriculum • The subject that will be taught and the knowledge and skills that the school expects successful students to acquire.	Implicit Curriculum • The lessons that arise from the culture of the school and the behaviors, attitudes, and expectations that characterize that culture.
Null Curriculum • “The options students are not afforded; the concepts and skills that are not a part of their intellectual repertoire” (Eisen, 1994, pp. 106-107).	Extracurricular Experiences • All of the schools-sponsored programs (athletics, band) that are intended to supplement the academic aspects of the school experience.

For example, students may see bulletin board displays where people who look like them are missing and therefore feel like they do not belong in that classroom, or they may see the way the teacher treats students when it comes to conflict and realize the

teacher displays favoritism towards certain students. Finally, null curriculum is made up of those things that are not taught in schools at all for a variety of reasons, such as contributions in science by scholars of color or women ([Eisner](#), as cited in Milner, 2017). Finally, extra-curricular curriculum includes school-sponsored opportunities that fall outside of academic requirements prescribed on the local and state levels. Examples of extra-curricular activities include participation in sports, music, student governance, yearbook, school newspaper, and academic clubs. Extracurricular participation is a strategy to promote school connectedness (Centers for Disease Control and Prevention, 2009). Extracurricular activities are often associated with many positive outcomes, such as higher academic achievement and decreased school dropout (Farb & Matjasko, 2012). According to the United States National Center for Education Statistics (2012), sports are the most common type of extracurricular activity among secondary school students, with 44% of high school seniors reporting participation in some type of sport. Additionally, 21% of students participate in music activities, as well as clubs, such as academic (21%), hobby (12%), and vocational clubs (16%).

There is immense power in determining what students will learn, with many competing forces at play. Because schooling in the United States is left to the jurisdiction of individual states, certain content is viewed, valued, and taught differently depending on the collective values of the state or county. For example, some students are taught about the Civil War as the “War of Northern Aggression,” while other schools may not allow Confederate flags in their buildings or on school grounds. Historical events are a part of the curriculum, but in many cases, these have been boiled down to the simplest pieces of information. Consider, for example, the difference between the following two lesson objectives: “Identify that Abe Lincoln wears a top hat” and “Explain how and why Abe Lincoln created the Emancipation Proclamation.” Imagine how

different learning could be if more complex and important details were a part of the curriculum for all students

LINK BETWEEN CURRICULUM, PLANNING, AND ASSESSMENT

Curriculum, planning, assessment, and instruction are all inextricably linked. Planning instruction is like a spider web, where all of the threads are connected in a carefully designed pattern. There are different kinds of spider webs, just as there are different ways to plan and deliver instruction and assessment.

This chapter outlines effective methods of instructional planning, but other methods exist in the world. You may have observed a teacher teach differently, perhaps more spontaneously, and enjoyed the experience. Keep in mind that all students are not the same. What worked for you or your family or friends is likely not the best or only way that teaching should be done. Teaching is challenging, complicated work, but with a solid understanding of curriculum, planning, assessment, and instruction, teachers are prepared to reach all students and move them to the next level of knowledge, skill, and understanding.

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TEACHER AGENCY IN CURRICULUM

In education, the concept of curriculum is an important thing for the future teacher to consider. Educators must constantly examine and reflect on their curricular goals and analyze their teaching tools and methods to make sure that all parts of the student's

experience, both the explicit plans and the hidden lessons conveyed, match their purpose of education.

Remember the warning as we introduced the learner-centered, society-centered, and knowledge-centered classification. While classification systems are convenient, the truth is that most educators will incorporate a spectrum of approaches, and the examples given in the chapter may represent the extreme implementation of these philosophies. The main takeaways may be the ideals that each approach embodies, from individual empowerment and societal reconstruction to comprehensive knowledge and exchange. There are ways to give learners a voice and control in their education that are not Montessori education or implementing full Project Based Learning.

Analyzing the American education system, at first glance, it has many of the criteria of a knowledge-centered curriculum, with an articulated curriculum of facts, competencies, and skills that students should be able to demonstrate their mastery of in defined subject areas. However, there is space in this curriculum for instructors to use their discretion and expertise.

As educators, it is those instructional choices that wield substantial power in shaping the student experience and our schools. It is essential to build a critical consciousness, continually evaluating practices and questioning the impact of those choices. By embracing this agency, educators can blend curricular and instructional philosophies and find their personal approach to meeting diverse student needs, giving students voice and choice in the curriculum, and making sure that today's students are tomorrow's citizens and neighbors.

Being able to articulate one's purpose of education is an important first step in the process of becoming a critical educator. Once your goals are well defined, the next step is critical awareness to make sure that the instructional methods and content match the stated purpose. As agents of change, educators have the

opportunity to influence and shape curricular choices that shape our students, schools, and societies.

Activity: Your Philosophy of Education

What is your teaching philosophy? What do you feel your role should be as a teacher in our educational system? Teacher candidates are often asked to explain their philosophy of education as part of the application and interview process.

Your teaching philosophy should be 2-3 pages in length and written in first person and in present tense. You will want to include examples and descriptions so your reader can “see” you in your classroom—these may be specific teaching strategies you use, assignments you integrate, discussions you have with students or the physical environment you create.

Some questions to get you started:

- Begin by making a list of what you feel education should do—what is the purpose of education or what are the goals of education? Are there specific educational theories that you believe in strongly?
- Make another list of teaching methods you feel best help you to reach this purpose. How do you interact with students? What does your classroom look and feel like? What kind of assignments do you believe are best? How do you support your students? How do you assess learning has taken place? What kind of strategies do you use to teach your specific discipline?
- Jot down two to three specific examples of your teaching methods and describe how you apply these in the classroom. What does this specifically look like?
- Also, write a justification of how you feel that your particular teaching methods help your students to reach your chosen goals of education. Why do you feel these are the best strategies for reaching the ideal education?

Once you have these portions written, go through them and select the teaching methods and the examples of these that you feel most fully convey your style of teaching.

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CHAPTER 3

Chapter 3: Assessment

- Assessment
- Questioning Techniques
- Feedback

ASSESSMENT

Even though you may think of instruction—the day-to-day activities of teaching—as the biggest part of your job as a future educator, assessment should actually come first. If you are following the backward design process, you should think first about your

objectives and assessments and then about the activities that the students will do.

It is likely that when you think of assessment, you think of the grade you received at the end of an instructional unit. However, there are many kinds of assessment that serve different purposes. Table 3.1 outlines the differences among three key types of assessments: diagnostic, formative, and summative.

Table 3.1: Types of Assessments

Type	Timing/Scoring	Purpose	Formats
Diagnostic	• Before instruction • Scored, but never graded	• To learn what students know before instruction • Enables a teacher to know whether their instruction had an impact	• Brief quiz • Questioning • Free write
Formative	• During instruction • Given frequently • Scored, but not usually graded	• To show students and teachers what students have learned during instruction	• Do Now/ Bellringer • Kahoot!, Quiziz, or similar digital tool • Exit Ticket • Observation • Questioning • Student notes • Daily assignments • Quiz • Homework
Summative	• After instruction • Scored and graded	• To show what students have learned as a result of instruction • To enable teachers to consider their next steps in terms of planning and teaching future units	• Test • Quiz • Project • Portfolio • Essay • Research Paper • Performance assessment such as a speech

Assessment can also be formal or informal.

Formal assessments: measure systematically what students have learned, often at the end of a course or school year. Standardized tests are a common example of formal assessments. These high-stakes, formal assessments are designed to measure how well students have mastered the content listed in the

standards. On the other hand, informal assessments tend to be local, non-standardized, and contextualized in daily classroom learning activities. Informal assessments are usually performance-based, meaning students are performing or demonstrating their understanding through a specific task. Teachers design assessments and may evaluate them with grades, rubrics, checklists, or other scoring conventions.

Formal Assessment: Measure systematically what students have learned, often at the end of a course or school year, such as with a standardized test.

Informal Assessments: these are local, non-standardized, and contextualized in daily classroom learning activities, often performance-based.

You will learn more about how to design high-quality assessments as you continue your journey toward becoming a teacher. For now, remember that high-quality assessments should always relate to the standards you taught in that particular lesson. This is called alignment. In addition, good assessments ask the right questions. For example, consider which of the following is more important as a life-long literacy skill: matching a secondary character in a text to a short phrase about what that person did or presenting a coherent argument that advances your position on a controversial topic? A useful tool for thinking about levels of questioning is Bloom's Taxonomy (Figure 6.3). Bloom's Taxonomy is a framework (Bloom et al., 1956) that divides levels of thinking into six categories, ranging from Knowledge to Evaluation. In response to some criticism, the taxonomy was later revised by a group of scholars, including Krathwohl (2002). The new version of the taxonomy included levels ranging from Remember to Create. It is important to understand that the framework is not meant to serve as a ladder that students must climb, where simpler knowledge and questions must always come first; rather, it is possible for students at all levels to consider information at all levels and move among them. This framework enables teachers to think about the kinds

of questions they ask and vary them as needed. Less experienced teachers tend to rely more upon lower-level questions that require basic recall skills, so be intentional about asking questions that challenge students to venture into other levels of the taxonomy as well.

Figure 3.1: Bloom's Taxonomy (Revised)



Bloom's Revised Taxonomy gradually increases intellectual rigor of questions and learning tasks over six levels: remember, understand, apply, analyze, evaluate, and create. The original version was similar, with its six levels including knowledge, comprehension, application, analysis, synthesis, and evaluation.

Designing and administering assessments that align with your standards and engage students at various levels of Bloom's Taxonomy is an important first step, but another key part of effective assessments is analyzing the data you collect. Analysis of data can occur on individual student, small group, or whole class levels. If many students demonstrate a similar misunderstanding on an assessment, that data indicates the teacher should re-teach that content to increase students' mastery. Data-driven instruction

looks at the results of various assessments when considering next instructional steps. This analysis can be done by individual teachers or with colleagues in a PLC.

REDUCING BIAS IN GRADING BY USING RUBRICS

In an ideal world, grades and assessments are fair and impartial. However, the reality is that bias often creeps into assessment systems. One simple workaround is to use rubrics with specific criteria.

[Quinn \(2021\)](#) conducted an experiment in which he gave teachers two second-grade writing samples, one presented as a Black student's work and one as a White student's. Teachers gave the White student higher scores

except when they used a grading rubric with specific criteria, which caused the pre-existing racial bias in the scores to disappear. Therefore, rubrics not only help students know up front what expectations are for an assignment but also reduce opportunities for bias to impact grading.

QUESTIONING TECHNIQUES

INTRODUCTION

The interaction between teacher and learners is the most important feature of the classroom. Whether helping learners to acquire basic skills or a better understanding to solve problems, or to engage in higher-order thinking such as evaluation, questions are crucial. Of course, questions may be asked by students as well as teachers: they are essential tools for both teaching and learning.

For teachers, questioning is a key skill that anyone can learn to use well. Similarly, ways of helping students develop their own ability to raise and formulate questions can also be learned. Raising

questions and knowing the right question to ask is an important learning skill that students need to be taught.

Research into questioning has given some clear pointers as to what works. These can provide the basis for improving classroom practice. A very common problem identified by the research is that students are frequently not provided with enough 'wait time' to consider an answer; another is that teachers tend to ask too many of the same type of questions. (Adapted from [Types Of Question](#), section Intro). (ORBIT)

Questioning Techniques

In 1940, Stephen Corey analyzed verbatim transcripts of classroom talk for one week across six different classes. His intent was to interrogate what the talk revealed about the learners' increase in understanding. He wrote, however, that "the study was not successful for the simple reason that during the five class days involved the pupils did not talk enough to give any evidence of mental development; the teachers talked two-thirds of the time" (p. 746). The research focus thus shifted to patterns of questioning.

Findings included:

- For every student query, teachers asked approximately 11 questions
- Students averaged less than one question each, while teachers averaged more than 200 questions each
- Teachers often answered their own questions
- Fewer teacher questions require deep thinking by the learner

Much has changed since 1940 – except, it seems, these patterns. Classroom discourse continues to be dominated by the 'recitation script': teachers asking known-answer questions (Howe & Abedin,

2013) that limit opportunities for learners to experience cognitive challenges, thereby inhibiting effective learning (Alexander, 2008).

Effective questioning techniques are critical to learner engagement and are a key strategy for supporting students to engage thoughtfully and critically with more complex concepts and ideas.

Why Question?

The purpose of questioning

Teachers ask questions for a number of reasons, the most common of which are

- to interest, engage, and challenge students
- to check on prior knowledge and understanding
- to stimulate recall, mobilizing existing knowledge and experience in order to create new understanding and meaning
- to focus students' thinking on key concepts and issues
- to help students to extend their thinking from the concrete and factual to the analytical and evaluative
- to lead students through a planned sequence which progressively establishes key understandings
- to promote reasoning, problem-solving, evaluation, and the formulation of hypotheses
- to promote students' thinking about the way they have learned

The kind of question asked will depend on the reason for asking it. Questions are often referred to as 'open' or 'closed'. Closed questions, which have one clear answer, are useful to check understanding during explanations and in recap sessions. If you

want to check recall, then you are likely to ask a fairly closed question, for example, 'What is the grid reference for Great Malvern?' or 'What do we call this type of text?'

On the other hand, if you want to help students develop higher-order thinking skills, you will need to ask more open questions that allow students to give a variety of acceptable responses. During class discussions and debriefings, it is useful to ask open questions, for example, 'Which of these four sources were most useful in helping with this inquiry?', 'Given all the conflicting arguments, where would you build the new superstore?', 'What do you think might affect the size of the current in this circuit?'

Questioning is sometimes used to bring a student's attention back to the task at hand, for example, 'What do you think about that, Peter?' or 'Do you agree?' (Adapted from [Types Of Question](#), section Why).

Common Classroom Sequence

A striking insight provided by classroom research is that much talk between teachers and their students has the following pattern: a teacher's question, a student's response, and then an evaluative comment by the teacher. This is described as an Initiation-Response-Feedback exchange, or IRF. Here's an example

I– Teacher – What's the capital city of Argentina?

R – Pupil – Buenos Aires

F– Teacher – Yes, well done

This pattern was first pointed out in the 1970s by the British researchers Sinclair and Coulthard. Their original research was reported in Sinclair, J. and Coulthard, M. (1975) *Towards an Analysis of Discourse: the English used by Teachers and Pupils*. London: Oxford University Press.

Sinclair and Coulthard's research has been the basis for extended debates about whether or not teachers should ask so many questions to which they already know the answer; and

further debate about the range of uses and purposes of IRF in working classrooms. Despite all this, it seems that many teachers (even those who have qualified in recent decades) have not heard of it. Is this because their training did not include any examination of the structures of classroom talk – or because even if it did, the practical value of such an examination was not made clear?

A teacher's professional development (and, indeed, the development of members of any profession) should involve the gaining of critical insights into professional practice – to learn to see behind the ordinary, the taken for granted, and to question the effectiveness of what is normally done. Recognizing the inherent structure of teacher-student talk is a valuable step in that direction. Student teachers need to see how they almost inevitably converge on other teachers' styles and generate the conventional patterns of classroom talk.

By noting this, they can begin to consider what effects this has on student participation in class. There is nothing wrong with teachers' use of IRFs, but question-and-answer routines can be used both productively and unproductively. (Adapted from [The Importance of Speaking and Listening](#), section IRF). (ORBIT

Professor Robyn Gillies, from The University of Queensland, explores some questioning techniques and strategies that can support deep learning.

Example questions that promote dialogical discourse include things like:

- On the one hand, you're telling me this, but on the other hand, you're saying something quite different.
- I wonder how these two positions could be reconciled.
- Can you explain that another way?
- Tell us again what you meant by ...?
- Have you considered looking at it this way? What might this or that type of person think about that?

These kinds of questions are designed to challenge students' thinking and encourage them to think about things in different ways. By creating a state of cognitive dissonance in students, they have to reconsider their thinking.

Questions that scaffold students' thinking might include things like:

- Have you considered using different descriptors in your search for the information you need?
- Have you thought about using some of this information to help you develop your ideas?
- Why don't you try brainstorming some of the problems and how could you solve them?

Both types of questions are used interchangeably to help students clarify their thoughts and think more deeply about issues.

(UQx: LEARNx Deep Learning Through Transformative Pedagogy)

In this next video, [Professor John Hattie](#), from the University of Melbourne, elaborates on our understanding of why questions are an essential component of developing self-regulated learners.



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=242#oembed-1>

(4:43 minutes)

<https://www.youtube.com/watch?v=VFcO2SUj4jc>
(UQx: LEARNx Deep Learning Through Transformative Pedagogy)
https://youtu.be/VFcO2SUj4jc?si=_ydWAQRYG5AKJchA

SUMMARY OF RESEARCH

Effective questioning

Research evidence suggests that effective teachers use a greater number of open questions than less effective teachers. The mix of open and closed questions will, of course, depend on what is being taught and the objectives of the lesson. However, teachers who ask no open questions in a lesson may be providing insufficient cognitive challenges for students.

Questioning is one of the most extensively researched areas of teaching and learning. This is because of its central importance in the teaching and learning process. The research falls into three broad categories

- What is effective questioning?
- How do questions engage students and promote responses?
- How do questions develop students' cognitive abilities?

What is effective questioning?

Questioning is effective when it allows students to engage with the learning process by actively composing responses. Research (Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001) suggests that lessons where questioning is effective are likely to have the following characteristics:

- Questions are planned and closely linked to the objectives

of the lesson.

- The learning of basic skills is enhanced by frequent questions following the exposition of new content that has been broken down into small steps. Each step should be followed by guided practice that provides opportunities for students to consolidate what they have learned and that allows teachers to check understanding.
- Closed questions are used to check factual understanding and recall.
- Open questions predominate.
- Sequences of questions are planned so that the cognitive level increases as the questions go on. This ensures that students are led to answer questions that demand increasingly higher-order thinking skills but are supported on the way by questions that require less sophisticated thinking skills.
- Students have opportunities to ask their own questions and seek their own answers. They are encouraged to provide feedback to each other.
- The classroom climate is one where students feel secure enough to take risks, be tentative, and make mistakes.

The research emphasizes the importance of using open, higher-level questions to develop students' higher-order thinking skills.

Clearly, there needs to be a balance between open and closed questions, depending on the topic and objectives of the lesson. A closed question, such as 'What is the next number in the sequence?', can be extended by a follow-up question, such as 'How did you work that out?'

Overall, the research shows that effective teachers use a greater number of higher-order questions and open questions than less effective teachers.

However, the research also demonstrates that most of the questions asked by both effective and less effective teachers are lower order and closed. It is estimated that 70–80 percent of all learning-focused questions require a simple factual response, whereas only 20–30 percent lead students to explain, clarify, expand, generalize, or infer. In other words, only a minority of questions demand that students use higher-order thinking skills.

How do questions engage students and promote responses?

It doesn't matter how good and well-structured your questions are if your students do not respond. This can be a problem with shy students or older students who are not used to highly interactive teaching. It can also be a problem with students who are not very interested in school or engaged with learning. The research identifies a number of strategies that are helpful in encouraging student response. (See Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001; Rowe 1986; Black and Harrison 2001; Black et al. 2002.)

Pupil response is enhanced where

- there is a classroom climate in which students feel safe and know they will not be criticized or ridiculed if they give a wrong answer
- prompts are provided to give students the confidence to try an answer
- there is a 'no-hands' approach to answering, where you choose the respondent rather than have them volunteer
- 'wait time' is provided before an answer is required. The research suggests that 3 seconds is about right for most questions, with the proviso that more complex questions may need a longer wait time. Research shows that the average wait time in classrooms is about 1 second (Rowe 1986; Borich 1996)

How do questions develop students' cognitive abilities?

Lower-level questions usually demand factual, descriptive answers that are relatively easy to give. Higher-level questions require more sophisticated thinking from students; they are more complex and more difficult to answer. Higher-level questions are central to students' cognitive development, and research evidence suggests that students' levels of achievement can be increased by regular access to higher-order thinking. (See Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001; Black and Harrison 2001.)

When you are planning higher-level questions, you will find it useful to use Bloom's taxonomy of educational objectives (Bloom and Krathwohl 1956) to help structure questions that will require higher-level thinking. Bloom's taxonomy is a classification of levels of intellectual behavior important in learning. The taxonomy classifies cognitive learning into six levels of complexity and abstraction.

Let's look at Bloom's Taxonomy presented earlier (Figure 3.1) in this chapter again.

On this scale, recalling relevant knowledge is the lowest-order thinking skill, and creating is the highest.

Bloom researched thousands of questions routinely asked by teachers and categorized them. His research, and that of others, suggests that most learning-focused questions asked in classrooms fall into the first two categories, with few questions falling into the other categories that relate to higher-order thinking skills.

Common Pitfalls of Questioning and possible solutions

Although questions are the most common form of interaction between teachers and students, it is fair to say that questions are not always well-judged or productive for learning. This section identifies some common pitfalls of questioning and suggests some ways to avoid them.

Not being clear about why you are asking the question: You will need to reflect on the kind of lesson you are planning. Is it one where you are mainly focusing on facts, rules, and sequences of actions? If that is the case, you will be more likely to ask closed questions which relate to knowledge. Or is it a lesson where you are focusing mainly on comprehension, concepts, and abstractions? In that case, you will be more likely to use open questions that relate to analysis, synthesis, and evaluation.

Asking too many closed questions that need only a short answer: It helps if you plan open questions in advance. Another strategy is to establish an optimum length of response by saying something like, 'I don't want an answer of less than 15 words.'

Asking too many questions at once: Asking about a complex issue can often lead to complex questions. Since these questions are oral rather than written, students may find it difficult to understand what is required, and they become confused. When you are dealing with a complex subject, you need to tease out the issues for yourself first and focus each question on one idea only. It also helps to use direct, concrete language and as few words as possible.

Asking difficult questions without building up to them: This happens when there isn't a planned sequence of questions of increasing difficulty. Sequencing questions are necessary to help students to move to the higher levels of thinking.

Asking superficial questions: It is possible to ask lots of questions but not get to the center of the issue. You can avoid this problem by planning probing questions in advance. They can often be built in as follow-up questions to extend an answer.

Asking a question then answering it yourself: What's the point? This pitfall is often linked to another problem: not giving students time to think before they answer. Build in 'wait time' to give students a chance to respond. You could say, 'Think about your answer for 3 seconds, then I will ask.' You could also provide prompts to help.

Asking bogus 'guess what's in my head' questions: Sometimes

teachers ask an open question but expect a closed response. If you have a very clear idea of the response you want, it is probably better to tell students by explaining it to them rather than trying to get there through this kind of questioning. Remember, if you ask open questions, you must expect to get a range of answers. Acknowledge all responses. This can easily be done by saying ‘thank you’.

Focusing on a small number of students and not involving the whole class: One way of avoiding this is to get the whole class to write their answers to closed questions and then show them to you together. Some teachers use small whiteboards for this. Another possibility, which may be more effective for more open questions, is to use the ‘no-hands’ strategy, where you pick the respondent rather than having them volunteer. One advantage of this is that you can ask students questions of appropriate levels of difficulty. This is a good way of differentiating to ensure inclusion.

Dealing ineffectively with wrong answers or misconceptions: Teachers sometimes worry that they risk damaging students’ self-esteem by correcting them. There are ways of handling this positively, such as providing prompts and scaffolds to help students correct their mistakes. It is important that you correct errors sensitively or, better still, get other students to correct them.

Not treating students’ answers seriously: Sometimes, teachers simply ignore answers that are a bit off-beam. They can also fail to see the implications of these answers and miss opportunities to build on them. You could ask students why they have given that answer or if there is anything they would like to add. You could also ask other students to extend the answer. It is important not to cut students off and move on too quickly if they have given a wrong answer.

Practical tips

- Be clear about why you are asking the questions. Make sure they will do what you want them to do.

- Plan sequences of questions that make increasingly challenging cognitive demands on students.
- Give students time to answer and provide prompts to help them if necessary. Ask conscripts rather than volunteers to answer questions

Reflection

- Look again at the list of pitfalls and think about your own teaching. Which of these traps have you fallen into during recent lessons?
- How might you have avoided them?

ADDITIONAL RESOURCES

100 questions that promote Mathematical Discourse-[Download Printable Version for quick reference](#)

References

ORBIT: The Open Resource Bank for Interactive Teaching, University of Cambridge, Faculty of Education. Retrieved from http://oer.educ.cam.ac.uk/wiki/Questioning_Research_Summary and http://oer.educ.cam.ac.uk/wiki/Teaching_Approaches/Questioning (CC BY NC SA)

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FEEDBACK

Professor Marilyn Goos from The University of Queensland defines what we mean by ‘feedback for deep learning.’

Feedback is something that tells you if you’re on the right track or not. In a nutshell, feedback is information provided on the performance or understanding of a task, which can then be used to improve this performance or understanding. Feedback helps to close the gap between actual performance and intended performance. There are a multitude of different types of feedback and we encounter many of these in our everyday lives.

Feedback can come from a diverse variety of sources as well. Feedback doesn’t need to be formal. In fact, some feedback is very informal, and we hardly recognize it for what it is. Feedback has a powerful influence on learning and, in particular, on deep engagement with content. If we would like our students to have a full understanding of a task and gain skills they can use in the future and transfer to other tasks, then effective feedback on learning is crucial.

For a fuller understanding of the nature of feedback and how it can be used to close the gap between actual performance and intended performance, we need to explore the different purposes, types, and levels of feedback and ask three important questions:

- 1) Where am I going?
- 2) How am I going? and
- 3) Where to next?

(Hattie & Timperley, 2007).

In exploring the Hattie and Timperley (2007) feedback model and the three feedback questions, van den Bergh, Ros, and Beijaard

(2012, p. 345) state: The first question is about the learning goals: 'Where am I going?'

The second question that has to be answered is: 'How am I going?' Learners need to know how the current performance relates to the learning goals.

Finally, learners will ask: 'Where to next?' What activities need to be undertaken to make better progress?

Conditions of Effective Feedback

Dr Cameron Brooks from the School of Education at The University of Queensland, Australia, explored the conditions that are important for effective feedback and how powerful effective feedback can be for deep learning.

"Effective feedback is essential for deep learning. However, what is often overlooked is the potential for feedback to have variable effects on learning
" (Brooks, 2021).

The use of feedback is regarded as one of the most powerful strategies to improve student achievement, and you may or may not be aware of just how much attention it receives in education policy and practice. As we explore effective feedback, I want you to reflect on ways feedback has influenced you in your own learning journey.

Feedback is typically viewed as information given to the student which is designed to cause modifications of actions and result in learning.

Recently, this cause-and-effect notion of feedback has been challenged as the provision of feedback is no guarantee of learning. Research suggests that much of the feedback that is given is, in fact, rarely used by students. For this reason, we need to focus on how feedback is being received rather than just how feedback is given. The effects of feedback on learning have been studied

by educational and psychological researchers since the early 20th century.

Feedback is typically related to greater academic achievement, improvements in student work, and enhanced student motivation. Further investigation of feedback research, however, reveals that feedback produces highly variable effects on learning. Numerous variables are identified in feedback literature that affect how feedback is received and used by students. These include the purpose, focus, and timing of feedback.

Feedback can serve many different purposes, such as providing a grade, a justification of a grade, a qualitative description of the work, praise, encouragement, identification of errors, suggestions on how to fix errors, and guidance on how to improve the work standard.

- Feedback can be directive and tell students where they went wrong or facilitative and provide guidance on how to improve.
- Feedback that includes elaborations about how to improve is more likely to lead to improvements in learning efficiency and student achievement.
- Improvement-based feedback that includes guidance is more effective than statements about whether work is right or wrong as it takes into consideration how learners receive feedback.

Literature on student perceptions of feedback includes findings that students become frustrated with feedback that is too general or tells them where they went wrong but does not provide guidance on how to improve. Effective feedback tells students how they are doing in relation to goals and criteria and then provides guidance and opportunities for improvement.

