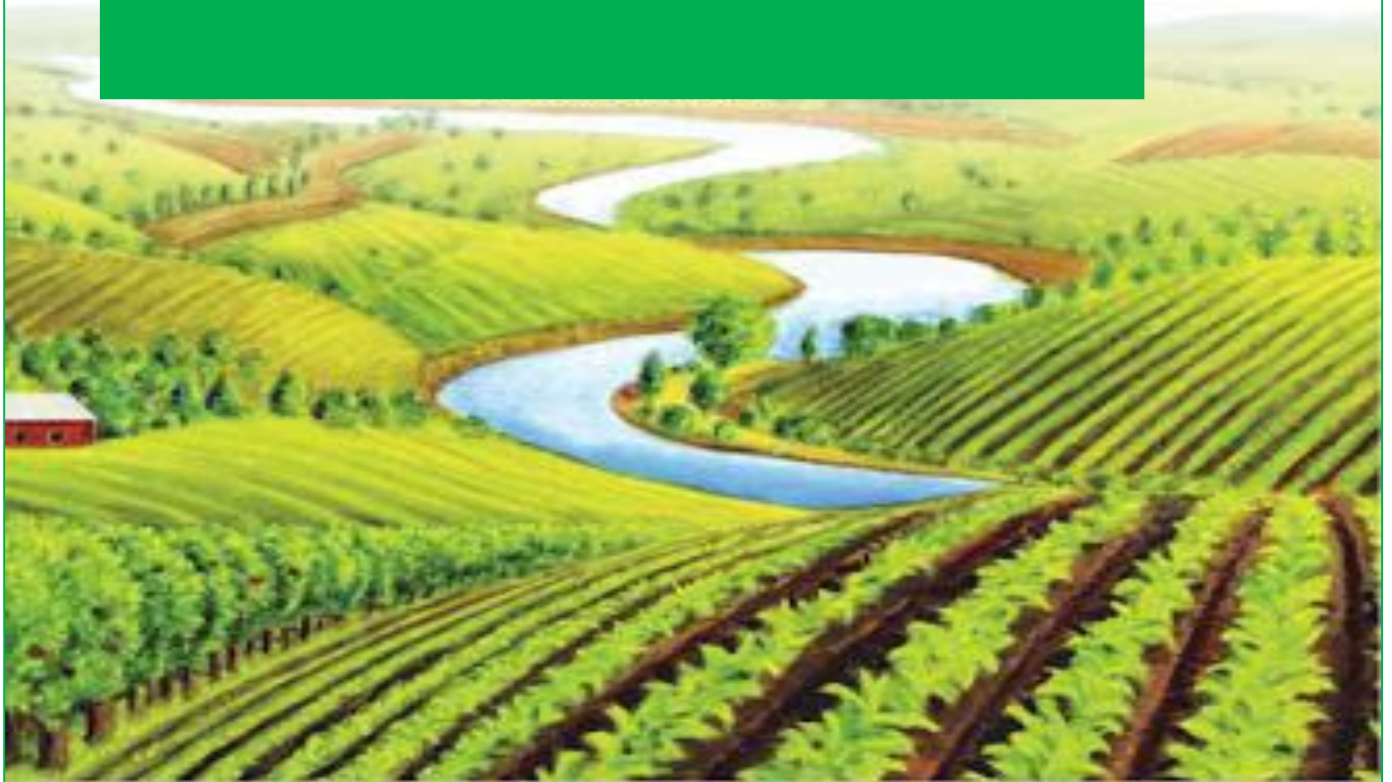




Textbook of Agricultural education

A guide for teachers and students

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“In the name of God”

A NOTE TO READERS, TEACHERS and

Welcome to our book. You’re helping a younger person to learn more effectively, which means we’re already on the same team!

If you are a teacher, you may wish to read the book together with your students. Or you may have a silent reading period, followed by a shared discussion. You will find that this book gives you a shared vocabulary to help you teach other subjects.

This updated textbook is appropriate for both introductory and advanced courses. Each chapter begins with a scenario designed to engage the learner in thinking about the content of that chapter. every lesson concludes with questions for review and discussion, as well as additional activities designed to guide the learner into further exploration. Textbook of Agricultural Education, is an engaging, immersive guide that will help prepare the next generation of agricultural educators.

It also opens doors for the great new careers that are emerging with modern-day changes. Thanks for joining us on this learning adventure. Let’s dive in!

ACADEMIC VOCABULARY IN TEACHING ENGLISH FOR AGRICULTURE AND ENVIRONMENT

Academic vocabulary in teaching English for Agriculture is very important to be implemented in nowadays teaching methods and materials, from the early beginning (CARTER et al., 1988). Students, teachers and researchers in each discipline use academic writing and vocabulary to convey ideas and make arguments and engage in academic conversations. Academic writing and vocabulary is characterized by evidence-based arguments, the exact choice of words, specific to the appropriate field of Agriculture, like the ESP language, logical organization of words, based on agriculture's specific fields and areas, and an impersonal tone, of course (BAKER et al., 1988). Although it was sometimes thought to be so long or inaccessible, strong academic vocabulary is the exact opposite: it informs, and gives a clear and specific meaning, in a direct way, allowing the student to engage in a conversation or to formulate phrases within a scientific dialogue.

Agricultural science courses comprise a wide area of organic sciences relying on many sectors and with utilization in agricultural procedures. Specific classes reaching this subject of study comprises animal husbandry, main horticulture, as well as soiling and insecticides. Excepting this type of classes, some others that can be provided, comprising flora and fauna study, environment, climate change and gestion of natural resources. Landscaping is also part of the classes which might be provided within the wide are of Agriculture (EDWARDS et al., 1981).

The reasons for which the students might have the choice of studying all the above mentioned sciences related to agriculture, are diverse, either to complete their professional profile and become true specialists within the areas they have chosen, or to develop their knowledge about the environmental sciences (BUSKIST et al., 2001).

Most of them, after graduating these specific areas and having a recognised degree within the field of Agriculture, will become either farmers, advisers in public offices from chambers of agriculture, or consultancy offices, or employees in public/private organisms, such as companies, NGOs, at national or international level.

However, all the provided classes, open new opportunities for the attendees, giving them a global overview of the worldwide agricultural context. Classes are offered also on line, which may be considered an opportunity in the current and future context (FERGUSON, 2002).

Even if one may say that academic vocabulary is meant only for specialized discussions, or for publications, English for agriculture, taught using academic vocabulary, leads to framing the personality of the future engineer, actual student, towards a professional and a specialist, not only in knowing how to implement the acquired knowledge but also how to transmit it and express it, either in writing but also when speaking and communicating.

On the other hand, English language is the most used and taught and we could also say that it is one of the most significant academic languages. It includes specific terms, and it may seem that using English academic vocabulary may seem more complicated, but more intelligent at the same time. It also confers self-confidence and self-esteem. Using academic vocabulary generally, but especially in Agriculture gives no place for rhetorical or flowery speech. Students may find it

difficult but it has been proved that it is in the same time, psychologically fascinating, and it appears that we trust more complicated languages.

Using a specific and general academic English vocabulary in the field of agricultural sciences and when teaching all the related classes, gives a clear overview on the importance of the need of having specific vocabulary and word data basis, wordlists, and a much closer approach of the students to the academic corpus of all the research papers and articles within the field of agricultural sciences. Analysing the importance of all specific word data basis within the field, one may notice that it is highly recommended to know and learn all the meanings, because most of the words have specific meanings and connotations, being included in the academic area, together with their technical meaning (MOORE, 2004).

Especially non-native English speakers have increased their interest in the last couple of years, on the specific vocabulary and its academic component, requested when doing research and scientific papers.

Additionally we noticed that a lot of words having general utilization got academic significance within the corpus, being consequently regarded as part of academic vocabulary. Recent research prove the intention and the importance of producing area-particular academic word data basis that, according to our opinion, could include the most used academic vocabulary in order to express the rhetorical side of the research area.

Most of those interested in learning and acquiring specific vocabulary are graduate students but also those who perform research in contexts where English is a foreign language (EFL), because their interest in publishing in English language touches and involves academic vocabulary, being a must in achieving a scientific paper.

Academic vocabulary represents an important part from the sub fields of vocabulary, respectively, high frequency words, academic vocabulary, technical vocabulary and low frequency words, where part of the English language was reunited in order to create pedagogical purposes (BAUER, et al., 1993). The high frequency words and the academic ones were gathered in more vocabulary lists, Coxhead's AWL (2000) and West's GSL (1953), being taken into account as priority when teaching vocabulary classes, including shaping and increase of development materials.

Academic vocabulary started to be considered and analysed to be common to academic texts from different types of texts and areas, resulting that, when compared with technical one, it is much more preferred and accessible for a foreign language professor, this observation pointing out its advantage (NATION et al., 2001).

The importance of academic English

- The course might be not a long academic course that requires students to achieve specific tasks to obtain a passing score. Courses usually take several months of work per week to complete.

- What does it mean, an academic English course? The focus of the academic English course is to provide students with more knowledge and understanding of English so that they can write academic papers and academic papers proficiently and competently. Through the topics covered in this study plan, students will learn how to fully express their ideas, how to increase their educational vocabulary, how to organize certain types of writing, how to avoid grammar and punctuation errors, and how to analyze certain types of text (KNIGHT, 2001).
- Achieving academic English courses can help students improve the way they organize themselves, their management of time, but also the language skills, and the capability to read and write in a professional English, college level, with appropriate vocabulary. All of them, even native English speakers, can taken advantage of having academic English courses.
- Course fees may vary depending on the type of the institution but also on the time necessary for each student to achieve the duties. In order to have a clearer overview, they should try to define their priorities, either to try to learn by following additional classes on line or to attend the classes. Having the possibility in an university to provide at the English classes academic English for Agriculture will attract the students more, spare money for their families and create professionals for the very start.
- Students who have completed academic English courses can use their improved language, literacy and communication skills to find careers in various professional fields, such as business, administration, education, public service and entertainment. Graduates can choose to serve as office administrators, project managers, human resources directors, school office managers, customer service representatives, and even writers and editors for local publications.
- Achieving academic English courses can help students learn the basic practical and professional skills required in the day by day activity in specific professional surroundings and environment.
- An university with specific faculties and study programmes, may introduce in the teaching of modern English language one ESP module for medium and advanced levels, optional class or on line course, dedicated to those who intend to become professionals on an international market in a continue development and with more and more high demands of polyglot specialists. Some word meanings in the Agro Corpus There were academic words from the Agro Corpus that were used with technical rather than academic meaning. The word culture provides an example of a word from the AWL used with technical meaning in the field studied.

When observing the frequent sequences of words that accompany this word, or its clusters (DORNYEI, 2001), it was revealed that culture was used with meanings associated with agriculture, meaning “cultivation of plants” (blueberry cell cultures, cultures were grown, cultures were maintained, cultures were incubated, size fractionated culture) and to biology (the culture medium, chitin broth culture, block liquid culture), meaning “experimental growth of microorganisms in a nutrient substance” (HUTCHINSON et al., 1987). This example adds further evidence to the point made by Hyland and Tse (2007) that disciplines use words with preferred meanings and collocational behaviour, as well as to the problems of homography identified by both Gairns, R. & Redman, (GAIRNS et al., 1993) and Jordan (JORDAN, 2007). Also, the collocations of the word strategy in our corpus further add to the examples provided by Gairns, R.

& Redman, to illustrate the tendency of words to have field-related collocational patterns. These authors found marketing strategy in business, learning strategy in applied linguistics and coping strategy in sociology. In the AgroCorpus, the common collocates were specific to the field, such as control strategies, management strategies, and adaptation strategy.

CONCLUSION

All the given results are able to give us very specific data and correlations between the taught subjects including academic vocabulary, highlighted and classified according to different study programmes and curricula, particular for Agriculture and related fields. Our learners are a clear example of students that acquire their language as they need it for their specific purposes, and do it by contributing their knowledge of science, of their specific topic of science, and of what it means to do science, although they are usually unaware of even basic grammatical rules. Our results also lend support to the argument that vocabulary should be taught considering the students' specific target context, (McKAY, 2006). The argument in favour of the use of a general academic word list may be valid in contexts where English is a second language, as is the context of academic writing courses for international students in English-speaking countries (DUDLEY-EVANS et al., 1998). These courses address learners of different linguistic backgrounds and different fields of study.

A specific focus on academic vocabulary involving a reduced – though with high coverage – list of words, allows for the possibility that the learners contribute their vast knowledge of their specific fields. In this way, both motivation and self-esteem may be increased, since the learners would be exposed to lexical items that they are somewhat familiar with, that they can recognize as part of the texts that they manipulate. In our view, a list of academic words should be a set of options to build the rhetoric of a text, providing all the necessary word data basis, including different criteria of classification, according to the specificity of the audience and the profile of the class of students, their interest and profile.

Chapter 1: Active and passive reading

Lesson1: Active and passive reading

Active reading skills act as a catalyst for critical thinking skills. And, when using critical thinking skills, you become an effective communicator and develop strong problem solving skills. If you use the strategies associated with actively reading, you will be able to recall and apply information as you read, to make your reading time as efficient as possible.

The Active Reading Definition

The acronym "ACTIVE" reading stands for asking questions, making connections, tracking down important information, inferring/predicting, visualizing and evaluating and synthesizing. No matter your age or what grade you are in at school, active reading helps you to better understand what you're reading, allowing you to apply what you've read to your overall schema. This can help make you a better reader, speaker, writer, etc. As you get older, using active reading strategies in college can help you be a more successful student.

"Asking" Questions about the Text

The first step in active reading is to ask yourself questions. Using a colored pen, circle new words that are unfamiliar to you. Underline concepts and phrases that confuse you and write the questions in the margins of the text or on a sticky note. Once you ask questions, your mind will seek to answer them and help you gain clarity. The main questions to ask are: what is your purpose for reading and what do you want to know after reading the material?

Making "Connections"

After asking questions, you'll have to try and make connections, which is easier when all the students have similar background knowledge. In order to become actively engaged in the reading process, you must make connections with the material. Pull from your past experiences or those of others that you may have heard about and connect them to the material. There are numerous ways that you can make connections while reading to include:

- Text to Text: Comparing to pieces of written material.
- Text to Self: The material you are reading to your own personal experiences.
- Text to World: The material you are reading to the world as a whole.

"Tracking" Down Important Information

The next step in ACTIVE reading is to track down information. In order to track down important information, you must be clear on your purpose for reading. Understanding internal and external text structures is also helpful. Internal text structure is the way in which a piece of writing is organized. External text structure is how the text is set up. Highlight all information that you consider important or worthy. Answer the questions that you came up with in the first step of actively reading.

Use What You Know and Learn to "Infer"

The equation for an inference involves taking what you know and adding it to what you've learned to reach your inference. You are in actuality drawing conclusions that go beyond what you have read. When you make a prediction you forecast what will come later in the material. Predictions will be answered by the end of the story, while inferring is a current analysis of what is going on in the story and may or may not be answered by the end of the story.

"Visualize" the Text You're Reading

When you are thoroughly involved in reading, a movie should take place in your mind. This is called visualizing. These mental images are connected to your past experiences. Reading will become three-dimensional, and it will help you retain the information long after you have encountered the material. This also assists with inference. Visualizing requires the use of your five senses. This imagery that is created can also transcend over to writing.

Lastly, "Evaluate" and Synthesizing

Finally, apply reasoning to what you have read and the conclusions that you have drawn. Locate the facts and opinions. Summarize the information. Add your own thoughts to what you have summarized from the new material. Analyze the content. Do you agree or disagree with the information? Why?

Answering these questions lead to a higher level of thinking. Now you must take the time and reflect on what you have read and gained from the material. Once you get to the step of evaluating and synthesizing, you should have a deeper understanding of the text.

When we read for pleasure, we rarely have a problem getting absorbed in what we're reading. After all, we selected the book or magazine and are looking forward to reading it. However, when we have an assignment that has been given to us rather than self-selected, it may be difficult to get interested. This is where the differences between active and passive reading come into play.

What Is the Difference Between Active and Passive Reading?

Every once in a while, even the most engaged students will look up from a page in their textbook and think, "What did I just read?" This is when you know you've been engaging in passive reading. When you're unclear on what you've read and when you can't describe it to a friend or a professor, you've very likely been reading passively.

What is passive reading, and how is it different from active reading? Reading is reading, correct? Not always. Passive reading is when a reader does technically read the words but absorbs next to nothing about what is written. Active readers begin reading with a desire to find out what is going to be said. Simply put, the difference between active and passive reading is the desire to learn something versus the desire to finish reading.

In more specific terms, active reading is when a reader reads critically and analytically. Readers approach the text with certain expectations and read what is written with an eye to how it relates to other things in their own lives or to the larger world.

The Importance of Active Reading

Especially in early elementary school, teachers cannot overstress the importance of active reading strategies. Active reading allows students to absorb what they have read. They make connections between texts, between real life events and between other expressions of ideas. Active reading means a student is engaging with the text in a deep and meaningful way.

Active reading doesn't only mean increased comprehension. It also fosters the opportunity for the student to develop new ideas and new ways of thinking. An active reader is more likely to seek out information about a topic of interest or ask questions when something is unclear. An active reader generally begins reading with some idea of what will be discussed and will have questions about what he has read.

What Are Some Active Reading Skills?

Teachers need to understand that new readers are not necessarily seeking meaning in the text they are given. This is especially true for students who have just mastered the art of word identification. These readers are slowly building their comprehension and should be taught active reading skills.

There are six main active reading skills: visualize, clarify, question, predict, connect and evaluate. These skills, when taken together, can help students to get the most out of their reading experience and to fully engage with the text.

The Six Active Reading Skills

Visualize. Students should try as best as they can to paint pictures in their mind of what is being described in the text. Visualizing brings the text to life and helps students to connect more easily.

Clarify. Take a moment to summarize or explain to yourself what you have just read. If you need to reread a sentence, take the time to do so until you have a clear understanding of what you've read.

Question. Do you have questions about the text? Is there something about which it made you wonder? Write your questions down.

Predict. Try to imagine or guess what might happen next based on what you've just read. If it's a story, what do you think will happen to the character? If it's a news article, where do you think this information is going to lead?

Connect. Try to make connections between what you are reading and things that you've seen, felt or experienced in your own life.

Evaluate. Think about what you've just read. Is there a theme? Does the author have a particular tone or attitude in the way she has written? Can you come to any conclusions? Try to develop an opinion about what you've read.

CHECK YOUR UNDERSTANDING

See how well the key ideas of this lesson have crept into your brain by writing down your answers to the following questions. When you're done, you can compare your answers with the ones at the back of the book. You may think you can skip these questions, but if you do, you will begin to lose the benefits of this book.

What Is the Difference Between Active and Passive Reading?

What Is the Importance of Active Reading?

What Are Some Active Reading Skills?

Lesson2: Basic Reading Skills

What Is a Developmental Reading Program?

Reading is an important skill for success in any facet of life. Reading is more than simply picking out words on a page; it is a process of critical thinking which involves evaluating ideas and applying them to everyday situations. Basic reading skills include vocabulary acquisition, pre-reading strategies, textual comprehension, organizational skills and response techniques. Mastering basic reading skills enables a reader to increase their reading speed, comprehension, and overall vocabulary. This is especially true for readers new to the English language who will find that utilizing ESL reading strategies will better help them understand what they've read.

Acquisition of Reading Skills

One of the most important aspects of acquiring reading skills is increasing vocabulary. An important basic skill in reading is recognizing words. To acquire a larger vocabulary the reader should practice word recognition using sight words and high-frequency word use lists such as the Dolch Basic Sight Vocabulary or Fry's List of 1000 High-Frequency Words. These words are practiced with flash cards, word walls, and worksheets. A person can improve their vocabulary also by working crossword puzzles and playing board games such as Scrabble. Games and other non-traditional teaching methods may be especially helpful for readers who have a reading disability or other learning challenge as it may help to look at words out of the context of a book or a newspaper to understand what they mean.

Pre-reading Strategies

Pre-reading strategies include taking the time to become acquainted with the text before jumping into the actual main body of the text. Readers should read the title, background information, author information and subheadings within the text. Readers should also note any highlighted or boldfaced words as well as captions under photographs. Previewing any pictures or sidebars that accompany the text also help the reader to connect with the material before actually beginning to read the text.

Learning Reading Comprehension

An important skill in reading is learning to comprehend the main idea of a text. This is accomplished by first determining the thesis statement of the text. The thesis statement, or topic sentence, tells the reader what the text is about; it is the most important sentence in the text. Sometimes the main idea is implied rather than directly stated in a sentence and the reader must learn how to infer (make an educated guess) as to what the main idea of the text is in order to comprehend the material as a whole.

Learning Organizational Skills

Another basic skill that is essential to reading is the ability to organize the material. This helps in improving reading comprehension and in increasing reading speed. Ways of organizing the information include highlighting key points, making notes in the margins and preparing an outline of the text. Training oneself to organize key points while reading aids in comprehension and improves reading speed.

Comprehension and Response

Summarizing the reading material allows the reader to personalize the information they have read. Studies show that people retain information better when they are able to relate it to their own personal experience. A summary of a reading text requires that the reader restate the main idea of the material and reflect on their own reaction to the content of the text. This basic reading skill is essential to becoming a better reader.

CHECK YOUR UNDERSTANDING

See how well the key ideas of this lesson have crept into your brain by writing down your answers to the following questions. When you're done, you can compare your answers with the ones at the back of the book. You may think you can skip these questions, but if you do, you will begin to lose the benefits of this book.

What Is a Developmental Reading Program?

Chapter2: Overview of Learning Theory

Lesson3: What is Education & Teaching?

Education is a discipline that involves teaching and learning through the means of transmitting and acquiring knowledge and skills. Formal education typically occurs in learning institutions such as schools, colleges, and universities and is generally guided by teachers. Teaching involves sharing knowledge and experiences in an organized way, guiding others to foster critical thinking skills and intellectual growth. A culture's norms, values, knowledge, and traditions are transmitted through education, helping to prepare students for their roles and responsibilities within society. A person's character can also be shaped through educational experiences.

Pedagogy is the term used to refer to the art and science of teaching methods. Just like there are various teaching methods to consider, each student brings different learning styles, preferences, and strengths into the classroom. Educators must understand a variety of pedagogical theories and approaches to teaching, as well as how to apply those methods to best meet the needs of each of their students.

One's character is also shaped by their educational experiences. Hence, social-emotional learning is an important part of formal education. It is vital for teachers to understand social-emotional development to help students learn to regulate their emotions, cope with frustration, and socially interact in respectful and responsible ways.

Lesson4: What is learning?

Learning is a step-by-step process in which an individual experiences permanent, lasting changes in knowledge, behaviors, or ways of processing the world. Discover effective classroom strategies for learning and the various types of learning.

Defining Learning

When you were a little kid, did you learn how to ride a bike? Did you learn how to do long division, or learn the capital cities of different countries? How about learning how to drive a car when you were a little older, or learning how to do laundry?

We use the term 'learning' all the time in everyday life. But within the field of educational psychology, the term learning is actually a specific term. Different people use different words to define learning within educational psychology, but in general, we're talking about a step-by-step process in which an individual experiences permanent, lasting changes in knowledge, behaviors, or ways of processing the world. Let's go through a few examples of different types of learning you might hear about in the field of educational psychology.

Types of Learning

One way that we all learn, even from infancy, is by observation. In educational psychology, we define observational learning as learning not by our own experiences, but by watching someone else behave and noting the consequences of that behavior. For example, we all learn how to speak as very young children by simply watching and listening to the people around us. We learn how to do simple motions (such as walking) by watching all of the adults around us walk. Sometimes, observational learning is so natural that we don't even realize that it's happening. Another type of learning identified by educational psychology is cognitive learning, which is learning through active and constructive thought processes, such as practice or using our memory. One example might be that you were taught how to tell time by looking at a clock. Someone taught you the meaning of the big hand and little hand, and you might have had to practice telling time when you were first learning it. This process of learning was entirely inside your mind, and didn't involve any physical motions or behaviors. It was all cognitive, meaning an internal thought process.

Maria watches her mother use the lawn mower one week, and the next week she is able to mow the lawn upon her first try. What kind of learning did Maria use in this example?

- Observational
- Cognitive
- Classical Conditioning
- Operant Conditioning
- Cooperative

Sanjay is in Pre-Algebra, and his teacher explains the concept of solving an equation for the 'x' variable. Sanjay learns how to do this by thinking about it quietly and practicing several problems on a worksheet. What kind of learning did Sanjay use in this example?

- Observational
- Cognitive
- Operant Conditioning
- Cooperative
- Classical Conditioning

The first time Joe complimented his grandmother, she smiled and gave him a hug, a consequence he enjoyed. He learned that every time he is nice to his grandmother, she rewards him in a similar way. Now, he's more likely to be nice every time he sees his grandmother, due to this anticipated reward. What kind of learning did Joe use in this example?

- Observational
- Cognitive
- Classical Conditioning
- Operant Conditioning
- Cooperative

Lesson5: Behavioral Perspective

Behaviorism is the theoretical perspective in which learning and behavior are described and explained in terms of stimulus-response relationships. The key assumptions of behaviorism are:

The environment influences behavior. Behaviorists believe that people's behaviors are a result of their interaction with the environment. Specifically, people become conditioned, or molded, to respond in certain ways based on responses like feedback, praise and rewards.

Learning is described through stimuli and responses. Behaviorists focus on observable events rather than events that occur inside a person's head, such as thoughts, feelings and beliefs.

Learning must involve a behavioral change. Theorists believe that learning has not occurred unless there is an observable change in behavior.

Learning must result when stimulus and response occur close together in time. Learners must associate their response with a stimulus. In order for that to occur, the two must happen in conjunction with each other, or, in other words, be contiguous.

Animals and humans learn in similar ways. Behaviorists, unlike many other theorists, performed their experiments using animals because they believed the study of animals could explain human learning behavior.

The major behaviorists you should be familiar with include John Watson, known as the father of behaviorism; Ivan Pavlov, best known for classical conditioning; B.F. Skinner, known for operant conditioning; and Edward Thorndike, known for the law of effect. John Watson is known as the father of behaviorism John Watson Behaviorist

Cognitive Perspective

The next perspective of educational psychology is the cognitive perspective. Cognitive psychology is the theoretical perspective that focuses on learning based on how people perceive, remember, think, speak and problem-solve. The cognitive perspective differs from the behaviorist perspective in two distinct ways. First, cognitive psychology acknowledges the existence of internal mental states disregarded by behaviorists. Examples of these states are belief, desire, ideas and motivation (non-observable states). Second, cognitive psychologists claim memory structures determine how information is perceived, processed, stored, retrieved and forgotten. Cognitive psychology encompasses perception, categorization, memory, knowledge representation, language and thinking processes.

The major cognitive psychologists you should be familiar with include Jean Piaget, who developed Piaget's theory of cognitive development and stages of cognitive development; Lev Vygotsky, best known for his sociocultural development theory; Noam Chomsky, referred to as the father of modern linguistics; and Jerome Bruner, who coined the term 'scaffolding.'

Developmental Perspective

Our next perspective is the developmental perspective. Developmental psychology is the perspective that studies change that occurs in learners over the course of a long period of time. The developmental perspective encompasses theories that are continuous and discontinuous in nature. Discontinuous theories are stage-like. The processes of learning and development involve distinct stages, which are characterized by qualitative differences in behavior. Theorists who posit discontinuous theories propose a specific

beginning and end period for each stage. Continuous theories, in contrast, explain that learning and development occur in incremental processes. Learning involves gradual and ongoing.

Learning Theory in the Classroom: Application & Trends

Learning theory in the classroom can be arduous or easy for some students and it is up to the teachers to supervise and help better their progression using models that change behavior. Learn more about learning theory, student learning, behaviorist models and cognitive learning theories.

Student Learning

Learning theories are research-based ideas about how students learn. Theories combine what is known about genetics, development, environment, motivation, and emotions to explain how students acquire, store, and apply knowledge. Let's take a look at some learning theories and how to apply them to the classroom.

Behaviorist Models

What is behaviorism and why does it matter? Behaviorism includes the theories of educational psychology that focus on the environmental factors influencing how students learn.

Ivan Pavlov's classical conditioning was perhaps the first behaviorist theory to emerge. Pavlov recognized that a neutral stimulus associates with a reflex response through conditioning. For example, when a teacher claps out a pattern, students repeat the pattern while focusing their attention to the teacher.

From Edward Thorndike's work, three laws of learning surfaced. The Law of Effect proposes that pleasurable consequences lead to repetition, while unpleasant outcomes extinguish behavior. The Law of Readiness explains that learners will be resistant to learning until they are ready and the Law of Exercise states that what is practiced strengthens, while what is not practiced becomes weaker.

Behaviorist Models in the Classroom

A teacher can apply the Law of Effect by engaging students in hands-on, inquiry-based, and relevant learning activities, which provide intrinsic motivation. Extrinsic rewards, like trinkets, praise, and recognition are motivating but can actually reduce engagement over time. Providing students with unpleasant consequence for failure, such as missing out of a preferred activity when homework is not completed, is negatively extrinsic. If a student makes the choice that he or she enjoys the defiant feeling associated with not meeting the teacher's expectations, it is negatively intrinsic.

The Law of Readiness supports some cognitive learning theories that we'll discuss shortly, but in effect, if a student is not developmentally ready to learn, he or she will not become ready through punishment or rewards. To use the Law of Readiness, a teacher should allow a student to learn at his or her own pace.

Using the Law of Exercise in a classroom requires a teacher to help students practice skills so that the skill is reinforced. In other words, teaching a concept briefly in September will not fully prepare that student for the state test in April. Students need to continually practice and build on the skills they are taught.

Cognitive Learning Theories

Current educational trends tend to favor cognitive learning theories that support the constructivist classroom. Constructivism is the belief that students learn on a personal level based on how prior knowledge is connected to new information.

The first researcher to study cognition in children was Jean Piaget. In addition to his work on the developmental stages of cognition, Piaget also introduced the concepts of assimilation and accommodation.

Assimilation and accommodation are the ways students resolve cognitive dissonance when presented with new information. To understand assimilation and accommodation, you first need to understand schema. Most of the time, when we receive new information, it meshes with our existing schema, which is our framework for understanding. Schema are the categories in your brain where information is sorted, similar to the way the hard drive of your computer stores information in files. However, there are times when the new information doesn't work with existing schema. In this instance, the learner must make accommodations to their schema in order to process new learning.

Which of the following best defines behaviorism?

- The effect environmental factors have on learning
- The effect genetic factors have on learning
- The effect prior learning experiences have on learning
- The effect teacher efficacy has on learning

Which of the following is an example of classical conditioning?

- Students return their homework so they can participate in a preferred activity.
- Students stop, look, and listen when the teacher claps her hands.
- Students are motivated to learn because the lesson is engaging.
- Students receive a sticker if they successfully complete an assignment.

Which of the following is an example of operant conditioning?

- A student improves through repetition.
- A teacher flips the light to get attention.
- The teacher actively ignores misbehavior.
- A student is given praise for a job well done.

Lesson6: Pedagogical Content Knowledge: Definition & Explanation

Pedagogical Content Knowledge

Anne had a chemistry teacher her sophomore year of high school who had an impressive background working in the field. She knew the subject matter perfectly, so most people would assume that her knowledge made her a great teacher. After all, the most important thing is for the teacher to know what they teach inside and out, right? Well, yes... and no. Anne learned through her experience with Mrs. Johnson that she needed more than a teacher who knew her subject well. She needed one who also knew how to teach it well. So, while Anne's teacher knew chemistry like the back of her hand, she didn't seem to know how to explain it, illustrate it, and make it understandable to Anne and her classmates. For someone who wasn't the greatest with formulas and science to begin with, Anne really needed more assistance.

As it turned out, Anne wasn't the only student who needed more from her teacher. In 1986, Lee Shulman, an educator and researcher, noticed that all students need a teacher who is more than knowledgeable about their subjects. They also need one who can teach their specific subjects clearly and effectively. He called this combination of content and teaching knowledge, pedagogical content knowledge.

So, back to our first scenario with Mrs. Johnson. If she had combined her knowledge of chemistry with class exercises, creative examples, and careful explanations, she would have displayed pedagogical content knowledge. She also would have been a more successful teacher.

How to Use It

How can teachers implement it in the classroom? Well, several features make up pedagogical content knowledge, and each is intended to provide students a route to genuine understanding and learning.

Combining Content and Pedagogy

As mentioned earlier, the foundation of pedagogical content knowledge is the combination of both content and pedagogy. Rather than just knowing the ins and outs of psychology, for example, a psychology teacher has to know exactly how to get the concepts across to students. Let's say the teacher wants students to learn about positive reinforcement. Of course, she has to have a knowledge of what that is in order to teach it; that is her knowledge of psychology content. Then, based on her own understanding, she can explain the term and use examples. She can demonstrate it to the class by telling her students that for the rest of the week every time someone raises their hand to answer a question, he will be given a candy bar. Students can experience what it's like to have behavior reinforced and encouraged. They will likely understand the term and also find it memorable.