Unfortunately, much of the feedback that is given in classrooms is directed to the self rather than to these specific learning

elements of tasks. Research directed to the self, most commonly given as praise, has been found to have negative impacts on learning as it can contribute towards learners developing a mindset that sees achievement as a fixed attribute rather than something to be worked on and improved.

Early behavioristic feedback models used feedback as a means of reinforcement of behavior with the belief that feedback needs to be immediate to help condition a response. As cognitivist theories emerged, researchers began to investigate the effects of immediate versus delayed feedback upon learning.

Immediate feedback vs. delayed feedback

Immediate feedback is more likely to be effective in the acquisition of verbal, procedural, and motor skills. While immediate feedback is helpful during initial task acquisition, it can negate deeper learning during tasks that encourage fluency and the development of skills and understanding.

In fact, delayed feedback can be more effective for difficult tasks due to the benefits associated with learners' processing and thinking about methods to satisfy task requirements. Therefore, delayed feedback may be beneficial for deeper learning, where learning concepts can be transferred from one context to another. This is, of course, dependent upon the type of task and the developmental capability of the learner.

Four common key conditions for effective feedback are evident from research:

1. Clarifying expectations and standards for the learner,
2. Scheduling ongoing, targeted feedback within the learning period,
3. Fostering practices to develop self-assessment, and
4. Providing feed-forward opportunities to close the

feedback loop.

Let's have a look at each of these conditions in more detail.

Clarifying expectations and standards for the learner.

Clarifying expectations and standards for the learner is a key prerequisite for effective feedback practice. The clarification of criteria and standards at the beginning of, or at least during the learning cycle, orients learners towards purposeful actions designed to satisfy or even exceed the learning intent or goals.

Feedback pertaining to expectations and standards that arrive at the conclusion of the learning cycle is terminal and of limited value, primarily due to the learner not being given further opportunity to be able to implement the feedback. Feedback has the potential to be increasingly powerful when the task intent and the criteria for success can be matched to challenging learning goals.

Goals are a powerful strategy for focusing the intention of learners on the feedback standard gap, for instance, the difference between where the learner currently is in the learning cycle and where they need to be at the end of the learning journey. Teachers need to be clear and specific when providing guidance on expectations, as students hold different interpretations of the learning intent from their instructors.

An example of an effective strategy for clarifying expectations and standards is the use of exemplars or models. Exemplars are particularly effective as they clearly depict the required standards and enable students to make a direct comparison between their own work and the stated standards of the exemplar. Students also report they value feedback that is matched to the assessment criteria.

Crucially, feedback pertaining to the clarification of the expectations and standards lays the platform for students to

monitor their own learning progress, and this is a key facet of self-regulated learning.

Scheduling ongoing, targeted feedback within the learning period.

Ongoing, targeted, and specific feedback received within the current learning period is more powerful than feedback received after learning.

Hence, formative rather than summative assessment is a key process for creating opportunities for feedback. Formative assessment provides learners with opportunities to both receive and implement feedback with a view to improving their work. The scheduling of formative assessment checkpoints throughout the learning period gives students multiple opportunities to demonstrate their knowledge, understanding, and skills.

Formative assessment also provides teachers with an evidence base of how their students are tracking towards achieving the learning intent. By comparing the learning intent and criteria for success with the student's current learning state (as evidenced within their formative assessment samples), teachers can direct their attention to the gap between where the learner is currently situated and where they need to be. Teachers can then draw upon pedagogical practices such as differentiation and scaffolding to meet the individual needs of learners before the conclusion of the learning period.

Fostering practices to develop self-assessment

Self-regulation is a key process within an effective model of feedback for deep learning. Self-regulated learners are cognizant of both the standards and criteria and their own current levels of performance or achievement. To develop self-regulatory behaviors, learners must be regularly engaged in tasks and activities that

match the criteria for success and include processes, such as self-assessment, that encourage critical thinking and reflection.

Calibration mechanisms such as self-review, retrieval questions, peer feedback, comparison with models, and exemplars all allow students to compare their work against given standards and, importantly, identify areas for improvement.

Self-assessment thus forms part of self-regulation, where students can direct and monitor actions to achieve the learning intent. Students who develop self-regulatory learning habits become willing and active seekers of feedback.

Feed-forward opportunities to close the feedback loop.

The final condition for effective feedback is the provision of opportunities for students to implement the feedback and close the feedback loop. The closing of the feedback loop is crucial as it requires learners to act on earlier feedback that they have received or self-generated. Often termed feed-forward, this highly valued process is often missing from some learning episodes due to delays in students receiving the feedback or misinterpretation of the feedback content.

Thus, feed-forward is heavily reliant on the three conditions of effective feedback that were discussed previously. When further consideration is given to incrementally increasing task challenges, feed-forward opportunities can foster great improvement in learners.

In conclusion, variables such as the purpose, focus, and timing of feedback can cause learners to receive feedback differently. Teachers need to strive to provide conditions for learners where feedback is more likely to be effective. These conditions include the clarification of expectations, the use of ongoing formative assessment, feedback that is aimed at developing self-regulation, and the provision of feed-forward opportunities.

In the video below, Dr. Cameron Brooks from the University of

Queensland provides effective feedback coaching for teachers in Brisbane, Australia. Watch Cameron work with teachers and think about the types of feedback teachers receive.

Watch the Video: (8:02 minutes)



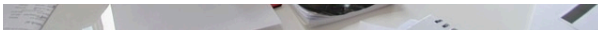
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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=242#oembed-2>

In this next video, Dr. Cameron Brooks from the University of Queensland talks about the model he developed for effective feedback.

[Click here to watch the video](#) (8:41 minutes)

Click here to view and download the [Feedback Matrix](#)



PEER FEEDBACK

Ultimately, learners need to be their own self-assessors in order to engage deeply with new content, processes, and skills. Peer- and self-feedback play very important roles in developing the type of self-initiated feedback for essential deep learning.

Dr. Melissa Cain from The University of Queensland explores the many advantages of providing and receiving peer feedback

MELISSA CAIN: Have you ever been asked to provide feedback to a friend or colleague? Did you find that easy? What concerns did you have? Were you worried that your feedback wouldn't be welcomed or that it might not be helpful?

Alternative assessment methods, such as peer assessment, are growing in popularity and have been found to receive a more positive response from students than more traditional assessment approaches. Engaging in peer feedback as part of the formative assessment process develops a range of critical thinking skills and is important in developing deep learning competencies.

Stephen Bostock, Head of the Centre for Learning, Teaching and Assessment at Glyndwr University relates that there are many benefits in providing and receiving peer feedback. Engaging in peer feedback gives students a sense of belonging and encourages a sense of ownership in the process.

This type of engagement also helps students recognize assessment criteria and develops a wide range of transferable skills. Interacting with their peers in this manner provides learners with opportunities to problem-solve and reflect. It increases a sense of responsibility, promotes independent learning, and encourages them to be open to a variety of perspectives. Commenting on the work of peers enables learners to engage with assessment criteria, thus inducting them into assessment practices and tacit knowledge. Learners are then able to develop an understanding of standards that they can potentially transfer to their own work.

Challenges of peer assessment

There are, however, some challenges surrounding the provision of effective peer feedback. Ryan Daniel, professor of creative arts at James Cook University, suggests that there exists the potential for resistance to peer feedback as it appears to challenge the authority of teachers as experts.

Indeed, students themselves have strong views about the effectiveness of peer assessment methods. This includes an awareness of their own deficiencies in subject areas, not being sure of their own objectivity, the influence of interpersonal factors such as friendship, and the belief that it is not their job but the teachers' to provide feedback.

Learners may also be cautious of being criticized by their peers and worry about a lack of confidence in their ability to provide effective feedback. Part of this issue relates to the issue of teacher power in the classroom. As this power is usually considered absolute by students, they may, in fact, consider their role to please teachers rather than demonstrate their learning by providing feedback. Providing effective peer feedback cannot be a one-time event. Learners need to be prepared over time to provide effective feedback.

Spiller (2011) suggested that learners need to be coached using examples and models and should be involved in establishing their own assessment criteria if possible. Teachers should demonstrate how they can match the work of a learner to an exemplar that most closely resembles its qualities. And everyone should engage in rich discussions about the process following the provision of peer feedback. As students become better at providing peer feedback over time, they gain confidence and become more competent at it.

Learning to provide peer feedback has many advantages. Most importantly, when students evaluate their peers' work and provide timely, specific, and personalized feedback, they have the

opportunity to scrutinize their own work as well. This is a critical factor in deep learning.

PEER CRITIQUE: CREATING A CULTURE OF REVISION

Your students can improve their work by recognizing the strengths and weaknesses in the work of others.

Watch the video: Be Kind, Be Specific, Be Helpful: (4:32 minutes)



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=242#oembed-3>

Using Self and Peer Feedback as Assessments for Learning

Watch the video: Using Self and Peer Feedback as Assessments for Learning (2:44 minutes) on using self and peer feedback as assessments for learning. (2:44 minutes)





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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=242#oembed-4>

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- [PERTS]. (Jan. 6, 2016). Using Self and Peer Feedback as Assessments for Learning. [Video File] Retrieved from <https://www.youtube.com/watch?v=6Ckrbsigh9E>
- UQx: LEARNx Deep Learning through Transformative Pedagogy (2017). University of Queensland, Australia (CC BY NC)

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CHAPTER 4

Chapter 4: Instructional Resources

- Instructional Strategy
- Instructional Resources
- Learning Resources
- Resources for Open Education Materials
- Adapt or adopt the Content?
- Finding, Evaluating, and Adapting Resources

In this chapter of the book, you will be introduced to the

instructional strategies (or instructional resources) in design lessons.

Materials to support lesson planning: [Instructional Materials Video](#)

INSTRUCTIONAL STRATEGY

An instructional strategy describes the instructional materials and procedures that enable students to achieve the learning outcomes. Your instructional strategy should describe the instructional materials' components and procedures used with the materials that are needed for students to achieve the learning outcomes. The strategy should be based on the learning outcomes. You can save time and money by not reinventing the wheel. However, be careful; a lot of existing instructional material is designed poorly.

Use the instructional strategy as a framework for further developing the instructional materials or evaluating whether existing materials are suitable or need revision. As a general rule, use the strategy to set up a framework for maximizing effective and efficient learning. This often requires using strategies that go beyond basic teaching methods. For example, discovery-learning techniques can be more powerful than simply presenting the facts.

No single teaching method or medium is ideal for all learners. As you proceed through developing an instructional strategy, start specifying the media that would most effectively teach the material.

LEARNING DOMAIN STRATEGIES

Each of Gagne's Domains of Learning (look back at the Analysis: the learning task chapter) is best taught with different instructional strategies.

Verbal Information

Verbal information is material, such as names of objects, that students simply have to memorize and recall.

When teaching verbal information:

- Organize the material into small, easily retrievable chunks.
- Link new information to knowledge the learner already possesses. For example, use statements such as “Remember how”, or “This is like ...”. Linking information helps the learner to store and recall the material.
- Use mnemonics and other memory devices for new information. You may recall that the musical notes of the treble clef staff lines can be remembered with the mnemonic Every Good Boy Deserves Fudge.
- Use meaningful contexts and relevant cues. For example, relating a problem to a sports car can be relevant to some members of your target audience.
- Have the learners generate examples in their minds, such as creating a song or game with the information or applying the knowledge to the real world. If the student only memorizes facts then the learning will only have minimal value.
- Avoid rote repetition as a memorization aid. Rote learning has minimal effectiveness over time.
- Provide visuals to increase learning and recall.

Intellectual Skills

Intellectual skills are those that require learners to think (rather than simply memorizing and recalling information).

When teaching intellectual skills:

- Base the instructional strategy and sequencing on the hierarchical analysis done earlier. Always teach subordinate skills before higher-level skills.
- Link new knowledge to previously learned knowledge. You can do this explicitly (e.g., the bones in your feet are comparable to the bones you learned about in your hands) or implicitly (e.g., compare the bones in your feet to other bone structures you have learned about).
- Use memory devices like acronyms, rhymes, or imagery for information such as rules or principles. You can use the first letters of words to help memorize information. For example, “KISS” means “Keep It Simple Stupid”. General rules can often be remembered through rhymes such as “i before e except after c”. Remember that rules often have exceptions. Tell your learners about the exceptions. Memory devices are best for limited amounts of information.
- Use examples and non-examples that are familiar to the student. For instance, when classifying metals, iron and copper are examples, while glass and plastic are non-examples.
- Use discovery-learning techniques. For example, let students manipulate variables and see the consequences.
- Use analogies that the learners know. However, be careful that learners do not over-generalize or create misconceptions.
- Provide for practice and immediate feedback.

Psychomotor Skills

Psychomotor skills are those that require learners to carry out muscular actions.

When teaching psychomotor skills:

- Base the instructional strategy on the procedural analysis done earlier.
- Provide directions for completing all of the steps.
- Provide repeated practice and feedback for individual steps, then groups of steps, and then the entire sequence.
- Remember that, in general, practice should become less dependent on written or verbal directions.
- Consider visuals to enhance learning.
- Consider job aids, such as a list of steps, to reduce memory requirements. This is especially important if there are many procedures or if the procedures are infrequently used.
- After a certain point, allow learners to interact with real objects or do the real thing. How much can you learn about swimming without getting wet?

Note that some skills involve other learning-domain classifications. For example, when learning how to operate a camcorder, many of the skills are psychomotor. However, deciding how to light an image is an intellectual skill. Also, note that the required proficiency level can affect the instructional strategy. There is a big difference between being able to imitate a skill and being able to automatically do a skill.

Attitudes

Attitudes involve how a student feels about the instruction whether they will value or care about the material presented to them.

When teaching attitudes:

- Base the instructional strategy on the instructional design steps done earlier.
- If you can, show a human model to which the students can easily relate. One consideration is that it may be better if the model is of the same socioeconomic group.
- Show realistic consequences for appropriate and inappropriate choices.
- Consider using video.
- Remember that attitudes taught through computer technology are not guaranteed to transfer to the real world. If appropriate and possible, consider arranging for practice opportunities to make the choice in real life. Alternatively, use role-playing to reinforce the attitudes taught.

Note that it can be difficult to test whether the attitudes taught have transferred to real situations. Will learners behave naturally if they know that they are being observed? If learners have not voluntarily permitted observations, then you must consider whether it is ethical to make the observations.

SEQUENCING LEARNING OUTCOMES

Using your needs and learning task analysis, determine the sequence of how the learning outcomes will be taught. In general,

to best facilitate learning, you should sequence the learning outcomes from:

- easy to hard
- You could teach adding fractions with common denominators and then with different denominators. Your lesson could first deal with writing complete sentences and then writing paragraphs.
- simple to complex
- As an example, first teach students to recognize weather patterns and then use what they have learned to predict the weather.
- Cover replacing a washer and then replacing a faucet.
- specific to general
- You could teach driving a specific car and then transfer the skills to driving any car. Similarly, you could cover adjusting the brakes on a specific mountain bike and then generalize the procedure to other mountain bikes
- Note that some students like to learn through an inductive approach (that is, from the general to the specific). For example, students could be presented with a number of simple examples, and based on those, be asked to generalize a rule. That general rule can then be applied to solving specific examples. Since some students will not enjoy an inductive approach, do not use it all of the time. Rather consider an inductive approach as a way to provide some variation and occasionally address other learning preferences.
- concrete to abstract

- As an example, teach measuring distances with a tape measure and then estimating distances without a tape measure. Cover writing learning outcomes and then evaluating learning outcomes.
- the known to the unknown
- You could do this by starting with concepts learners already know and extending those concepts to new ideas. In other words, build on what has been previously taught.

Each of these methods of sequencing learning outcomes enables students to acquire the needed knowledge base for learning higher-level skills. Note that these guidelines are not black-and-white rules.

MOTIVATING STUDENTS

As Lao Tzu observed, “You can no more teach without the learner than a merchant can sell without a willing buyer.” Follow the ARCS motivation model to ensure that students will be motivated to learn.

ARCS Motivational Model

As described by Keller, motivation can be enhanced through addressing the four attributes of Attention, Relevance, Confidence, and Satisfaction (ARCS). Try to include all of the attributes since each alone may not maintain student motivation. Your learner analysis may have provided useful information for motivating students. You should build motivational strategies into the materials throughout the lesson design process. This is challenging since each learner is an individual with unique interests, experiences, and goals.

Attention

Gain attention and then sustain it. You can gain attention by using human-interest examples, arousing emotions such as by showing a peer being wheeled into an ambulance, presenting personal information, challenging the learner, providing an interesting problem to solve, arousing the learner's curiosity, showing exciting video or animation sequences, stating conflicting information, using humor, asking questions, and presenting a stimulus change that can be as simple as an audio beep. One way to sustain attention is by making the learning highly interactive.

Relevance

Relevance helps the student to want to learn the material by helping them understand how the material relates to their needs or how it can relate to improving their future. For example, when teaching adult students how to solve percent problems, having them calculate the gratuity on a restaurant bill may be more relevant than a problem that compares two people's ages. You can provide relevance through testimonials, illustrative stories, simulations, practical applications, personal experience, and relating the material to present or future values or needs. Relevance is also useful in helping to sustain attention. For material to be perceived as being relevant, you must strive to match the learner's expectations to the material you provide.

Confidence

If students are confident that they can master the material, they will be much more willing to attempt the instruction. You will need to convince students with low confidence that they can be successful. You can do this by presenting the material in small, incremental steps or even by stating how other similar students have

succeeded. Tasks should seem achievable rather than insurmountable. You should also convince students who are overconfident that there is material that they need to learn. You can do this by giving a challenging pre-test or presenting difficult questions.

Satisfaction

Satisfaction provides value for learning the material. Satisfaction can be intrinsic from the pleasure or value of the activity itself, extrinsic from the value or importance of the activity's result, for social reasons such as pleasing people whose opinions are important to them, for achievement goals such as the motive to be successful or avoid failure, or a combination of these. Examples of intrinsic satisfaction include the joy or challenge of learning, increased confidence, positive outcomes, and increased feelings of self-worth. Examples of extrinsic satisfaction include monetary rewards, praise, a certificate, avoidance of discomfort or punishment for not doing it, and unexpected rewards. Some evidence suggests that extrinsic motivation, such as a certificate for completing a course, does not last over time. Nonetheless, it is better to assume that some students need extrinsic motivation. To be safe, try to provide your learners with both intrinsic, which should have more of the focus and extrinsic rewards. If the intrinsic motivation is high for all learners, you will not need to plan as much for extrinsic motivation. Note that satisfaction can be provided by enabling learners to apply the skills they have gained in a meaningful way. Remember to let the students know that the material to be learned is important. Consider increasing extrinsic motivation through quizzes and tests.

Watch the video:

ARCS The Movie – How to Motivate Students with the ARCS Model



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=246#oembed-1>

DEVELOP AND SELECT INSTRUCTIONAL MATERIALS

Based on the instructional strategy for each learning outcome and information from the other steps of the lesson design process, you need to determine whether materials should be gathered or developed. The main reason for using existing materials (those owned by your institution or purchased) is to save time and money.

Gather Existing Material

Some but likely not all of the needed material may exist. Learning-object repositories may be found within your institution or at provincial/state, national, and international sites. Compare any existing material to the instructional strategy. Determine whether it is suitable and cost-effective. Determine whether the existing material can be adapted or supplemented. The alternative is to get permission to repurpose existing materials for your own needs. Remember, if you include work done by others, you have the proper permissions and have researched all copyrights regarding the material you have selected.

Develop The Needed Material

The instructional strategy of the materials you develop should consider the learning domain, motivational techniques, each phase of instruction, and all of the information gained through the lesson design process. It is wise to create a paper-based version (storyboard) of what will appear on each screen that a student will see. See the Storyboarding section of this chapter for more information. Storyboards are easier to review and edit than content within a learning management system.

Based on the storyboard, make final decisions about the media needed to effectively teach the material. These decisions are based on what will most effectively teach the material as well as practical considerations such as cost and available expertise. Once you make the decisions, start creating the media. You must consider the file formats that will be used and where the media will be stored, such as DVD-ROM, CD-ROM, Internet, or intranet.

A final storyboard must be created for the person who transfers the material to the learning management system. An accurate storyboard will reduce the number of subsequent revisions needed. After you develop the media, individual pieces can be incorporated into the system. After this, you can begin the final formative evaluation. The components of a complete instructional multimedia package can also include:

- an easy-to-use student manual with directions, strategies, learning outcomes, and summaries
- remedial and enrichment material
- an easy-to-use instructor's manual

An instructional strategy should describe the instructional materials' components and the procedures used with the materials needed for students to achieve the learning outcomes. Your instructional strategy should be based on your instructional

analysis, the learning outcomes, and other previous instructional design steps or on how others have solved similar problems. At the end of this process, you should have a clear set of specifications describing how the material will be taught. You will use the instructional strategy as a framework for further developing the instructional materials or evaluating whether existing materials are suitable or need revision. Consider strategies that go beyond basic teaching methods. Remember that you can address a variety of learning styles if you teach with a variety of different methods and media. No single teaching method or medium is perfect for all learners. As you proceed through developing an instructional strategy, start specifying the media that would most effectively teach the material.

Each learning domain classification is best taught with different instructional strategies.

When teaching verbal information:

- Organize the material into small, easily retrievable chunks based on a cluster analysis done earlier.
- Link new information to knowledge the learner already possesses.
- Use memory devices like forming images or using mnemonics for new information.
- Use meaningful contexts and relevant cues.
- Have the learners generate examples in their minds, do something with the information, or apply the knowledge to the real world.
- Avoid rote repetition as a memorization aid.
- Provide visuals to increase learning and recall.

When teaching intellectual skills:

- Base the instructional strategy and sequencing on a

hierarchical analysis done earlier.

- Link new knowledge to previously learned knowledge.
- Use memory devices like forming images or mnemonics for new information.
- Use examples and non-examples that are familiar to the student.
- Use discovery-learning techniques.
- Use analogies that the learners know.
- Provide for practice and immediate feedback.

When teaching psychomotor skills:

- Base the instructional strategy on a procedural analysis done earlier.
- Provide directions for completing all of the steps.
- Provide repeated practice and feedback for individual steps, then groups of steps, and then the entire sequence.
- Remember that, in general, practice should become less dependent on written or verbal directions.
- Consider visuals to enhance learning.
- Consider job aids, such as a list of steps, to reduce memory requirements.
- Allow learners to interact with real objects or do the real thing.

When teaching attitudes:

- Base the instructional strategy on the instructional analysis done earlier.
- If you can, show a human model to which the students can easily relate.

- Show realistic consequences for appropriate and inappropriate choices.
- Consider using video.
- Remember that attitudes taught through computer technology might not transfer to the real world.
- Note that it can be difficult to test whether the attitudes taught have transferred to real situations.

Based on the subordinate skills analysis, sequence the learning outcomes from lower to higher level skills, easy to hard, simple to complex, specific to general, concrete to abstract, and/or the known to the unknown.

It is important for your lessons to motivate learners because without motivation learning is unlikely to occur. Regular and ongoing instructor/teacher presence, especially when students are studying partly or wholly online, is essential for student success. This means effective communication between teacher/instructor and students. It is particularly important to encourage inter-student communication, either face-to-face or online. Motivation can be enhanced through addressing these attributes: Attention, Relevance, Confidence, and Satisfaction (ARCS).

Try to include all of the attributes since each alone may not maintain student motivation. You should build motivational strategies into the materials throughout the instructional design process.

- To gain attention, involve and motivate the students. Do this throughout the lesson.
- Inform the student of the learning outcome before major learning occurs to help them focus their efforts.
- Stimulate recall of prerequisites by stating the needed prerequisite skills or giving a pre-test.
- When presenting the material, sequence the material in

increasing difficulty and in small incremental steps. Use a variety of methods to maintain interest. Provide examples that are meaningful, relevant, and realistic. Base some of the content on the potential for making mistakes. The proportional amount of effort needed to cover a learning outcome should be based on the learning outcome's frequency, importance, and difficulty.

- While presenting the material, provide learning guidance to help students learn the material.
- While presenting the material, elicit the performance so that learners can find out how well they are doing. Do this by asking questions or providing opportunities to practice the skill. Remember to address metacognition within this activity.
- When eliciting the performance, provide detailed feedback. Your feedback should be positive, constructive, and immediate. Your feedback should provide complete information as to why the answer and other answers are right or wrong or guide students in how to attain the stated learning outcome.
- Formally assess the student's performance. Tests should approximate real situations. Test all learning outcomes and only the learning outcomes. Tests should be criterion-referenced.
- Enhance retention and transfer so that students retain the information and can transfer the information beyond the specific ideas presented in the lesson.

Each type of instructional activity has strengths and weaknesses depending on the problem being solved. Incorporating a variety of creative instructional approaches can help maintain student interest and motivation as well as ensure that each student occasionally has a match between their learning style and the

teaching style. Many effective lessons include more than one type of instructional activity, some fun ways to learn, and social activities like collaboration and discussions.

Based on the instructional activities for each learning outcome and information from the other steps of lesson design process, you need to determine whether materials should be gathered or developed. The main reason for using existing materials (those owned by your institution or purchased) is to save time and money.

The instructional strategy of the materials you develop should consider the learning domain, motivational techniques, each event of instruction, and all of the information gained through the design process. It is wise to create a paper-based version (storyboard) of what will appear on each screen that a student will see. Storyboards are easier to review and edit than content within a learning management system. Based on the storyboard, make final decisions about the media needed to effectively teach the material. After you develop the media, individual pieces can be incorporated into the learning management system.

DESIGNING LEARNING ACTIVITIES

The importance of providing students with a structure for learning and setting appropriate learning activities is probably the most important of all the steps towards quality teaching and learning, and yet the least discussed in the literature on quality assurance.

This is the most critical part of the lesson design process, especially (but not just only) for fully online students, who have neither the regular classroom structure nor campus environment for contact with the instructor and other students nor the opportunity for spontaneous questions and discussions in a face-to-face class. Regular student activities are critical for keeping all students engaged and on task, irrespective of the mode of delivery.

These can include:

- assigned readings;
- simple multiple-choice self-assessment tests of understanding with automated feedback using the computer-based testing facility within a learning management system;
- questions regarding short paragraph answers, which may be shared with other students for comparison or discussion;
- formally marked and assessed monthly assignments in the form of short essays;
- individual or group project work spaced over several weeks;
- an individual student blog or e-portfolio that enables the student to reflect on their recent learning and which may be shared with the instructor or other students;
- online discussion forums, which the instructor will need to organize and monitor.

There are many other activities that instructors can devise to keep students engaged. However, all such activities need to be clearly linked to the stated learning outcomes for the course and can be seen by students as helping them prepare for any formal assessment. If learning outcomes are focused on skills development, then the activities should be designed to give students opportunities to develop or practice such skills. These activities also need to be regularly spaced, and an estimate made of the time students will need to complete the activities. Student engagement in such activities will need to be monitored by the instructor.

It is at this point where some hard decisions may need to be made about the balance between 'content' and 'activities'. Students must have at least enough time to do regular activities (other than

just reading) once each week or their risk of dropping out or failing the course will increase dramatically. In particular they will need some way of getting feedback or comments on their activities, either from the instructor or from other students, so the design of the course will have to take account of the instructors' workload as well as the students'.

Most university and college courses are overstuffed with content, and not enough consideration is given to what students need to do to absorb, apply, and evaluate such content. A very rough rule of thumb is that students should spend no more than half their time reading content and attending lectures, the rest being spent on interpreting, analyzing, or applying that content through the kinds of activities listed above. As students become more mature and more self-managed, the proportion of time spent on activities can increase, with the students themselves being responsible for identifying appropriate content that will enable them to meet the goals and criteria laid down by the instructor. However, whatever your teaching philosophy though, there must be plenty of activities with some form of feedback for online students, or they will drop like flies on a cold winter's day.