Understanding Student Perceptions

Pedagogical content knowledge requires an understanding of where students are coming from in reference to the subject being taught. That's because, in order to teach material well, teachers have to know what the students bring to the table as far as prior conceptions, feelings, and strategies. For example, many students tend to have personal thoughts about math word problems. A math teacher with pedagogical content knowledge would address each of these prior conceptions and show why each one is inaccurate. The teacher would help the students understand how to break down word problems to make them clearer and see them from a different perspective. If the students have certain strategies that they have been using, the teacher would want to know what those are, and how they might need to be changed.

Deciding a Subject's Difficulty

Teachers with pedagogical content knowledge must have a good grasp of which aspects of their subjects are typically easy for students and which are typically more difficult. That way, they can create lesson plans that move through the easier material quickly and provide more time for the difficult subjects. This will help students fully grasp the more difficult topics so they are better prepared to move forward.

Who is responsible for developing the concept of pedagogical content knowledge?

- Lee Shulman
- Erik Eriksen
- Richard Mueller
- Virginia Satir

What is pedagogical content knowledge?

- Years of experience teaching a certain subject
- The combination of knowing a subject and how to teach it
- The knowledge of how to teach well
- A fancy term for what students learn in class

What is a feature of pedagogical content knowledge?

- Knowledge of what coursework is hard and easy for students
- A creative use of illustrations and examples to explain material
- Awareness of student prior conceptions of the subject
- All of these answers are correct

Chapter3: The Scientific Method in agricultural and environment education

Lesson7: Scientific Method

The scientific method is a set of principles and procedures followed to gain knowledge through making questions and observations, performing experiments, and formulating and testing a hypothesis. Explore the key elements and real-life applications of the scientific method. Is There Only One Scientific Method?

When you first took science class in school, you probably learned the basic steps of a scientific investigation. You've likely heard of words like 'hypothesis,' 'experiment,' and 'observation.' You may have even memorized a prescribed set of steps. The scientific method is a set of procedures that scientists follow in order to gain knowledge about the world.

However, the steps involved in the scientific method vary widely among the different scientific disciplines. Chemists follow the method a bit differently than psychologists. Geologists and botanists have their own unique methods. So, is there really one scientific method that encompasses all of science? To find out, we'll need to learn more about the scientific process.

Key Elements of the Scientific Method

There are six key steps that tend to characterize the scientific method. The first step is the question. This is the part where a scientist proposes the problem that he or she wants to solve. A well-conceived question usually leads to a hypothesis, a potential answer to the question at hand. Sometimes, hypotheses look more like predictions. The scientist predicts what the outcome will be when he or she tests the hypothesis. The scientist's test is also called the experiment. Experiments are ordered investigations that are intended to prove or disprove a hypothesis. Important data comes from performing an experiment.

The scientist has to make observations of the results that he or she gets from the experiment. An observation is a statement of knowledge gained through the senses or through the use of scientific equipment. Observations are crucial for collecting data. Once the results are in, the scientist must begin the analysis. Data analysis involves comparing the results of the experiment to the prediction posed by the hypothesis. Based on the observations he or she made, the scientist has to determine whether the hypothesis was correct. He or she then sums up his or her findings with a conclusion. The conclusion of a scientific process is a statement of whether the original hypothesis was supported or refuted by the observations gathered.

The six steps of the scientific method do not always occur in the same order. The elements of the scientific method.

The scientific method usually employs all six of the steps I mentioned, but the steps don't always occur in the same order. Real scientists may go back and repeat steps many times before they come to any conclusions. It's actually better to use the word 'elements' to describe the steps, since the first step, question, does not always come first. Sometimes, for example, it's an observation that came first and spawned the initial question. Likewise, observations that are made during an experiment can inspire more questions that scientists have to answer. The scientific method is much more fluid than you might think. Let me show you how the steps can feed back and branch out from one another with an example from my own experience.

Environmental problems can be investigated in a systematic way using the scientific method. Explore the steps of the scientific method: observations and questions, hypothesis, experiment, interpreting results and making conclusions. Discover the definition and applications of the scientific method in this lesson.

The Scientific Method

All science begins with making observations and asking questions. These questions are often developed because people want to learn more about what they are observing. To find the answers to their questions, researchers use the scientific method, which is a structured technique used to test ideas and potential answers to scientific questions. Although the specific steps of the scientific method can vary by discipline, it is widely agreed upon that the fundamental elements of the scientific method include five steps. The scientific method starts with:

- Making observations, and then moves on to
- Asking questions
- Formulating a hypothesis
- Conducting an experiment, and ends with
- Interpreting results and making conclusions

Observations and Questions

Most scientific evaluations begin with someone making observations about something that is occurring in nature or the world around them. Observations are the first step in the scientific method, and they set the foundation that the proceeding steps are based on. Once a scientist has made observations, they are often curious about what they have seen and want to learn more. At this point, scientists begin to ask questions about their observations, which is the second step in the scientific method. These questions can be very broad or specific depending on the topic being investigated.

Hypothesis

After a question has been asked, the next step in the scientific method can occur. The third step is to formulate a hypothesis. A hypothesis is a proposed explanation that aims to answer the question formulated, and the hypothesis must be testable through experimentation. The development of a hypothesis is a very important step in the scientific method because it is what the remaining steps are based on, and it will be returned to after more steps are completed. Once the hypothesis is created, scientists make predictions about what should happen if the hypothesis is found valid, and therefore supported, and also what should happen if the hypothesis is not valid and is rejected.

Experiment

Conducting an experiment is the fourth step in the scientific method. An experiment is an activity designed to gather data that will be used to support or reject the hypothesis. An experiment involves multiple variables, which are specific factors that can be manipulated. Most experiments include an independent variable, which is the factor that the scientist alters, and a dependent variable, which is the factor that is being measured. When an experiment includes these aspects, it is referred to as a controlled experiment because the scientist is in control of how each variable influences the experiment. This is an important part of the scientific method because by controlling the variables in the experiment, the scientists can determine which variable is causing the predicted result.

What is the next step if the data doesn't support the hypothesis?

- The hypothesis is rejected and a new hypothesis is developed.
- The hypothesis is rejected and the experiment is over.
- The hypothesis is accepted and the research is published.
- The hypothesis is accepted and new hypothesis is developed.
- The hypothesis is accepted and the research is repeated.

Which type of experimental variable is the factor that the scientist is altering?

- Independent variable
- Dependent variable
- Control variable
- Altered variable
- Changed variable

What is the correct order of the steps of the scientific method?

- Observations, questions, hypothesis, experiment, interpreting results and making conclusions
- Observations, questions, predictions, experiment, interpreting results and making conclusions
- Observations, hypothesis, experiment, interpreting results and making conclusions
- Questions, hypothesis, experiment, interpreting results and making conclusions
- Questions, hypothesis, predictions, experiment, and interpreting results and making conclusions

Lesson8: Formulating the Research Hypothesis and Null Hypothesis

Generally, research projects are designed to test a hypothesis, which is a statement of the condition to be studied or the question to be answered. Research projects actually prove or disprove a null hypothesis, which states the opposite of the hypothesis. Learn how to formulate the research hypothesis and null hypothesis, including research questions and if/then statements, and understand the concept of invalid hypothesis.

Research Question

After determining a specific area of study, writing a hypothesis and a null hypothesis is the second step in the experimental design process. But before you start writing a hypothesis and a null hypothesis, which we will get to, you have to have a question. This is the bottom, or base, which you will build up from.

What are you interested in? What are you curious about? This is a good place to start because your research should answer the question. I am curious about the effects of bright lights on studying. You take the thing you are interested in and turn it into a question. Here is mine: 'What is the effect of bright light on studying?' That's how easy it is to write a research question. Next we will explore how to formulate a research hypothesis based on your research question, then we'll look into what a null hypothesis is and how to write one of these.

Formulating a Hypothesis

You have a question and now you need to turn it into a hypothesis. A hypothesis is an educated prediction that provides an explanation for an observed event. An observed event is a measurable result or condition. If you can't measure it, then you can't form a hypothesis about it because you can't confirm or reject it. In addition, a hypothesis typically takes the form of an if-then statement so you can test it with your research. What does our hypothesis look like?

'If we increase the amount of light during studying, then the participant's performance on test scores will decrease.'

Let's break down our hypothesis. First off, it is an if-then statement: 'If we increase..., then the participant's...'. This creates a prediction that we can test by increasing the light on participants as they study and then see if their test scores go down. It also means that the hypothesis can be proven correct or incorrect based on what happens to the test scores. If test scores don't change, then our hypothesis was incorrect and we will reject it.

You probably also noticed that we changed 'studying' to 'test scores' and the vague term about 'bright light' into 'amount of light.' This is an example of operationalizing, which is finding a way to measure or quantify a variable. Studying can't really be researched, but test scores can. And they are basically the same thing since studying typically increases test scores. Also, simply saying 'light' is too vague to be useful or researched, so it was turned into 'amount of light.'

Null Hypothesis

After you formulated your research hypothesis, what if there isn't a connection between light and studying? That is kind of what a null hypothesis is; a null hypothesis is defined as a prediction that there will be no effect observed during the study. The reason researchers develop a null hypothesis is to ensure that their research can be proven false. So whenever you are conducting an experiment with a hypothesis, you will create a null hypothesis. Research typically includes a hypothesis, and when this is the case you will form a null hypothesis as

Starting off with a research question provides a researcher with:

- A strong foundation and a question to answer
- Their hypothesis
- Their null hypothesis
- Accurate information about how to accomplish the experiment

A hypothesis is:

- A research question
- A description of an event
- An educated prediction
- A sentence proving a phenomenon
- A psychological diagnosis

Which of the following has NOT been operationalized?

- Test scores
- Popularity
- Weight
- Amount of light

Lesson9: Research Variables: Dependent, Independent, Control, Extraneous & Moderator

In experimental research, factors that have any varying quality or quantity are known as a Variable. Discover the uses of Independent, Dependent, Control, Extraneous, and Moderator variables in conducting research.

As a researcher, you're going to perform an experiment. I'm kind of hungry right now, so let's say your experiment will examine four people's ability to throw a ball when they haven't eaten for a specific period of time - 6, 12, 18 and 24 hours.

We can say that in your experiment, you are going to do something and then see what happens to other things. But, that sentence isn't very scientific. So, we're going to learn some new words to replace the unscientific ones, so we can provide a scientific explanation for what you're going to do in your experiment.

The starting point here is to identify what a variable is. A variable is defined as anything that has a quantity or quality that varies. Your experiment's variables are not eating and throwing a ball.

Now, let's science up that earlier statement. 'You are going to manipulate a variable to see what happens to another variable.' It still isn't quite right because we're using the blandest term for variable, and we didn't differentiate between the variables. Let's take a look at some other terms that will help us make this statement more scientific and specific.

Dependent and Independent Variables

A moment ago, we discussed the two variables in our experiment - hunger and throwing a ball. But, they are both better defined by the terms 'dependent' or 'independent' variable.

The dependent variable is the variable a researcher is interested in. The changes to the dependent variable are what the researcher is trying to measure with all their fancy techniques. In our example, your dependent variable is the person's ability to throw a ball. We're trying to measure the change in ball throwing as influenced by hunger.

An independent variable is a variable believed to affect the dependent variable. This is the variable that you, the researcher, will manipulate to see if it makes the dependent variable change. In our example of hungry people throwing a ball, our independent variable is how long it's been since they've eaten.

To reiterate, the independent variable is the thing over which the researcher has control and is manipulating. In this experiment, the researcher is controlling the food intake of the participant. The dependent variable is believed to be dependent on the independent variable.

Your experiment's dependent variable is the ball throwing, which will hopefully change due to the independent variable. So now, our scientific sentence is, 'You are going to manipulate an independent variable to see what happens to the dependent variable.'

Unwanted Influence

Sometimes, when you're studying a dependent variable, your results don't make any sense. For instance, what if people in one group are doing amazingly well while the other groups are doing about the same. This could be caused by a confounding variable, defined as an interference caused by another variable. In our unusually competent group example, the confounding variable could be that this group is made up of players from the baseball team.

In our original example of hungry people throwing the ball, there are several confounding variables we need to make sure we account for. Some examples would be:

Metabolism and weight of the individuals (for example, a 90 lb woman not eating for 24 hours compared to a 350 lb man not eating for 6 hours)

Ball size (people with smaller hands may have a difficult time handling a large ball)

Age (a 90-year-old person will perform differently than a 19-year-old person)

Confounding variables are a specific type of extraneous variable. Extraneous variables are defined as any variable other than the independent and dependent variable. So, a confounding variable is a variable that could strongly influence your study, while extraneous variables are weaker and typically influence your experiment in a lesser way. Some examples from our ball throwing study include:

If I release 10 spiders into a room and measure how long it takes people to get out of the room, what is the independent variable?

- The spiders
- The people
- The amount of time it takes the people to leave the room
- The room

A researcher wants to figure out if uncomfortable seats in a classroom will increase the research participant's attention to the lesson and decrease their fidgeting. Why are attention level and fidgeting the dependent variable?

- Because it is the variable that the researcher changes to see how the other variables will respond.
- Because it is the variable that the researcher is manipulating.
- Because it is the variable the researcher is primarily interested in.
- It isn't; the dependent variable is the uncomfortableness of the seats.

Which of the following best describes control variables?

- They provide the researcher with control over the independent variable.
- They are kept the same over multiple trials.
- They increase the variability of the experiment.
- They increase the participants' control over the experiment.

Lesson10: True Experimental Design

Scientists in almost every field of study use experiments to answer research questions. Imagine you are a psychologist, and you want to investigate whether caffeine has an effect on student behaviors and performance in the classroom. How would you go about finding out the answer to this question? The answer is that you would do an experiment. This lesson covers all of the different aspects of an experiment you would want to consider.

Independent and Dependent Variables

The first thing any experimenter needs to decide is what variables you are studying. Let's imagine your hypothesis is that when students in school consume caffeine, their performance on tests is affected. You might hypothesize that caffeine increases test performance because it causes the students to be less sleepy and more focused, or you might hypothesize that caffeine decreases test performance because it makes the students jumpy and hyper. Either way, you have two variables involved in this study.

The independent variable in an experiment is the variable that you control as the experimenter and the one that creates two or more groups in the study. In order to study caffeine, you might give half of the students a caffeinated drink and the other half of the students simply get water. The difference between the two groups is whether they have caffeine or not. So, the independent variable is the variable that you, as the experimenter, have manipulated.

The dependent variable in an experiment is the outcome variable or the one you are simply measuring. Here, you guessed that caffeine might affect test performance. So, in this example, your dependent variable is test performance.

Another way to think about independent variables and dependent variables is in terms of cause and effect. This study is testing whether caffeine (the cause) has an effect on test performance. All experiments are testing if whatever makes the groups different has an effect on some outcome variable. The independent variable is always the cause. Here, that's the caffeine. The dependent variable is always the effect. Here, that's test performance. So, the independent variable always happens first, and the dependent variable always happens second.

Experimental vs. Control Groups

Now, let's talk about why we need more than one group in an experiment. Imagine you went into a classroom, gave every student caffeine and then tested them on some kind of performance measure, such as the number of times they can jump a rope. You can see how these students performed after having caffeine. But how can you know if their performance was increased or decreased compared to what they would have done without caffeine? With only one group in your study, you can't be sure what the effects of caffeine were.

So, in an experiment we always need at least two groups to compare. Let's go back to the example of giving half of the students caffeine and half of the students water to drink. When we're testing for the effect of the independent variable, we want to make sure that one of the groups in our study can serve as the natural, or baseline, group. That natural or baseline group is called a control group. In our example, the control group would be all of the children who only drank water.

We then compare the control group to the group of children who received caffeine. In an experiment, the group that receives some kind of change to their natural environment is called the experimental group. In our example, the experimental group would be all of the children who drank caffeine.

We need at least two groups so that we can compare the experimental group to the control group. Control groups are especially necessary when testing for the effect of drugs, like caffeine, because we want to make sure the group doesn't change simply because they think they are supposed to. When you change your behavior just because you expect a change, that's called the placebo effect. For example, let's say we give all of the children soda, but half of the sodas have caffeine and half are caffeine-free. We wouldn't want to tell the children which kind of soda they got, because they might change their behavior simply due to expectations. This type of problem can be avoided with a good control group.

Random Assignment

When we divide the class up into the control group versus the experimental group, it's important to make sure that this division occurs at random. When each person in the study has an equal chance of being in either the control group or the experimental group, that's called random assignment. You might decide which group each person is in by flipping a coin, as an example.

Why is random assignment important? We want to make sure that the groups are as identical as possible in every way except for the independent variable. Let's go through an example of why this matters.

Imagine that you decided that all the boys in the class would get the caffeine drink, while all the girls in the class got the no-caffeine drink. Then, you tested for the effects of caffeine using the dependent variable of jumping rope. Now, imagine that you see a difference! The caffeine group is better at jumping rope. But, you can't actually conclude that caffeine was the cause. It could be that boys are better at jumping rope. Unless the groups are identical in every possible way except for the independent variable, you can't be sure what caused any difference in the dependent variable. But if the independent variable really is the only difference between groups, then you can be sure, because there's no other explanation. This is why random assignment is so important: only with random assignment can you be sure of a cause-effect relationship within an experiment.

Dr. Patel does an experiment in which she shows people either a happy movie, a sad movie, or no movie in a classroom. Then, she asks them to fill out a survey assessing their feelings about whether they want to adopt a pet from the animal shelter. In this experiment, what is the INDEPENDENT variable?

- The participants
- The classroom location
- Their feelings about pet adoption
- How long the movie lasts
- The type of movie viewed

Dr. Patel does an experiment in which she shows people either a happy movie, a sad movie, or no movie in a classroom. Then, she asks them to fill out a survey assessing their feelings about whether they want to adopt a pet from the animal shelter. In this experiment, what is the DEPENDENT variable?

- The participants
- The classroom location
- Their feelings about pet adoption
- How long the movie lasts
- The type of movie viewed

Dr. Patel does an experiment in which she shows people either a happy movie, a sad movie, or no movie in a classroom. Then, she asks them to fill out a survey assessing their feelings about whether they want to adopt a pet from the animal shelter. In this experiment, what was the control group?

- The group of pets who are currently in the animal shelter
- The larger population of people who live in that town
- The people who watched no movie
- The people who watched the sad movie
- The people who watched the happy movie

Chapter4: Application of Statistics in Business

Lesson11: What Is Business Statistics?

Business statistics is a specialty area of statistics which are applied in the business setting. It can be used for quality assurance, financial analysis, production and operations, and many other business areas. Just as in general statistics, there are two categories: descriptive and inferential. Descriptive statistics are used to describe the total group of numbers. Inferential statistics infers relationships from the population of numbers.

Use of Descriptive Statistics

Descriptive statistics are used to summarize and describe total numbers. Looking at statistical numbers such as mean, or the average number, mode, or the most frequent number, or median, or the middle number, helps managers monitor business activities and make decisions. Often numbers themselves do not show the big picture, so ratios, or numbers representing relationships are used.

Perhaps you're a regional manager who oversees 15 different car dealerships. You will keep track of sales per month, number of vehicles sold, number of salesmen, sales per person, operational costs, delivery times, and other information. You use this statistical information to look at trends, understand relationships between numbers, and make sound business decisions. Perhaps you need to shift a sales member to a different store, or realize that you need more available stock during certain months, all of which helps maximize the company's resources and profit.

Or, perhaps, you're a regional store manager and are concerned about how long customers have to wait to check out. Currently, customers queue in multiple lines with a single cashier. You measure the mean length of time for customers to complete their transaction for a month. Then the next month, you line up customers in a single line with multiple cashiers and measure the mean length of time for the transaction. You notice that even though customers take longer to walk to the next available cashier, the overall transactions are reported faster. When the company expands and builds the next store, you specifically request it to be designed with one queuing line, using your findings to substantiate the request.

Use of Inferential Statistics

Inferential statistics help managers draw conclusions based on limited data. When predicting the future, we don't have a magic crystal ball, but we do have statistical strategies, such as sampling, probability, and models.

Marketing departments often use inferential statistics. A company might issue a survey and ask questions about their products. However, it's impossible to survey every individual customer. The marketing department will determine the appropriate sample size, or the number of people to ask. Based on the results, statisticians can infer the responses are representative of the larger group of customers.

Finance departments use statistical modeling for predicting budgets and capital expenditures, when there are many unknown factors. A statistical model is a representation of what will probably happen. Unfortunately, economists can't predict everything so they use probability. Probability is simply the likelihood of something happening.

For example, let's say a company is taking out a loan for construction of a plant expecting it to be operational in 3 years. They are relying on the income from the plant to repay the loan. The finance team will run a statistical model that will include any possible delays, changes to building regulations, and catastrophic events. It's best to be prepared so it doesn't bankrupt the company if something goes wrong.

How do descriptive and inferential statistics differ?

- Descriptive statistics only attempt to describe data, while inferential statistics attempt to make predictions based on data.
- Inferential statistics only attempt to describe data, while descriptive statistics attempt to make predictions based on data.
- Descriptive statistics are more computationally sophisticated than inferential statistics.
- Inferential statistics are more computationally sophisticated than descriptive statistics.

Which two are examples of descriptive statistics?

- Mean and standard deviation.
- Median and correlation.
- Variance and regression analysis.
- Hypothesis testing and histograms.

What is statistical estimation?

- Methods for reducing errors in inferential statistics.
- Methods for reducing errors in descriptive statistics.
- Methods for rounding answers in statistical calculations.
- Methods to determine the best graph to represent statistical data.

Lesson12: Defining the Difference between Parameters & Statistics

Using Statistics to Understand Populations

Lenae is campaigning for town mayor. Today, she is doing a little market research to understand the concerns of the people in her town. In order to collect this information, Lenae will have to understand parameters and statistics when working with populations.

In this lesson, you will learn about the differences between parameters and statistics when working with data. But first, let's review populations and samples.

Understanding Populations & Samples

A population is all members of a specified group. For example, in Lenae's case she is collecting data on a very literal population, the population of her town. All members of this town would be included in the population. However, most of the time it isn't practical to get information from every member of a population.

When this happens, we have to find a different way of getting information that represents the population without actually asking the whole population. Lenae will probably not have the time and resources to collect information from the entire town; therefore, she will need another approach to getting the information she needs. She will need a sample to gather this information.

A sample is a part of a population used to describe the whole group. For example, Lenae could go to a local event or mail out surveys to the people in her town. As long as the information she collects is from the town and not a neighboring community, then this can count as Lenae's sample group.

Samples are used to help the data researcher, in this case Lenae, to understand the entire population. There are many different ways you can get a sample from your population. These include:

- Random sampling
- Simple random sampling
- Cluster sampling
- Stratified sampling
- Systematic sampling

Now that you understand population and samples, let's discuss how they relate to parameters and statistics.

Parameters & Statistics

Lenae has collected the information she needs from her sample. Now it is time to analyze this information using the concepts of parameters and statistics.

A parameter is the characteristics used to describe a population. For example, Lenae knows one parameter of her population is that they all live in the same town. This is a 100% known parameter of the population. If Lenae was able to see a 100% accurate census in the town, she could probably find parameters such as the number of people in a certain age range in the population. It's hard to have 100% proof for particular characteristics of a population. This is when we use statistics.

A statistic is the characteristics of a sample used to infer information about the population. For example, Lenae is using a sample to analyze data about her town's population. Lenae has found that 64% of the people she surveyed are concerned about the safety of the town's parks. Lenae can use this statistic to infer that approximately 64% of the town is also concerned about the safety of the town's parks.

Now that you understand parameters and statistics, let's practice by identifying the two.

What are all members of a specified group?

Population Sample Parameter Statistics Variance

What are the characteristics of a sample used to infer information about the population?

- Population
- Sample
- Statistic
- Parameter
- Variance

What do we call a part of a population used to describe the whole group?

- Population
- Sample
- Statistic
- Parameter
- Variance

Lesson13: What is Quantitative Data? - Definition & Examples

What Is Quantitative Data?

What's the difference between having seven apples and saying that they are delicious? Well, for one, we can count or measure the seven apples, but we can't put a number to how delicious they are. Those apples might be delicious to one person and be completely sour to another person.

What does this have to do with quantitative data? It has everything to do with quantitative data because it shows you what is considered quantitative data and what is not. Saying you have seven apples, because they can be represented numerically, is a piece of quantitative data. But, saying that they are delicious is not because you can't write that using numbers.

There are two types of data that quantitative data covers. They are data that can be counted and data that can be measured. Let's talk about what each data type looks like.

Data That Can Be Counted

Another way of saying that the data can be counted is to call it discrete data. Having the seven apples, for example, is discrete data because you can count seven apples. If you were to count the number of apples each tree produced in an apple orchard, that data is quantitative since the apples can be counted.

Other examples of discrete data include the number of girls in a math class, the number of boys who come to eat ice cream at three pm, and the number of kittens that a particular mom cat has. All of these are discrete and quantitative data because they can be represented by a mathematical number, and you can physically count them.

Data That Can Be Measured

Quantitative data is also data that you can measure. In math lingo, this is called continuous data. The weight of seven apples is continuous data because you can put the apples on a scale and weigh or measure them.

Other examples of continuous data include the height of your mom, the length of a football field, and the weight of a wolf. All of these are continuous data because you can measure them and represent them in a numerical manner.

Brown school has decided to review their ratio of girls to boys in the Second grade class. They decided to count the number of boys in Second grade. This is an example of what type of data?

- Qualitative and continuous
- Discrete and continuous
- Quantitative and continuous
- Measured and graphed
- Quantitative and discrete

Which of the following answers is an example of discrete data?

- 58 km
- 16 miles
- 120 pounds
- 8 puppies
- 1.12 inches

Which of the following answers is an example of continuous data?

- 3.14 cm 1 apple 3 pies 10 tests 4 zebras

Lesson14: Nominal, Ordinal, Interval & Ratio Measurements: Definition & Examples

Understanding Data

Chloe is working on a project for her agriculture class. She is growing and classifying different types of flowers. So far, she has collected data on the different types of flowers, the color of the flowers, the height of the flowers, and the number of petals on each flower. In order to analyze all of the data that Chloe has collected, she will need to understand the different types of data.

First, data is just information that is collected for analysis. Data is generally used to either disprove or prove a hypothesis. Data can be grouped into two different types of information: categorical and quantitative. In this lesson, we will be talking about two types of categorical data: nominal and ordinal. We will also be talking about two other types of measuring data: interval and ratio measurements.

Nominal and Ordinal Data

First Chloe collects information about the different types of flowers she's growing, and the colors of each. She counts 4 roses, 6 daisies, 3 sunflowers, and 4 lilies. The colors of the flowers are 3 red, 4 yellow, and 10 white. She decides to assign a code to each type and color of flower to keep track of this information in her records.

According to this table, a red rose would have the numerical code 15, with the first number representing the flower type and the second number representing the color. As far as the data is concerned, the number 15 does not need to be added, subtracted, multiplied, divided, or ordered in any way. It does not have a value of 15; it is simply a code to indicate a red rose. This is an example of nominal data, or categorical data that assigns numerical values as an attribute to an object, animal, person or any other non-number. This is similar to the numbers that are given to horses during a race. The numbers themselves have no value, they simply identify the horses.

Next, Chloe has entered her roses into a local gardening competition. She had one rose get 4th place, one got 7th place, and one got 2nd place. These rankings are an example of ordinal data, which is data that can be ordered and ranked, but not measured, such as levels of achievement, prizes, rankings, and placements. Similar to nominal data, ordinal data cannot be multiplied, divided, added, or subtracted. However, the difference between ordinal data and nominal data is that the data can be ordered. Because ordinal data has to do with placement and rankings, you can order the data in descending or ascending order. When remembering ordinal data, think ordinal=order.

Interval and Ratio Measurements

Chloe has entered another rose competition. This time, her flowers have to fit in certain categories. As she is filling out the paperwork, she notices some unusual questions. Take a look:

The second question represents a form of measurement called interval measurement, which is data that is grouped in evenly distributed values and measured based on the group to which that variable is attributed. In other words, interval data is measured in groups, rather than individually. For example, Chloe can measure the distance between each leaf and come up with 0.7. However, if the competition managers are trying to collect and group data in a more manageable way, then they will ask her to circle the option that is 0.5-1 inch. If you are collecting this information, you can really get a good visual representation by using a bar graph to display the data like this:

The next question asks about how many petals there are on Chloe's flower. You can take data like this and make a comparison. For example, what if the competition managers wanted to know how many flower petals there are in comparison to the leaves? They can learn this by using another form of measurement called a ratio, which is a mathematical comparison between two numbers. This can be represented with a colon; however, we can take a ratio and manipulate it to gather more information about our data. For example, if Chloe has 6 leaves and 12 petals, then we could write that ratio like this: 6:12. We can also

easily see from this that there are twice as many petals as there are leaves. However, how would you find this comparative information if the ratio was more complicated? Let's take another look at Chloe's survey.

What is information that is collected for analysis?

- Data
- Nominal Data
- Ordinal Data
- Ratio
- Interval measurement

What is data that is grouped in evenly distributed values and measured based on the group to which the variable is attributed?

- Data
- Nominal Data
- Ordinal Data
- Interval measurement
- Ratio

What is a mathematical comparison between two numbers?

- Data
- Nominal Data
- Ordinal Data
- Interval measurement
- Ratio

Lesson15: The Purpose of Statistical Models

Purpose of Statistics

Benjamin is working on a project for his agriculture class. He found research that shows that under the right conditions, plants will grow a consistent amount every day. Benjamin wants to test this information and see if he can predict the height of his plants after 10 days.

Benjamin needs to understand statistical models and the purpose of statistics before he can properly analyze this information. In this lesson, we will discuss the purpose of statistics and how you can use statistical models to achieve this purpose.

First, let's discuss the purpose of statistics. The purpose of statistics is to describe and predict information. This can be divided into descriptive statistics and inferential statistics. Sometimes we collect data in an attempt to describe the characteristics of a population. For example, Benjamin can collect data on the colors of the flowers of certain types of plants. Over time, he may have enough information to say that the plant produces a white flower 56% of the time, a purple flower 34% of the time, and a blue flower 10% of the time. This is an example of how Benjamin used statistics to describe the plant.

Statistics is also used to predict information. Benjamin can use the same information that he collected to predict the color of flower that the plant would produce. If Benjamin has a plant that hasn't yet produced a flower, he can say that it is most likely to produce a white flower and least likely to produce a blue flower. Now that you understand that the purpose of statistics is to describe and/or predict, let's discuss the role that statistical model plays in that purpose.

A statistical model is a combination of inferences based on collected data and population understanding used to predict information in an idealized form. This means that a statistical model can be an equation or a visual representation of information based on research that's already been collected over time. Notice that the definition mentions the words 'idealized form'. This means that there are always exceptions to the rules. For example, let's say that Benjamin waters his plants for 10 days with the correct amount of water under the correct conditions. However, what if someone accidentally knocks over one of the plants? Or what if an animal breaks into the greenhouse and starts feeding on the plant? These are extreme examples, but often unexpected conditions can interfere with collecting data.

Now let's talk about types of statistical models and how they are used.

Types of Statistical Models

Before you can understand the types of statistical models, you must first understand the reason these models exist. Statistical models exist because we are looking for a relationship between two, or sometimes more, variables. For example, in Benjamin's case there are two variables: the number of days the plants grow and the height of the plants. We know from earlier that the more days the plants grow, the taller they get. Of course, there is the matter of the condition of the plants, the amount of water, the amount of light, etc. These are all other variables that could affect the experiment. But for now, let's limit these two variables, just to keep things simple. The relationship between the height of the plants and the number of days the plants grow is known as a correlation, which is the relationship between two variables or sets of data. A correlation test is one type of statistical model.

Essentially, all statistical models exist to find inferences between different types of variables and because there are different types of variables, there are different types of statistical models. For example, let's say that Benjamin was collecting information about the different types of plants that grow in his region. He would be collecting data that would be grouped into categories, which is known as categorical data. In this experiment, Benjamin would have to use a different statistical model to analyze his data than the one he used to find a correlation between the height of the plants and the number of days they spent growing.

Some of the types of models, or statistical tests, include regression, analysis of variance, analysis of covariance, and chi-square. These are just a few examples of statistical models; there are many different

ways we can analyze data depending on the variables. We will discuss many of these models in depth in future lessons.

Now let's talk more about the types of variables involved in different statistical models.

Types of Variables

Benjamin has been experimenting with his plants. He has added a different type of fertilizer, different amounts of water, and different amounts of humidity and sunlight to some of the plants. Now one of the plants has started to bloom only blue flowers, which is very rare. Unfortunately, Benjamin isn't sure which of the changes or combination of changes caused the plant to bloom blue flowers. To understand this phenomenon, Benjamin needs to understand two types of variables: response and explanatory.

A response variable is the observed variable, or variable in question. In Benjamin's case, the blue flowers would be the response variable. This is similar to a dependent variable, which is a condition or piece of data in an experiment that is controlled or influenced by an outside factor, most often the independent variable. However, sometimes data can be collected without doing an experiment and in these cases, there is still a response variable.