EVALUATE

The last key 'fundamental' of the teaching and learning process is evaluation and innovation: assessing what has been done and then looking at ways to improve on it. New tools and new approaches to teaching are constantly becoming available. They provide the opportunity to experiment a little to see if the results are better, and if we do that, we need to evaluate the impact of using a new tool or course design. It's what professionals do. But the main reason is that teaching is like golf: we strive for perfection but can never achieve it. It's always possible to improve, and one of the best ways of doing that is through a systematic analysis of past experience. We will discuss the evaluation process (formative and

summative evaluations) later. Continuous evaluation that drives the implementation of improvements is a never-ending process, ensuring the lesson design process is effective and engaging for the student learner today and tomorrow.

BUILDING A STRONG FOUNDATION OF COURSE DESIGN

The emphasis in this series of steps is on getting the fundamentals of teaching right. Regardless of what revolutionary tools or teaching approaches are being used, what we know of how people learn does not change a great deal over time, and we do know that learning is a process, and you ignore the factors that influence that process at your peril.

For learning leading to successful outcomes, it is important to remember that most students need:

- well-defined learning goals;
- instructional strategies linked with the appropriate learning domains;
- a proper sequencing of instructional events; providing a clear timetable of work based on a well-structured organization of the curriculum;
- appropriate and engaging learning activities, with regular feedback
- manageable study workloads appropriate for their conditions of learning;
- a skilled instructor; regular instructor communication and presence;
- a social environment that draws on and contributes to the knowledge and experience of other students;
- other motivated learners to provide mutual support and encouragement.

There are many different ways these criteria can be met, with many different tools.

Key Terms

Key Terms

- **Instructional Strategy**
describes the instructional materials and procedures that enable students to achieve the learning outcomes.
- **Learning Outcomes** are what the student should know or be able to accomplish at the end of the course or learning unit.
- Subordinate Skills Analysis is a process for determining the skills that must be learned before performing a step
- Learning Domain Classification verbal information, intellectual skills and cognitive strategies, psychomotor skills, and attitudes.
- Verbal information is material, such as names of objects, that students simply have to memorize and recall.
- Intellectual skills are those that require learners to think (rather than simply memorizing and recalling information).
- **Psychomotor skills** are those that require learners to carry out muscular actions.
- **Attitudes** involve how a student feels about the instruction whether they will value or care about the material presented to them.
- **Relevance** helps the student to want to learn the material by helping them understand how the material relates to their needs or how it can relate to improving their future.

- ARCS refers to the attributes of Attention, Relevance, Confidence, and Satisfaction. The ARCS model promotes student motivation.
- Instructional Events (gaining attention, informing the learner of the learning outcome, stimulating recall of prerequisites, presenting the material, providing learning guidance, eliciting the performance, providing feedback, assessing performance, and enhancing retention and transfer) represent what should be done to ensure that learning occurs.

Key Takeaways

Key Takeaways

- Learning domain classification (i.e., verbal information, intellectual skills, cognitive strategies, psychomotor skills, and attitudes) is best taught with different instructional strategies.
- Teach learning outcomes in the order that best facilitates learning.
- The four attributes of Keller's ARCS Motivational Model are Attention, Relevance, Confidence, and Satisfaction. Including all of the attributes may increase student motivation.
- The unique interests, experiences, and goals of each learner influence motivation.

- Instructional events include gaining attention, informing the learner of the learning outcome, stimulating recall of prerequisites, presenting the material, providing learning guidance, eliciting the performance, providing feedback, assessing performance, and enhancing retention and transfer.
- You have been tasked with designing a university orientation course for freshmen community college students. Everyone at the institution is aware that students feel an orientation course is not necessary and that it is a waste of their time. Explain what portion of the ARCS Motivational Model might be applied to the design of the course to help students understand why this course is important for their success.
- You have been tasked with designing a university orientation course for freshmen community college students. Everyone at the institution is aware that students feel an orientation course is not necessary and that it is a waste of their time. Explain what portion of the ARCS Motivational Model might be applied to the design of the course to help students understand why this course is important for their success.

Exercises

Exercise

You have been tasked with designing Parent Night Orientation for an elementary school. Everyone at the school is aware that parents feel an orientation night is not necessary and that it is a waste of their

time. Explain what portion of the ARCS Motivational Model might be applied to the design of the orientation night to help parents and staff understand why this course is important for student success.

SOURCES:

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LEARNING RESOURCES

Learning Resources Materials are materials that are used for teaching a course.

Below are definitions of the Material Types that can be selected during the upload process for both the “Primary Material Type” field and the “Secondary/Other Material Type” field.

1. **Animation:** Successive drawings that create an illusion of movement when shown in sequence. The animations visually and dynamically present concepts, models, processes, and/or phenomena in space or time. Users can control their pace and movement through the material typically, but they cannot determine and/or influence the initial conditions or their outcomes/results. Animations typically do not contain real people, places, or things in movement.
2. **Assessment Tool:** Forms, templates, and technologies for measuring performance.
3. **Assignment:** Activities or lesson plans designed to enable students to learn skills and knowledge.
4. **Case Study:** A narrative resource describing a complex interaction of real-life factors to help illustrate the impact and/or interactions of concepts and factors in depth.
5. **Collection:** A meaningful organization of learning resources, such as websites, documents, apps, etc., that provides users with an easier way to discover the materials.
6. **Development Tool:** Software development applications platforms for authoring technology-based resources (e.g.

web sites, learning objects, apps.).

7. **Drill and Practice:** Requires users to respond repeatedly to questions or stimuli presented in a variety of sequences. Users practice on their own, at their own pace, to develop their ability to reliably perform and demonstrate the target knowledge and skills.
8. **ePortfolio:** A collection of electronic materials assembled and managed by a user. These may include text, electronic files, images, multimedia, blog entries, and links. E-portfolios are both demonstrations of the user's abilities and platforms for self-expression, and if they are online, they can be maintained dynamically over time. An e-portfolio can be seen as a type of learning record that provides actual evidence of achievement.
9. **Hybrid/Blended Course:** The organization and presentation of course curriculum required to deliver a complete course that blends online and face-to-face teaching and learning activities.
10. **Illustration/Graphic:** Visual concepts, models, and/or processes (that are not photographic images) that visually present concepts, models, and/or processes that enable students to learn skills or knowledge. These can be diagrams, illustrations, graphics, or infographics in any file format, including Photoshop, Illustrator, and other similar file types.
11. **Learning Object Repository:** A searchable database of at least 100 online resources that is available on the Internet and whose search result displays an ordered hit list of items with a minimum of title metadata. A webpage with a list of links is not a learning object repository.
12. **Online Course:** The organization and presentation of course curriculum required to deliver a complete course

fully online.

13. **Online Course Module:** A component or section of a course curriculum that can be presented fully online and independent from the complete course.
14. **Open Journal – Article:** A journal or article in a journal that is free of cost from the end user and has a Creative Commons, public domain, or other acceptable use license agreement.
15. **Open Textbook:** An online textbook offered by its author(s) with Creative Commons, public domain, or other acceptable use license agreement allowing use of the ebook at no additional cost.
16. **Photographic Image – Instructional:** Photos or images of real people, places, or things that visually present concepts, processes, and/or phenomena that enable students to learn skills or knowledge. These can be photographs, images, or stock photography.
17. **Presentation:** Teaching materials (text and multimedia) that are used to present curriculum and concepts to learners.
18. **Quiz/Test:** Any assessment device intended to evaluate the knowledge and/or skills of learners.
19. **Reference Material:** Material with no specific instructional objectives and similar to that found in the reference area of a library. Subject-specific directories to other sites, texts, or general information are examples.
20. **Simulation:** Approximates a real or imaginary experience where users' actions affect the outcomes of tasks they have to complete. Users determine and input initial conditions that generate output that is different from and changed by the initial conditions.

21. **Social Networking Tool:** Websites and apps that allow users to communicate with others connected in a network of self-identified user groups for the purpose of sharing information, calls for actions, and reactions.
22. **Syllabus:** A document or website that outlines the requirements and expectations for completing a course of study. Course Outlines would also be included in this.
23. **Tutorial:** Users navigate through a set of scaffolded learning activities designed to meet stated learning objectives, structured to impart specific concepts or skills, and organized sequentially to integrate conceptual presentation, demonstration, practice and testing. Feedback on learner performance is an essential component of a tutorial.
24. **Video – Instructional:** A recording of moving visual images that show real people, places and things that enable students to learn skills or knowledge.
25. **Workshop and Training Material:** Materials best used in a workshop setting for the purpose of professional development.
26. **Other**

RESOURCES FOR OPEN EDUCATION MATERIALS

By [Don Watkins](#) (Correspondent) August 23, 2016



Image by:Opensource.com

Shrinking school budgets and growing interest in open content has created an increased demand for open educational resources. According to the [FCC](#), “The U.S. spends more than \$7 billion per year on K-12 textbooks, but too many students are still using books that are 7-10 years old, with outdated material.” There is an alternative: openly licensed courseware. But where do you find this content and how can you share your own teaching and learning materials? This month I’ve rounded up a list of seven open educational resources for K-12 and higher education:

1. [OERCommons](#) offers [Open Author](#), which is platform agnostic and can be used to create media-rich documents simply by opening an account on the site. A [lesson builder](#) for K-12 content and a [module builder](#) designed specifically for higher education are also available on the site. Follow OERCommons on Twitter: [@oercommons](#).
2. [National Science Digital Library \(NSDL\)](#) is a free site where teachers and students can share lesson plans. Joining the

National Science Digital Library is easy—simply become a member of [OERCommons](#), a digital library and resource. Resources from preschool through adult education are available in 26 different resource types and 15 subject areas. Follow NSDL on Twitter: [@nsdl](#)

3. The [CK-12 Foundation](#) is a California-based nonprofit organization with a mission to reduce the cost of textbook materials for the K-12 market both in the U.S. and worldwide. Key benefits include: access to free textbooks; access to high-quality, educator-created content; support for publishing tools that make content creation easy; and licensing via Creative Commons [CC BY-NC](#). CK-12 Foundation is providing us with the textbooks of the future, which are free, open, and remixable. Follow CK-12 on Twitter: [@CK12Foundation](#).
4. The [Khan Academy](#) site explains its mission as, “Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom.” All material is openly licensed via the [MIT Open License](#). Follow Khan Academy on Twitter: [@khanacademy](#).
5. The [MIT Open Courseware](#) site provides a web-based publication of virtually all of the 2,340 courses offered by Massachusetts Institute of Technology. Follow MIT OCW on Twitter: [@MITOCW](#).
6. [Merlot](#) is a curated collection of free and open online resources for teaching, learning, and professional development in higher education. Content is licensed under Creative Commons [CC NC-ND](#) (with some exceptions noted). Merlot offers a free content builder for registered site users. Follow Merlot on Twitter:

[@MERLOTOrg](#).

7. [Saylor Academy](#) provides free online courses and an Open Course Option pathway to a free [Associate in Science in Business Administration degree](#). Follow them on Twitter: [@saylordotorg](#).
8. What additions do you have for the list? Let me know about them in the comments.

ADAPT OR ADOPT THE CONTENT?

ADOPT

Adopt means faculty will use the resource outright, with little or no changes to the content. This may be the way to go if they are truly happy with the resource or if they are just getting their feet wet. They can always try it out and make changes in later semesters if they want.

Adapt means they will be using the resource, but also adapting it. Perhaps they will add in an extra section of their own writing (to make it more relevant to their student demographic), or they will take out significant parts of an existing chapter. Either of these (and more) are excellent reasons to adapt a resource, rather than simply adopting it.

You indicated that the faculty did in fact find existing content. That is excellent news!

Now consider: Does your faculty member want to adopt or adapt the resource?

ADOPT CONTENT

Let's make sure the students will be able to access it simply

Resource Format

First, what is the format of the resource in question? It might be a textbook offered in PDF, ePub, HTML, through [Canvas Commons](#), or offered online in some other way.

If the resource is in Pressbooks, there is an LTI integration that places the content into direct view in Webcourses (so it appears just like a Webcourses Page would):

Insert an image of a Pressbook page.

If the person wants to use a resource external to Pressbooks, it's usually pretty easy to point the students toward it. For instance, if a faculty member wanted to adopt this [Engineering textbook](#) offered through Open SUNY, they could simply link to that webpage and ask students to download the PDF from there.

The faculty member may want to download the PDF from the site and upload it into their course as well. If you're really nifty like John Raible with this [AMH2020](#) course, a big PDF could be broken into separate chapter PDFs and linked within each module. IDs aren't expected to do this work, but you can point faculty to resources that might help them (e.g., <https://oir.ucf.edu/fmc/>).

Note: If the resource also comes in a print version, this will be helpful in the Communication Plan section below.

Communication Plan

Next is to discuss how to communicate with students about access to the resource. It's recommended in the syllabus to clearly say that the resource is online and freely available. A direct link to the resource can be placed there.

If there is a print option, it should be mentioned in the syllabus (for instance, students could buy a [print version](#) of the Psychology OpenStax book if they really wanted to). In the case of print, list the ISBN number. When putting in an order to the bookstore, this ISBN

can be listed but make sure that “come to class before buying book” is noted by the faculty member.

Here is the language used in the AMH2020 course which uses an OpenStax book: “U.S. History by OpenStax ISBN: 978-1-938168-36-9. The textbook is free and available online.

[Textbook download instructions.](#)

You can choose to print out the pages – free through Student Government – or if you insist, the book is for sale in the bookstore.”

Pro Tip: Encourage the faculty member to make their syllabus visible within PeopleSoft by using the [Course Preview Feature](#) before students register for the course, so students can see that the materials are free. Also consider [sending out an email to the class roster](#) before class starts so that students understand they don’t have to buy a copy.

LICENSE

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ADAPT CONTENT

Below are some considerations to make when adapting open content:

- If your faculty have big ideas, ask them to consider adapting one chapter or section before doing the entire resource.
- Are your faculty going to create new content to add to an

existing resource?

- Are your faculty going to try and find other OER to use in addition to this resource? What licenses do those resources have?
- The more restrictive the license, the more considerations will have to be given when adapting the content. (cf. [Creative Commons licenses](#))
- Public Domain = You can do anything you'd like with the content.
- Creative Commons Attribution (CC BY) = You can do anything, but have to attribute original work (like citing a paper).
- Creative Commons Attribution-ShareAlike = You can do anything, but have to release it under same CC license.
- Creative Commons Attribution-NonCommercial = You can modify, but can not sell it (i.e., print copies can not be sold by the bookstore).
- Creative Commons Attribution-NoDerivatives = You can not modify; have to use as is. (Adapting is NOT an option here.)
- ...or any mixture of the above.
- Make sure the appropriate licensing and attributions are applied to this new, adapted resource.
- Determine the format of these resources to plan appropriately for adapting them. (Some common file types are listed below.)
- PDF
- HTML

- Word
- Images
- ePub

Adapting PDFs

PDFs are the most difficult file format to adapt. They can be either image-based or created from other products such as HTML or Microsoft Word.

- For the latter, you can copy the text and paste it into Word, Pressbooks, a plain text editor, et al.
- For image-based documents (i.e., you are unable to select the text), use [Adobe Acrobat Pro's OCR \(Optical Character Recognition\)](#) feature to turn the image into text. This process is not 100% effective depending on the quality of the image. OCR likes to switch b's and d's, and i's for ! marks.

Adapting other file formats

With the exception of PDF documents, all other file formats (listed below) can be imported and modified directly in Pressbooks (<https://guide.pressbooks.com/chapter/tools/#importtool>) or <https://networkmanagerguide.pressbooks.com/chapter/getting-content-into-pressbooks/>).

- Log in to Pressbooks to use the above functionality. (All users who accessed this book through Webcourses had a user account automatically created.)

The clearest advantage of using Pressbooks to edit and compile content is that the platform is internally supported by the Techrangers and UCF's Pressbooks Network Manager (Jim), so any

technical issues that arise or formatting issues you'd like to take care of can be managed through a TBD submission (or by contacting Jim directly).

Learn more about these 'other' file formats.

HTML

HTML provides the most flexibility in 1) styling via CSS, 2) including other artifacts (images, links, etc), 3) editing, 4) printing, and it's the easiest to make [accessible for users of assistive technology](#).

HTML files that can be linked and/or created in Webcourses@UCF, Webcourses@UCF Pages, or services like Pressbooks. HTML documents can also be easily transformed into accessible PDFs and be imported into an ePub editor such as [Sigil](#).

Word

Many of the advantages of HTML can be found in Word. The major drawback is the lack of customized styling available in HTML. For example, specialized layouts and customized line numbering. [Accessibility resource for Word documents](#). Any Word document, however, can be easily imported and styled in Pressbooks (<https://guide.pressbooks.com/chapter/import-from-word-docx/>).

ePub

Another option is to create an ePub file. Think of it like a specially formatted zip file containing the materials and a table of contents. It is intended to be read on a tablet and sometimes on a laptop. Pressbooks and [Sigil](#) are both great open-source ePub editors. Depending on your use case, you might choose one over the other.

LICENSE

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FINDING, EVALUATING, AND ADAPTING RESOURCES

Teachers have always created and shared teaching materials, though finding and reusing others' work is not always simple. [1] This chapter will teach you how to find free and openly licensed teaching resources that already exist and adapt them for use in your own classrooms.

WHY IT MATTERS

If you're going to find the best open resources for your course, and share your work as OER, and join an OER community of practice, you need to know how to find, evaluate, and adapt openly licensed resources. And what if we want to think bigger, what effect might open education have globally?

How is the openness, the opportunity to revise, remix and share, of content potentially impactful on a global scale? If the public had access to and could creatively remix the world's knowledge, what new opportunities might we find to address global challenges (e.g., United Nations [Sustainable Development Goals](#))

LEARNING OUTCOMES

- Find OER in open repositories, Google, CC Search, and other platforms
- Evaluate how to reuse, revise, and remix the OER you find
- Demonstrate how different OER can be used together, paying attention to license compatibility.

Personal Reflection: What it Matters to You

Where do you currently find your learning resources? Do you seek open alternatives for materials you currently use? How do you evaluate your existing learning resources, and how can you apply those measures to openly licensed content? [\[2\]](#)

Once you identify the learning resources you currently use, ask yourself the following questions:

- Is this resource available to all of my learners at no cost?
- Can my learners and I keep a copy of this resource forever?
- Does my class have the legal rights to fix errors, update old or inaccurate content, improve the work, and share it with other educators around the world?
- Can my learners contribute to and improve our learning resources as part of their course work?

If the answer to these questions is “No,” you’re likely using learning resources that don’t provide the legal permissions you and your learners need to do what you want to do. Conversely, if you answered “Yes” to all of the questions, you are likely using OER.

ACQUIRING ESSENTIAL KNOWLEDGE

Finding Resources

Not everything on the internet is OER, and some works labeled as “open” may not have the legal permissions to exercise the 5Rs. So how do you recognize OER and how do you choose which OER will work best in your class? Remember that for a resource to be an OER it has to be available to everyone at no cost and be in the public domain or under an open license.

Finding the resources you want to use is the first step to bringing OER into your classroom. Discovery is one of the primary barriers to educators using OER. Fortunately, there are many established ways to search for OER.

First, for a short introduction on how to find OER, watch this video: How can I find OER? https://www.youtube.com/embed/NJRlaQkiWKw?si=3VK3czyycj_jEy2D. If you want to know more about most popular general options for searching for OER, you might consider reading through this [Open Washington course module](#).

OER REPOSITORIES AND SEARCH TOOLS

There are many websites that host large collections of OER (e.g., [Wikimedia Commons](#)), but some universities host their own OER repositories and services. A good first step is to do a general OER search using [Google Advanced Search](#) and filter your results by “Usage Rights” (pull-down menu at the bottom of the screen). See [Google’s post](#) on how to use the tool effectively. There are also hundreds of online platforms on which you can share your openly licensed content. [Creative Commons maintains a directory](#) of some of the most popular OER platforms used by educators organized by content type (photos, video, audio, textbooks, courses, etc.), and

here are a handful of largest, most often used OER search tools and repositories:

- [OER Commons](#)
- [OASIS Metafinder](#)
- [Open Textbook Library](#)

Try searching several different platforms and meta-search tools to find the greatest number of results to choose from.

LISTSERVS AND GOOGLE GROUPS

Open educators often ask each other for help when looking for OER on email listservs and Google Groups. Here are a few you might want to join:

- [SPARC LibOER](#)
- [Community College Consortium for Open Educational Resources \(CCCOER\) Google Group](#)
- [Creative Commons Open Education Platform Mailing List](#)
- [Iowa OER Google Group](#)

Openly Licensed Images

As you begin to use and create OER, remember that the images you use should be free and openly licensed, as well. Here are some sources you might consider for openly licensed images:

- [Creative Commons CC Search](#)
- [Library of Congress Flickr Account](#)
- [The Met Collection](#)
- [Unsplash](#)

- [The Noun Project](#)
- [Nappy: Beautifully Diverse Stock Photos](#)

Evaluating Sources

Just like any other teaching resources, you need to carefully evaluate the OER you plan on using in your teaching. Educators who are new to OER may have concerns about quality because OER are available for free and may have been remixed by other educators. The process of using and evaluating OER is not that different from evaluating traditional all-rights-reserved copyright resources. Whether education materials are openly licensed or closed, you are the best judge of quality because you know what your learners need and what your curriculum demands.

Subject specialists (educators and librarians) assess the quality and suitability of learning resources, often along the following criteria [3]:

Comprehensiveness	Does it look like it covers the topic thoroughly and completely?
Accuracy	Do you notice any errors or inaccuracies?
Relevance	Does it fit your objectives?
Longevity	Will this resource remain relevant for a sufficient period of time?
Clarity	Will it be readable and easy to understand for your students?
Consistency	Does the OER have a unified style, perspective, and content?
Modularity	Can you easily change the order of chapters or sections, or delete sections entirely, and still have the work make sense?
Organization/ Structure/ Flow	Is the OER organized well into sections, headings, and chapters? Does the structure assist with accessibility? Does the content follow a logical progression?
Interface	How easy is the resource to use and navigate?
Grammatical Errors	Does the work seem like it was proofread?
Cultural Relevance	Who is this work speaking to? Who is it leaving out?

And be careful not to let anyone tell you OER are “low quality”

because they are free. As the [SPARC OER Mythbusting Guide](#) points out:

- In this increasingly digital and internet-connected world, the old adage of “you get what you pay for” is growing outdated. New models are developing across all aspects of society that dramatically reduce or eliminate costs to users, and this kind of innovation has spread to education resources.
- OER publishers have worked to ensure the quality of their resources. Many open textbooks are created within rigorous editorial and peer-review guidelines, and many OER repositories allow faculty to review (and see others’ reviews of) the material. There is also a growing body of evidence that demonstrates that OER can be both free of cost and high quality—and more importantly, support positive student learning outcomes.

Also, be careful not to get pulled into a debate about “high or low quality education resources,” when what educators should really be concerned about is “effectiveness.” Read these two posts from David Wiley: [Stop Saying “High Quality”](#) and [No, Really – Stop Saying “High Quality.”](#)

Remixing and Adapting Resources

Openly licensing learning materials enables educators to use the materials more effectively, which can lead to better learning and student outcomes. OER can be remixed and adapted, updated, tailored, and improved locally to fit the needs of learners by translating the OER into a local language, adapting a biology open textbook to align it with local science standards, or modifying an OER simulation to make it accessible for a student who cannot hear.

The ideas of remix and adaptation are fundamental to education. Creative reuse of materials created by other educators and authors is about more than just seeking inspiration; we copy, adapt, and combine different materials to craft education resources for our learners.



Photo by José Carlos Cortizo Pérez. CC BY 2.0

Incorporating materials created by others and combining materials from different sources can be tricky, not only from a pedagogical perspective, but also from a copyright perspective.

Online digital education resources have different legal permissions that empower (or not) the public to use, remix and share those resources. Here are a few of those legal categories:

- [Public domain](#) works (not restricted by [copyright](#)) can be remixed with any work. For example, anyone can remix the [Adventures of Huckleberry Finn](#) by Mark Twain with [Alice's Adventures in Wonderland](#) by Lewis Carroll.

- All-rights-reserved copyrighted works, available for free online, which you can only use under the project terms of service, or using an exception or limitation to copyright, such as fair use or fair dealing. For example, many MOOCs allow free reuse of their content, but do not allow copying, revise, remix, or redistribution.
- All-rights-reserved copyrighted works in closed formats do not allow the public to remix or adapt a work. For example, a blockbuster movie available only in streaming service that you cannot use or even link to.
- [Creative Commons](#) licensed works (and other free licenses) that have various permissions and restrictions. For example, Wikipedia (BY-SA) allows you to reuse their content for commercial purposes, while WikiHow (BY-NC-SA) does not. A Wikipedia article cannot be remixed with a WikiHow article.

If you want to know which CC licensed works can be remixed with other CC licensed works, check out the [CC Remix Chart](#) below. Where there is a green check at the intersection of two CC licensed works, you can remix those two works. Where you see a black X, you cannot remix those two CC licensed works.



CC License Compatibility Chart / CC BY 4.

FINAL REMARKS

We live in a world of information abundance, and an increasing percentage of our digital knowledge is openly licensed. Finding the right open resources that fit the needs of your learning spaces and your learners can be a challenge. One of the major motivations for using OER is the ability to revise, remix, and share these works to best suit the needs of your learners. Search engines, OER repositories and platform services with built-in tools for using Creative Commons licenses help, but finding the right OER still takes time.

Attribution:

1. The Creative Commons' [CC Certificate Resources](#), Chapter 5: Creative Commons For Educators, published

under a Creative Commons [Attribution 4.0 International License](#).⁴

2. [This worksheet](#) from University of Iowa's [OpenHawks program](#) can help with evaluating the OER you find.
3. Open Textbooks Review Criteria from the Open Textbook Network:
<https://open.umn.edu/opentextbooks/reviews/rubric>
4. [Getting Started with Open Educational Resources](#) by Mahrya Burnett, Jenay Solomon, Heather Healy is licensed under a [Creative Commons Attribution 4.0 International License](#), except where otherwise noted.

Chapter 5: Technology in Planning

- Technology Integration Models
- Use of Artificial Intelligence in Lesson Planning
- Selection of Educational Technology

Technology Integration Models

Technology integration models are theoretical models designed to help teachers, researchers, and others in the education field think about technology integration in meaningful ways.

Different groups use many technology integration models. Some models are very popular, while only very small groups of people use others

Some are very similar to one another, while others are very unique. Rather than provide an exhausting description of each

technology integration model, we will briefly overview a few that we believe to be most widely used or valuable to help you begin thinking about technology integration in your classroom. The models we will explore will include the following: TPACK, RAT, SAMR, and PIC-RAT.

TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE(TPACK)

TPACK is the most commonly used technology integration model among educational researchers. The goal of TPACK is to provide educators with a useful framework for understanding technology's role in the educational process. At its heart, TPACK holds that educators deal with three types of core knowledge on a daily basis: content knowledge, pedagogical knowledge, and technological knowledge. Content knowledge is knowledge of one's content area, such as science, math, or social studies. Pedagogical knowledge is knowledge of how to teach.

Technological knowledge is knowledge of how to use technology tools.

These core knowledge domains, however, interact with and build on each other in important and complicated ways. For instance, if you are going to teach kindergarten mathematics, you must understand both mathematics (i.e., content knowledge) and how to teach (i.e., pedagogical knowledge), but you must also understand the relationship between pedagogy and the content area. That is, you must understand how to teach mathematics, which is very different from teaching other subject areas because the pedagogical strategies you use to teach mathematics will be specific to that content domain. When we merge content knowledge and pedagogical knowledge together, a hybrid domain emerges called pedagogical content knowledge. Pedagogical content knowledge includes knowledge about content and

pedagogy, but it also includes the specific knowledge necessary to teach the specified content in a meaningful way.

Video: What is the TPACK Model



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=295#oembed-1>

Source: https://www.youtube.com/embed/yMQiHJsePOM?si=ixl0Kujx_AYxZEol

TPACK goes on to explain that when we try to integrate technology into a classroom setting, we are not merely using technological knowledge, but rather, we are merging technological knowledge with pedagogical content knowledge to produce something new. TPACK, or technological pedagogical content knowledge, is the domain of knowledge wherein technology, pedagogy, and content meet to create a meaningful learning experience. From this, educators need to recognize that merely using technology in a classroom is not sufficient to produce truly meaningful technology integration. Rather, teachers must understand how technology, pedagogy, and content knowledge interact with one another to produce a learning experience that is meaningful for students in specific situations.

REPLACEMENT, AMPLIFICATION, AND TRANSFORMATION(RAT) & SUBSTITUTION, AUGMENTATION, MODIFICATION, AND REDEFINITION(SAMR)

RAT and SAMR (are very similar technology integration models, though RAT has been used more often by researchers and SAMR has been used more often by teachers. Both of these models assume that the introduction of technology into a learning experience will have some effect on what is happening, and they try to help us understand what this effect is and how we should be using technology in meaningful ways.

RAT is an acronym for replace, amplify, and transform, and the model holds that when technology is used in a teaching setting, technology is used either to replace a traditional approach to teaching (without any discernible difference in student outcomes), to amplify the learning that was occurring, or to transform learning in ways that were not possible without the technology (Hughes et al. , 2006). Similarly, SAMR is an acronym for substitution, augmentation, modification, and redefinition (Puentedura, 2003). To compare it to RAT, substitution and replacement both deal with technology use that merely substitutes or replaces previous use with no functional improvement in efficiency. Redefinition and transformation both deal with technology use that empowers teachers and students to learn in new, previously impossible ways.

Video: PICRAT Matrix Lesson



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=295#oembed-2>

Source: https://youtu.be/o-PI_gJQFel?si=QyJJRvfCho-nZBKg

The difference between these two models rests in the center letters, wherein RAT's amplification is separated into two levels: SAMR's augmentation and modification. All of these levels deal with technology use that functionally improves what is happening in the classroom, but in the SAMR model, augmentation represents a small improvement, and modification represents a large improvement.

Both of these models are helpful for leading educators to consider the question: What effect is using the technology having on my practice? If the technology is merely replacing or substituting previous practice, then it is a less meaningful use of technology, whereas technology use that transforms or redefines classroom practice is considered to be more valuable.

PASSIVE INTERACTIVE CREATIVE (PIC): PIC-RAT

Building off of the ideas presented in the models above, we will now provide one final model that may serve as a helpful starting point for teachers to begin thinking about technology integration. PIC-RAT assumes that there are two foundational questions that teachers must ask about any technology use in their classrooms:

1. What is the students' relationship to the technology? (PIC: Passive, Interactive, Creative)

2. How does the teacher's use of technology influence traditional practice? (RAT: Replace, Amplify, Transform; cf. Hughes, Thomas, & Scharber, 2006)

The provided illustration maps these two questions on a two-dimensional grid, and by answering these two questions, teachers can get a sense of where any particular practice falls.

For instance, if a history teacher shifts from writing class notes on a chalkboard to providing these notes in a PowerPoint presentation, this would likely be categorized in the bottom-left (PR) section of the grid because the teacher is using the technology to merely replace a traditional practice, and the students are passively taking notes on what they see. In contrast, if an English teacher guides students in developing a creative writing blog, which they use to elicit feedback from peers, parents, and the online community on their short stories, this would likely be categorized in the top-right (CT) section, because the teacher is using the technology to transform the practice to do something that would have been impossible without the technology, and the students are using the technology as a tool for creation.

Experience has shown that as teachers begin using technologies in their classrooms, they will typically begin doing so in a manner that falls closer to the bottom-left of the grid. However, many of the most exciting and valuable uses of technology for teaching rest firmly in the top-most and right-most sections of this grid. For this reason, teachers need to be encouraged to evolve their practice to continually move from the bottom-left (PR) to the top-right (CT) of the grid.

Source: <https://edtechbooks.org/encyclopedia/picrat>

Further Resource: Video: PICRAT for Effective Technology Integration in Teaching

<https://youtu.be/bfVuG620Bto?si=iwI2Y6LbPhilwTja>

For more information on the PIC-RAT model, please view [this video](#), scripted by Dr. Kimmons and Dr. Richard E. West of Brigham Young University.

Source:

- YouTube: <https://www.youtube.com/watch?v=yMQiHJsePOM>

- Youtube: <https://www.youtube.com/watch?v=bfvuG620Bto>

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USE OF ARTIFICIAL INTELLIGENCE IN LESSON PLANNING

How can Artificial Intelligence (AI)

AI tools help produce engaging lesson plans and class meeting activities?

This chapter explores:

- how to prompt an AI tool to produce a draft lesson plan, and how to adapt it for classroom use;
- how to use AI tools to brainstorm classroom activities.

DRAFTING LESSON PLANS

The first steps in any writing task can be the most difficult and time-consuming. AI tools can write a first draft of a lesson plan, which can be made classroom-ready through a combination of reprompting and human editing. Here is an example of a prompt for generating a lesson plan first draft:

A screenshot of interaction with ChaptGPT

2. Scientific Principles of Climate Change (1 Hour)**PROMPTING
CHATGPT TO PRODUCE A DRAFT LESSON PLAN**

One RRC Polytech communication instructor, who used ChatGPT to generate a first-draft lesson plan about asking for clarification in a culinary workplace, found that the tool was useful for generating ideas and structure, but significant reworking was needed to make it useable for class. [\[1\]](#)

Carefully editing and refining AI output is critical to ensure that the lesson plans produced are as good or better than the instructor could create without the use of AI tools.

Consider [ChatGPT's response](#) to the prompt in the text box above. Some instructors may wish to start the class with an intro activity that raises student interest, turn the interactive lecture into a facilitated discovery activity, or have the guest speaker visit prior to the application activities. One or two rounds of reprompting followed by the instructor's own revisions could turn that initial output into a usable lesson plan.

For those who plan to use an AI tool to produce multiple lesson plans, adding [custom instructions](#) could save time. One example of custom instructions might be “Every time I ask for a lesson plan, make sure that each hour of class time has a ten-minute break, no portion of an activity is longer than twenty minutes, and facilitative teaching and active learning strategies are employed whenever possible.” Uploading one or more previous lesson plans with a prompt could also improve the quality of the AI tool’s initial output. For more about reprompting, custom instructions, and adapting AI outputs, please see the [Writing and Refining Prompts](#) chapter.

In addition to speeding up lesson planning, AI tools can make lesson plans more effective. One RRC Polytech instructor found that it improved their scaffolding by ensuring that they didn’t overlook important foundational skills that students would need to complete a task. [2]

When provided with information about what has already been covered in the course, AI tools can remind instructors to integrate review of previously taught concepts into lesson plans and make recommendations about how to draw connections between different course topics. [3]

AI tools can also provide suggestions for integrating multiple literacies into a lesson, such as incorporating digital or cultural literacy alongside a core topic, [4] and can be prompted to check or adapt a lesson plan according to a chosen framework or set of principles, such as [Universal Design for Learning](#). AI tools can also review and critique an existing lesson plan, in general, or according to chosen criteria such as accessibility, active learning, or connection to course learning outcomes.

PRODUCING CLASSROOM ACTIVITIES

Once a lesson plan has been established, AI tools are able to brainstorm ideas for interactive classroom activities, accepting

input about topic, audience, style, and other requirements. One RRC Polytech instructor teaching in an education-related program reported that AI tools allowed them to brainstorm activities in new formats when they had been using the same kinds of activities over and over. [\[5\]](#)

See the following screenshot for an example of how to prompt an AI tool to generate classroom activity ideas.

Click the image to read the full conversation (ChatGPT login required).

1. **Vertical Non-Permanent Surfaces (VNPS) Problem Solving:** Utilize the whiteboards on the three

Prompting ChatGPT for classroom activity ideas.

The above prompt generated eight suggestions, some of which could be directly usable or adaptable for the classroom. Once an activity is refined, AI tools can be prompted to produce a set of instructions for students or instructions that a substitute instructor could follow.

When planning activities, the most commonly reported use of AI tools among RRC Polytech staff is creating or adapting a diverse set of examples, questions, or case study scenarios. The following section outlines more information about these topics.

Generating Examples

Mollick and Mollick note that providing students with a diverse range of examples leads to increased comprehension and recall, critical thinking, and ability to apply new information. They suggest weaving examples into lectures, practice questions, and course materials. [\[6\]](#)

When teaching the same course in different programs, RRC Polytech communication instructor Jacob Carewick has used AI tools to rework an existing set of examples for a new context, noting that AI tools can incorporate jargon and workplace issues from specific industries. [\[7\]](#)

Library and Academic Services Reference Technician Rosemary Woodby reported using AI tools to generate sample project topics for a research-related presentation to a civil engineering geomatics class. [\[8\]](#)

In addition to generating examples that make activities, lessons, and courses more relevant and engaging, AI tools can help vary a set of examples. This could include asking an AI tool to provide examples from varied perspectives, such as different organizational roles, generations, or backgrounds, [\[9\]](#) or to provide counterpoints.

[\[10\]](#)

Due to bias in AI tools' training data, AI output must be carefully reviewed to ensure that attempts to diversify content don't perpetuate offensive stereotypes. The following screenshot shows one way to prompt an AI tool for a list of examples. Click the image for ChatGPT's response (login required).

3. She is interested **in learning** new skills for career advancement.

An ESL instructor prompting ChatGPT for examples

GENERATING QUESTIONS

AI tools can produce a large number of questions appropriate to a topic and level of knowledge. These might be questions for discussion, a review quiz, or in-class practice activities and can be based on an AI tool's existing information, a web search, or a supplied document. For example, Jacob Carewick and other RRC Polytech instructors have used ChatGPT while preparing for mock job interview activities to produce technical questions outside their areas of expertise. [\[11\]](#)

See the following image for an example of how to prompt an AI tool to produce a set of questions. [\[12\]](#)

Click the image for a ChatGPT's full response and user reprompting to increase the level of difficulty (login required).

d. Overhydration

Prompting ChatGPT to generate practice questions.

Generating Case Studies

AI prompts can also be the starting point for a range of case studies and scenarios. One RRC Polytech instructor has used ChatGPT to brainstorm ideas for communicative scenarios related to culinary employment and has found them to be more closely connected to the cultural and social context of students' future workplaces than scenarios they had drafted on their own. They engaged students in the process of revising the scenarios, increasing both the utility and relevance of the scenarios and students' understanding of refining AI tool outputs. [13]

AI tools can create a list of potential scenarios or case studies based on a simple prompt. Including a few sample scenarios that have already worked in a course could improve the tool's first output. Once an AI tool has generated a list of scenarios, one technique for follow-up prompting is to indicate which ones from the list

work best and why. Also, be sure to ask for more scenarios that are along the same lines. The following image shows a sample prompt for generating case study scenarios. [\[14\]](#)

Click the image to view the full interaction with ChatGPT, including follow-up prompts (login required).

playtime.

Prompting ChatGPT to generate case study scenarios.

Key Takeaways

- AI tools can produce first drafts of lesson plans that can be adapted for use in class.
- AI tools can generate ideas and instructions for classroom activities.
- AI tools are useful for brainstorming examples, questions, and case studies.

Exercises

- Consider the lesson plan generated by ChatGPT earlier in this chapter. What changes need to be made to the lesson

plan before delivering it? Would reprompting be an efficient way to refine the lesson plan, or should the instructor edit it themselves?

- Experiment with prompting an AI tool to generate case studies, examples, questions, and classroom activities related to your area of instruction. How would you rate the AI tool's output? What prompting techniques yield the best results?

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LEARNING WITH DIGITAL TOOLS

In this chapter, we will look at the use of technology in K-12 schools. The main takeaway from this chapter should be: “Learning First, Tech Second”.

Much of the content is derived from a massive open online course (MOOC), LEADED501x Leading Ambitious Teaching and Learning, from the University of Michigan, School of Education, Ann Arbor, Michigan.

The technology integration section of the MOOC, Learning with Digital Technology Tools, is presented by Liz Kolb, Clinical Assistant Professor, University of Michigan, School of Education.

Included will be videos and abbreviated versions of the video transcripts. In this first section, we will look at some basic guidelines for using technology for learning.

Watch the video lecture (19:48 minutes): What is Ambitious Learning Through Technology Tools?https://www.youtube.com/embed/NfalVfdT640?si=aRKyfbOSxsNFt_yV



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=295#oembed-3>

Source: LEADed501x Leading Ambitious Teaching & Learning. (2016, Nov. 14). MCHLATLX2016-V001500. [Video File]. Retrieved from <https://youtu.be/NfalVfdT640>

Technology integration is driven by good teaching practices and not fancy tools

There's almost this assumption that technology magically creates these amazing learning gains in the classrooms and new cognition. That does not happen. Instead, often we will see classrooms where students are all over the classroom when they have their laptop or their tablet. They look like they're engaged because they're excited about having it. But we have to be careful that they're actually learning through the technology.

We tend to make the mistake of giving children a one-to-one device, thinking one-to-one is the ultimate solution for learning, and then step away and assume that the technology, the app, or the software will do the rest of the work for us.

We need to bring in those good, effective teaching methods and strategies. When we look at effective literacy learning strategies, none of them say, just give a child a book, and they will learn to read. So, we shouldn't assume, just give a child a tablet or a mobile device, and suddenly, they're going to learn through it. We need to integrate effective practices.

Added Value

Technology should be the last piece of the instructional sequence. It should be something that is going to add value to those good literacy or good mathematical instructional practices rather than just something that's exciting and fun.

It's important to ensure that math is connected to students' everyday understanding and their world. That doesn't mean a story problem where it talks about apples or bicycles, which are relevant to the children. It means connecting their everyday life, what they see and do around them, to mathematical strategies and understanding. Notice many of these effective strategies have to do with collaboration, authenticity, collaboration, and inquiry. Using some of those higher-order thinking skills, or higher-cognitive thinking skills, are important in learning. These are the things we want to bring into technology learning.

When we look at the research over the last couple of decades, the research does not say we should be isolating students. They should not be using a bunch of what we call drill and practice software which is where they do a lot of multiple choice type questions. Instead, we need to do what we do in mathematics. We need to ask students to inquire, to analyze, to synthesize, to hypothesize.

It's not so important that they're just consuming content and answering questions really quickly or swiping to get to the game, which sometimes has negative learning gains. Instead, it's important that we are adding value to the learning.

Key Takeaways:

Research on Effective Tech Use in Learning

- Elicit higher-order thinking around content over consumption of content. (Wenglinsky, 2006)
- Quality over quantity (Wenglinsky, 2006)
- Avoid "drill and practice" in isolation. (Wenglinsky, 1998)
- "Value-added" element to the learning (Means et al. 2009)

We've learned that we need to avoid drill and practice software

despite the hundreds of thousands of pieces of educational software that are drill and practice. Because those rarely have learning gains, and often, they are negative learning gains. In addition to that, it's quality over quantity.

What we've learned is that children who use technology every day have no better, and sometimes worse, learning outcomes as far as their standardized test scores and other assessments than children who use technology less frequently but with higher quality applications that reach those higher-order thinking skills. These are important things that we need to consider.

We must focus on the time-on-task, and learning goals must come first. We need to make sure that the software is meeting those needs and not distracting from those needs.

Key Takeaways:**Research on Effective Tech Use in Learning**

- Focus on learning goals (Linnenbrink & Printrich, 2003)
- Time-on-task active engagement (Wartella, 2015)
- Co-use or joint media engagement (Darling-Hammond, et al, Hirsh-Pasek et al., 2015, Guernsey, 2012)
- Connect learning to authentic experiences (Vaala et al., 2015; Guernsey, 2012; Wartella, 2015)

So much software has many bells and whistles, and as I mentioned, games and exciting features for the students. But often, they don't meet the learner's needs when it comes to what we want them to comprehend and understand.

A huge part of using technology comes down to a big piece of literacy learning practices, which is this idea of co-use or joint media engagement. Students should be working together, rather than isolated in a corner. Co-use could also be a parent to a child, and it could be a teacher to a child. It doesn't have to be a child to a child.

Technology should bridge the school experience with everyday life and the world around the student.

Technology should bridge students' school experiences with their everyday lives, the world around them, and the things that they're hearing on the news. Technology should connect students and teachers to experts and the real world through meaningful ways.

When we're using technology, it's important for the teacher to say, this is why we're using this app or software. It is also important to ask children to work collaboratively.

We know learning is social. When using technology for learning in any content area, students should be co-using the device. They should be working together. They should collaborate rather than work in isolation. Read-alouds and think-alouds are great ways to show that students are understanding.

To make their thinking a little more visible, students using technology devices can participate in what we call share-alouds, where they share what they're doing at different moments with other students with teachers in a written format.

Children need to have their learning monitored. Monitored comprehension means the teachers should be checking in and monitoring with the devices. They should be sitting down with the children periodically if they're in a one-to-one classroom rather than assuming that the software is doing the work and is doing it correctly.

Children need to be reflecting, questioning, retelling, and predicting as they work; these are things that students can be doing through the software. Again, eliciting some of these higher-order thinking skills means making sure the software isn't drill-and-practice but is actually software that allows this creativity in unique and innovative ways.

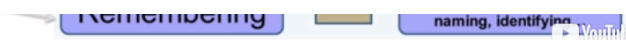
Modeling and Guided Practice

Finally, the idea of guided practice. Teachers should be showing

students how to use the software. They can do the, I do, we do, you do, format. When they're doing that, and not just modeling how to navigate the software, but in particular, how to think as they're navigating the software.

Ensure you are teaching students how to think about cognition and learning as they navigate the software.

What do we mean by eliciting higher-order thinking skills?



Screenshot from the video lecture: <https://www.youtube.com/watch?v=NfalVfdT640>

We want to make sure that the learning through technology is happening in the higher processing areas. One of the things that we've learned from the research over the past couple of decades is that when learning happens in drill-and-practice programs, we just don't see learning gains and effective outcomes.

The more students use the drill and practice programs, the less effective the learning outcomes. We really want to look for software that elicits those higher processing skills.

Key Takeaways:

- We know that technology should engage learners.
- We know that technology should enhance learning. It

should add value to it.

- We know that technology should be extending learning beyond the classroom in unique ways.

Technology Should (Triple E)

Engage Learning	Enhance Learning	Extend Learning
• Time-on-task learning • Focus on learning goals • Co-use and Co-Engagement • Social • Less distractions	• Value added to learning • Scaffolds and supports • Could not do with Traditional Tools • Personalized • Differentiation of learning	• Bridge School Learning and Everyday Lives • Help Students Make Sense of the World TODAY • Connecting Existing Knowledge with new Knowledge

Technology Should (Triple E)

WHAT IS ENGAGED LEARNING WITH TECHNOLOGY TOOLS?

Well, it’s really important that the focus is on the learning goals, this idea of time-on-task, and that the technology is not distracting from the learning goals, which it can easily do and a lot of software does.

The software is really motivating the students with different types of scaffolds to get them interested and invested in the learning goals.

One of the most important pieces is the idea of having an active learner. They’re not passive and just consuming knowledge. But, they’re productive, that they’re innovative, inquiring, hypothesizing, and using those higher-order thinking skills. They are not doing it isolated, rather, they’re doing it in a very collaborative way through co-use and co-construction.

When we look at time-on-task, we know that technology should be helping students focus on their learning goals. It should allow opportunities for students to learn with fewer distractions.

Co-use and joint engagement compared to individual use. When considering co-use, we want students to build a collaborative and shared understanding around content. They should be working together.

If you have a one-to-one classroom, I highly recommend that you take away a few devices occasionally and make it one-to-two or one-to-three so that students can collaborate and work together because it's much more difficult to build a shared understanding when they're isolated with their devices.

Another benefit of co-use is there's just more opportunity to inquire and co-analyze and just kind of check for understanding together. Again, when it's individual use, we just don't see those opportunities arise as much because all the students are working on their own isolated pieces of software.

Reflections

- Do you notice co-use or joint engagement in different ways? Either students are working collaboratively with devices, or they're choosing apps and software that are collaborative for students so they can work on it together.
- How are the teachers monitoring and checking in with the students?
- Are they modeling how to navigate the tool and comprehend the content with the tool?

WHAT IS ENHANCED LEARNING WITH TECHNOLOGY TOOLS?

Watch the video lecture (3:20 minutes): Leading Ambitious Teaching & Learning



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=295#oembed-4>

<https://www.youtube.com/embed/5pLhfoybeUI?si=VQbTtu5fyUWHxjzE>

Source: LEADed501x Leading Ambitious Teaching & Learning. (2016, Nov. 14). MCHLATLX2016-V001300. [Video File]. Retrieved from <https://youtu.be/5pLhfoybeUI>

Now that we've had a chance to look at what engaged learning with technology tools is all about, let's look at the characteristics of an enhanced learner using technologies. Often, the words engaged and enhanced get thrown about together, but they're very different when it comes to technology tools. There are three different things we want to be looking for in enhanced learners.

Technology should add value to the learning goals

First, we want to look for this idea that there's a value-added. We should see evidence that students are able to develop a more sophisticated understanding of the content learning goals because of something that's happening with the technology.

Technology includes supports and scaffolds to help make learning more attainable (accessible)

Technology can often bring in scaffolds, or supports, for the students, whether it's feedback, whether it's a way to differentiate

instruction through leveled learning, that would help the student understand the learning goals better.

Do we need the technology?

If the task is something that we can easily do with traditional tools, then we don't need to use the technology. But if it's something that we can't do with traditional tools, then that's where the value-added is realized.

Technology absolutely should be something that integrates, supports, and scaffolds to help make learning more attainable. Making sure that there is this value-added is an important element we should be looking for.

A few examples of that would be differentiating learning and personalizing learning. Unfortunately, these two terms are often used synonymously, yet they have very different meanings.

When we're differentiating learning, we're looking at students who are learning at different learning levels. An example of differentiating learning would be software that allows students to read the same article or book based on their [Lexile level of reading](#). If a student is at a lower Lexile level, they can read the same article that another student is reading, but the text will look different, including it being formatted differently for them to meet their learning needs.

[Newsela](#) is an example of a program that provides multiple Lexile levels of the same news article.

Personalizing learning software is software that allows the teacher to actually create different activities for different learners based on their interests and the way that they like to learn. While the students are learning, the teacher can weigh in during the process of learning. Teachers can see what students are doing as they are working and can put comments, or even drawings, on the student's screens in real-time. Google Docs is an example of a program that can be used for personalized and collaborative learning. Google Docs allows teachers to create a value-added

element to the learning with a co-use application woven throughout it as well.

Reflections

- Reflect on your own experiences using technology in the classroom, and think about how the learning is enhanced or value is added to the learning process through the technology tools. Look for scaffolds and supports for the learning that's provided by the technology, and notice if there's any differentiation of instruction or personalization that's happening through the technology.

WHAT IS EXTENDED LEARNING WITH TECHNOLOGY TOOLS?

Now that we've looked at the characteristics of an enhanced learner and an engaged learner using technology tools, it's time to look at the characteristics of what an extended learner needs with technology tools. This is an exciting piece of learning with technology tools because it's something that was much more difficult to do prior to having access to digital technology in schools.

How can technology make learning authentic?

It allows students to look at the world around them in a different way, in a very unique way. For example, they can help solve real-world problems through technologies, tools, and the different strategies and methods they learn in school.

The things we tend to look for are the ways that technology can help students connect and create this bridge to their everyday lives.

Examples:

- Bring experts into the classroom virtually.
- Skype, Google Hangout, with pen pals from across the globe so students are able to learn new languages, and learn new cultural norms from other students.

- Livestream to connect with literacy experts, such as a favorite author.
- Social studies: students collaborating with others using Minecraft

Reflections

- If you would like to watch videos of teachers in the field talking about how they extend learning with technology, go to www.edx.org, search for “Leading Ambitious Teaching and Learning,” and enroll in the MOOC. Reflect on your own teaching with technology, and look for evidence that demonstrates extended learning.
- Does the technology help the learners connect classroom learning to their everyday lives?
- Is the technology helping to connect the prior knowledge and interest of the students in the classroom learning and then bridging that back to their everyday lives?

Triple E-Resources

Liz Kolb has developed Triple E Evaluation Rubrics to use when: Evaluating the connection between the technology in a lesson plan and the learning goals of the lesson.
<http://www.tripleeframework.com/triple-e-printable-rubric-for-lesson-evaluation.html>

Evaluating Apps and Websites for Learning Potential <http://www.tripleeframework.com/uploads/2/2/8/7/2287991/evaluateappstriplee.pdf>

Instructional Strategies to help meet the Triple E Framework.
<http://www.tripleeframework.com/instructional-strategies.html>

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Other Resources for Evaluating Technology

Kerry Gallagher (@KerryHawk02) and Ross Cooper (@RossCoops31)

posted a blog on EdSurge on April 21, 2016, "[Should I Download that App? A Ten-Question Checklist for Choosing Tools Worth Your- and Your Students'- Time](#)" They suggest asking yourself these ten questions before tapping GET, INSTALL or BUY. Please read the full article that includes their rationale behind each question.

1. What content do we want students to learn?
2. What skills will our students practice or refine when they use this app?
3. Will our students be consumers or creators when they use this app?
4. What are my students' needs, and can this app meet them?
5. Is there a better app that achieves the same purpose?
6. Is there a comparable/better app at a cheaper price?
7. Is there an app on your devices that already does the same thing?
8. Does the app promote our school and district "best practices"?
9. How will we inform everyone else?
10. Have we talked to the app creators?

Gallagher, K, and Cooper, R. (2016, April 21). Should I Download that App? A Ten-Question Checklist for Choosing Tools Worth Your- and Your Students'- Time. [Blog Post]. Retrieved from <https://www.edsurge.com/news/2016-04-20-should-i-download-that-app-a-ten-question-checklist-for-making-tools-worth-your-while>.

Course Technology Evaluation Tool

[Course Technology Evaluation Tool](#)-click on the link to access the evaluation tool.

Exercises

Exercise

- As an assignment, you will use the technology evaluation tool to evaluate an application/program that supports learning in the content area of mathematics.

You may have a new program at school, or you can borrow one from another teacher. Explore the program thoroughly. Deliberately make mistakes to see how the program will respond. Find out what kinds of software personalization options are available. Does the program teach the skill it claims to teach? How would you use this program in your classroom? Describe your overall experience with the tool. Would you recommend it to others? **Why or Why not?**

Source:

- MichiganX:LEADed501x Leading Ambitious Teaching and Learning. (2017). (an Open edX MOOC). Module 2: Ambitious Learning with Digital Tools (CC NY NC ND)

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SELECTION OF EDUCATIONAL TECHNOLOGY

- Selection of Educational Technology describes how preservice teachers can select technological tools and applications for various experiences and situations they may encounter as teachers.



We know that there is a problem when the devices we plan to use in our instruction are more outdated than the personal

devices that students carry with them daily. A problem educators face daily is keeping their lessons innovative and interesting. The average student has an attention span that ranges from five to twelve minutes (Dunneback & Therrell, 2015). The combination of advances in technology, along with the individual needs of each student, must be considered when designing and revamping lessons. The characteristics of the “millennial” student are significantly different than students from previous generations. Millennials can be described as students who were raised by “helicopter parents” who tended to hover, over-protect, and coddle. To successfully teach them, there must be revisions to pedagogies and tools (Russo, 2013).

There is much to consider when selecting educational technology. While some of the time, your district will choose a set of tools for you to use, there are also often opportunities for teachers to decide on their own which services will best meet your teaching philosophy. Most school districts have upgraded their school campuses to be

Wi-Fi enabled, along with having devices like Chromebooks and tablets available for students. Some schools have even received grant money for each student to have a device assigned to them individually.

Once devices have been selected for use, the security of information and student data is paramount. The student information system utilized by the school should already have security provisions in place. Firewalls and spam-blocking technology are something that individual teachers should not have to worry about. If your school/district has not upgraded its technology, then this would be your starting point. Determining the resources that will affect your ability to implement or embed technology into your plans must be considered.