When analyzing data, we often ask, 'What is causing the response variable?' Benjamin has been asking the same question: 'What is causing the blue flowers?' To answer his question, you'll need to understand explanatory variables.

An explanatory variable is a variable or set of variables that can influence the response variable. In Benjamin's case, this refers to all of the things he did to his plants, such as watering, adding fertilizer, and changing humidity and sunlight. All of these factors could have influenced the blue flower's appearance.

Why do different types of statistical models exist?

- because there is no way to find relationships between all of the variables that exist
- to explain why a set of variables incur a response in the variable in question
- because there are many different types of variables and the models provide ways to analyze them
- to determine which variables should be controlled or changed

Variables are collected in the form of data. What are the two major forms of data?

- measurable and non-measurable
- numerical and ordinal
- explanatory and response
- categorical and quantitative

The _____ is a condition or piece of data in an experiment that is controlled or influenced by an outside factor, most often the independent variable.

- statistical model
- explanatory variable
- independent variable
- dependent variable

Lesson16: Random Selection & Random Allocation: Differences, Benefits & Examples

Random Selection

Aubree is conducting an experiment. She wants to find out if oranges consumed on a regular basis will help improve the chances of someone staying healthy during the winter months. Aubree will have to design a research experiment to find the answer to this question. As she is designing her research, she will need to understand random selection and random allocation.

In this lesson, you will learn about random selection and random allocation, how to use them and the differences between the two. First, let's discuss random selection.

Random selection is the method of selecting a sample from the population to participate in a study. Basically, random selection is the way Aubree will choose who will be a part of her study. Most studies use some sort of random sampling to select participants. There are different ways you can select participants for a study.

First, Aubree will need to decide on her population. A population is all members of a specified group. For example, let's say that Aubree wants to study the effects of oranges on college students. This means that her population will be all college students in the world. Of course, it's hard to conduct a study of this size. We can solve this problem using random selection. Aubree can get a sample of her population by selecting students at a local college for her study.

A sample is a part of a population used to describe the whole group. For example, Aubree can conduct her study with a random selection of students in certain classes at the college, or she can select every other student that is willing to be a part of the study.

There are many different ways you can get a sample from your population. These include random sampling, simple random sampling, cluster sampling, stratified sampling, and systematic sampling. Now that we have covered random selection, let's move on to random allocation.

Random Allocation

Remember, Aubree is studying the effects of orange consumption on college students. She wants to know if consuming oranges on a regular basis will help improve the chances of someone staying healthy during the winter months.

As such, Aubree has to compare two groups of students: those that consume oranges on a regular basis and those that consume oranges on an irregular basis or not at all. Aubree will have to use a control group and a treatment group because she wants to see the effects of orange consumption and will need to compare two groups.

The control group is the group that remains untreated throughout the duration of an experiment. For example, in Aubree's experiment the students that do not consume oranges on a regular basis would be the control group.

The treatment is the variable in an experiment that is used on an experimental group. For example, the oranges in Aubree's experiment would be the treatment, and the experimental group would be whomever is selected to receive the treatment. This is where random allocation comes in.

Random allocation is the method used to select members of a sample to receive the treatment in an experiment. Random allocation is the way Aubree will select her experimental group, or the group that will consume oranges in the experiment. She can select this group using similar methods that she used with random sampling. For example, she can write all of the participants' names on a piece of paper and randomly select half of the names from a hat. The names selected would be the experimental group.

What is the method used to choose members of a group to participate in an experiment?

- Random population
- Random selection
- Random sample
- Random allocation
- Random control

All members of a specified group are referred to as what?

- Selection
- Population
- Control
- Allocation
- Sample

What is a part of a population used to describe the whole group?

- Selection
- Population
- Sample
- Allocation
- Control

Lesson17: What is the Center in a Data Set? - Definition & Options

The center of a data set is represented by the typical value that represents the data set. Explore the definition of the center in a data set, and review options for finding it, including the mean and median.

Finding Your Center

Elizabeth is working on a science project. She is testing the effectiveness of bleach on certain types of stains. After trying the bleach on each stain five times, Elizabeth records how many times the bleach removes the stain completely. Check out this chart to see how the project turned out.

Data representing how many washes it takes to remove a stain with bleach data chart

Elizabeth has a data set of 4, 2, 5, 4, 1, 2 and 3. She wants to find a way to summarize the information. Elizabeth needs to find the center of data, a single number that summarizes the entire data set. You can find the center of data using either the mean or the median of the data set.

Using Mean

The mean is the sum of the numbers in a data set divided by the total number of values in the data set. The mean is also commonly known as the average. The mean can be used to get an overall idea or big picture of the data set. Mean is best used for a data set with numbers that are closer together.

Since all of Elizabeth's numbers are close together, she can use mean to find the center of her data set. Simply add all of the numbers together and divide by how many numbers there are in the data set: $4 + 2 + 5 + 4 + 1 + 2 + 3 = 21 / 7 = 3$. Elizabeth's center of data for this data set is 3. She can summarize that, on average, bleach will effectively remove a stain 3 out of 5 times.

Using Median

Elizabeth is now experimenting with the effectiveness of plain soap on stains. After trying the soap on stains eight times, Elizabeth records how many times the soap removes the stain completely. Check out the chart she has made showing the effectiveness of soap on the stains.

From this chart you can see that our data set is 6, 7, 8, 8, 6, 0 and 7. You might notice that we have several numbers that are close together and one number that is a bit off. This number is referred to as the outlier. An outlier is a value that is much larger or smaller than the other values in a data set, or a value that lies outside the given data set.

What is a single number that summarizes an entire data set?

- Center of data
- Mean
- Median
- Outlier
- Range

What is the sum of the numbers in a data set divided by the total number of values in the data set?

- Center of data
- Mean
- Median
- Outlier
- Range

For the following data set, select the best method for summarizing the data.

3, 3, 4, 5, 2, 9, 5, 2, 3, 4

- Mean
- Median
- Outlier
- Mode
- Range

Lesson18: Calculating the Mean, Median, Mode & Range: Practice Problems

The mean, median, mode, & range are fundamental statistical calculations necessary to evaluate and comprehend the significance of a set of numbers. Learn how to calculate mean, median, mode, & range through real-world practice problems.

Mean, Median, Mode & Range Definitions

The mean is the arithmetic average of a data set. This is found by adding the numbers in a data set and dividing by how many numbers there are. The median is the middle number in a data set when the numbers are listed in either ascending or descending order. The mode is the value that occurs the most often in a data set, and the range is the difference between the highest and lowest values in a data set.

We will be looking at practice problems to help you find the mean, median, mode, and range of a data set. Since these are practice problems, feel free to pause the video during each example and try to work out the problems on your own. Then, play the video to check your answers.

Gasoline Prices

According to the U.S. Bureau of Labor Statistics, the gas prices for each month of the year in 2000 were as follows, rounded to the nearest hundredth of a decimal:

1.30, 1.37, 1.54, 1.51, 1.50, 1.62, 1.59, 1.51, 1.58, 1.56, 1.56, 1.49.

Let's start with the mean. Pause the video here to see if you can find the mean of this data set. The mean of a data set tells us on average how much gas cost in the year 2000. We can find the mean by adding all of the numbers up and dividing by 12, which is the number of months in the year and how many numbers we have in this data set.

$$1.30 + 1.37 + 1.54 + 1.51 + 1.50 + 1.62 + 1.59 + 1.51 + 1.58 + 1.56 + 1.56 + 1.49 = 18.13 / 12 = 1.51$$

1.51 is the mean for this data set. This number tells us on average the price of gas for the entire year. You will notice that 1.51 appears in the data set. Sometimes you will have an average that does not appear in the data set, but will still show you the big picture of the numbers given.

Okay, let's move on to median. Pause the video here to see if you can find the median of this data set. The median of a data set tells us what number falls directly in the middle. This is useful if you have one or two numbers that are greatly larger or smaller than the rest of the numbers in the data set. If the numbers are all pretty close together, then the mean and the median will be very close to the same number.

First, arrange the numbers in either ascending or descending order.

1.30, 1.37, 1.49, 1.50, 1.51, 1.51, 1.54, 1.56, 1.56, 1.58, 1.59, 1.62

Now, eliminate each number until you are down to the middle.

The following data set represents the average number of children per family for 10 countries in 2014. Calculate the mean number of children per family. 5.8, 6.1, 1.9, 1.4, 2.6, 2.8, 1.3, 4.4, 4.4, 1.7

- 4.4
- 4.8
- 5
- 3.24

Which of the following describes the best approach to finding the median of an even set of numbers?

- Select whichever of the numbers appears to fall in the middle of the data set
- Place numbers in ascending or descending order, calculate the average of the middle terms
- Calculate the average of the two highest and two lowest numbers in the set
- Determine which of the numbers in the set is found most frequently

The value that occurs the most frequently in a data set is known as the _____.

- Mean
- Median
- Mode
- Range

Lesson19: Simple Random Samples: Definition & Examples

Simple Random Sampling

Adrian is gathering information for a trip he plans to take. He is thinking about moving permanently to a new town. However, he wants to get an idea of how the people in the town feel about the safety of the town. Unfortunately, Adrian does not have the resources to ask every person in the town how they feel about the safety. How should Adrian go about collecting this data?

In this lesson, you will learn about how to use and recognize simple random sampling in statistics. First, let's discuss the meaning of simple random sampling by defining a few key terms.

When you are doing an experiment, you want to gather information about a population. A population is all members of a specific group. For example, the population of Adrian's research will be, quite literally, the population of the town. Sometimes a population is not that geographically contained. If Adrian wanted to know the typical income of a person over 30, then anyone with a job over 30 in the entire world would be in his population. Since Adrian does not have the resources to ask everyone in the town how they feel about safety, he will have to use a sample of the population.

A sample is a part of the population used to describe the whole group. Adrian will want to make sure all demographics are represented in his sample. He doesn't just want the opinion of the teenagers in his town or just the men over 50. He wants to get all demographics equally represented in his sample. To do this, Adrian will need to use random sampling, which is a method of choosing an equally distributed subset from a larger population. This takes us to simple random sampling or SRS, which is a type of random sampling where the variables have an equal and unsystematic chance of selection.

For example, if you were to toss a handful of 6-sided dice on a table, you would have an equal and unsystematic likelihood of getting a one, two, three, four, five, or six. When I say unsystematic, I mean you aren't throwing the dice and then only choosing the number off of every other dice on the table. When you use a system to randomize the selection instead of just taking the random selections as they fall, then you are not using simple random selection.

In Adrian's experiment, Adrian can use a phone book with all of the names of the people in the town as his population group. He can then put each name on a piece of paper and put the papers into a bag. Adrian can blindly select a certain number of names from the bag as part of his simple random sampling.

Now that you understand the meaning of simple random sampling, let's discuss how to use simple random sampling.

Using Simple Random Sampling

Simple random sampling is meant to be a balanced representation of the demographics of the population. When you are discussing a population of people, that means all of the demographics: age, race, religion, ethnicity, socioeconomic status, education level, etc. that are all currently present in the given population.

What is the name for all the members of a specified group?

Sample Subset Simple random sampling Population

What is a part of a population used to describe the whole group?

- Sample
- Subset
- Simple random sampling
- Event

What is a type of random sampling where the variables have an equal, and unsystematic, chance of selection?

- Subset
- Simple random sampling
- Population
- Event

Lesson20: Stratified Random Samples: Definition, Characteristics & Examples

Stratified Random Sampling

Jackie is the president of the party planning committee of her school. Right now, the party planning committee is planning a winter formal. She is researching the different DJs that are available to work at the winter formal. Each DJ has a different percentage of music that he or she is able to play.

Jackie needs to find the right DJ for the winter formal so that the students of her school are happy with the music choices. Jackie can't ask every member of the school his or her music preferences. How can she figure out which DJ to hire?

In this lesson, you will learn about stratified random sampling, what it is, and how to use it.

What Is Stratified Random Sampling?

Stratified random sampling is a random sampling method where you divide members of a population into 'strata,' or homogeneous subgroups.

This is the percentage of each music genre that each DJ will play. DJ Thunder Cat will only play 60% rock, 20% pop, 15% hip hop, and 5% country. DJ Xtreme Mix will only play 75% hip hop, 20% pop, 5% rock, and no country. DJ Midnight will only play 50% pop, 35% country, 10% hip hop, and 5% rock. Each of these genres is an example of a strata, or a homogeneous subgroup. The group or population is music, while the strata is each kind of music.

Stratified random sampling works the same way. Jackie doesn't have the ability to question every student in the school. However, she can use stratified random sampling to get an understanding of the music tastes of the students in the school. Jackie can divide the student body into different strata, or subgroups, and then ask each of these subgroups what types of music they prefer.

Stratified random sampling is different from other types of sampling because you are separating the population into groups first. You must be very familiar with the demographics of your population if you intend on using stratified random sampling. Let's discuss how to use stratified sampling and the ways you can use this sampling in an experiment.

Using Stratified Random Sampling

Jackie decides that a stratified random sample may be the best way to collect her information. When dividing the school into stratified random samples, she must keep two things in mind:

- Stratified random samples cannot have crossover.
- Stratified random samples must include all members of a population.

Stratified random samples cannot have crossover. In other words, each of the strata must be mutually exclusive. In Jackie's case, she must choose some type of group in which each student is a part of one group but not more than one. Jackie could use something like age or school classification, such as freshman, sophomore, junior, and senior.

Which type of random sampling divides members of a population into homogeneous subgroups?

- Simple random sampling
- Cluster random sampling
- Stratified random sampling
- Systematic random sampling

Which of the following conditions must be met for a sample to be a stratified random sample?

- The strata must occur naturally.
- Each group must be equally separated.
- The strata must have a crossover.
- It must include all members of a population.

When selecting strata groups, it is recommended you have:

- More than 7 strata.
- No more than 4 to 6 strata.
- Less than 3 strata.
- Between 6 and 8 strata.

Lesson21: Systematic Random Samples: Definition, Formula & Advantages

Systematic Random Sampling

Lucas is a new manager at the local movie theater. The owner of the movie theater wants to find out how the customers feel about the new renovations they've done at the theater. Lucas can't ask every customer that comes in how they feel, especially when the movie theater gets busiest on Friday and Saturday nights. In this lesson, you will learn about systematic random sampling and how to use it when collecting data.

What Is Systematic Random Sampling?

Systematic random sampling is the random sampling method that requires selecting samples based on a system of intervals in a numbered population. For example, Lucas can give a survey to every fourth customer that comes in to the movie theater. The fact that Lucas is giving the survey to every fourth customer is what makes the sampling systematic because there is an interval system. Likewise, this is a random sample because Lucas cannot control what type of customer comes through the movie theater.

Additionally, remember that systematic random sampling must still ensure that all outcomes are given equal chance of getting selected in the sample. Therefore, Lucas cannot only select every fourth customer that comes through the door during the evenings or on the weekends. He must select every fourth customer every time the theater is open.

Lucas must also ensure that by choosing every fourth customer he does not include any sort of pattern in the selection. We will talk about this more when discussing the pros and cons of systematic random sampling.

Now that you understand the definition of systematic random sampling, you can learn when and how to use systematic random sampling.

How to Use Systematic Random Sampling

Let's discuss when and how to use systematic random sampling. Lucas's boss wants to send his employees to a weeklong training session that is out of town. Due to limited funding, Lucas's boss, Alex, cannot send all of his employees; he must choose a group to go to the training. Alex owns 12 movie theaters and employs 200 people. He has 12 managers out of the 200 employees. Alex can use systematic random sampling to select the group of employees that will attend the training.

Alex can follow these steps to create a group from systematic random sampling:

- Create a list of employees

- Select a beginning number

- Select an interval

- Gather a list of employees based on the interval number

First, Alex will need to create a list of his employees. Then, he will need to randomly decide which number to start his selection process. For this, Alex uses a random number generator to select which employee he will begin with. The random number generator produces the number 34. Now Alex needs to create an interval. First, he needs to decide how many employees he wants to send to the training. After reviewing his budget, Alex decides he can afford to send 20 employees to the training. To find the interval he needs, Alex can divide the total number of employees he has (the population size) by the number of employees he wants to send to the training (the sample size), like this:

$$200 / 20 = 10$$

This would make his interval 10, meaning that every 10th person after the 34th person would be selected until he had a total of 20 people.

Therefore, the following people would be selected:

34, 44, 54, 64, 74, 84, 94, 104, 114, 124, 134, 144, 154, 164, 174, 184, 194, 14, 24, 35

The numbers 14, 24, and 35 are included here because in order to select 20 people, Alex will have to continue selecting every 10th person, even if that means starting back at the beginning of the list. The number 35 is included because the 34th person has already been selected at this point.

What if the interval number happened to be a fraction? What if Alex decided he wanted to select 23 people to go to the training?

He would still use this method:

$$200 / 23 = 8.69565\dots$$

Obviously, you cannot select .69565..... of a person. To compensate for this, Alex will need to pick every 8th person then every 9th person and continue to rotate this pattern until he has 23 people.

Alex would end up with the following people:

34, 42, 51, 59, 68, 76, 85, 93, 102, 110, 119, 127, 136, 144, 153, 161, 170, 178, 187, 195, 4, 12, 21

What is the method that requires selecting samples based on a system of intervals in a numbered population?

- Simple random sampling
- Cluster sampling
- Stratified random sampling
- Systematic random sampling
- Law of large numbers

When doing systematic sampling, you must remember that all outcomes must be given _____ chance of being selected.

- equal
- twice the
- less than half of the
- more than double

To use systematic random sampling, you must first create a list of your population, and then:

- Create a list of employees
- Select an interval
- Select a beginning number
- Gather a list of your sample
- Put all names in a hat

Lesson22: Cluster Random Samples: Definition, Selection & Examples

Cluster random samples refer to the participants including all members of a population, which are selected through cluster sampling. Learn about cluster sampling and cluster random sampling, explore the definition, selection, and examples of cluster random samples, and understand how and when to use cluster sampling in research.

Cluster Random Sampling

Donna is running for student class president. She has some key issues in her campaign, such as bullying in the school, the prom theme, and fixing the water fountains in the school. Her campaign manager, Lulu, wants to collect information about how the students feel about the different issues in the campaign. She specifically wants to know about the different interest groups in the school.

In this lesson, you will learn about cluster sampling, including what it is, how to use it, and some of the advantages and disadvantages of using this sampling method.

What Is Cluster Sampling?

Cluster sampling is the sampling method where different groups within a population are used as a sample. This is different from stratified sampling in that you will use the entire group, or cluster, as a sample rather than a randomly selected member of all groups.

For example, Lulu wants to conduct some marketing research for Donna's campaign. She specifically wants information from the different interest groups of the school. In the school, she has found that 30% of the students are involved in athletics, 25% of the students are involved in an academic club, 20% of the students are involved in an art or theater club, and 25% are involved in a music club. None of the students are involved in more than one club and all of the students are involved in a club. Lulu knows that Donna is a member of an athletics club and the athletics students support Donna's campaign.

How to Use Cluster Sampling

When conducting research and using cluster sampling, you must keep a few things in mind:

- Cluster random samples cannot have crossover.

- Cluster random samples must include all members of a population.

Let's start with the rule that cluster random samples cannot have crossover. In other words, each of the clusters must be mutually exclusive. In this case, Lulu cannot divide the school population into interest groups where students are involved in more than one club or are a member of more than one cluster. Lulu has decided to conduct research with only the students that are in the arts, theater, and music clubs. Since Lulu already knows that no students are involved in more than one of each of the club categories, she knows her cluster sample does not have crossover.

We also know that cluster samples must include all members of a population, meaning that all of the students in the school must be a member of one of the four clubs. If there are students that are not a member of one of the clubs, then the cluster sample does not work.

If Lulu doesn't have time to give a survey to all the students in the club, she can use two-way cluster sampling, which is a sampling method that involves separating the population into clusters, then selecting random samples from each of the clusters. Lulu can use simple random sampling to select members of each cluster, or club, to give a survey.

You may be wondering how two-way cluster sampling is different from stratified sampling.

Stratified random samples must have an equal selection from each group that is proportionate to the population. Cluster sampling selection does not have to be equal; however, the clusters should be as close to the same size as possible.

Stratified random samples should not divide the population into more than six groups and are usually organized by demographic. Cluster sampling can be many groups and can be based on anything, including interests, hobbies, political views, geographical location, etc.

Because Lulu is using cluster sampling, she can select as many or as few people from each group as she wants.

When to Use Cluster Sampling

You should use cluster sampling when:

- ✓ The entire population is unclear or unknown
- ✓ The sample clusters are geographically convenient

_____ is a sampling method where different groups within a population are used as a sample.

- Random sampling
- Simple random sampling
- Cluster sampling
- Systematic sampling

Which is a sampling method that involves separating the population into clusters, and then selecting random samples from each of the clusters?

- Two-way cluster sampling.
- Simple random sampling.
- Stratified sampling.
- Systematic sampling.

How do cluster sampling and stratified random sampling differ?

- In cluster sampling, the sample must match the proportion of the groups in the population, but in stratified random sampling this is not necessary.
- Stratified random sampling requires selection from each group proportional to their share of the population, but cluster sampling does not.
- Stratified random sampling allows groups to mix together, but cluster sampling does not.
- Cluster sampling allows groups to mix together, but stratified random sampling does not.

Lesson23: How to Interpret Correlations in Research Results

Correlations acknowledge some relationship between two variables. In this lesson, learn how to graphically represent and statistically interpret correlational data.

Introduction to Correlation

Imagine you're reading the newspaper, and you see an article that says that a study was done on whether reading books about vampires makes children want to turn into vampires themselves. The article says that there's a correlation between reading vampire books and desire to be a vampire, and that the correlation is -1.5 . The reporter concludes that vampire books should be banned, because they are causing children to turn into vampires! What do you think of this reporter's conclusion? If you understand the theory and statistics behind correlational studies, you'll know that this reporter needs to go back to school to learn about how correlations really work. That's the topic of this lesson.

The Purpose of Correlations

A correlation is a simple statistic that explains whether there's a relationship or association between any two variables. Correlations are probably the most common statistic used in the field of psychology, so it's important to understand how they work.

Let's start with how we might do a basic correlational study before we get to the meaning behind the actual numbers from the statistics. In a correlational study, researchers pick two variables they think might be associated with each other. For this lesson, let's think about a student who wants to go from high school to college. The admissions office at each college will want to know what that student's high school grades were like, because they believe that high school grades can predict college grades. In other words, they believe that high school grades are associated with college grades. Why would they make this conclusion? They could make a graph showing all of the students they have accepted in the past, and this graph could show both variables.

On the y-axis, we could plot each student's high school grade point average. On the x-axis we could plot that same student's overall college grade point average. We put a dot on the graph showing where these two variables intersect. We keep going until we have a dot for every student. Each dot represents one person. This type of graph is called a scatter plot. A scatter plot shows a dot for each person of interest, where each dot represents one person's scores on the two variables of interest. Here, each dot shows one person's high school grades and college grades. You can remember the name 'scatter plot' because after we plot, or mark, the graph with each person, it looks like a bunch of dots have been scattered all over it.

After all of the dots have been plotted, we can look for the general pattern, or trend, that is a representation of most people. In other words, if you were to draw a single, straight line on this graph, where would you draw the line? It would probably be right here. This line is a quick summary of the general pattern of dots we see on the scatter plot.

Now, how does this graph relate to correlations? A correlation is simply a number that is assigned to represent this scatter plot and this line. The equation for how to calculate the number you end up with is complicated, and you don't need to know it until you take a statistics class in college. For now, all you need to know is that the equation gives you a number that's like a code, and you can interpret this number, or code, to know what the graph looks like that resulted in this number. How to read the number is what we'll cover next in this lesson.

Interpreting the Statistic: Direction

The resulting statistic you get from a correlation equation is called a correlation coefficient. There will always be two parts to a correlation coefficient. The first part is the sign, or direction, meaning whether the coefficient is a positive number or a negative number. That sign is the first part of the code you need to know.

The second part of the correlation coefficient will be a number. The number will always be between zero and one. That means that the correlation coefficient will always be somewhere between negative one and positive one, but it could be anywhere in between. Let's go over each part of the correlation coefficient and discuss what that part means.

We'll start with the sign, or direction. Unless your coefficient is exactly zero, you'll have a number that's either positive or negative. The sign of positive or negative is simply a code that indicates how the line appeared on the scatter plot. Remember our example before? We plotted high school grades and college grades, and we ended up with a line that looked like this. Notice that the line goes from the bottom left corner of the graph to the upper right corner of the graph. That means that as one of our variables went up in value, so did the other variable. In other words, if a student had a high GPA in high school, he or she is likely to also have a high GPA in college. As one variable gets higher, the other variable also gets higher.

Whenever we graph two variables that move in the same direction, the line we draw will generally go from the bottom left to the upper right of the graph. We call this a positive correlation. A positive correlation means that both variables move in the same direction - as one goes up, the other goes up, or vice versa. We call this a positive correlation because when we do the equation to come up with our correlation coefficient, the result is going to be a positive number. It can be anywhere from +0.01 all the way up to +1.00.

The only other option for a correlation will be that it's got a negative sign in front of the coefficient. You won't be surprised to learn that we call this a negative correlation. A negative correlation means that the two variables move in the opposite direction from each other - as one goes up, the other goes down. What would that look like on a scatter plot? Where would we draw the line?

Imagine that we plotted two variables we think move in opposite directions. Let's pick college grade point average and the number of hours a student spends partying instead of studying. We might imagine that the more you party at college, the lower your grades might be. So the two variables move in opposite directions; as one goes up (that would be the partying), the other goes down (that would be the GPA).

If we made a scatter plot of several students who were already in college, we could put number of hours partying on the y-axis, and keep college grades on the x-axis. Now, the scatter plot might look like this. Where would we draw the line representing the general pattern? Here, it goes from the upper left to the bottom right. This will always be where the line goes for a negative correlation.

So, now you know what the positive or negative sign means on a correlation coefficient. It tells you whether the two variables move in the same direction or opposite directions. It also tells you the general direction of the line you would see on a scatter plot showing all of the people used to calculate the correlation.

Interpreting the Statistic: the Number

The second part of any correlation coefficient is the number that appears after the sign. Remember that a correlation coefficient will always range from zero to one. So, you might see a correlation of -0.85, or +0.14, or +0.98. You already know what the negative or positive sign means. What does the number behind it mean?

The number you see in a correlation tells you the strength of the association between the two variables of interest. In other words, are these two variables very strongly related, or not? Let's go through some examples to make this clear.

If the number you get is a perfect zero, that means that the two variables are not related to each other at all. You can imagine some variables that simply have nothing to do with each other. For example, college

grades are not correlated with how tall you are, or what color your eyes are or the average number of pizza slices you eat in any given week. These variables are not correlated, meaning the correlation coefficient you would get would be zero.

As a correlation moves from zero to one, it means that the relationship becomes stronger and stronger. A low correlation means that the two variables are a little bit related to each other, but not much. A high correlation, meaning one that's closer to the value of one, means that the two variables are very strongly related to each other. For example, high school grades and college grades are generally related to each other.

Which one of the following coefficients indicates the strongest relationship between two variables while remaining within the possible range of correct calculations?

- +4.50
- 0.00
- 0.83
- 2.78

Which one of the following coefficients indicates that the two variables of interest move in opposite directions while remaining within the possible range of correct calculations?

- +4.50
- +0.32
- 0.83
- 2.78

José wants to calculate a correlation; which of the following graphs should he use?

- Scatter plot
- Line graph
- Histogram
- Pie chart

Lesson24: Inferential Statistics

Imagine a teacher is interested in studying several aspects of her class, such as the personality of her students, whether boys are different from girls or whether different teaching styles lead to different results in her students. In order to understand any of these aspects of the children in her class, the teacher must understand some basic statistics so that she can quantify her understanding, or, in other words, put it into numerical form.

In another lesson for Educational Psychology, you can learn about ideas such as the mean, median and mode to describe people, or how a standard bell curve works. This lesson focuses on a slightly different type of statistic, called inferential statistics.

Inferential statistics are ways of analyzing data that allow the researcher to make conclusions about whether a hypothesis was supported by the results. You can remember the term inferential because it comes from the word 'inference,' meaning 'to draw a conclusion from clues in the environment.' How do inferential statistics work?

Two Types of Inferential Statistics

To make things easier, let's think about an example from a classroom. Imagine a teacher suspects that the boys in her class are more extroverted - or more talkative, energetic and social - than the girls in her class. The teacher's guess about the difference between boys and girls is what we call a hypothesis. In psychology, a hypothesis is an educated guess about a trend, group difference or association believed to exist. Her hypothesis is that boys are more extroverted than girls. How would she test this hypothesis? The teacher would probably do something to measure extroversion, such as give the students a personality survey to complete, or simply observe them and keep track of extroverted behaviors. Either way, she can measure the level of extroversion in every boy and every girl. Then she can compare the scores across the two groups.

The first type of inferential statistic we need to discuss is called a t-test. A t-test is used to compare the average scores between two different groups in a study to see if the groups are different from each other.

In our example, the teacher would use a t-test to compare the average level of extroversion in the group of boys versus the group of girls. T-tests are very common in psychology because they can be used to compare any two groups in an experiment. If you do an experiment where you ask some people to eat healthy food and some people to eat unhealthy food, such as candy, you could then test them on some variable, such as whether they get a stomachache. A t-test would again be used here, because you are comparing the two different groups. You can use t-tests to compare two groups that occur naturally, such as boys versus girls, or you can compare two groups that you have created in an experiment.

So a t-test compares two groups. You can remember the term t-test by pretending that the letter 't' stands for the word 'two,' meaning the two groups you are comparing. But what if you want to compare more than two groups? Imagine that the teacher thinks that as children age, they become more extroverted. Now she might give personality tests to children in each grade level in the school, such as all the way from kindergarten to sixth grade. How could she compare all of these different groups, now that we have more than two?

The second basic type of inferential statistics is called an analysis of variance. Researchers usually use the nickname ANOVA for this test. An analysis of variance is a test that compares the average scores between three or more different groups in a study to see if the groups are different from each other.

In other words, an ANOVA is exactly the same as a t-test, but it can analyze multiple groups at once. The difference is simply how the equation works to analyze the groups, which you can learn more about in a statistics class if you're interested. For now, all you need to know is that the ANOVA compares multiple groups, while a t-test can only compare two groups.

Let's go through one more example of when you might use each test. Imagine a teacher believes that different teaching styles result in different scores when children take a test over the material. He might try lecturing for one group of students, versus worksheets with a second group of students. He then gives everyone the same test, and wants to compare the results.

If he only had these two groups, he would use a t-test to compare the scores. However, now let's say that he wanted to add a third teaching style, which was having the students learn the material on their own and then teach it to each other. If he now wants to compare all three teaching styles to each other, he would use an analysis of variance, or an ANOVA test.

A teacher wants to compare the reading comprehension skills of children with learning difficulties and children without learning difficulties. Which statistical test should she use to make this comparison?

- Regression
- p-test
- Analysis of Variance (ANOVA)
- t-test

A teacher wants to compare children of high, medium, and low family incomes on their satisfaction with the school lunch program. Which statistical test should be used to make this comparison?

- Regression
- p-test
- Analysis of Variance (ANOVA)
- t-test

A researcher asks a group of students to complete a survey that measures maturity. She finds that the average score for girls is higher than the average score for boys, with a p-value of 0.03. What should she conclude from this p-value?

- Three percent of the girls are more mature than the boys, on average.
- There's a three percent chance that the scores in the study are due to random chance.
- There's a ninety-three percent chance that the scores in the study are due to random chance.
- Ninety-three percent of the girls are more mature than the boys, on average.

Lesson25: One-Tailed Vs. Two-Tailed Tests: Differences & Examples

Significance

Some of my friends are currently applying for their doctoral internship. This process involves writing several essays about yourself that must be shorter than 500 words, tabulating several hundred hours of therapy with clients, figuring out what assessment procedures they have completed, and no matter how hard and how fast you work you always feel like you're a week behind.

This has, understandably, caused the level of stress in these doctoral students to rise. The question I have is, 'Are their stress levels significantly different now than as compared to their stress levels last year?'

To fully test this will require me to go back in time with my time machine and have them take several stress tests. Then I jump back to the present and give the same people more stress tests. With all of this data, I am looking to see if there is a significant difference between last year and this year.

Statistically significant means the difference in the results did not occur by random chance. This is almost always represented by a lower case p, which stands for probability. Another term you may also hear is 'alpha,' and it may be represented by the alpha symbol (that little one that looks like a fish).

In psychological research, random chance typically means these results would only occur by chance less than 1 in 20 times, or .05. If you've done any reading of psychological research articles, you may have seen $p < .05$, which means the probability of these results being a fluke is less than 1 in 20 times. The ways something could be a fluke are by data collection error or just by the numbers being too similar. The significance tells you that the scores are so far apart that even with some variations they are telling us something.

This significance is taken from a normal distribution. It says that the numbers you are comparing are so different that something is going on, whether the data set is way higher or way lower. What the tailed test does is manipulate how we interpret the probability.