Once technology devices have been selected, the next step would be to consider what type of learning system or application you would like to use. Considering what your goal or purpose is

important at this point. It is recommended that you start out small. Understanding your own ability levels and how you may access these tools effectively is what educators must be focused on. If the district has a grade book or LMS that they have mandated that everyone use, this would be the starting point. The emergence and increasing use of tablet technologies and applications are changing the work of teacher educators. This change calls for the need to have tools to guide educators in the direction that will aid their intentions (Cherner, Dix, & Lee, 2014).

THE IMPORTANCE OF CAREFUL SELECTION

Choosing the right tool also includes choosing software that respects student data privacy and takes sufficient security precautions to put parents and school officials at ease. The test provides personalized learning, coupled with the right software, which meets student needs. Relevant laws that protect student privacy are also vital in the selection process. This section addresses some of the primary concerns to consider when selecting educational technology.

LEGAL



We must select tools that adhere to the established legal requirements. According to the US Department of Education, the Family Educational Rights and Privacy Act (FERPA) is a federal

privacy law that “protects student data education records from infringement of unauthorized third-parties or users. The law applies to all schools who are eligible to receive funds from the U.S. Department of Education” (Family Educational Rights and Privacy Act (FERPA), 2015).

Written parental permission is essential to disclose any student educational information, but FERPA does allow school sites to release those records if school officials have a legitimate scholarly interest in the tools (Family Educational Rights and Privacy Act (FERPA), 2015). Such rights are then transferred to the student once they reach the age of 18 or enter a postsecondary institution. The Office of the Chief Privacy Officer (OCPO) is also responsible for implementing another law that strives to safeguard student and parental rights in education called the Protection of Pupil Rights Amendment (PPRA).

PRIVACY

Like school officials, teachers make cognizant choices regarding the privacy and security of the applications they use with students by collaborating with tech advocacy groups like The Common Sense Privacy Evaluation Initiative (What Is the Privacy Initiative?, n.d.). Over 100 schools and districts chose to participate in the initiative, creating a plan with the intention that pursues not only assessing educational technology tools but also working in partnership with K-12 educational software industry to streamline and regulate privacy and security policies (What Is the Privacy Initiative?, n.d.).

Similar to the private sector, the federal government is also moving to implement guidelines through an advisory center, the Privacy Technical Assistance Center (PTAC), managed by the Department of Education. This regulatory agency considers possible actions that a second or even third party may not consider because they figure the FERPA regulations may not apply. For instance, a third-party provider cannot use data from a FERPA-

protected source, like a school, for any purpose that was not shared initially (“Protecting Student Privacy | U.S. Department of Education,” n.d.). One example is Google’s product Classroom. Significant strides were made with the feedback it received from the teachers and administrators of Chicago Public Schools. The third largest school district in the nation they had privacy and security concerns that they were not willing to concede. The multibillion-dollar company had to adhere to the FERPA laws if it wanted to continue to do business with the K-12 education sector. The feedback proved to be invaluable in making products that meet the needs of a diverse group of students while protecting the sensitive data provided (Singer, 2017).

Because data records are distributed more widely than ever since the local district network is no longer used for software deployment. According to a recent study from Fordham University School of Law, it discovered that 95% of school districts relied on cloud services, but fewer than 25% of contracts specified the purpose for disclosing student data (Duane, n.d.).

PUFFERY

In advertising, puffery is when a commercial claim is exaggerated. The same thing can happen when educational technology companies make over-inflated promises about what is possible through the use of their tools. As an educator, do your due diligence in connecting the software tool with your objectives and not falling for false promises. It may seem like a daunting task, yet it can be exciting at the same time.

Legal issues, privacy concerns, and the potential for puffery are only some of the considerations we need to make when evaluating educational technology. Important questions to ask during the evaluative portion of your decision include:

1. Do the creators of educational software respect data

privacy?

2. How much information does the company need to allow the product to be used?
3. Has your district, or other districts, had experience with the product?
4. What reviews are available, and how were they rated in customer service?
5. Is the product open to teacher feedback? How likely and how often is the input implemented?

These questions can assist you as you consider which tool will best fit your needs. The time you invest will protect your students, as well as your own reputation as an educator. This next section provides additional advice for adopting new technology.

TOOL SELECTION

The accessibility of the technology tools and apps can be overwhelming for any teacher to choose from. Picking the right app or tool that your students can easily navigate while driving home your lesson objectives. When you are selecting a tool, take into consideration the following items:

Start Small

Trying to get a handle on too many technologies causes unnecessary stress. Learning a digital instrument takes time, and applying it as part of the lesson can take an hour to a couple of days. Knowing if it will work smoothly during the class session. You also must provide secure and specific directions that you go over, demonstrate and have availability all semester. Having clear instructions that you review, model, and have available all semester is helpful.

Focus on Your Goals

It can be tempting to get caught up in the list of features a technology tool provides and miss determining whether or not the educational goal will be met through its use. Choose a few tools at a time and try them out. Give them a test run to see which are the easiest to learn and use. Read the reviews to gauge whether they meet the basic needs of other customers and how likely the product will align with your lesson goals. This method leads to the actual picking of the best tools that will serve your needs. The more you try out the tools, the easier it gets because you will know what you want. Move on to another if the app no longer meets your demands.

Assess What You Have

Take stock of the technology available in your class and on your campus. Knowing the technology capabilities determines the app's capacity for usefulness. Also, you should find out what websites and apps your students used in the past. Be mindful of district firewalls, therefore, check ahead if the technology is capable.

CONSIDER THE IMPLICATIONS OF WHETHER OR NOT TO PAY

As a teacher, the excitement of a new tool and the possibilities of enhancing your lessons is overpowering. Getting clear on how you intend to pay for them is crucial. Questions to ask yourself include: are you willing to pay or go the free route? If you are ready to pay, who will be paying for the tool? What features are included in the tech, and how much of a difference does paying make? How does the company make its money and stay sustainable when it gives its tool away for free? Is there a potential for our students' data to be the produce that is being bought and sold?

Revise and Reflect

Review your goals and reflect on how well the tool has fulfilled your needs. How long and often is the app used? Do any problems arise while using the new tech? Remember, if it is not working well enough, you can pick another. Determine how it will be paid for – this reflection can reinforce the digital divide if we do not think carefully about who will bear the cost.

CONCLUSION

The selection of tools may seem like a difficult process at first glance. However, when you take into consideration the hype of the tool, privacy, and the legal ramifications you may have using a tool, take a deep breath,

start small, and determine whether the tool you are selecting will achieve the goals you have for using it in your classroom. By utilizing the steps of selecting tools discussed in this chapter, you will be trying the best tools for your classroom that are available. Also, you will more likely implement and keep the tools you select. Therefore,

take your time to go through the steps discussed in this chapter, and you will have plenty of powerful tools to utilize in your classroom.

Source

- Antoine, F. M, Porter, T.M., and Reye-Aceytuno, E., (2018). Igniting Your Teaching with Educational Technology :A Resource for New Teachers. Editors: Matt Rhoads & Bonni Stachowiak. Retrieved from <https://edd7032017f2.pressbooks.com/chapter/5/> (CC BY)
- A complete reference list of the original ebook Igniting

Your Teaching with Educational Technology: Resources for New Teachers can be viewed

at: <https://edd7032017f2.pressbooks.com/back-matter/references/>

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Chapter 6: Learning Goals and Objectives

- What is a Lesson Objective?
- Bloom's Taxonomy
- Learning Goals
- Writing Objectives

WHAT IS A LESSON OBJECTIVE?

Lesson Objective: The lesson objective states what students will know or be able to do at the end of the lesson. The strategies, materials, assignments, and assessments used in a lesson are determined by and must align with the lesson objective. Therefore, lesson planning begins with the end in mind.

Video: Creating Learning Objective Video

https://youtube.com/watch?v=_woMKwBxhwU%3Fsi%3DVUOKMpHPquBX07WV

Goals vs. Objectives

When planning lessons, GOALS describe the lesson's summative outcomes (where students will go), and the OBJECTIVES describe how students will get there.

Video: The Role of Learning Outcomes



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=301#oembed-1>

Source: https://youtu.be/YHbjhcmAYac?si=z1TX4aX_OLT03vuM

Include SMART attributes when writing objectives:

S-Specific: Concise, well-defined statements of what students will know, understand, and be able to do at the end of the lesson. The objective should state exactly what is to be accomplished by the student and the conditions in place, such as,

- Given a topic on American history,....
- Provided with a calculator and a three-minute time limit,...., or
- Independently, following the five-step scientific method,....

Learning outcomes should be simply stated in student-centered terms. If students are aware of the intended outcome, then they

know where their focus should lie. This clarity helps decrease anxiety about their ability to succeed and helps build intrinsic motivation.

M-Measurable: Learning objectives must be quantifiable. Measurable objectives state the outcomes that can be assessed in definite and specific ways, the quality or level of performance that will be considered acceptable (mastery level). The criterion can be expressed by describing the performance standard to be met. For example, Write a descriptive paragraph that includes a topic sentence, three supporting detail sentences, and a closing sentence.

It is easier if you start with behavioral verbs (action verbs) that can be observed (either informally or formally) and measured. Using concrete verbs will help keep your objectives clear and concise. Bloom's Taxonomy provides a list of such verbs, which are categorized according to the level of achievement at which students should be performing.

While the verbs above clearly distinguish the action that should be performed, there are verbs to avoid when writing a learning objective. The following verbs are too vague or difficult to measure: appreciate, cover, realize, be aware of, familiarize, study, become acquainted with, gain knowledge of, comprehend, know, learn, understand, learn.

A-Attainable: Learning objectives should be written at the appropriate developmental level for student success. It is essential that students have the pre-requisite knowledge and skills and that the lesson's time frame supports achieving the objective. You can determine the appropriate level of challenge by referring to pre-assessment results. Learning activities should be challenging yet offer students a realistic chance to master the objective.

R-Relevant: The skills or knowledge described must be appropriate for the grade level and subject area or an individual's IEP goals. The process of setting learning objectives begins with knowing the specific standards, the benchmarks, and the

supporting knowledge students in your school or district are required to learn. Common Core State Standards and curriculum documents are the source for this information. This is essential to ensure students receive the same important content from teacher to teacher.

T-Time-bound: Time-bound – State when students should be able to demonstrate the skill (“By the end of the lesson,...”, etc.).

SMART GOAL EXAMPLES

- After reading the book “Life in the Rainforest” and participating in a class discussion, students will accurately identify three specific similarities and three specific differences between plants and animals as demonstrated through written completion of a Venn diagram.
- At the conclusion of this lesson and following class discussion, students will accurately present, in writing or explanation with illustrations, three roles of local government and the responsibilities of each.
- After two lessons on digestion patterns, students will accurately identify, in writing, the digestive function of each area of the alimentary digestive system as demonstrated in a student-generated labeled diagram.

(Center for Educational Resources – John Hopkins University, The Innovative Instructor Blog-Marcia Hall, July 2016; Designing Lessons for the Diverse Classroom, Bureau of Instructional Support and Community Services, Division of Public Schools and Community Education, Florida Department of Education)

Additional examples:

- Following this 30-minute lesson, provided with 5 index

cards containing two-syllable nonsense words ending with the “consonant-le” syllable pattern, students will correctly read at least 4 of the 5 words without visually marking them.

- By the end of two lessons on bullying, students will correctly explain the difference between a bully and a friend. Students will have a choice of writing a short paragraph that includes a thesis statement and call to action or providing an oral presentation that includes a thesis statement and call to action.
- At the conclusion of this lesson on measuring volume, in which students will work in pairs to measure the volume of a cone, sphere, and cylinder, students will individually measure the volume of each correctly. Students will choose one object of each shape from various everyday objects, correctly identify each shape, and choose the correct formula for measuring and label each measurement accurately.
- By the end of this 40-minute lesson, after independently reading 5 provided complete sentences, students will use the ‘mountain’, underline, zigzag, and square symbols to label the initial capital letter, noun, verb, and ending punctuation in each sentence with 90% accuracy.

MEASURABLE OBJECTIVES IN LESSON PLAN

The lesson goal should be written as a SMART goal and clearly articulate what students should know and/or be able to do at the end of the lesson.

The best lesson objectives require that students utilize higher-order/deep thought processes. Goals that target learning (versus completion) are more likely to be connected to quality learning experiences that stretch students’ thinking, foster self-reflection,

and encourage skills transfer. Lesson objectives that are learning-oriented (EX: “Students will accurately describe four cause and effect relationships” vs “Students will accurately answer four of five comprehension questions”) focus on the actual skill that the lesson objective targets.

References:

- Youtube Video: <https://www.youtube.com/watch?v=YHbjhcmAYac>

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BLOOM’S TAXONOMY

Bloom’s Taxonomy is a classification system used to define and distinguish different levels of human cognition—i.e., thinking, learning, and understanding.

Educators have typically used Bloom’s taxonomy to inform or guide the development of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional methods such as questioning strategies (Bloom’s Taxonomy, 2014).

Caption: Photograph of Benjamin Bloom’ Image Source: <http://redie.uabc.mx/contenido/vol6no2/art-104-spa/bloom.png>

BIOGRAPHY

Benjamin Samuel Bloom, one of the greatest minds to influence the field of education, was born on February 21, 1913, in Lansford, Pennsylvania. As a young man, he was already an avid reader and curious researcher. Bloom received both a bachelor’s and master’s

degree from Pennsylvania State University in 1935. He went on to earn a doctorate's degree from the University of Chicago in 1942, where he acted as first a staff member of the Board of Examinations (1940-43), then a University Examiner (1943-59), as well as an instructor in the Department of Education, beginning in 1944. In 1970, Bloom was honored with becoming a Charles H. Swift Distinguished Professor at the University of Chicago.

Bloom's most recognized and highly regarded initial work spawned from his collaboration with his mentor and fellow examiner Ralph W. Tyler and became known as Bloom's Taxonomy. These ideas are highlighted in his third publication, *Taxonomy of Educational Objectives: Handbook I, The Cognitive Domain*. He later wrote a second handbook for the taxonomy in 1964, which focuses on the affective domain. Bloom's research in early childhood education, published in his 1964 *Stability and Change in Human Characteristics* sparked widespread interest in children and learning and eventually and directly led to the formation of the Head Start program in America. In all, Bloom wrote or collaborated on eighteen publications from 1948-1993.

Aside from his scholarly contributions to the field of education, Benjamin Bloom was an international activist and educational consultant. In 1957, he traveled to India to conduct workshops on evaluation, which led to great changes in the Indian educational system. He helped create the International Association for the Evaluation of Educational Achievement (IEA) and organized the International Seminar for Advanced Training in Curriculum Development. He developed the Measurement, Evaluation, and Statistical Analysis (MESA) program at the University of Chicago. He was chairman of both the research and development committees of the College Entrance Examination Board and the president of the American Educational Research Association.

INTRODUCTION

One of the basic questions facing educators has always been, “Where do we begin in seeking to improve human thinking?” (Houghton, 2004). Fortunately, we do not have to begin from scratch in searching for answers to this complicated question. The Communities Resolving Our Problems (CROP) recommends, “One place to begin is in defining the nature of thinking.

Before we can make it better, we need to know more of what it is” (Houghton, 2004). Benjamin S. Bloom extensively contemplated the nature of thinking, eventually authoring or co-authoring 18 books. According to a biography of Bloom, written by former student Elliot W Eisner, “It was clear that he was in love with the process of finding out, and finding out is what I think he did best. One of Bloom’s great talents was having a nose for what is significant” (2002).

Although it received little attention when first published, Bloom’s Taxonomy has since been translated into 22 languages and is one of the most widely applied and most often cited references in education. (Anderson & Sosniak, 1994, preface), (Houghton, 2004), (Krathwohl, 2002), (oz-TeacherNet, 2001). As of this writing, three other chapters in this e-book make reference to Bloom’s Taxonomy, yet another testament to its relevance.

HISTORY

In 1780, Abigail Adams stated, “Learning is not attained by chance; it must be sought for with ardor and attended to with diligence” (quotationspage.com, 2005).

- Learning, teaching, identifying educational goals, and thinking are all complicated concepts interwoven in an intricate web.

Bloom was arduous, diligent, and patient while seeking to

demystify these concepts and untangle this web. He made “the improvement of student learning” (Bloom 1971, Preface) the central focus of his life’s work.

Discussions during the 1948 Convention of the American Psychological Association led Bloom to spearhead a group of educators who eventually undertook the ambitious task of classifying educational goals and objectives. Their intent was to develop a method of classification for thinking behaviors that were believed to be important in the processes of learning. Eventually, this framework became a taxonomy of three domains:

- The Cognitive – the knowledge-based domain consisting of six levels,
- The Affective – the attitudinal-based domain consisting of five levels, and
- The Psychomotor – the skills-based domain consisting of six levels.

In 1956, eight years after the group first began, work on the cognitive domain was completed, and a handbook commonly referred to as “Bloom’s Taxonomy” was published. This chapter focuses its attention on the cognitive domain.

While Bloom pushed for the use of the term “taxonomy,” others in the group resisted because of the unfamiliarity of the term within educational circles.

Eventually, Bloom prevailed, forever linking his name and the term. The small volume intended for university examiners “has been transformed into a basic reference for all educators worldwide. Unexpectedly, it has been used by curriculum planners, administrators, researchers, and classroom teachers at all levels of education” (Anderson & Sosniak, 1994, p. 1). While it should be noted that other educational taxonomies and hierarchical systems have been developed, it is Bloom’s Taxonomy that remains, even after nearly fifty years, the *de facto* standard.

What is Bloom's Taxonomy?

Understanding that “taxonomy” and “classification” are synonymous helps dispel uneasiness with the term. Bloom's Taxonomy is a multi-tiered model of classifying thinking according to six cognitive levels of complexity. Throughout the years, the levels have often been depicted as a stairway, leading many teachers to encourage their students to climb to a higher (level of) thought.

The lowest three levels are knowledge, comprehension, and application. The highest three levels are analysis, synthesis, and evaluation. According to current research, “The taxonomy is hierarchical; [in that] each level is subsumed by the higher levels. In other words, a student functioning at the ‘application’ level has also mastered the material at the ‘knowledge’ and ‘comprehension’ levels.” (UW Teaching Academy, 2003). One can easily see how this arrangement led to natural divisions of lower and higher-level thinking.

Clearly, Bloom's Taxonomy has stood the test of time. Due to its long history and popularity, it has been condensed, expanded, and reinterpreted in various ways. Research findings have led to the discovery of a veritable smörgåsbord of interpretations and applications falling on a continuum ranging from tight overviews to expanded explanations. Nonetheless, one recent revision (designed by one of the co-editors of the original taxonomy along with a former Bloom student) merits particular attention.

Revised Bloom's Taxonomy (RBT)

During the 1990s, a former student of Bloom's, Lorin Anderson, led a new assembly that met for the purpose of updating the taxonomy, hoping to add relevance for 21st-century students and teachers. This time, “representatives of three groups [were present]: cognitive psychologists, curriculum theorists and

instructional researchers, and testing and assessment specialists” (Anderson & Krathwohl, 2001, p. xxviii).

Like the original group, they were also arduous and diligent in their pursuit of learning, spending six years to finalize their work. Published in 2001, the revision includes several seemingly minor yet actually quite significant changes. Several excellent sources are available that detail the revisions and reasons for the changes. A more concise summary appears here. The changes occur in three broad categories: terminology, structure, and emphasis.

Terminology changes

Changes in terminology between the two versions are perhaps the most obvious differences and can also cause the most confusion. Basically, Bloom’s six major categories were changed from noun to verb forms. Additionally, the lowest level of the original knowledge was renamed and became remembering. Finally, comprehension and synthesis were retitled to understanding and creating. In an effort to minimize the confusion, comparison images appear below.

Bloom’s table http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm

Exhibit 4: Terminology changes “The graphic represents the NEW verbiage associated with the long familiar Bloom’s Taxonomy. Note the change from Nouns to Verbs [e.g., Application to Applying] to describe the different levels of the taxonomy. Note that the top two levels are essentially exchanged from the Old to the New version.” (Schultz, 2005) (Evaluation moved from the top to Evaluating in the second from the top, Synthesis moved from second on top to the top as Creating.)

Source: http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm- link/resource is no longer accessible.

The new terms are defined as:

- Remembering: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
- Understanding: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- Applying: Carrying out or using a procedure through executing or implementing.
- Analyzing: Breaking material into constituent parts determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
- Evaluating: Making judgments based on criteria and standards through checking and critiquing.
- Creating: Combining elements to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

(Anderson & Krathwohl, 2001, pp. 67-68)

Structural changes

Structural changes seem dramatic initially, yet are quite logical when closely examined. Bloom's original cognitive taxonomy was a one-dimensional form. With the addition of products, the Revised Bloom's Taxonomy takes the form of a two-dimensional table.

One of the dimensions identifies The Knowledge Dimension (or the kind of knowledge to be learned), while the second identifies The Cognitive Process Dimension (or the process used to learn).

Each of the four Knowledge Dimension levels is subdivided into either three or four categories (e.g. Factual is divided into Factual, Knowledge of Terminology, and Knowledge of Specific Details and

Elements). The Cognitive Process Dimension levels are also subdivided by the number of sectors in each level, ranging from a low of three to a high of eight categories. For example, Remember is subdivided into the three categories of Remember, Recognizing, and Recalling, while the Understanding level is divided into eight separate categories.

The resulting grid, containing 19 subcategories, is most helpful to teachers in both writing objectives and aligning standards with curricula. The “Why” and “How” sections of this chapter further discuss the use of the Taxonomy Table and provide specific examples of applications.

Table 6.1. Bloom’s Taxonomy

Copyright (c) 2005 Extended Campus — Oregon State University

Bloom's Taxonomy (Revised)		
Create	Verb Change, combine, compare, compose, construct, create, design, devise, formulate, generate, hypothesize, imagine, improve, invent, plan, predict, propose	
Sample Question		
• Design a... to... • How would you improve...? • Formulate a theory for...		
Activities, Products, Outcomes:		
• Design a computer lab for your program • Invent a machine to		
Evaluating Making Judgments Based on Criteria	Verb	argue, appraise, assess, check, debate, decide, defend, determine, dispute, editorialize, judge, justify, prioritize, rate, recommend, select, support, verify

[Access the Revised Bloom's Taxonomy and Sample Questions:](#)

Verbs and Products/Outcomes Based on the Six Levels of Revised Bloom's Taxonomy

Adapted from <https://www.niu.edu/citl/resources/guides/instructional-guide/blooms-taxonomy.shtml>, "Bloom's Bakery, an Illustration of Bloom's Taxonomy" by Argiro, Forehand, Osteen, &

Taylor (2007), and Extending Children's Special Abilities: Strategies for Primary Classrooms by Dalton & Smith (1987, pp. 36-37)

Level of Thinking(Highest to Lowest)VerbsSample Question /
Statement StemsActivities, Products, Outcomes

Creating: Making Something New	change, combine, compare, compose, construct, create, design, devise, formulate, generate, hypothesize, imagine, improve, invent, plan, predict, propose	• Design a... to... • How would you improve...? • Formulate a theory for...? • Predict the outcome of...? • How would you test...? • How would you estimate the results for...? • If you had access to all resources, how would you deal with...? • What would happen if...? • How many ways can you...? • Develop a new proposal that would... • Create new and unusual uses for... • Construct a new model that would change...	• Design a computer lab for your program • Invent a machine to do a specific task • Imagine a new product and plan a marketing campaign • Design a cover image for a film • Formulate a hypothesis for... • Compose a musical score for ... • Devise a problem set for... • Plan a system of governance for a utopian society
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Evaluating: Making Judgments Based on Criteria	argue, appraise, assess, check, debate, decide, defend, determine, dispute, editorialize, judge, justify, prioritize, rate, recommend, select, support, verify	• What is your opinion of...? • How would you prove or disprove...? • Would it be better if...? • What would you recommend...? • How would you rate the...? • What would you cite to defend the actions...? • How could you determine...? • How would you prioritize...? • Based on what you know, how would you explain...? • What data were used to make the conclusion? • How would you compare the ideas ...? • How would you compare the people? • How would you justify...?	• Debate the merits of... • Write a letter to... defending your views on ... • Write an end-of-the-year report in which you appraise... • Recommend a solution to the problem of... • Justify a proposal for... • Select the most useful products for... • Prioritize spending for local government • Assess the credibility of sources
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Analyzing: Distinguishing Different Parts of a Whole	advertise, analyze, appraise, attribute, categorize, compare, contrast, differentiate, distinguish, examine, identify, infer, investigate, organize, outline, separate, sequence, test	• What are the parts or features of ...? • How is ____ related to ...? • What is the theme ...? • List the parts ... • What inferences can you make ...? • How would you classify ...? • How would you categorize ...? • What evidence can you find ...? • What is the relationship between ...? • What is the function of ...? • What motive is there ...? • Differentiate the distinct parts of ...	• Analyze data according to ... • Troubleshoot problems with lab equipment • Arrange a conference and sequence all necessary steps • Make an organizational chart of your unit or department (categorize) • Write an ad campaign for your organization (advertise) • Distinguish between ethical and unethical behavior
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Applying: Using Information in New Situations	classify, construct, complete, demonstrate, dramatize, examine, execute, illustrate, implement, practice, show, solve, use	• How would you use...? • What examples can you find to? • How would you solve ____ using what you've learned? • What approach would you use to...? • What would result if...? • What elements would you choose to change ...? • What questions would you ask in an interview with ...?	• Construct a marketing strategy for your organization • Develop a storyboard of digital images to demonstrate a process • Draw a flow chart that illustrates a system • Perform the scene • Practice the task • Use the tool to... • Graph the parabola
Understanding: Explaining Information and Concepts	calculate, compare, define, describe, discuss, distinguish, expand, explain, identify, interpret, locate, outline, predict, report, restate, translate	• How would you classify the type of...? • How would you compare or contrast...? • How would you rephrase the meaning of...? • What facts or ideas show...? • Which statements support...? • What can you say about...? • Which is the best answer to...? • How would you summarize...?	• Explain what you think is the main idea • Identify what you think are the most important supporting details • Restate the story in your own words • Compare the events leading up to the two wars • Interpret the artwork • Translate the passage into English • Calculate the solution using the appropriate formula

Remembering: Recalling or Recognizing Information	describe, duplicate, find, list, locate, name, recall, recognize, reproduce, state, tell, underline, write	• What is...? • Where is...? • How did ____ happen? • How would you describe...? • Who was...? • Who were the main...? • When did...? • Recall...	• List the main events • Write a timeline of events for... • Recite a poem • Locate the parts of ____ on a diagram • Underline all the adverbs • Define the scientific terms • Describe the Fourth Amendment Changes in emphasis
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Emphasis is the third and final category of changes. As noted earlier, Bloom himself recognized that the taxonomy was being “unexpectedly” used by countless groups and never considered an audience for the original publication. The revised version of the taxonomy is intended for a much broader audience. Emphasis is placed upon its use as a “more authentic tool for curriculum planning, instructional delivery, and assessment” (oz-TeacherNet, 2001).

Why use Bloom's Taxonomy?

As history has shown, this well-known, widely applied scheme filled a void and provided educators with one of the first systematic classifications of the processes of thinking and learning. The cumulative hierarchical framework consists of six categories, each requiring achievement of the prior skill or ability before the next, more complex, one, remains easy to understand. Out of necessity, teachers must measure their students' abilities. Accurately doing so requires classifying levels of intellectual behavior important in learning. Bloom's Taxonomy provided the measurement tool for thinking.

With the dramatic societal changes over the last five decades, the Revised Bloom's Taxonomy provides an even more powerful tool to

fit today's teachers' needs. The structure of the Revised Taxonomy Table matrix "provides a clear, concise visual representation" (Krathwohl, 2002) of the alignment between standards and educational goals, objectives, products, and activities.

- Today's teachers must make tough decisions about how to spend their classroom time. Clear alignment of educational objectives with local, state, and national standards is necessary.

Like pieces of a huge puzzle, everything must fit properly. The Revised Bloom's Taxonomy Table clarifies the fit of each lesson plan's purpose, "essential question," goal, or objective. The twenty-four-cell grid from Oregon State University that is shown above, along with the printable taxonomy table examples, can easily be used in conjunction with a chart. When used this way, the "Essential Question" or the lesson objective becomes clearly defined.

How can Bloom's Taxonomy be used?

A search of the World Wide Web will yield clear evidence that Bloom's Taxonomy has been applied to various situations. Current results include a broad spectrum of applications represented by articles and websites describing everything from corrosion training to medical preparation. In almost all circumstances, when an instructor desires to move a group of students through a learning process utilizing an organized framework, Bloom's Taxonomy can prove helpful. Yet the educational setting (K-graduate) remains the most often used application. A brief explanation of one example is described below.

The educational journal *Theory into Practice* published an entire issue on the Revised Bloom's Taxonomy. Included is an article entitled "Using the Revised Taxonomy to Plan and Deliver Team-Taught, Integrated, Thematic Units" (Ferguson, 2002).

The writer describes using the revised Bloom's Taxonomy to plan

and deliver an integrated English and history course entitled “Western Culture.” The taxonomy provided the team teachers with a common language with which to translate and discuss state standards from two different subject areas. Moreover, it helped them to understand how their subjects overlapped and how they could develop conceptual and procedural knowledge concurrently. Furthermore, the taxonomy table in the revised taxonomy provided the history and English teachers with a new outlook on assessment and enabled them to create assignments and projects that required students to operate at more complex levels of thinking (Abstract, Ferguson, 2002).

Bloom’s group initially met hoping to reduce the duplication of effort by faculty at various universities. In the beginning, the scope of their purpose was limited to facilitating the exchange of test items measuring the same educational objectives. Intending the Taxonomy “as a method of classifying educational objectives, educational experiences, learning processes, and evaluation questions and problems” (Paul, 1985 p. 39), numerous examples of test items (mostly multiple choice) were included. This led to a natural linkage of specific verbs and products with each taxonomy level. Thus, when designing effective lesson plans, teachers often look to Bloom’s Taxonomy for guidance.

Likewise the Revised Taxonomy includes specific verb and product linkage with each of the levels of the Cognitive Process Dimension. However, due to its 19 subcategories and two-dimensional organization, there is more clarity and less confusion about the fit of a specific verb or product to a given level. Thus, the Revised Taxonomy offers teachers an even more powerful tool to help design their lesson plans.

As touched upon earlier, through the years, Bloom’s Taxonomy has given rise to educational concepts, including terms such as high and low-level thinking. It has also been closely linked with multiple intelligences (Noble, 2004), problem-solving skills, creative and critical thinking, and, more recently, technology integration.

Using the Revised Taxonomy in an adaptation from the Omaha Public Schools Teacher's Corner, a lesson objective based upon the story of Goldilocks and the Three Bears is presented for each of the six levels of the Cognitive Process as shown on the Revised Taxonomy Table.

- Remember: Describe where Goldilocks lived.
- Understand: Summarize what the Goldilocks story was about.
- Apply: Construct a theory as to why Goldilocks went into the house.
- Analyze: Differentiate between how Goldilocks reacted and how you would react in each story event.
- Evaluate: Assess whether or not you think this really happened to Goldilocks.
- Create: Compose a song, skit, poem, or rap to convey the Goldilocks story in a new form.

Although this is a very simple example of the application of Bloom's taxonomy, the author is hopeful that it will demonstrate both the ease and the usefulness of the Revised Taxonomy Table.

Conclusion

Countless people know, love, and are comfortable with the original Bloom's Taxonomy and are understandably hesitant to change. After all, change is difficult for most people. The original Bloom's Taxonomy was and is a superb tool for educators. Yet, even "the original group always considered the [Taxonomy] framework a work in progress, neither finished nor final" (Anderson & Krathwohl 2001 p. xxvii). The new century has brought us the Revised Bloom's Taxonomy which really is new and improved.

Media

[LSU Center for Academic Success] (2013, May 26) Use Bloom's to Think Critically [Video File] (4:20 minutes) from <https://youtu.be/DVecgNBPgM>

Online resources on Bloom's Taxonomy

Keep these resources on hand as a guide when you are writing lesson plans and developing learning objectives, student tasks, questions, and assessments.

[Verbs, Sample question stems, Potential activities, and products](#)

Kathy Schrock has organized apps across the six levels of Bloom's Taxonomy—"Bloomin Apps"

References

Forehand, M. . (2010) Emerging Perspectives on Learning, Teaching, and Technology, Global Text, Michael Orey. (Chapter 3). Retrieved from https://textbookequity.org/Textbooks/Orey_Emergin_Perspectives_Learning.pdf

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Learning Goals

The Learning goal describes the knowledge the learner is expected to obtain as a result of instruction (Mager, 1962). Normally, they start from very broad statements such as "learners will be able to fix a broken computer." This phase starts to narrow the scope of the learning goal and focus on how to provide instruction. Remember, these are not objectives. Objectives will be covered specifically at the end of the process. Constructing the

learning goal does not need to be complex, however, it needs to be focused.

Keep in mind learning goals may already predetermined depending on your setting. K-12 education may have learning goals set on the local or state level. Trade or vocational areas, industry training boards, or employers' associations set learning goals that must be followed for qualifications to be accredited. Even in higher education, an instructor may 'inherit' a course where the goals are already set, either by a previous instructor or by the academic department. These situations require flexibility with the analysis.

Examples

- When provided a malfunctioning computer, the learner will be able to diagnosis the malfunction and conduct a repair.
- When given pertinent information about student loan reform, the learner will be able to write a position letter to their United States Congress representatives.
- When provided with movie information, the learner will be able to classify the movie into a specific genre.

Types of Learning

Robert Gagné posited that not all learning is equal and each distinct learning domain should be presented and assessed differently. Therefore, as an instructional designer, one of the first tasks is determining which learning domain applies to the content. The theoretical basis behind the Conditions of Learning is that learning outcomes can be broken down into five different domains: verbal information, cognitive strategies, motor skills, attitudes, and intellectual skills (see Figure 6.1).

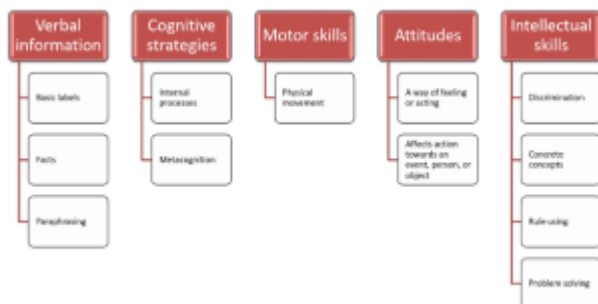


Figure 6.1

Figure 6.1

Gagné's Domains of Learning

Verbal information includes basic labels and facts (e.g. names of people, places, objects, or events) and bodies of knowledge (e.g. paraphrasing of ideas or rules and regulations). Cognitive strategies are internal processes where the learner can control his/her own way of thinking such as creating mental models or self-evaluating study skills. Motor skills require bodily movement, such as throwing a ball, tying a shoelace, or using a saw. Attitude is a state that affects a learner's action towards an event, person, or object. For example, appreciating a selection of music or writing a letter to the editor. Intellectual skills have their own hierarchical structure within the Gagné taxonomy and are broken down into discrimination, concrete concepts, rule using, and problem-solving.

Discrimination is when the learner can identify differences between inputs or members of a particular class and respond appropriately to each. For example, distinguishing when to use a Phillips-head or a flat-head screwdriver. Concrete concepts are the opposite of discrimination because they entail responding similarly to all class members or events. An example would be classifying music as pop, country, or classical. A learner must relate two or

more simpler concepts and, as a rule, state the relationship among concepts.

In many cases, it is helpful to think of these as “if-then” statements. For example, “If the tire is flat, then I either need to put air in the tire or change the flat tire.” Finally, problem-solving is combining lower-level rules and applying them to previously unencountered situations. This could include generating new rules through trial and error until a problem is solved.

WRITING OBJECTIVES

A learning objective is a description of an optimal performance learners are expected to be able to exhibit before they are considered competent in meeting the learning goal (Mager, 1962). Essentially, the goal describes the knowledge the learner is expected to obtain, while the objective describes how the learner will demonstrate that they have obtained that knowledge. Once learning goals are established, learning objectives that are directly associated with these specific outcomes should be built. Consider the following example of a misaligned learning outcome and learning objective proposed by Dick and Reiser (1989): “The learning goal is developing lifelong health habits, and the associated learning objective is listing the major bones in the leg”(p. 23). Although both the outcome and the objective both fall under the content area of Health and the Human Body, the listing of the major bones in the leg would not be an appropriate performance to assess whether or not learners would be able to develop lifelong health habits.

Mager (1984) proposes that there are three elements of a quality learning objective: performance, condition, and criterion. The performance is what the learner is expected to do or the result of the instruction. The condition describes the circumstances in which the performance should occur. The criterion establishes the

minimum threshold of acceptable performance. Furthermore, an objective should clearly express an observable behavior that students are expected to perform in order to indicate achievement (Dick & Reiser, 1989).

Orelove (1995) stated that when a goal includes the absence of performance on the part of a student, it also lacks quality. For example, “Johnny will sit quietly for 20 minutes” or “By the end of the course, students should know historically important dates in history” (p. 4). Neither of these examples requires observable activity or quality performance on the part of the students. In addition, neither goal is measurable. According to Benjamin Bloom, objectives should be measurable and serve to help create a structure for hierarchically classifying the measurability of learning objectives (Bloom, Engelhart, Furst, and Krathwohl, 1956; Anderson and Krathwohl, 2001).

A simple way to craft learning objectives is to use Heinrich, Molenda, Russell, and Smaldino’s (1996) ABCD format.

- Audience
- Behavior (Mager’s performance element)
- Condition (Mager’s condition element)
- Degree (Mager’s criterion element)

Heinrich et al. (1996) use Mager’s (1984) three elements while adding the audience. The audience is the learner. Sometimes, the generic term “learner” or “student” can be used. It is a best practice to be as specific as possible (Heinrich et al., 1996). For example, a 12th-grade history students or English Composition I students.

Objective Builder

To assist in writing learning objectives, the University of Central Florida (UCF) has created an easy-to-use objective builder at

<https://cdl.ucf.edu/teach/resources/objective-builder-tool/>. This tool uses a modified version of Heinrich et al. (1996) ABCD format. The audience and condition are flipped to yield a CABD format. This was done to improve readability.

Objective Builder offers three learning domains to choose the behavior: cognitive (thinking), affective (feeling), and psychomotor (doing). Each domain uses a specific framework along with associated measurable verbs. The audience, condition, and degree components are textboxes and are displayed once they are entered. At the end of one objective, more can be added. Copy the objectives into a learning management system or Word document when completed. It is released open-source, so this means it is free to host on your own website, and edits can be made. More information is available at <https://github.com/ucfopen/objective-builder>.

Examples

Audience (A), Behavior (B), Condition (C), and Degree of Mastery (D).

Note: It is easier to write the learning objective in the order of C, A, B, D.

The learning objective is written in the cognitive domain at the understanding level of Anderson and Krathwohl's Revised Bloom's Taxonomy of the Cognitive Domain.

- Given a blank map of the United States, a fifth-grade social student will identify all 50 states and capitals with 90 percent accuracy.

The learning objective is written in the affective domain at the valuing level of Krathwohl and Bloom's Taxonomy of the Affective Domain.

- Given a group project, the group members will seek input from everyone throughout the entire project.

Learning objective written in the psychomotor domain at the guided response level of Simpson's Taxonomy of the Psychomotor Domain.

- Given pizza ingredients, the employee will assemble a pizza in less than 10 minutes.

Terminal objective example

- When provided with a plot, pacing, and the frequency of stunts, the learner will be able to classify the movie into a specific genre within two attempts.

Enabling objective example

- When given a movie scene, the learner will determine how many stunts occurred within two attempts.

Source:

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Chapter 7: Instructional Model

- Instruction
- Problem-Based Learning
- Project-Based Learning
- Backward Design Process

INSTRUCTION

Now that we've laid the foundation for an effective lesson by discussion, planning, and assessment, we can turn to instruction. Instruction involves the actual act of teaching a lesson and is usually what comes to mind when you envision teaching. You likely have experienced both good and poor teaching in your life as a student. Teaching is not telling. To teach well requires careful planning and knowledge of the learners in the room. Various tools,

techniques, and strategies help teachers organize their instruction more logically and deliver it appropriately.

Teaching strategies are usually a series of steps that a teacher might have the students follow to encourage interaction or deeper thinking during instruction; strategies usually take from 5 to 15 minutes to enact during a lesson. An example of a strategy is “think-pair-share,” where a student turns to a partner to discuss a question or prompt before sharing with a larger group. Other strategies include using graphic organizers or creating metaphors to help students see content in a new way. You will have entire classes about teaching strategies in different content areas, often called methods courses, as you continue in your journey toward becoming a teacher. For now, we’ll investigate one very powerful, research-based strategy that can be used in all grades and content areas: Think-Pair-Share.

Think-Pair-Share is a particularly effective strategy because it allows students to share ideas with just one other person before being asked to share with the class. Students can have an opportunity to articulate their ideas prior to whole-class discussion. Extended Think-Pair-Share is a strategy used for English Learners. Instead of just an open-ended dialogue, students are prompted to use sentence frames, such as “I think the experiment showed us _____ because I saw _____ happen.” Or, “That character in the story is very _____. I know this because he _____”. In this way, the dialogue is more structured, and English learners practice correct English syntax. This video shows a math teacher using the Think-Pair-Share strategy during a lesson.

When planning instructional activities, always keep them aligned with your standards, objectives, and assessments. While it can be tempting to turn to Teachers Pay Teachers, Pinterest, or TikTok for instructional inspiration, many of these “fun” activities do not result in meaningful learning. Always keep your instructional goals at the forefront of your selection of instructional activities.

Video: Think, Pair, Share



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-1>

Source: https://youtu.be/tPSfolz_700

One or more interactive elements have been excluded from this text version. You can view them online here: <https://mtsu.pressbooks.pub/introtoedshell/?p=562#oembed-1>

DIRECT INSTRUCTION

Direct Instruction is an evidence-based teaching method. In general usage, the term direct instruction refers to (1) instructional approaches that are structured, sequenced, and led by teachers and/or (2) the presentation of academic content to students by teachers, such as in a lecture or demonstration. In other words, teachers are “directing” the instructional process, or instruction is being “directed” at students.

While a classroom lecture is perhaps the image most commonly associated with direct instruction, the term encompasses various fundamental teaching techniques and potential instructional scenarios. For example, presenting a video or film to students could be considered a form of direct instruction (even though the teacher is not actively instructing students, the content and presentation of material were determined by the teacher). Generally speaking,

direct instruction may be the most common teaching approach in the United States since teacher-designed and teacher-led instructional methods are widely used in American public schools. That said, it's important to note that teaching techniques such as direct instruction, differentiation, or scaffolding, to name just a few, are rarely mutually exclusive—direct instruction may be integrated with any number of other instructional approaches in a given course or lesson. For example, teachers may use direct instruction to prepare students for an activity in which the students work collaboratively on a group project with guidance and coaching from the teacher as needed (the group activity would not be considered a form of direct instruction).

Key Takeaways

In addition, the basic techniques of direct instruction not only extend beyond lecturing, presenting, or demonstrating, but many are considered to be foundational to effective teaching. For example:

- Establish learning objectives for lessons, activities, and projects, and then make sure that students understand the goals.
- Purposefully organizing and sequencing a series of lessons, projects, and assignments that move students toward stronger understanding and the achievement of specific academic goals.
- Reviewing instructions for an activity or modeling a process—such as a scientific experiment—so that students know what they are expected to do.
- Providing students with clear explanations, descriptions, and illustrations of the knowledge and skills being taught.
- Asking questions to make sure that students have

understood what has been taught.

It should be noted that the term direct instruction is used in various proprietary or trademarked instructional models that have been developed and promoted by educators, including—most prominently—Direct Instruction, created by Siegfried Engelmann and Wesley Becker, which is an “explicit, carefully sequenced and scripted model of instruction,” according to the National Institute for Direct Instruction.

DEBATE

In recent decades, the concept of direct instruction has taken on negative associations among some educators. Because direct instruction is often associated with traditional lecture-style teaching to classrooms full of passive students obediently sitting at desks and taking notes, it may be considered outdated, pedantic, or insufficiently considerate of student learning needs by some educators and reformers.

That said, many of direct instruction’s negative connotations likely result from either a limited definition of the concept or a misunderstanding of its techniques. For example, all teachers, by necessity, use some form of direct instruction in their teaching (i.e., preparing courses and lessons, presenting and demonstrating information, and providing clear explanations and illustrations of concepts are all essential and, to some degree, unavoidable teaching activities). Negative perceptions of the practice tend to arise when teachers rely too heavily upon direct instruction or when they fail to use alternative techniques that may be better suited to the lesson at hand, or that may improve student interest, engagement, and comprehension.

While a sustained forty-five-minute lecture may not be considered an effective teaching strategy by many educators, the alternative strategies they may advocate—such as [personalized learning](#) or [project-based learning](#),

to name just two options—will almost certainly require some level of direct instruction by teachers. In other words, teachers rarely use either direct instruction or some other teaching approach—in actual practice, diverse strategies are frequently blended together. For these reasons, negative perceptions of direct instruction likely result more from a widespread over-reliance on the approach and from the tendency to view it as an either/or option rather than from its inherent value to the instructional process. (Direct Instruction, 2013)

The next section of the chapter is adapted from McLeskey, J., Barringer, M-D., Billingsley, B., Brownell, M., Jackson, D., Kennedy, M., Lewis, T., Maheady, L., Rodriguez, J., Scheeler, M. C., Winn, J., & Ziegler, D. (2017, January). High-leverage practices in special education. Arlington, VA: Council for Exceptional Children & CEEDAR Center. (Public domain)

USE EXPLICIT INSTRUCTION

Teachers make content, skills, and concepts explicit by showing and telling students what to do or think while solving problems, enacting strategies, completing tasks, and classifying concepts. Teachers use explicit instruction when students learn new material and complex concepts and skills. They strategically choose examples and non-examples and language to facilitate student understanding, anticipate common misconceptions, highlight essential content, and remove distracting information. They model

and scaffold steps or processes needed to understand content and concepts, apply skills, and complete tasks successfully and independently.

Watch this video on Explicit Instruction: (*start at 1:30 minutes:)



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-2>

Source: https://youtu.be/ESFVNzihOZ0?si=loC_zQOC_NxPoHoT [Council for Exceptional Children]. (2019, April 22). HLP#16 Use Explicit Instruction. {Video file}. Retrieved from <https://youtu.be/ESFVNzihOZ0>

Video Transcript available at: https://highleveragepractices.org/wp-content/uploads/2018/06/Explicit_Instruction_Script-002.pdf

In summary, explicit instruction is effective for most students, not only those with disabilities. This approach can be used across grade levels and content areas. Although explicit instruction can be provided by any teacher, the unique setting and needs of the students being taught determine

the level of intensity with which the teacher uses this practice. The difference in intensity is not merely the number of students in each class but that instruction should be appropriately intense and matched to the unique needs of students. A trained special educator or similar specialist is responsible for ensuring data that

is carefully collected and monitored drives instructional decision-making. This ensures the explicit instruction being delivered is appropriately intense and that the team is ready to make changes as needed.

This next section contains excerpts from the National Center on Intensive Intervention. (2016). [Principles for designing intervention in mathematics](#). Washington, DC: Office of Special Education, U.S. Department of Education, and is in the public domain.

EXPLICIT, SYSTEMATIC INSTRUCTION IN THE CONTEXT OF MATHEMATICS INSTRUCTION

Explicit, systematic instruction in mathematics requires educators to clearly teach the steps involved in solving mathematical problems using a logical progression of skills (Hudson, Miller, & Butler, 2006; Montague & Dietz, 2009). Explicit instruction may take the form of teaching students how to use manipulatives, teaching specific algorithms for solving computational problems, or teaching strategies for solving more advanced mathematical concepts. Systematic instruction considers the scope and mathematical trajectories, such as the types of examples used for developing the foundational skills prior to the introduction/re-teaching of grade-level material (Gersten et al., 2009; Kroesbergen & Van Luit, 2003; Maccini, Mulcahy, & Wilson, 2007). Regardless of the concept or skill being taught, explicit, systematic instruction should include the following components (Archer & Hughes, 2011; Hudson et al., 2006):

- 1. Advance Organizer:** Providing students with an advance organizer allows them to know the specific objective of the lesson and its relevance to everyday life.

2. Assessing Background Knowledge: In assessing background knowledge, instructors determine whether students have mastered the prerequisite skills for successful problem-solving in the new concept area. If the prerequisite skills were recently covered, an assessment of background knowledge should be conducted quickly. If, however, those skills were taught several weeks ago, more time may be needed to refresh students' memories. Instructors can also determine whether students are able to generalize previously learned concepts to new concepts. For example, if students have previously learned regrouping strategies in addition and subtraction, can they generalize these concepts to regrouping in multiplication and division? In addition, instructors should ask students questions about the new concept to assess their knowledge of the concept.

3. Modeling:

During the modeling phase, instructors "think aloud" as they model the process of working through a computation problem; read, set up, and solve a word problem; use a strategy; or demonstrate a concept. During modeling, instructors should be clear and direct in their presentation; they also should be precise and mindful in using general and mathematical vocabulary and in selecting numbers or examples for use during instruction. During modeling, instructors should involve students in reading the problems and should ask questions to keep students engaged in the lesson.

4. Guided Practice:

During guided practice, instructors engage all students by asking questions to guide learning and understanding as students actively participate in solving problems. During this phase, instructors prompt and scaffold student learning as necessary. Scaffolding is gradually eliminated as students demonstrate accuracy in using the material being taught. Positive and corrective feedback is provided during this phase, and instruction is adjusted to match student needs. Students should reach a high level of mastery (typically

85 percent accuracy or higher) before moving out of the guided practice phase.

5. Independent Practice: After achieving a high level of mastery, students move to the independent practice phase, where they autonomously demonstrate their new knowledge and skills. During independent practice, the instructor closely monitors students and provides immediate feedback as necessary. Countless independent practice activities can be used with students, and the primary focus of the independent practice activity should be related to the content of the modeling and guided practice. If students demonstrate difficulty at this stage, instructors evaluate and adjust their instruction to re-teach concepts as needed.

6.Maintenance: Students with disabilities often have a difficult time maintaining what they have learned when the knowledge is not used on a regular basis. Students are given opportunities to independently practice these skills during the maintenance phase. During this phase, instructors use distributed practice to assess student maintenance at regularly scheduled intervals. Distributed practice focuses on a specific skill, strategy, or concept. The frequency of these practice assessments is determined by the difficulty level of the skill and according to individual student needs. Maintenance may also include cumulative practice.

Instructors often want to know how much time they should spend on each phase. Although there are no specific guidelines concerning how much time should be devoted to each phase, the bulk of the instruction should occur within the guided practice phase (National Center on Intensive Intervention, 2013).

Watch Videos on How to do Direct Instruction – Teach Like This
(3:40 minutes)



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-3>

Source: https://youtu.be/OJlkkUPC_yM

Watch the Video Key Takeaways- I do, We do, You do



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-4>

Source: <https://youtu.be/APyvwPzxZ7I>

Goal Mastery Learning

- Ido– Teacher Modeling, Teacher Directed
- We do– Guided Practice with Support and Structure

- You do– Independent Practice to Demonstrate Learning
-

Watch the video Teaching Matters: Explicit Instruction (4:53 minutes)



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-5>

Source: <https://youtu.be/APyvwPzxZ7I>

THE GRADUAL RELEASE OF RESPONSIBILITY MODEL

Explicit Instruction (aka Gradual Release of Responsibility – GRR)

The Gradual Release of Responsibility instructional model uses explicit instruction to help students achieve success. Teachers plan lessons using an “I do”, “We do”, “You do it together”, and “You do it individually” framework.

During the “I do” phase, the teacher models the lesson using strategies, such as a think-aloud, to show students how to accomplish the learning objective. For example, if a teacher is teaching a lesson on how to identify the adjectives in a sentence, the “I do” phase may look similar to this:

Example:

Teacher: Ok...so my first sentence is “The black puppy jumped over the brown log.” Well, thinking about what an adjective is, I remember that an adjective is used to describe a noun. So, first, I should identify the nouns in the sentence. (pauses to show that they are thinking about which words are the nouns.) Ok...so after thinking about it a bit, I remember that a noun is a person, place, thing, or idea. In my sentence, I think I have two nouns – puppy and log. I know this

because “puppy” is an animal, and “log” is a thing. Ok...so if these are my two nouns, can I find any words that describe “puppy” or “log” (Teacher pauses for a few more seconds to simulate thinking time.) Well, in this sentence, I see that the word “black” comes before the word “puppy” and seems to be telling me what that puppy looks like. This must mean that “black” is an adjective because it describes what the puppy looks like. I also notice that the word “brown” comes before the word “log”. Since this seems to describe what the log looks like, it must be an adjective as well. So, the two adjectives in my sentence are “black” and “brown”.

During the “We do” phase, the teacher repeats the instructional modeling of the lesson; however, this time, students are involved in the process. For example:

Example:

Teacher:

Ok...let’s do sentence number 2 together. Read the sentence out loud with me: “The lazy cat lounged on the green couch.” Great job! Now, looking at our new sentence on your whiteboard, write down the first noun you see. (

The teacher pauses to allow students time to write down the noun “cat”.) Ok, everyone, on the count of three, hold up your whiteboards...1...2...3... (The teacher looks over all the whiteboards to make sure that the majority of the students have written the word “cat”.) Great job, everyone! The first noun is “cat”. I’m going to underline that word here on the board with green. Ok...now, above the word cat, I want you to write the word that seems to describe the cat. (The teacher walks around as students write their answers to check student understanding. Once the teacher has checked all student responses, students are asked to share with the class again.)

Ok, everyone, on the count of three, let's turn those whiteboards around...1...2...3. Great job again!

The word that seems to describe the cat is "lazy". I will draw a red box around that word and then an arrow to the word cat so we know that "lazy" describes "cat". Ok, is there another noun in our sentence? (The teacher pauses briefly to hear student responses.)

That's right, there is another noun. Write the second noun on your whiteboard. (The teacher pauses to let students write down the noun "couch" and then repeats the above process with students, making sure that all students have also identified "green" as the word that describes the color of the couch.)

During the "You do it together" phase, the teacher has students work in pairs or small groups to identify the adjectives in a few more sentences. As the students work, the teacher walks around to check student understanding and to correct any misconceptions. Also, during this time, the teacher may pull a small group of students who need additional instruction in order to be successful.

The final phase, or the "You do it individually" phase, has students complete the exercises by themselves, usually in the form of a formative assessment. Teachers can also use an exit ticket to assess student comprehension of the concept taught individually. The data from this formative assessment can then be used to adjust the planned instruction for the following day.

Additional resources:

- <https://iris.peabody.vanderbilt.edu/module/math/cresource/q2/p04/>
- https://pdo.ascd.org/lmscourses/pd13oc005/media/formativeassessmentandccswithelaliteracymod_3-reading_3.pdf

- https://keystoliteracy.com/wp-content/uploads/2017/08/frey_douglas_and_nancy_frey-gradual_release_of_responsibility_intructional_framework.pdf

Key Takeaways

Gradual Release

This model focuses on the [I do-We do- You do] model and similar aspects of the Direct Instruction Method but can incorporate a collaborative phase prior to the release to independent work:

1. Modeling (I Do It)
2. Guided Practice (We Do It Together)
3. Collaborative Practice (You Do It Together)
4. Independent Practice (You Do It Individually)

Additional steps in the Direct Instruction Teaching Method Include:

4. Monitoring- how will you formatively assess learning and collect data on student learning?
5. Feedback- how will you respond to student learning: move learning forward, address misconceptions, and areas of difficulty?