Two-Tailed Test

A two-tailed test, also known as a non directional hypothesis, is the standard test of significance to determine if there is a relationship between variables in either direction. Two-tailed tests do this by dividing the .05 in two and putting half on each side of the bell curve.

Why would someone do this? To determine if there is an interaction.

Remember those stress levels I went back in time to get? Let's say I do a simple test called a t-test, which compares two averages. I have the average stress levels from last year compared to the average stress levels of this year.

After some probability calculations, I learn that there is no significant difference between last year's and this year's stress levels. This tells me that this year's stress levels are neither higher nor lower than last years. What if I jump in my time machine again and go back 15 years. The average age of my subjects is currently 26, so I will talk to them when they are about 11. Wow. I suddenly am starting to feel really old. Anyway, I collect their stress levels and then jump back to the present and do another t-test, and I find out that their stress levels are lower now than when they were younger. The beauty of the two-tailed test is that when you run your numbers, the math will tell you if it's significantly higher or lower.

One-Tailed Test

A one-tailed test, also known as a directional hypothesis, is a test of significance to determine if there is a relationship between the variables in one direction. A one-tailed test is useful if you have a good idea, usually based on your knowledge of the subject, that there is going to be a directional difference between the variables.

Directional difference is my fancy way of saying that you know one of the set of scores will be higher or lower than the other. Looking back at our original example of the stressed out graduate students, I think we

can make a good guess on whether adding additional stressors will cause a person to be more or less stressed.

A civil engineer is trying to prove that his new method of laying blocks is more effective than the traditional method. The engineer will conduct a:

- One-tailed test
- Two-tailed test
- Random test
- Point estimate

Why is a two-tailed test sometimes referred to as the non-directional hypothesis?

- Because this test only verifies if there is a statistically significant difference between groups or not.
- Because researchers are unsure of what to do with their data.
- Because this test determines if there is a statistically significant difference between groups in either direction.
- Because two-tailed tests are conducted when the results are both positive and negative.

In statistical equations, probability is usually represented by ____.

- a lower case p
- the word probability
- the abbreviation py
- the alpha symbol

Lesson26: What is a Chi-Square Test? - Definition & Example

Definitions Involved in Chi-Square Test

I've been reading a lot about undercover officers lately, and it made me start wondering how many police officers work undercover versus how many apply to be in the program. I mean, not everyone who applies can work undercover because they may not fit a need or their scores on psychological tests just don't measure up.

If the numbers were really close between those who applied and those who got in, we would need to know if there is a statistically significant difference. Statistically significant means the difference in the results did not occur by random chance. This is almost always represented by a lowercase p, which stands for probability.

If you have read any psychological research articles, you may have seen $p < .05$, which means that the probability of these results being a fluke is less than 1 in 20 times. This has been the agreed upon level of chance that results can be wrong for quite a while. We'll get into how you figure it out for a chi-square in just a moment.

What we need is a specific statistical test to allow us to take categorical data, like those who did make it into the undercover program and those who did not. What we need is a chi-square, which is a statistical test used to compare expected data with what we collected.

What a chi-square will tell us is if there is a large difference between collected numbers and expected numbers. If the difference is large, it tells us that there may be something causing a significant change. A significantly large difference will allow us to reject the null hypothesis, which is defined as the prediction that there is no interaction between variables. Basically, if there is a big enough difference between the scores, then we can say something significant happened. If the scores are too close, then we have to conclude that they are basically the same.

Statistics

The actual formula for running a chi-square is actually very simple:

$$(o-e)^2 / e$$

You take your observed data (o), and subtract what you expected (e). You square the results, and then divide by the expected data in all the categories.

To use the number we find, we refer to the degrees of freedom, usually labeled as df for short, and is defined for the chi-square as the number of categories minus 1. Due to the nature of the chi-square test, you will always use the number of categories minus 1 to find the degrees of freedom. The reason this is done is because there is an assumption that your sample data is biased, and this helps shift your scores to allow for error.

You will then locate a chi-square distribution table, which is found in almost every statistical textbook printed. Using your degrees of freedom, you will locate the p-value you're interested in using the process below; typically the p-value is .05. If you can, see if your number is greater than .01, which means that your results could only happen by chance 1 in 100 times. Because of copyright restriction issues, we won't be able to provide a full image of the chi-square distribution table, but below is basically what they look like and how you find the digit you're lo

Which of the following types of data are required in order to run a chi-square?

- Categorical data
- Interval data
- Ratio data
- Experienced data

You are observing a psychologist run a chi-square. You see the psychologist take his number of categories and subtract 1. Which of the following is the psychologist calculating?

- Degrees of freedom
- The chi of chi-square
- How to reduce the chi-square to useability
- How to make a chi-cube

Between which of the following data does a chi-square measure the difference?

- Collected and expected
- Assumed and expected
- Recorded and implied
- Implied and population

Lesson27: What Are t-Tests? - Assessing Statistical Differences between Groups

Definitions

I've often wondered if having two classes combined is a good thing. No. Sorry. Not some kind of anti-Marxist/Marxist idea - I meant school classes. When you combine two classes you have to teach to the lowest level in the room. For example, if you had a class for high schoolers where you combined seniors and freshman, than you have to teach it at the freshman level. This will bore the seniors out of their minds because they are well above that level.

However, if you taught at the senior level, then you would confuse the freshman because they haven't had as much experience. The same issues happen at college and graduate school, probably even more. So the question for those designing the classes and those who are evaluating whether or not to combine two different levels of students is, 'Are the experience and knowledge levels of the classes so different that one group will not get any use out of the class?'

The t-Test is a statistical test to determine if there is a measured difference between two groups. The t-Test always has a lower case letter 't,' which seems to have been chosen arbitrarily. The t-Test can also be referred to as the Student's t-Test because it was printed under the pseudonym 'Student' by William Gossett to avoid issues with an employer at a brewery. While you don't need to know this to do the statistics, sometimes it's interesting to remember that the purpose of statistics is to solve real world problems. For instance, is beer A, on average, better than beer B?

Null & Alt

T-Tests use both a null and an alternative hypothesis. A null hypothesis is typically the standard assumption and is defined as the prediction that there is no interaction between the variables. This is opposed by the alternative hypothesis, also known as the research hypothesis, defined as the prediction that there is a measured interaction between the variables.

Because t-Tests are specifically looking to see if there is a difference between the two groups of scores, the null hypothesis is that there is no difference between the groups. So, if we have a 4th and 5th grade combination class and if we failed to reject the null hypothesis, then that would mean there is no significant difference between the 4th and the 5th graders. The t-Test can reject the null hypothesis, which would mean that we would look to the alternative hypothesis. With the alternative hypothesis, we would be able to say that there is a significant difference between the groups.

T-Test Stats

Let's illustrate how a t-Test works by looking at two groups of graduate students who have been put into the same class. We gave everyone a test to determine their level of knowledge on the subject. First, we will list out the data scores that we collected:

| Group 1 | Group 2 |
|---------|---------|
| 5 | 2 |
| 6 | 3 |
| 4 | 4 |
| 5 | 3 |
| 2 | 7 |

Our total number of participants is 10 and we will represent this by the letter n, so $n = 10$. We need to figure out how much variance there is within all of the scores, so we will calculate the mean of each group. The mean of Group 1 is 4.4, and the mean of Group 2 is 3.8. To calculate the variance, we need to calculate

their standard deviation, which is defined as a number corresponding to a bell curve describing how spread out the data is.

The process of calculating standard deviation involves finding how much each score differs from the average, squaring them, adding them up, and then square rooting them. Many calculators and online cheats will let you do it quickly, and few statisticians will calculate it by hand. If you're interested in how to do a more in depth calculation, please view the lesson detailing it. The standard deviation of Group 1 is 1.52, and the standard deviation of Group 2 is 1.92.

The first step in the t-Test is calculating how much variability is in the sample. This part of the formula will help inform us if the differences between the samples might be explained by how spread out the data is. The formula is simply squaring each standard deviation, and then dividing by the number of numbers in the group, and then adding them up.

So, $(1.52^2 / 5) + (1.92^2 / 5)$. This becomes $0.462 + 0.737$, which equals 1.199.

When are degrees of freedom lost?

- When calculating the mean.
- When calculating the t-value.
- When calculating standard deviation.
- When calculating variance.

Identify the statement that appropriately describes the null hypothesis:

- There is no difference between the groups.
- There is no difference between the individuals.
- There is a difference between the groups.
- There is a difference between the individuals.

Some high school students were divided into two groups, group A and group B, and given the same test. Group A consisted of 6 students and the average score was 12 with a standard deviation of 2. Group B consisted of 8 students and the average score was 11 with a standard deviation of 3. The variability within the groups is:

- 1.339
- 1.792
- 0.667
- 1.125

Lesson28: Using ANOVA to Analyze Variances between Multiple Groups

Definitions

I don't want to get too much into my own history, but I attend (or did attend, depending on when you're hearing this) a clinical program that emphasized a particular type of theory over others. This is, in fact, not uncommon; if you progress you'll hear more and more of the different camps that exist in psychology. Some of the larger ones include psychoanalytic, cognitive-behavioral therapy, and person-centered therapy. But these are just a few of the several hundred styles.

Eventually, you'll arrive at something called evidence-based practice. This is where a therapist uses techniques that have been demonstrated to work through statistical and experimental evidence. In my own opinion, if your therapist isn't using evidence-based practice, then you should run far and fast.

To create evidence-based practice, we have to look at, well, evidence. We need to compare the effectiveness of treating different psychological maladies. What's more, we need to be able to compare a whole bunch of different modalities because sitting there and doing ten statistical tests is no fun at all. We want to do just one.

The analysis of variance, usually shortened to ANOVA, is a statistical procedure for locating a difference between multiple levels of a single independent group mean. For those of you who are familiar with the T-tests, this is basically a way of running a whole bunch of those in one go. But why run an ANOVA instead of several T-tests?

It is unethical to run multiple statistical tests on the same data because you will eventually find something due to the sheer probability and not an actual relationship.

You'll be able to examine a large amount of data and look for interactions without having to do a whole lot more statistical analyses.

ANOVAs come in many flavors, so let's look at each one independently so your brain doesn't start trying to make them all smash together.

One-Way Between Subjects

We start with a one-way between subjects ANOVA, which is a ridiculous mouthful to say. One-way has several specific components that identify it as such, and they are:

- One independent variable

- An independent variable that has multiple levels

- One dependent variable

Things are clearer with an example. Let's say you're interested in seeing how effective therapy is for a depressed patient. Your independent variable here will be your patient's amount of time in therapy, while the dependent variable is your patient's depression level.

Your multiple levels will be the amount of time in therapy. We will have our different levels in three-month intervals, so three, six, nine, and twelve months. But wait! We forgot about the between subjects aspect.

Between subjects is defined as a study in which the subjects are placed in mutually exclusive groups and will be compared to each other. So in our experiment, we will have four groups of participants, and each of them will remain separate.

Following our experiment, we will compute to see if there is a difference between the different levels of the independent variable. This will give us an F-ratio, which is defined as a score to determine the level of difference between the means. This score is checked in a specific table, or, if you're lucky enough, you will do the math on a statistical computer program and be given the significance value. If your F-ratio is significant, you will know that there is a difference between one of your variable levels.

All the F-ratio has told us is if there is a significant difference between any of the groups. If our F-ratio is significant, then we will run a follow-up test to determine what the difference is. The follow-up test will tell us exactly which groups are different. There are several iterations, and they require a bit more than we're going into here.

One-Way Repeated Measure

Very similar to a one-way between measures is a one-way repeated measure. Repeated measure indicates that the study uses the same group of participants for each level of the variable. Looking at a similar example, let's say we have one group of participants and check in with them every three months. This would give us the same number of scores, but we would be repeating the measures instead of comparing between them.

If you were doing the same testing on the same group of people, you may have what is called a carryover effect. Carryover effect is defined as previous levels or conditions that may cause subsequent assessments to be altered. Basically, if you're assessing the same group of people every three months, and most of the people got better in the first three months, then their 'already better-ness' will carry over to the next set of scores.

When calculating your F-ratio, the statistics will be slightly different when taking the carryover effect into account. This makes the F-ratio less likely to be statistically significant because you're looking for larger changes because smaller changes can be explained by the carryover effect.

Two-Way

Ready for stuff to get a little more complicated? A two-way ANOVA has the following characteristics:

Two independent variables

Each independent variable has multiple levels

There's one dependent variable

The purpose of running an ANOVA is to find the _____ .

- differences between means
- similarities between means
- characterizations shared between means
- most effective score

Brian is conducting a study to determine whether meditation affects body weight. Brian plans to have three different groups, where each group will be assigned a different length of meditation time. When Brian gathers his data, he will compare the body weights of the participants between groups. Which type of ANOVA is Brian using?

- Between subject
- Repeated measure
- Mixed method
- Multivariate

In order to conduct a study to determine whether meditation affects body weight, Brian plans to have one group participate in different lengths of meditation time. After each length of meditation time, Brian will measure the body weight of each individual in the group, which is _____ form of ANOVA.

- between subject
- repeated measure
- mixed method
- multivariate

Chapter5: Educational Technology Trends: What Teachers Should Know

Lesson29: Educational Technology

Walking into a classroom today is very different from walking into a classroom ten years ago. Though that may seem like a short period of time, the many advances in educational technology have created a drastic change in teaching and learning. For example, students are able to access information more quickly and easily without needing to leave the classroom to do research. Also, creation tools are more widely available, leading to an increased emphasis on student created content. Educational technology can be defined as any digital device that aids or enhances student learning. In order to incorporate technology effectively into the classroom, it is important to understand the current trends in this area.

Trend 1 - Flipped Classrooms

As more people gain access to technology tools and the Internet, flipped classrooms are becoming more prevalent. A flipped classroom is one in which students learn important information at home on the computer through videos and recorded lectures and explore the concepts and complete activities in the classroom.

The concept of a flipped classroom came about when two high school teachers in Colorado realized they were able to record presentations and post them online for sick students. When a student was missing a lot of class time, these teachers shared their lectures and presentations online for students to access at home. Soon, the videos gained popularity and started to spread. This led to the creation of the flipped classroom.

In this format, the teacher is responsible for creating videos and lectures and sharing them with students online. Then, when students come into the classroom, teachers act as a guide on the side as students explore the concepts more in-depth. In actual practice, teaching and learning in a flipped classroom is more complicated. As a teacher in a flipped classroom, you must set clear expectations and be ready to act if students are not completing the required work at home. Learning in a flipped classroom requires that students take the initiative to work at home, meaning that parents, teachers, and students must be a team in education.

Trend 2 - Social Media in the Classroom

With the increased use of technology came a boom in different forms of social media. Social media is a digital tool you use to connect with other people around the world. More and more students are becoming active and familiar with social media, and teachers are beginning to use this tool in their classroom. For example, a lesson that incorporates social media could have students using a classroom blog to write posts and respond to others. In this lesson, students would be required to write a blog post responding to several prompts related to something learned in class. Students would also be required to comment on each other's blog posts, creating a social media classroom discussion.

Students and teachers can also use social media to connect with students somewhere else in the country or the world. As a teacher, you would need to work to make these connections. Students would then communicate with each other via social media (Facebook, for example) to learn more about different cultures. This can culminate with a presentation or essay about what the students learned.

When using social media in your classroom, whether to interact with students, connect them to someone around the world, or one of the many other possibilities, it's important to remember to teach students how to be safe online. Social media can be a great tool to teach many different subjects, but student must know how to use the tool and stay safe when doing so. Since students will most likely be using tools that are

available to everyone, there is always the chance that someone will try to prey on young people's naturally trusting nature. Students should be taught how to handle these situations and what information is not okay to share online.

Trend 3 - Mobile Learning

Similar to a flipped classroom, educational technology is also making it easier for students to engage in mobile learning. portable devices, such as smartphones and tablets, allow students access to the Internet from wherever they are. This has opened up possibilities for students to learn while they are out in the world. For example, when on a class trip to the zoo, students can use an Internet-connected tablet to further research different animals. Some may argue that if they are using the devices at the zoo, they are missing out on crucial experiences; however, if these devices are allowing them to explore information further, they are only enhancing their experiences.

Mobile learning is also not just limited to class trips. Students can use smartphones to practice concepts they just learned in school while on the bus ride home. They can also do school work while they are on a trip or absent from school. There are many educational apps that students and teachers can use to help students continue learning even when outside of the classroom.

What is educational technology?

- Books and resources that teach you how to use computers.
- Tools teachers use to help them plan their lessons.
- Any digital device that aids or enhances student learning.
- None of the answers are correct.

What is the role of the teacher in a flipped classroom?