Watch this video that models gradual release in the context of a writing lesson. (8:06 minutes).



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-6>

Source: [CitizensAcademyCleve]. (2011, Dec. 5). Gradual Release (Modeled-Guided-Independent Practice). [Video File]. Retrieved from https://youtu.be/uE_KTMRwbJs

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- Graphics in this eBook are from Pixabay.com unless otherwise noted.
- Math Icon – Image by [Dean Norris](#) from [Pixabay](#)
- Class-Image by [emmaws4s](#) from [Pixabay](#)

PROBLEM-BASED LEARNING

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Problem-Based Learning is a teaching methodology.

Note: the terms Problem-based Instruction and Inquiry and Problem-based Learning are equivalent terms.

Description

- Problem-based inquiry is an effort to challenge students to address real-world problems and resolve realistic dilemmas.

Such problems create opportunities for meaningful activities that engage students in problem-solving and higher-ordered thinking in authentic settings. Many textbooks attempt to promote these skills through contrived settings without relevance to students' lives or interests. A notorious algebra problem concerns the time at which two railway trains will pass each other:

Two trains leave different stations headed toward each other. Station A is 500 miles west of Station B. Train A leaves Station A at 12:00 pm, traveling toward Station B at a rate of 60 miles per hour. Train B leaves Station B at 2:30 pm for Station A at a rate of 45 miles per hour. At what time will the trains meet?

Reading this question, one might respond, "Who cares?", or, "Why do we need to know this?" Such questions have created substantial anxiety among students and have, perhaps, even been the cause of nightmares. Critics would argue that classic "story problems" leave a lasting impression of meaningless efforts to confuse and torment students as if they have come from hell's library. Problem-based inquiry, on the other hand, intends to engage students in relevant, realistic problems.

Several changes would need to be made in the above problem to promote problem-based inquiry. It would first have to be acknowledged that the trains are not, in fact, traveling at constant rates when they are in motion; negotiating curves or changing tracks at high speeds can result in accidents.

Further, all of the information about the problem cannot be presented to the learner at the outset; that is, some ambiguity must exist in the context so that students have an opportunity to engage in a problem-solving activity. In addition, the situation should involve a meaningful scenario. Suppose that a person intends to catch a connecting train at the second station and requires a time-efficient itinerary. What if we are not given data about the trains but instead the outcome of a particular event, such as an accident?

Why should we use problem-based inquiry to help students learn?

The American educational system has been criticized for having an underachieving curriculum that leads students to memorize and regurgitate facts that do not apply to their lives (Martin, 1987; Paul, 1993). Many claim that the traditional classroom environment, with its orderly conduct and didactic teaching methods in which the teacher dispenses information, has greatly inhibited students' opportunities to think critically (Dossey et al., 1988; Goodlad, 1984; Wood, 1987). Problem-based inquiry is an attempt to overcome these obstacles and confront the concerns presented by the National Assessment of Educational Progress:

If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. We have, in effect, been committing an act of unthinking, unilateral educational disarmament. (A Nation at Risk, 1983)

Problem-based inquiry emphasizes learning as a process that involves problem-solving and critical thinking in situated contexts. It provides opportunities to address broader learning goals that focus on preparing students for active and responsible citizenship. Students gain experience in tackling realistic problems, and emphasis is placed on using communication, cooperation, and resources to formulate ideas and develop reasoning skills.

WHAT IS A FRAMEWORK FOR A PROBLEM-BASED INQUIRY?

Situated cognition, constructivism, social learning, and communities of practice are assumed theories of learning and cognition in problem-based inquiry environments. These theories

have common themes about the context and the process of learning and are often associated.

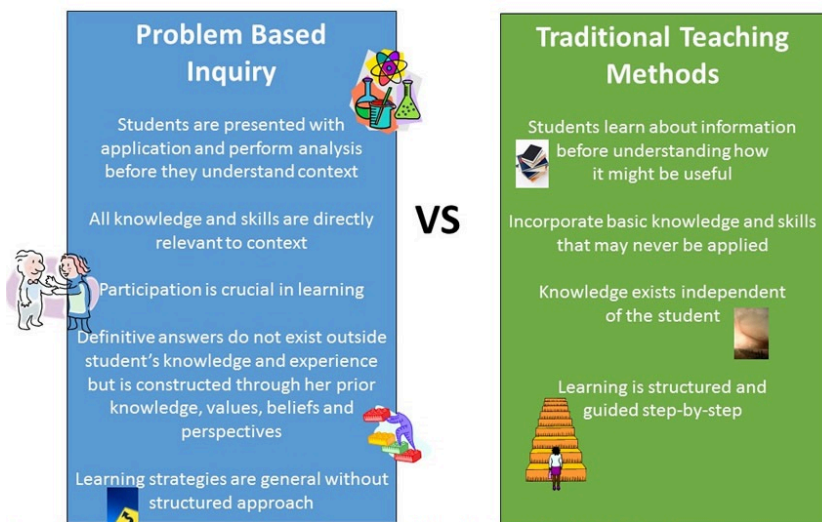


Figure 2. The tables above compare Problem Based Inquiry with Traditional Teaching Methods. Problem Based Inquiry presents an application to students to perform analysis before they understand context. In addition, all knowledge and skills are directly relevant to context. Participation is crucial in learning. Definitive answers do not exist outside student's knowledge and experience but is constructed through her prior knowledge, values, beliefs and perspectives. Finally, Problem Based Inquiry uses general learning strategies without a structured approach. Traditional teaching methods require students to learn about information before understanding how it might be useful. It incorporates basic knowledge and skills that may never be applied. Traditional methods support existence of knowledge independent of the student and guides learning step-by-step.

Problem Based Learning vs. Traditional Teacher Methods

CHARACTERISTICS

Some common characteristics of problem-based learning models:

Activity is grounded in a general question about a problem with

multiple possible answers and methods for addressing the question.

Each problem has a general question that guides the overall task, followed by ill-structured problems or questions that are generated throughout the problem-solving process. That is, to address the larger question, students must derive and investigate smaller problems or questions that relate to the findings and implications of the broader goal. The problems or questions thus created are most likely new to the students and lack known definitive methods or answers that have been predetermined by the teacher.

Learning is student-centered; the teacher acts as the facilitator.

In essence, the teacher creates an environment where students take ownership of the direction and content of their learning.

Students work collaboratively towards addressing the general question

. All of the students work together to attain the shared goal of producing a solution to the problem. Consequently, the groups co-depend on each other's performance and contributions to make their advances in reasoning toward answering the research questions and the overall problem.

Learning is driven by the context of the problem and is not bound by an established curriculum.

In this environment, students determine what and how much they need to learn to accomplish a specific task. Consequently, acquired information and learned concepts and strategies are tied directly to the context of the learning situation. Learning is not confined to a preset curriculum. The creation of a final product is not a necessary requirement of all problem-based inquiry models.

Project-based learning models most often include this type of product as an integral part of the learning process because learning is expected to occur primarily in the act of creating something. Unlike problem-based inquiry models, project-based learning does not necessarily address a real-world problem, nor does it focus on providing argumentation for resolution of an issue.

In a problem-based inquiry setting, there is greater emphasis on problem-solving, analysis, resolution, and explanation of an authentic dilemma. Sometimes, this analysis and explanation is represented in the form of a project, but it can also take the form of verbal debate and written summary.

Instructional models and applications

- There is no single method for designing problem-based inquiry learning environments.

Various techniques have been used to generate the problem and stimulate learning. Promoting student ownership, using a particular medium to focus attention, telling stories, simulating and recreating events, and utilizing resources and data on the Internet are among them. The instructional model, problem-based learning, will be discussed next with attention to instructional strategies and practical examples.

Problem-Based Learning

- Problem-based learning (PBL) is an instructional strategy in which students actively resolve complex problems in realistic situations.

It can be used to teach individual lessons, units, or even entire curricula. PBL is often approached in a team environment with an emphasis on building skills related to consensual decision-making, dialogue and discussion, team maintenance, conflict management, and team leadership. While the fundamental approach of problem-solving in situated environments has been used throughout the history of schooling, the term PBL did not appear until the 1970s and was devised as an alternative approach to medical education.

In most medical programs, students initially take a series of fact intensive courses in biology and anatomy and then participate in a field experience as a medical resident in a hospital or clinic.

However, Barrows reported that, unfortunately, medical residents frequently had difficulty applying knowledge from their classroom experiences in work-related, problem-solving situations. He argued that the classical framework of learning medical knowledge first in classrooms through studying and testing was too passive and removed from context to take on meaning.

Consequently, PBL was first seen as a medical field immersion experience whereby students learned about their medical specialty through direct engagement in realistic problems and gradual apprenticeship in natural or simulated settings. Problem-solving is emphasized as an initial area of learning and development in PBL medical programs more so than memorizing a series of facts outside their natural context.

In addition to the field of medicine, PBL is used in many areas of education and training. In academic courses, PBL is used as a tool to help students understand the utility of a particular concept or study. For example, students may learn about recycling and materials as they determine methods that will reduce the county landfill problem.

In addition, alternative education programs have been created with a PBL emphasis to help at-risk students learn in a different way through partnerships with local businesses and government. In vocational education, PBL experiences often emphasize participation in natural settings.

For example, students in architecture address the problem of designing homes for impoverished areas. Many of the residents need safe housing and cannot afford to purchase typical homes. Consequently, students learn about architectural design and resolve the problem by constructing homes made from recycled materials. In business and the military, simulations are used as a means of instruction in PBL. The affective and physiological stress associated with warfare can influence strategic planning, so PBL in military settings promotes using “war games” as a tactic for facing authentic crises.

In business settings, simulations of “what if” scenarios are used to train managers in various strategies and problem-solving approaches to conflict resolution. In both military and business settings, the simulation is a tool that provides an opportunity to not only address realistic problems but to learn from mistakes in a more forgiving way than in an authentic context.

Designing the learning environment

The following elements are commonly associated with PBL activities.

many resources, communication with others, and cooperation within the learning environment. Situated Cognition, Constructivism, Social Learning, and Communities of Practice are elements of Problem Based Inquiry.

Problem generation: The problems must address concepts and principles relevant to the content domain. Problems are not investigated by students solely for problem-solving experiences but as a means of understanding the subject area. Some PBL activities incorporate multidisciplinary approaches, assuming the teacher can provide and coordinate needed resources such as additional

content, instructional support, and other teachers. In addition, the problems must relate to real issues that are present in society or students' lives. Contrived scenarios detract from the perceived usefulness of a concept.

Problem presentation: Students must "own" the problem, either by creating or selecting it. Ownership also implies that their contributions affect the outcome of solving the problem. Thus, more than one solution and more than one method of achieving a solution to the problem are often possible. Furthermore, ownership means that students take responsibility for representing and communicating their work in a unique way.

Predetermined formats of problem structure and analysis towards resolution are not recommended; however, the problem should be presented such that the information in the problem does not call attention to critical factors in the case that will lead to immediate resolution. Ownership also suggests that students will ask questions, reveal information, and synthesize critical factors throughout the problem-solving process.

Teacher role: Teachers act primarily as cognitive coaches by facilitating learning and modeling higher-order thinking and meta-cognitive skills. As facilitators, teachers give students control over how they learn and provide support and structure in the direction of their learning. They help the class create a common framework of expectations using tools such as general guidelines and timelines.

As cognitive modelers, teachers think aloud about strategies and questions that influence how students manage the progress of their learning and accomplish group tasks. In addition, teachers continually question students about the concepts they are learning in the context of the problem in order to probe their understanding, challenge their thinking, and help them deepen or extend their ideas.

Student role: Students first define or select an ill-structured problem with no obvious solution. They develop alternative

hypotheses to resolve the problem and discuss and negotiate their conjectures in a group. Next, they access, evaluate, and utilize data from various available sources to support or refute their hypotheses. They may alter, develop, or synthesize hypotheses in light of new information. Finally, they develop clearly stated solutions that fit the problem and its inherent conditions based on information and reasoning to support their arguments. Solutions can be in the form of essays, presentations, or projects.

Maine School Engages Kids With Problem-Solving Challenges
(11:37)



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from this version of the text. You can view them online

here: [https://pressbooks.uwf.edu/planning-
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Source: <https://youtu.be/i17F-b5GG94> [PBS NewsHour]. (2013, May 6). Maine School Engages Kids with Problem-Solving Challenges. [Video File]. Retrieve from <https://youtu.be/i17F-b5GG94>

Special correspondent John Tulenko of Leaning Matters reports on a public middle school in Portland, Maine, that is taking a different approach to teaching students. Teachers have swapped traditional curriculum for an unusually comprehensive science curriculum that emphasizes problem-solving, with a little help from some robots.

Effectiveness of Problem and Inquiry-based Learning

Why does inquiry-based learning only have an effect size of 0.31 when it is an approach to learning that seems to engage students and teachers so readily in the process of learning?

When is the right and wrong time to introduce inquiry and problem-based learning?

Watch this video from John Hattie on inquiry and problem-based learning (2:11 minutes).

[Corwin]. (2015, Nov. 9). John Hattie on inquiry-based learning. [Video File]. Retrieved from <https://youtu.be/YUooOYbgSUG>.

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- Glazer, E. (2010) Emerging Perspectives on Learning, Teaching, and Technology, Global Text, Michael Orey. (Chapter 14) Attribution CC 3.0. Retrieved from https://textbookequity.org/Textbooks/Orey_Emerging_Perspectives_Learning.pdf

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DOCUMENT-BASED QUESTIONS (DBQ)

Document-Based Questions (DBQs) first appeared on the Advanced Placement test in about 1973. They are essay or short answer questions that students must answer using primary and secondary sources provided in a reading packet.

Outside of the AP exams, DBQs have been used in middle and high school English language arts and social studies classrooms. They are designed to help students learn to critically analyze documents, synthesize the information contained in the documents, and then use what they have learned to answer questions.

The DBQ Project (2024) uses a 6-step method for using DBQs and what they term “Mini-Qs”. Mini-Qs are smaller DBQs that do not require as much reading, and who’s questions require shorter answers than the traditional DBQs. Mini-Qs are often used in middle school classrooms to help introduce students to the idea of DBQs.

According to the DBQ Project, a teacher needs to make sure that the DBQ they are designing or going to use has these 6-steps:

1. A hook exercise that engages the students and orient them to what will be covered in the documents.
2. A background essay that orients students to the question by providing essential context to help them understand the accompanying documents.
3. A planning stage that allows students to preview the question(s), ask clarifying questions, and access prior knowledge about the topic.
4. An analysis stage that allows students to begin reading and analyzing the provided documents to find text-based evidence to support their claims. Students should also begin thinking about any outside information they want

to include in their responses.

5. A categorizing stage that allows students to organize their evidence into an outline based on the DBQ question and their proposed answer to the question.
6. The writing stage is where students use their outline and evidence to develop their essay responses.

Source:

- <https://www.wikihow.com/Write-a-DBQ-Essay>
- <https://letscultivategreatness.com/how-to-effectively-build-a-dbq-classroom/>

PROJECT-BASED LEARNING THROUGH DEVELOPING THE FIVE ATTITUDES OF CREATIVE PEOPLE



PROJECT BASED LEARNING IS A TEACHING METHODOLOGY.

Developing deep learning competencies can be achieved in many ways, but one of the most exciting is through project-based learning.

- Project-based learning is a learner-centered pedagogy that involves learners identifying a real-world problem and engaging in hands-on learning to identify a solution.

Dr Melissa Cain from the School of Education at The University of Queensland notes in this next video how a deeper engagement with content can be developed through engaging in project-based learning.

Project-based learning using Piirto's five core attitudes (4:52

minutes)



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-8>

Video: UQx DEEPx Project-based learning using Piirto's five core attitudes.

<https://www.youtube.com/embed/YyoZx3WPb9o?si=ZGamLO55LVtqZpmY>

Video Script

MELISSA CAIN: Do you have the right attitude for deep learning? Jane Piirto, in her work 'Creativity for 21st Century Skills', identified five core attitudes that creative people possess. These are:

1. self-determination
2. openness to experience
3. risk-taking
4. a tolerance for ambiguity
5. group trust

We see these attitudes displayed in episodes of deep learning. One of the ways to develop these attitudes and deep learning competencies further is through project-based learning.

In a nutshell, project-based learning (or PBL for short) is a learner-centered pedagogy that applies to all ages. It involves students identifying a real-world problem with authentic connections and engaging in a hands-on project to identify a solution.

Project-based learning places emphasis on the process of inquiry regarding the final product. Through connecting with students' interests, prior experiences, and family funds of knowledge, well-constructed projects excite and motivate students to work collaboratively on learning about a topic in depth over an extended period of time.

This includes students sharing their findings with others in insightful ways and using a range of communication strategies to suit various learner preferences and abilities.

Through project-based learning, students connect with experts in the real world to initiate a sustained inquiry.

In project-based learning, student choice and student voice are critical elements in igniting intrinsic motivation, developing a sense of agency, and placing the learners as captains of their ship.

Project-based learning has a focus on deep learning skills such as:

- critical thinking
- collaboration
- communication
- innovation
- creativity

Project-based learning also fosters teamwork and positive social relations and develops higher-order cognitive skills so that learners engage in analyzing, synthesizing, justifying, evaluating, and creating. (Bloom's Taxonomy)

To undertake such a project successfully, students will also need

to demonstrate Piirto's core attitudes of self-discipline, openness to experience, risk-taking, tolerance for ambiguity, and group trust.

- To summarize, project-based learning involves an in-depth investigation of real-world topics, manipulation of authentic objects, and active learning through projects that occur over weeks or months and is achieved through questioning experts, making observations, making connections, and demonstrating learning to others.

Project-based learning incorporates the Universal Design for Learning (UDL) principles. These provide a framework that helps teachers plan learning activities to meet the diverse needs of all students.

These principles include multiple means of representation to allow for connections to be made by all students through varied means of presenting information, multiple means of action and expression so that students can choose topics, ideas, and information, as well as how to organize them, display them, and how they will present them for their chosen audience, and multiple means of engagement. Students work with their interests and on authentic problems.

Personal relevance and subjectivity are important. Students are engaged and motivated by their team and the technology they use. In the future, you might like to consider developing learning activities that involve extended projects and that develop attitudes essential for moving students from surface to deep learning.

The Creative Arts Charter School video is useful for demonstrating a number of key concepts in motivating students for deep learning. Take the time to revisit this video and look for the following main concepts of project-based learning:

1. Learners working with a real-world issue that is presented in an authentic manner.
2. Exploration of the topic begins with a 'big question' and

extends over weeks or months.

3. Learners connect with experts or 'knowledgeable others'.
4. There is an emphasis on the process of inquiry over the final product.
5. There are opportunities for collaborative learning, teamwork, and the development of positive social relationships.
6. Learners present their findings to others in insightful ways.

Link to video: [Creative Arts Charter School's Approach to Project-Based Learning](https://www.youtube.com/watch?v=1nq4gFp_vAY)(5.59 minutes)



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=334#oembed-9>

https://www.youtube.com/embed/1nq4gFp_vAY?si=m_VlqDBuD4qgleDp [Tom Scott]. (2013, Jan. 16). Creative Arts Charter School Approach to Project-Based Teaching. [Video File]. Retrieved from https://youtu.be/1nq4gFp_vAY

The following are a few representative examples of the kinds of arguments typically made by advocates of project-based learning:

- Project-based learning gives students a more “integrated”

understanding of the concepts and knowledge they learn while also equipping them with practical skills they can apply throughout their lives. The interdisciplinary nature of project-based learning helps students make connections across different subjects rather than perceiving, for example, math and science as discrete subjects with little in common.

- Because project-based learning mirrors the real-world situations students will encounter after they leave school, it can provide stronger and more relevant preparation for college and work. The student not only acquires important knowledge and skills, they also learn how to research complex issues, solve problems, develop plans, manage time, organize their work, collaborate with others, and persevere and overcome challenges, for example.
- Project-based learning reflects the ways in which today's students learn. It can improve student engagement in school, increase their interest in what is being taught, strengthen their motivation to learn, and make learning experiences more relevant and meaningful.
- Since project-based learning represents a more flexible approach to instruction, it allows teachers to tailor assignments and projects for students with a diverse variety of interests, career aspirations, learning styles, abilities, and personal backgrounds. For related discussions, see [differentiation](#) and [personalized learning](#).
- Project-based learning allows teachers and students to address multiple learning standards simultaneously. Rather than only meeting math standards in math classes and science standards in science classes, students can work progressively toward demonstrating proficiency in a variety of standards while working on a single project or

series of projects. For a related discussion, see [proficiency-based learning](#).

The following are a few representative examples of the kinds of arguments that may be made by critics of project-based learning:

- Project-based learning may not ensure that students learn all the required material and standards they are expected to learn in a course, subject area, or grade level. When a variety of subjects are lumped together, it's more difficult for teachers to monitor and assess what students have learned in specific academic subjects.
- Many teachers will not have the time or specialized training required to use project-based learning effectively. The approach places greater demands on teachers—from course preparation to instructional methods to evaluating learning progress—and schools may not have the funding, resources, and [capacity](#) they need to adopt a project-based learning model.
- The projects that students select and design may vary widely in [academic rigor](#) and quality. Project-based learning could open the door to watered-down learning expectations and low-quality coursework.
- Project-based learning is not well suited to students who lack self-motivation or who struggle in less-structured [learning environments](#).
- Project-based learning raises a variety of logistical concerns since students are more likely to learn outside of school or in unsupervised settings or to work with adults who are not trained educators.

Reflection

How and why could the Problem-Based and/or Project-Based Learning teaching methods enhance opportunities for deep learning, motivation, equity, and inclusion of students with disabilities?

- Reflections from Robin Vogt, Granite State College School of Education teacher candidate

Finding inclusive educational balance with students who have disabilities is not an easy task. Many factors affect not only the student's willingness to participate but also their ability to consistently contribute to the overarching educational goal(s) that is set by the teacher. Cooperative learning opportunities encompass everything that is good and right about education and the success of an entire body of students. Most importantly, the special education population that makes up a percentage of this student body plays a large role in these successes as well. Deeper learning, motivation, equity, and inclusion are all aspects of PBL (Project-Based Learning) and the ultimate goal that surrounds its pedagogy.

As with any instructional practice, students should have clear expectations, and feel a connection to the content of real world applications. In that process, students (both populations) should be able to problem-solve, feel motivated by the task, and work with each other as learners (not individuals) to achieve success. Project-based learning is built on "identifying real-world problems" and finding solutions (UQx, 2017). When performing the necessary

tasks involved, all students have an equal opportunity at both completing the learning or finding themselves coming to a conclusion on where things may have gone wrong. These experiences are not true to just one kind of learner; they cross many levels of understanding and learning styles. Using Project-Based Learning inclusively allows students with diverse learning needs to interact with his or her peers on a leveled-playing field, all with the same purpose and drive at heart. Hearing the voices of peers that they (learners with diverse needs) understand and possibly look up to is momentous and a deciding factor in the learning process. Classmates motivate and push each other to new limits when given the tools to do so. There is no single teacher who can do this; however, the experience of PBL (Project-Based Learning) and the unique opportunity to be with classmates as a unified unit can create those deep learning experiences.

Outlined by Bloom's Taxonomy, "higher-order cognitive skills" can embrace the learning experiences created by PBL and cooperative teaching methodology. When exposed to the learning methods and practices of his or her own peers, the student's motivation to participate and be part of the strategy is increased dramatically. There are times, especially when discussing students with diverse learning needs, when the learner is spending quite a few hours in another setting on discrete trials or receiving IEP services. Their participation in the general-education classroom is often limited and held to a small period of time during the week. Socially, the inclusiveness of Project-Based, Problem-Based, and cooperative-teaching learning is needed. Academically, the inclusiveness is influential. Personally, the experience created by all three pedagogues cannot be compared to any other facet of education. Encouraging and allowing learners with diverse learning needs to participate in these learning formats can mean the difference between a really good day filled with exploration and just another day of the same language and learning in the classroom. Project-based learning should not be used every day;

however, when used at the right time and within the right environment, the PBL undertaking can drive learning for many students with different learning needs.

Source: UQx: LEARNx Deep Learning through Transformative Pedagogy. (2017). University of Queensland, Australia. (an Open edX MOOC). Project Based Learning

Attribution:

- Project-Based Learning. (2013). The Glossary of Education Reform. Retrieved from <http://edglossary.org/project-based-learning/> UQx: LEARNx Deep Learning through Transformative Pedagogy (2017). University of Queensland, Australia
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Chapter 9-: Micro Teaching

- What is Microteaching
- Peer Assessment in Microteaching
- Benefits of Engaging in Peer Review of Teaching

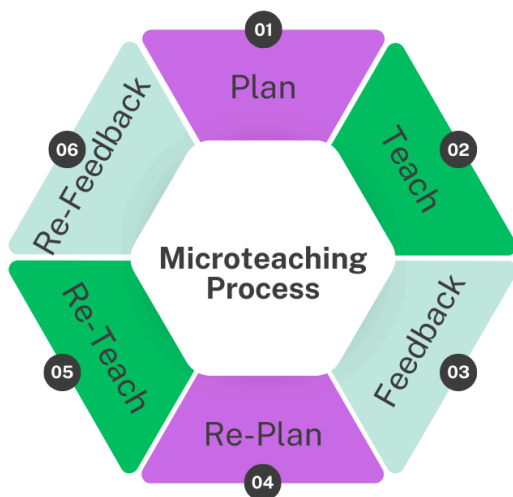


Figure 9.1: Microteaching Process

What is microteaching?

Why wait for student evaluations to receive feedback on teaching practices? Microteaching provides an opportunity for faculty and instructors to improve their teaching practices through a “teach, critique, re-teach” model. Microteaching is valuable for both new and experienced faculty to hone their teaching practices. It is often used in pre-service teacher training programs to provide additional experience before or during the clinical experiences.

Microteaching is a concentrated, focused form of peer feedback and discussion that can improve teaching strategies. It was developed in the early and mid-1960s by Dwight Allen and his colleagues at the Stanford Teacher Education Program (Politzer, 1969). The microteaching program was designed to prepare the students for their internships in the fall. In this early version of microteaching, pre-service teachers at Stanford taught part-time to

a small group of pupils (usually 4 to 5). The pupils were high school students who were paid volunteers and represented a cross-section of the types of students the pre-service teachers would face during their internships.

WHY USE MICROTEACHING?

Microteaching has several benefits. First, because the lessons are so short (usually 5 to 10 minutes), they have to focus on specific strategies. This means that someone participating in a microteaching session can get feedback on specific techniques he or she is struggling with. In a pre-service or training situation, participants can practice a newly learned technique in isolation, rather than working that technique into an entire lesson (Vare, 1993).

Microteaching is also an opportunity to experiment with new teaching techniques. Rather than trying something new with a real class, microteaching can be a laboratory to experiment and receive feedback, first (Kuhn, 1968).

HOW DOES MICRO-TEACHING WORK?

In the classic Stanford model, each participant teaches a short lesson, generally 5 to 10 minutes, to a small group. The “students” may be actual students, like in the original Stanford program, or they may be peers playing the role of students. In the case of pre-service teachers and teaching assistants, there generally is at least one “expert”, as well. If desired, the session can be videotaped for review later (Vare, 1993).

The presentation is followed by a feedback session. In some cases, the feedback session can be followed by a re-teach, so that the instructor has an opportunity to practice the improvements suggested during feedback (Vare, 1993).

GIVING FEEDBACK

Receiving criticism is hard for all of us. Setting a tone of respect and professionalism may help participants to be tactful and to keep feedback constructive. Here is an example of ground rules used by the CASTL program at California State University (http://fdc.fullerton.edu/learning/CASTL/carnegie_microteaching_materials.htm):

Ground Rules

1. Respect confidentiality concerning what we learn about each other.
2. Respect agreed-upon time limits. This may be hard, but please understand that it is necessary.
3. Maintain collegiality. We're all in this together.
4. Stay psychologically and physically present and on task.
5. Respect others' attempts to experiment and to take risks.
6. Listen and speak in turn, so everyone can hear all comments.
7. Enjoy and learn from the process!

Feedback should be constructive and based on observation, rather than judgments. A good example of feedback is "You fidget with your pen while talking, and that is distracting," rather than "You seem nervous and unprepared." The first comment is about observable behavior, while the second is a judgment about what that behavior means.

Commenting on observable behavior also leads to suggestions for improvement. Again, using our pen example, a better example of feedback would be, "You fidget with your pen while talking. Perhaps it would be better to keep a hand in your pocket."

In the Stanford model, feedback was given using a 2+2 system. Each participant started their feedback with two positive comments, followed by two suggestions for improvement. This gives the instructor a sense of his or her strengths and areas of improvement.

HOW CAN MICROTEACHING BE USED?

The most common application for microteaching is in pre-service teacher training, like the original Stanford model. However, that certainly isn't the only application. Microteaching has also been used to train teaching assistants and new faculty on teaching methods. Even experienced faculty can refine their teaching techniques using microteaching.

A similar technique, micro-rehearsal, has been used to train prospective music conductors. (Kuhn, 1968) Like microteaching, the students conduct a 5- to 10-minute rehearsal with sample musicians. Following the rehearsal, the musicians provide feedback on the prospective conductor's rehearsal technique.

Microteaching techniques can also be used in other fields. In business, microteaching can be used to focus on presentation skills, persuasion and negotiation techniques, and interviewing techniques. In counseling and social work, microteaching can be used to hone questioning and active listening skills. It also applies outside of the classroom. For example, departments like Career Service can use

microteaching techniques to prepare students for job interviews.

Ultimately, microteaching is a useful technique for teaching soft skills, presentation skills, and interpersonal skills. This focused approach encourages growth through practice and critique. The "teach, critique, re-teach" model gives the instructor immediate feedback and increases retention by providing an opportunity for practice.

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https://oercommons.s3.amazonaws.com/media/courseware/relatedresource/file/Micro_Teaching_ussdbNX.pdf

PEER ASSESSMENT IN MICROTEACHING

OVERVIEW

Peer Assessment in microteaching is an interactive evaluation technique where peers review and critique each other's teaching presentations in a microteaching session.

Microteaching is an innovative practice-oriented approach where teaching sessions are conducted on a smaller scale, often with a reduced duration and with a few students or peers acting as learners. This method facilitates a supportive environment where aspiring teachers can experiment with new teaching strategies, receive immediate constructive feedback, and engage in reflective practice. During these sessions, participants take turns teaching short lessons on chosen topics, after which they receive feedback from their peers based on specific assessment criteria such as lesson plan, delivery, clarity of instruction, interaction/ engagement

strategies, content knowledge, uses of visual aid and/or technology integration, peer feedback and responsiveness to learner needs. Additionally, microteaching involves a cycle of steps of how to plan, the way of teaching, observation, assessing learning, replanning, reteaching, and reobserving. In general, microteaching is a useful tool for assisting novice teachers in learning about and reflecting upon good teaching methods and can be best assessed by peers.

OBJECTIVE

The primary aim of Peer Assessment in Microteaching: This assessment method was designed to assess and improve teaching skills, pedagogical approaches, and classroom management strategies. By participating in peer assessment, educators are encouraged to critically evaluate their own teaching practices and those of their colleagues, promoting a culture of continuous learning and improvement. The process is intended to help i) educators become more adaptable, responsive, and effective in their teaching methods, ultimately enhancing student learning outcomes. ii) to promote a reflective teaching practice, and iii) to build a collaborative professional community where prospective teachers and educators can share best practices, challenges, and innovations in teaching.

GRADING

The rubric consists of key aspects of teaching effectiveness and peer feedback. The aspects of teaching include:

1. Lesson Planning: whether the Lesson is well-structured, objectives are clear, and materials are effectively utilized.
2. Lesson delivery: whether the teaching/class presentation considered student-centered approaches, engaging, clear, and well-paced, with excellent use/choice of language.

3. Observation on Patterns of Interactions: whether the lesson has demonstrated an exceptional ability to engage students, encourages participation, and responds effectively to questions, and effectively uses technology for interactive learning.
4. Uses of visual aid and technology integration/with technology enhanced activities: whether innovative methods of teaching aids were used, and technology integrated that may significantly enhance learning outcomes.
5. Classroom management: whether there is evidence of exceptional ability to manage classroom dynamics, disruptive behaviors, and maintaining an effective and inclusive learning environment.
6. Language skills: skillfully integrated and balances all four language skills (listening, speaking, reading, and writing) and subskills (grammar, vocabulary, pronunciation, etc.), promoting comprehensive language development.
7. Pragmatism and Cultural awareness: Lessons reflect the practical application of concepts, encouraging real-world understanding and engagement. Incorporates real-world applications and cultural contexts into their lessons. These elements are crucial for creating engaging, relevant, and inclusive learning environments.
8. Inclusivity: demonstrates outstanding ability to adapt lessons for adult learners who do not speak Kiswahili as a second/foreign language. Also, focus on students with special learning needs, ensuring accessibility and engagement.
9. Quality Peer Feedback: Provides constructive, specific, and respectful feedback that contributes to professional

growth, and provides actionable feedback, including perspectives on inclusivity, and differentiation for diverse learners.

ASSESSMENT CRITERIA

From Excellent- Good – Satisfactory – Need Improvement Scoring points: Total points earned across all criteria determined the peer assessment grade. The maximum score was 20 marks. Feedback was detailed, highlighting strengths and areas for improvement.

Role of Peer Assessment in Microteaching

Implementing peer assessment in microteaching fostered a collaborative learning environment where peers could openly share feedback, insights, and teaching strategies. This method significantly enhanced reflective practice, as participants could see their teaching through the eyes of their peers, leading to a deeper understanding of their pedagogical strengths and areas for improvement.

Peer Evaluation: Your Feedback is Critical Role You Play

One challenge noted was the variability in the quality and depth of feedback provided by peers, and culturally, peers were uncomfortable offering feedback to their peers. The cultural discomfort associated with offering peer feedback, highlights the crucial areas for consideration in implementing peer assessments. Consider the importance of constructive criticism in professional growth. Consider when providing feedback:

- Follow the TAG! approach (Tell something good, Ask questions, Give suggestion, and anything you like to add)
- Should be constructive

- Should be consistent and depth across all evaluations
- The importance of specific, actionable feedback to enhance teaching practices.

Remember, the peer assessment process is a learning opportunity not just for the presenters who do the microteaching but also for the the evaluators as well because analyzing and assessing teaching practices can deepen one's own understanding and approach to teaching.

Video: 60-Second Strategy: TAG Feedback



One or more interactive elements has been excluded from this version of the text. You can view them online

here: <https://pressbooks.uwf.edu/planning-curriculum/?p=357#oembed-1>

Source: <https://youtu.be/OdYev6MXTOA?si=Es7WLURRpGncIP1Z>

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BENEFITS OF ENGAGING IN PEER REVIEW OF TEACHING

- Gain a sense of community: Teacher candidates may often feel as if they will be teaching and dealing with the challenges of this work in isolation. Soliciting and receiving feedback from your peers can help to break down silos and create community by sharing things that have worked well and lessons learned with your colleagues (Hutchings, 1996).
- Receive feedback from multiple perspectives: It is important to consider collecting feedback from different perspectives (peers, instructor, university supervisor, instructors, or students) to ensure that all the feedback you are collecting reveals a similar story and outcome. Hence, peer feedback will allow you to collect information, re-plan your lesson as needed, and re-teach it to improve your teaching to help you grow professionally.
- Observing your peers can also help enhance your teaching:
If you take on the role of a peer reviewer, observing a colleague's teaching techniques can spark new ideas for your own teaching. You should meet regularly to discuss your observations – not to provide evaluative feedback but to gather ideas that you both might want to implement in your own courses.

Leverage peer feedback to improve your teaching:

Peer review can help to increase critical reflection of teaching and can motivate and encourage you to experiment with new teaching methods. Research has shown that instructors who participate in peer review incorporate more active learning strategies in their courses, increase the quality of their feedback to students, and

report enjoying discussing teaching with their colleagues (Bernstein, 2000).

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Chapter 8: Backward Design Process and Instruction Models

- Introduction
- Backward Design Process as a Curriculum Development Model
- Lesson Planning
- Constructivism Theory and the 5E Model
- 5E Lesson Format
- Launch-Explore-Summarize Lesson Format

In this chapter, you will apply the knowledge you have learned to develop lesson plans. Planning takes place at different levels: state, district, school, department. States usually develop curriculum standards that are used to create lesson goals and objectives.

Districts often provide a formal curriculum in the form of textbooks and supplementary materials. Schools are responsible for providing the classroom curriculum in the form of instruction using the state standards and the district's formal curricula. The breadth and depth of lesson plans often depend on the requirements of school and district administration. While in college, instructors might ask you to provide more details in the lesson you planned as compared to other lessons that you might have been exposed to. It is important to note that regardless of the requirements for the type of lesson plans you will be asked to prepare, lesson plans are considered public documents and are proof of the state standards you have covered.

BACKWARD DESIGN PROCESS AS A CURRICULUM DEVELOPMENT MODEL

"To begin with the end in mind means to start with a clear understanding of your destination. It means to know where you're going so that you better understand where you are now so that the steps you take are always in the right direction." —Stephen R. Covey



The essential question in all curriculum planning is: what should students know and be able to do as a result of the lesson or learning? Since national, state, and local standards often guide the work of teachers and curriculum developers, they serve as a framework to help prioritize the “learning targets.” It is traditional to begin with the frontloading design, which puts the standards first, but in an age of high-stakes testing, many districts are looking at how to match curriculum with state and district testing requirements.

Backward design, or the backloading of curriculum, is often used when the traditional frontloading of curriculum is not practical. Why is this? Frontloading becomes impractical when state or local districts adopt assessments that do not reveal the content of what is tested. This is most often the case with assessments that are published by corporations whose goal is to maintain a “normal curve” with a few students having high scores, with most students scoring in the middle, and some having low scores. This is in contrast to schools and teachers who want to have as many students as possible attain high scores.

To help solve this problem, curriculum developers attempt to match the contents of the local or state curriculum, which are based on the standards, to the test or tests using backward design.

Districts often begin with the test items that were released as a starting point in the process. A more in-depth description of this process follows.

Essential Questions

- How is backward design different than traditional curriculum design?
- What are the main elements of the Backward Design model?
- How is the Backward Design model similar to English's Aligned Curriculum? How are they different?
- Why isn't backward design used in all curriculum design processes?

BACKWARD DESIGN

From Vanderbilt University Center for Teaching, *Understanding by Design*.

Understanding By Design, a text written by Grant Wiggins and Jay McTighe, offers a framework for designing courses and content units called "Backward Design." Instructors typically approach course design in a forward design manner, meaning they consider the learning activities (how to teach the content), develop assessments around their learning activities, and then attempt to draw connections to the learning goals of the course. In contrast, the backward design approach has instructors consider the learning goals of the course first. These learning goals embody the knowledge and skills instructors want their students to have learned when they leave the course. Once the learning goals have been established, the second stage involves consideration of assessment. The backward design framework suggests that instructors should consider these overarching learning goals and how students will be assessed before considering how to teach the

content. For this reason, backward design is considered a much more intentional approach to course design than traditional methods of design.

The Three Stages of Backward Design

“Deliberate and focused instructional design requires us as teachers and curriculum writers to make an important shift in our thinking about the nature of our job. The shift involves thinking a great deal, first, about the specific learnings sought, and the evidence of such learnings, before thinking about what we, as the teacher, will do or provide in teaching and learning activities.” — Grant Wiggins, *Understanding by Design*



Figure 8.1 – UbD: Stages of Backward Design

UbD Resources

The blank [backward design template](#) is referred to as UbD

Template 2.0. The older version (version 1.0) can also be downloaded at the Jay McTighe site previously mentioned, as well as other resources relevant to

Understanding by Design. The template walks individuals through the three stages of backward design.

The following template shows how a curriculum is developed, with an eye to “Desired Results” which can be translated to test scores.

1. Use the [UbD Template 2.0](#) to apply the Backward Design model to one of your favorite units or lessons.
2. Post a brief response to the following question in the ILA Response Group: Did you find the backward design process beneficial? Why or why not?

BENEFITS OF BACKWARD DESIGN

“Our lessons, units, and courses should be logically inferred from the results sought, not derived from the methods, books, and activities with which we are most comfortable. Curriculum should lay out the most effective ways of achieving specific results... in short, the best designs derive backward from the learnings sought.”

In *Understanding by Design*, Wiggins and McTighe argue that backward design is focused primarily on student learning and understanding. When teachers are designing lessons, units, or courses, they often focus on the activities and instruction rather than the outputs of the instruction. Therefore, it can be stated that teachers often focus more on teaching rather than learning. This perspective can lead to the misconception that learning is an activity when, in fact, learning is derived from a careful consideration of the meaning of the activity.

As previously stated, backward design is beneficial to instructors because it innately encourages intentionality during the design process. It continually encourages the instructor to establish the purpose of doing something before implementing it into the curriculum. Therefore, backward design is an effective way of guiding instruction and designing lessons, units, and courses. Once the learning goals, or desired results, have been identified, instructors have an easier time developing assessments and instruction around grounded learning outcomes.

The incorporation of backward design also lends itself to transparent and explicit instruction. If the teacher has explicitly defined the learning goals of the course, then they have a better

idea of what they want the students to get out of learning activities. Furthermore, if done thoroughly, it eliminates the possibility of doing certain activities and tasks for the sake of doing them. Every task and piece of instruction has a purpose that fits in with the overarching goals and goals of the course.

As the quote below highlights, teaching is not just about engaging students in the content. It is also about ensuring students have the resources necessary to understand. Student learning and understanding can be gauged more accurately through a backward design approach since it leverages what students will need to know and understand during the design process to progress.

“In teaching students for understanding, we must grasp the key idea that we are coaches of their ability to play the ‘game’ of performing with understanding, not tellers of our understanding to them on the sidelines,” (Wiggins and McTighe, 1998).

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In the following video, Dr. Stephanie Chasteen and others from the University of Colorado Boulder introduce the concept of backward design with some specific examples of how it can be used in developing curriculum for STEM courses.

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BACKWARD DESIGN AS A CURRICULUM-DEVELOPMENT MODEL

Neither backward design nor “frontloading” the curriculum is better than the other. It just depends. The real questions are: where, as a teacher or a committee, do you want to begin? What are the priorities?

The traditional “frontloading” approach begins with the aims, goals, and objectives as a basis for writing the curriculum, then developing learning activities and assessments (formative and summative) to assess the curriculum. With the backward design, the teacher or curriculum committee either develops the assessments or relies on evidence from commercial assessments or released items from state tests as a beginning point.

A key question here is: what is the evidence that students have met the standards? (i.e., attained the prescribed knowledge and skills to plan the teaching and learning activities). This encourages teachers to “think like an assessor,” according to Wiggins and McTighe. The challenge is that commercial testing companies that develop state tests do not want the most, let alone all the items, known because they fear it would invalidate the test. Experts like Fenwick English argue that if teachers and curriculum committees had more knowledge about what the commercial tests are actually assessing (not specifically individual test items), it would help to create better alignment between what is written, what is taught, and what is tested. This alignment, as we learned earlier, can be helpful to all students, especially students from homes of poverty where there is a paucity of books and reading materials. Unfortunately, most testing companies do not share much of this information, and the released items tend to be those that they will not use again.

Backward design works best when the school or district develops its own tests so they know what the targets are. Even without the knowledge of what is on the tests, most districts tend to favor backward design or backloading because there is great pressure from the stakeholders for students to attain high test scores. In private schools, where high-stakes testing is not as much of an issue, curriculum development is most often frontloaded, particularly with classical education, where the aims, goals, and objectives are of primary importance.

Insight

There is no single “best way” to develop a curriculum. The most important decision for a curriculum committee to make regarding which design to use should be based on what is most appropriate for the school or district.

Summary

Traditional or “frontloading” and backward or “backloading” design models are used to create a curriculum, and both have benefits. In schools or districts where aims, goals, and objectives are the focus, the traditional model is probably the best choice. In many districts, backward design is used because there is an expectation that students should attain high test scores.

Credits:

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LESSON PLANNING

Great lessons don't just happen! Effective practitioners are intentional about determining a lesson's purpose and the instructional process they'll use to best meet their students' needs. They plan so that students' investment of time in learning is valued and productive and moves them toward the attainment of specific learning objectives.

In teacher education programs, teacher candidates are required

to prepare comprehensive lesson plans that foster the process of planning effective instruction. With time and experience, this process becomes intrinsic, leading to the need for less documentation.

This chapter is intended to serve as a resource for beginning teachers as they master the art of effective lesson planning and for experienced teachers as they revisit the components of lesson planning that become second nature over time.

Each chapter presents a component of lesson planning critical for student learning and describes how that component is targeted in our college's lesson planning tools, including the CPS's [CEP Lesson Plan Template](#), the [CEP Lesson Plan Rubric](#), and the [CPS Lesson Observation Feedback Tool](#).

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CONSTRUCTIVISM THEORY AND THE 5E MODEL

Constructivism is a relatively young theory that was brought to the forefront in the 1960's. The premise is built on the works of cognitive theorist Piaget, Bruner, and Vygotsky. In this paper we will discuss constructivism learning theory, the 5-E model, and how they can work together in the classroom. Bruner stated that "you cannot strip learning of its content, nor study it in a 'neutral' context. It is always situated, always related to some ongoing enterprise" (Bruner, 2004).

KEY THEORIST – JEROME BRUNER

Jerome Bruner was born in 1915 in New York City. He is known to

be one of the leaders in the rise of cognitive theory in education. “Bruner suggested that intellectual ability developed in stages through step-by-step changes in how the mind is used.” (Smith, 2002) Bruner taught at Harvard University and Oxford University. Bruner wrote *The Process of Education* (1960), which is considered an important work that greatly influenced American education policy by highlighting four themes that resonated with many teachers. These themes described the learning process of children as exploratory in nature that was driven by natural curiosity. Scaffolding of content was first defined by Bruner. He wrote *Toward a Theory of Instruction*, which presented “the case for education as a knowledge-getting process” (Bruner, 1966).

THEORETICAL CONCEPTS

Critical Thinking

Learners need to think critically by considering different viewpoints and acknowledge bias when solving given problems (Hashimoto & Nyikos, 1997). This is especially true when it comes to digital literacy in the 21st century. Social interaction activities play a vital part in the cognitive development of new ideas or varied points of view. In other words, there are two key elements to critical thinking: 1. a frame of mind that allows examination of multiple viewpoints; and 2. determining the reliability of a source, distinguishing relevance, detecting bias, and identifying assumptions (1997).

Zone Proximal Development

Within a group, each person has an individual zone of potential. This is due to individuals having different experiences. However, when collaboration occurs and interrelationships are formed, individual

viewpoints and schemas have the ability to grow (Hashimoto & Nyikos, 1997).

5E LESSON FORMAT

The 5E Instructional Model includes five phases that all begin with the letter “E.” The five phases are engage, explore, explain, extend/elaborate, and evaluate.



5E Model – University of Kansas- Edwards Campus, Julia Fulbright

Engaged

When students are engaged, they are able to make connections between past and present learning experiences and mentally engage the student on the concept, process, or skill that is being learned (5E, 2014). This coincides with the constructivist theory because Vygotsky says that learning occurs when students build off their prior knowledge or experiences.

Explore

This phase provides students with a common base of knowledge through exploring concepts, processes, or skills to be learned (5E, 2014). This can be done using Web Tools, social media, collaboration with experts, or any other method of exploration. This phase relates to Bruner's contributions to the constructivism theory in his belief that learning must be a process of discovery.

Explain/Elaborate/Evaluate

The last three phases of the 5E model are: explain, elaborate, and evaluate. When students explain or verbalize their understanding, the teacher is able to introduce new vocabulary, terms, and explanations (5E, 2014). The teacher is also able to catch any misconceptions. The constructivist theory suggests that learning occurs when knowledge is applied to real-life situations. The 5E model supports this with the elaborate phase. In this phase, students extend their knowledge through practice and application (2014). Lastly, students should self-reflect on learning and assess their own understanding while the instructor is able to evaluate the students' understanding of key concepts (2014).

Sample 5E Lessons: <https://oercommons.org/courseware/lesson/96466>

Watch the video: Inquiry-Based Learning: Developing Student-Driven Questions



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=347#oembed-1>

APPLICATION IN THE 21ST CENTURY

Critical Thinking

The constructivism theory suggests that collaboration plays a vital role in critical thinking. It also believes that the ability to determine the validity of material is equally important. This can be done in the 21st century by using digital Web 2.0 Tools such as blogging, wikis, and discussion boards.

Zone of Proximal Development

Zone of Proximal Development (ZBD) is an individual's ability to learn new knowledge on a subject based on prior knowledge or experiences. Because we all have different experiences, we comprehend things in different ways. Therefore, when put into a group, collaboration can occur, and schemas can grow. This can be done using social media formats such as See Saw. Fortunately, stimulations, gaming, and virtual experiences are other ways that students are able to grow their Zone of Proximal Development in the 21st century.

CONCLUSION

The 21st century is evolving around technology. It is changing the way we think, learn, and operate. “Buzz words” in the education world include collaboration, higher order, and real-world experiences. Constructivism is a theory that encompasses these thoughts while applying them to how we learn. For example, constructivism suggests that learners are able to learn best when they are able to tap into prior knowledge, and information is scaffolded. Feedback also plays an important role in the learning process, according to constructivists. This theory has evolved over many years and includes research done by Dewey, Piaget, Vygotsky, and Brunner.

The 5E design model lends itself perfectly to helping designers mold lessons and/or courses around constructivist ideas. The students are expected to engage, explore, explain, elaborate, and evaluate. The model also entices real-world scenarios, high-order thinking, and collaboration which ties it nicely to the constructivism theory.

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[Pros and Cons of using the 5E Design Model and Constructivism in Adult Education](#) by [Kathleen Beaser](#) is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivs 3.0 United States License](#).

LAUNCH-EXPLORE-SUMMARIZE LESSON FORMAT

The Launch-Explore Summarize Teaching Model is a mathematics instruction model. In this three-phase lesson format is a problem-solving structure to promote meaningful math learning by activating prior knowledge, letting students explore mathematical thinking, and promoting a math community of learners. The three elements of this format are: launch, explore, and summarize.

- 1) Launch: the beginning phase: getting ready;
- 2) Explore: the middle phase: students work/explore the content; and
- 3) Summarize (End): class discussion.

[View References](#)

Example: Use This Strategy in the Classroom

Watch how this first-grade teacher uses the three-phase lesson format to teach Operations and Language Skills. Through this problem-solving approach, students persevere to advance their mathematical thinking and Mathematical Flexibility.

Watch the Video: **Grade 1 Math Lesson 3 Phase Lesson CCSS**



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here: <https://pressbooks.uwf.edu/planning-curriculum/?p=347#oembed-2>

Source: <https://www.youtube.com/watch?v=3DEDuy6YLtQ>

To implement this lesson format, teachers can start by asking thought-provoking questions and connecting the ideas of the mathematical task/problem to prior student experiences. Next, students explore and work on the task independently then with peers. Lastly, teachers bring the whole class back together to discuss the math ideas developed in the task and draw connections to strategies different students used.

Design It into Your Product

Products can be built around these three-phases to support the problem-solving process. They can also embed task-specific, extension questions or additional support when necessary depending on the learner's misconceptions, challenges, or strategies. This additional feedback can be useful in stretching learners' Mathematical Flexibility and Motivation to problem solve.

Design It into Your Product

Products can be built around these three-phases to support the problem-solving process. They can also embed task-specific, extension questions or additional support when necessary depending on the learner's misconceptions, challenges, or strategies. This additional feedback can be useful in stretching learners' Mathematical Flexibility and Motivation to problem-solve.

Additional Resources

Additional examples, research, and professional development. These resources are possible representations of this strategy, not endorsements.

Expanded on This Framework

Planning a Math Unit:

- Launch-Explore-Summarize Teaching Model
- Access the materials: [Launch-Explore-Summarize Teaching Model](#)
- Launch– Explore- Summarize – Reflect – Apply (LESRA)

- Access the materials: [Launch – Explore- Summarize – Reflect – Apply](#)
- Launch-Explore-Discuss
- Access the materials: [Launch-Explore-Discuss Framework](#)

Chapter 10 Grow Professionally: Teaching Reflection

- Reflecting and Growing in through Lesson Plan
- Grow Professionally
- Closing Notes

REFLECTING AND GROWING IN THROUGH LESSON PLAN

The most successful, highly effective teachers are reflective practitioners. Following the teaching of your planned lesson, you will reflect upon your instruction and experience. You will do so with the educator who observed your lesson (instructors, university supervisor, field placement faculty, and/or cooperating teacher). This is an extremely valuable opportunity in which to receive constructive feedback that, if acted upon, will positively impact the planning and execution of your future instruction.

In a teacher preparation program, it is strongly recommended that you videotape yourself as you instruct students. This provides powerful insight into your teaching practices and habits. It allows you to observe everything from your body language to your verbal language, as well as interactions with students. It enables you to monitor your effective implementation of professional

instructional practice. As a result of reflection you are able to identify an area for growth in future lessons.

You are additionally expected to reflect in writing following your observed teaching, referring to effective documented evidence of your student's progress in planning the next steps in your students' learning. You'll reflect upon the processes used in your instruction and the classroom environment. You'll note what went well and determine an area of your teaching to focus on in the future (Professional Responsibility).

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GROW PROFESSIONALLY

As teacher candidates are prepared to enter the classroom, growing professionally is important. It is important to know that teaching is a lifelong process and one can get better at doing something by doing it, evaluating, and reflecting on their teaching practices to grow. In this continuous improvement process to become a better teacher today than yesterday, you must make sure that you are aware of any state guidelines for your professional practice and development. In the state of Florida, educators must use the Florida Educator Accomplished Practices (FEAPs) to guide their professional improvement. These guidelines were established by the Florida Department of Education. You can find more information on the FEAPs at: <https://www.fldoe.org/teaching/professional-dev/the-fl-educatoraccomplished-practices.stml>.

REFLECTION

In order to find the best ways to improve your teaching practice,

regular reflection on the challenges of teaching, the success (or failure) of students, and the choices you made before, during, and after teaching a lesson must become an integral part of your practice. Effective reflection is a deliberate, meaningful, and structured review of information in order to improve professional practice.

Reflection involves looking at student work to determine the efficacy of your instruction. It's a process of self-observation and self-evaluation. Reflection comes in many forms, including:

- collaborating with colleagues
- analyzing student work
- audio/video recording of teaching to capture the moment-to-moment process of teaching written accounts of experiences (journal writing, blogging, self-reporting)
- peer observation can provide opportunities for you to view other colleagues in order to expose yourself to different teaching styles and to provide opportunities for critical reflection on your own teaching

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CLOSING NOTES

This chapter closes the book on the materials that we strategically selected for teacher candidates enrolled in teacher preparation programs at the University of West Florida; specifically, for the course Planning and Curriculum. We authors reflect on the teaching process as we introduced at the beginning of the book

that teaching is a reflection process. We selected these materials by reflecting on our experiences working with teacher candidates.

Nguyen: a faculty member who taught teacher candidates in teacher education programs courses: from Planning and Curriculum, Mathematics Methods, and Field Experience. For Miller: as a former assistant principal who worked directly with teachers and saw the challenges that new teachers faced in planning to teach the curriculum. We both have curricula that we plan, implement, assess, and reflect on, as demonstrated in the Figure. We hope that readers find these materials useful to help teacher candidates as they prepare for the actual classrooms.