- Provide videos and lectures for students to view at home while acting as a 'guide on the side' in the classroom.
- Lecture students in the classroom and assign them homework to complete at home.
- Assign students books to read while in the classroom and homework to complete at home.
- Create videos for students to watch on laptops in the classroom while you lecture.

Which is an example of mobile learning?

- Researching something using a tablet on a class trip.
- Practicing concepts on a smartphone on the bus ride to and from school.
- Completing missed work online while on a trip or absent from school.
- All of the answers are correct.

Lesson30: Effects of Technology in the Classroom

Our World of Technology

Tim rushes to class after a hard day of work. He immediately takes out his cell phone and iPad. As the teacher is preparing a lesson using the smart board, Tim sends a text message to remind his sister to turn off his television and informs his wife to withdraw \$20.00 from the ATM. In today's society technology is everywhere! Engaging people, or attracting their attention, is important when attempting to keep students focused in the classroom. Technology in the classroom is an effective tool to engage students in instruction and prepare them for 21st Century skills.

Technology Improves Academic Achievement

The time has changed from using mainly textbooks, chalkboards, and lectures to increase student achievement. Classrooms are becoming more diverse, which requires teachers to be more creative with their approach. Educators have to acknowledge the variety of learning styles in their taught curriculum. The taught curriculum is the information from the subject that is taught to the students.

Technology is a necessity. Educators have been challenged with the opportunity to provide modern-day approaches in helping students advance in the classroom. In the past few years, many classrooms have been overflowing with the use of iPads, cell phones, laptops, smart boards, Internet, etc..., to engage students in instruction. Software programs have been used to administer standardized tests and weekly classroom assessments. Technology minimizes behavior and classroom management problems because students are eager to learn. It also allows teachers to differentiate instruction effectively. Teachers are able to maximize the use of multiple virtual assignments based on the students' level of understanding.

Tons of information is available on the Internet. For example, a teacher could use a short video to introduce verbs. Next, she may request the students to use their laptops to log into a verb website. Finally, students will begin the same lesson but advance according to their ability. They can immediately receive feedback concerning their individual areas of weakness. This is just one example of how students can use technology to achieve.

Technology Increases Communication Strategies

Technology increases students' ability to communicate, exemplify thoughts, beliefs, and stories. However, students can use blogs or discussion boards to express themselves about a topic. Students are able to research, and use social media to convey knowledge and converse daily. It definitely motivates students and encourages them to work hard! The information becomes alive because students have access to ongoing visual images with the incorporation of text. Technology provides a quicker approach to obtaining immediate feedback for areas of concern and it supports the educational development of students.

Identify an effective way to engage students in 21st Century learning?

- using technology
- using the chalkboard
- lectures
- drawing images

Which statement or word describes engaging?

- attracts attention
- annoying
- boring
- supports

List two effective technological approaches that students use to communicate topics discussed in the classroom.

- discussion boards and conversations
- discussion boards and blogs
- head phones and blogs
- lectures and conversations

Lesson31: Future Technology in the Classroom

The Future is now

Tomorrow is the geometry unit test for Sebastian, and he still confuses simple definitions such as complementary and supplementary angles. His teacher, Mrs. Billet, anticipated the need for pre-test review and introduces the class to the augmented reality application on their tablets. She posted relevant trigger pictures around the room, and by pointing the tablet's camera, AR allows students to watch problems being solved and listen to videos that explain theories. Students were buzzing over the novel approach, absorbed in topic review.

As you can see from the scenario above, the growth of future technology in our nation's classrooms promises to deliver methods for teaching and learning that only existed in the minds of visionaries in previous decades. Even techniques and tools that we depend on now are undergoing remarkable changes as we use them. This lesson explores some exciting technologies that will greatly affect classrooms in the future.

Future Technologies in Education

Using technology in in the classroom makes learning real, tangible, and most importantly, available to teachers and learners around the world. Let's take a closer look at some classroom technologies that are still evolving, but promise even more great leaps for learners and teachers.

Augmented Reality (AR)

Augmented reality is a technology that is activated by the combination of a trigger image and an uploaded video response. The process is similar to aligning bar codes on store products to a phone app and having product descriptions, price per ounce, and store availability come up. Stop into a bookstore or library, and take a look at an AR-enabled copy of the Guinness World Records 2014 or 2015. The potential is clear when you point the app at a trigger picture of a cobra and see it coil off the page, or target a photo trigger of the world's smallest woman, then rotate the image so the viewer can walk 360 degrees around her and even snap a selfie.

Education is already seeing some uses for AR, such as promotion for student activities like plays or sports, messages to students from teachers and back, cross-curricular content review, and in-depth learning, such as skeletal and circulatory systems overlaid on the human body. Eventually, students could wear Google Glasses instead of using tablets or smartphones for endless AR possibilities.

Virtual Field Trips

Virtual field trips have been around for years as the Internet became the window on the world, but today, with augmented reality possibilities, students cannot only see places they might never travel to, but can interact with teachers who appear to be in these places. What an amazing opportunity for students to see the Amazon River and talk with the teacher who appears to be standing on its banks.

3D Printing

Most technologies are cost prohibitive in the early development stages, but teachers hope 3D printing becomes universally affordable quickly. Moving learning from two dimension to three dimension allows students to consider all sides of a concept, make adjustments to a design proposal by making a prototype, and creatively problem solve an issue at a remote site. Students who are comfortable with its use and

usefulness early in their education will be ready for extensive collegiate and career-based usage, especially in areas such as architecture, engineering, and space and underwater exploration.

Computing in the Cloud

Work projects, textbooks, flipped learning tools, videos, and homework assignments moved to the easily accessed, web-based cloud removes such barriers as lost work and missing details. It also eliminates time and place for all learners and teachers, allowing work to be conveniently started and stopped from anywhere. Cloud-based virtual learning environments (VLEs) are one concept within this technology, allowing students to participate, interact, and discuss without actually being in the same room with other learners. This technology is a natural for study groups.

Online Social Networking

Skype, Twitter, text messaging through a variety of servers, and diverse web platforms for online seminars or webinars have all changed the face of education. This will continue to improve as tools are improved and integrated seamlessly across applications. Skype, webinars, and active messaging are real-time experiences with everyone 'attending,' but are often recorded for future and repeated viewing. Add in the numerous YouTube, TeacherTube, Vimeo, and other videos stockpiled for open use, and the future of this area of technology is strong.

Second Life

The technology of personally designed avatars wandering in created online worlds while talking, collaborating, creating, and socializing is relatively new, conceived by Linden Lab in 2003. This concept is experiencing new growth as universities are energized by its potential, and some corporations have moved boardrooms onto Second Life so co-workers from around the world can brainstorm and construct prototypes in a unique, online, face-to-face experience. In the future, teachers may incorporate this into their classrooms to enhance student interaction and collaboration. However, Second Life developers and users note this is an unrestricted adult environment, so is best applied to higher education.

The application that uses a captured trigger graphic or picture and a teaching response video is known as what?

- a biometrics reader
- augmented reality (AR)
- a gaming program
- a 3D printer

3D printing is an exciting addition to school classroom technology tools that can do what?

- allow students to consider all sides of a design problem
- solve classroom problems at remote sites
- assist in design correction by creating a prototype in miniature
- All answers are correct.

Educators understand no two students learn the same things at the same rate of speed or in the same order. What type of future technology will assist in creating personalized curricula?

- 3D printers
- adaptive technology and software
- augmented reality (AR)
- gaming

Chapter6: Blended Learning Models and Solutions for Teachers

Lesson32: What is Blended Learning? - Definition & Models

Definition of Blended Learning

Did you know that our present K-12 students were born after the World Wide Web came out in 1991? Imagine how technology has made their childhoods vastly different from yours. Today's 14-year-old was born in 2001, the same year a human received the first artificial heart. In 2007, more babies were born in the U.S. than at any other time in our history. But what will 2007 be remembered for? The first iPhone. Our K-12 students only know a life with technology, so you can see why blended learning is not a trend but the new pedagogy.

Blended learning is a mix of e-learning with classroom instruction. Both environments are partly or fully supervised, depending on the model. It is not a simple matter of using more technology in the classroom or assigning homework that requires using the Internet or other technologies. Blended learning is a more robust teaching model that is adopted by a school or an individual classroom. It is still formal learning, as students are assessed on what they learned both online and face-to-face.

Desirable Qualities of Blended Learning

The most obvious reason why schools and teachers enjoy a blended learning model is that it increases engagement. More than half of children 8-12 years old have a phone or smartphone, which is like having a handheld computer. With blended learning students can use their smartphones for classroom activities and learn online at their own pace.

This may sound like a matter of convenience, but engagement is a powerful technique. In a blended learning environment students are continuously connected to the content. Many learning styles are stimulated through various technologies and digital media, helping the students comprehend, retain, and apply information.

Models

Face-to-Face Driver Model: This is a 'softer' approach to blended learning. The lecture will always be in-person. An individual teacher will add content online to support the curriculum. For example, in-class lectures are supported by supplementary lectures and virtual world activities found online.

Rotation Model: The rotation model is a fixed schedule of in-classroom and online instruction. It alternates between an in-classroom lecture supported by online study and an online lecture with supporting classroom activities. For example, in week 1, students will have face-to-face lectures and activities will be online. In week 2, students will watch online lectures and the classroom will be used for activities.

3 Flex Model: Students learn primarily online, while the classroom is used for tech support.

Online Lab Model: Courses are taught fully online but supervised by an adult in the physical classroom.

Self-Blend Model: Students take extra courses online. This is common for students wanting to take advanced courses for college or at-risk students who need extra coursework to graduate.

Online Driver Model: This is also taught fully online. It is self-paced with teachers checking in on a student and providing support as needed.

Ways to integrate

Implementing a blended learning environment is not something you can do alone. It is an overhaul of the traditional classroom that requires additional technologies, technical support, and the understanding of both students and parents about how it will work.

Which of the following is a desirable quality of a blended learning environment?

- Content engagement
- Offering something for every learning style
- Flexibility
- All of these apply

In which model is instruction delivered fully online, but supervised in a brick-and-mortar classroom?

- Online Lab model
- Flex model
- Super model
- LMS model

What is the advantage of a Self-Blend model?

- Students can take additional courses to prepare for college
- Students don't need to attend class
- Students have full responsibility for what they learn
- Students can rotate between schools

Lesson33: Alternative Learning Solutions: Terms & Differences

In this lesson, we will examine the various alternative learning solutions available to students and differentiate between blended learning, online learning, personalized learning, customized learning, and competency-based learning.

Alternative Learning Solutions

Stephanie is a bright student who has some life circumstances that make traditional schooling in the classroom an impossible option for her. She is intent on graduating, but that will not happen if she has to attend regularly scheduled classes at the local high school. Stephanie decides to explore some alternative learning solutions to assist in her determination to finish school. By finding an alternative to the traditional classroom setting, Stephanie can accomplish a goal that would be otherwise out of her reach.

Students who work well independently can excel in an alternative learning situation image of a girl using a computer.

Blended learning

With blended learning, a student learns through both online and traditional learning environments. Students have face-to-face time with instructors in a traditional classroom setting. The classroom lectures and discussions set up the content of the course, and assignments are explained. Students also have a web-based component where text content like reading assignments, quizzes, and lecture notes are delivered. Students save class time by completing the online work at home. Stephanie likes the benefit of live access to the teacher, but the biggest benefit to blended learning is to her social life and having occasional access to friends.

Online learning

Online learning provides only web-based instruction and has become increasingly popular among returning nontraditional students who may have jobs or families that make this kind of flexibility appealing. With online learning, students could be projected into a live classroom via closed circuit tv or web cam. However, many online classes are asynchronous meaning the content delivery and participation in discussions and assignments are not happening at the same time, but rather self-paced via email or discussion forums. If Stephanie decides she can see her friends on weekends instead of in class, this would be a good option. She is comfortable with technology and would have no trouble adjusting to online learning, but she is also aware that it would take self-discipline to keep on task.

Personalized learning

Personalized learning, a self-directed form of learning, is ideal for those who have a boundless thirst for knowledge about a variety of topics that can be created into a curriculum that appeals to those interests. The teachers serve as a guide or a coach as the students create their own individualized curriculum based on their needs, learning style and interests.

One criticism of personalized learning is that the interests of the students may not align with the state standardized requirements. If aligning to the standards is an important factor, there are ways to personalize high-interest content using the standards for structure and guidance. Stephanie would thrive with a personalized learning plan. She is curious and wants to know about lots of different things. She is concerned, however, that she may not be able to pass the standardized tests if she only learns about the fun stuff she likes.

Which of the following best describes characteristics of blended learning?

- student learns through both online and traditional learning environments
- applied to boost motivation and achievement and keep students on track for college and career
- provides only web-based instruction
- student-directed and paced to student needs, learning styles, and interests

Which of the following best describes characteristics of online learning?

- students can advance based on demonstration of mastery
- student-directed and paced to student needs, learning styles, and interests
- provides only web-based instruction
- student learns through both online and traditional learning environments

Which of the following best describes characteristics of personalized learning?

- student-directed and paced to student needs, learning styles, and interests
- provides only web-based instruction
- students can advance based on demonstration of mastery
- student learns through both online and traditional learning environments

Lesson34: Factors Driving the Growth of Blended Learning

Blended learning is becoming increasingly common in education. In this lesson, you will explore this instructional method and the factors that are driving its growth.

What Is Blended Learning?

Remember when going to school meant being in your assigned seat when the bell rang? As your education has continued, you may have had the chance to take online classes, too, where you never actually entered a physical classroom. Now an increasingly popular teaching method blends these two experiences.

Blended learning is a method of instruction that integrates traditional instruction with technology in varying degrees. For example, a class taught in a blended format might meet just once per week in a classroom while all assignments and activities are accessed and completed remotely.

Blended learning extends the reach of instruction beyond the classroom through the use of digital resources. This method combines mobile, online, and classroom learning to increase student success and engagement. In short, it allows learners take an active role in their own education.

Blended Learning Combines Traditional Classroom Learning with Online and Mobile Learning blended learning

Now that we understand what blended learning is, let's examine the factors that are making blended learning an increasingly popular teaching method.

Why Is Blended Learning Becoming More Common?

Almost every election cycle brings the rising costs of public education to the forefront. Add to that the challenge that educators face in meeting the unique needs of all students in a traditional school setting. These types of issues make blended learning models very appealing to educators and students because blended learning provides benefits for both.

Economic Advantages

Blended learning models reduce overall costs of operation for schools. When face-to-face meetings become fewer, the need for physical space and staff is naturally reduced. Additional expenses such as supplies, maintenance, and transportation are also decreased with a blended learning model. Finally, the costs for technology have declined drastically over the past decade making it extremely cost-effective as an educational tool.

Personalization and Customization

In a traditional classroom, teachers are frequently held to a tight schedule. This becomes problematic when students require additional help or attention. Blended learning models allow for personalization and customization of the material as students can work at their own pace and can spend extra time on areas of concern.

In other words, students are able to take an active role in their education by personalizing content. Blended learning extends the reach of teachers because if students need extra help on something, the resources are always there for them. Blended learning models also allow for customization of materials because the teachers and students are no longer confined by the traditional school schedule and can design plans for the needs of the individual student.

Convenience

If working from home in your pajamas sounds appealing to you, then blended learning is right up your alley. Blended learning models are convenient. They reduce the need for a commute because learning can take place from home or anywhere else with an internet connection.

In addition, blended learning models usually allow teachers and students to design their own schedules for work. This is especially appealing for those who have additional work or family requirements that would be disrupted in a traditional educational model.

Which method of instruction combines traditional modes of instruction with online content?

- Traditional learning model
- Classroom learning model
- Blended learning model
- Online learning model

Which of the following represents an economic advantage of blended learning?

- Increased ability to rent out school facilities
- Reduced costs for technology
- Increased ability to track spending
- None of these

Blended learning allows you often to work from home in your pajamas. Which factor driving the growth of blended learning is this an example of?

- Convenience
- Effectiveness
- Efficiency
- Economic advantage

Lesson35: Why You Should Try Blended Learning in Your Classroom

In today's day and age, technology is everywhere, and the traditional textbook-only approach to learning is becoming a thing of the past. Continue reading to discover how blended learning can enrich your classroom and boost student achievement.

You may have already heard your fair share of information on blended learning as a new teacher in a technology-driven world, but what does it exactly entail? Well, according to a 2011 publication by blended learning advocate and spokesperson Heather Staker, "blended learning occurs when a student learns partly at a supervised 'brick-and mortar' location away from home and partly in an online environment that allows the student to control elements such as time and pace." This post highlights some of the most important reasons to consider giving blended learning a try in your classroom.

Perks of Blended Learning

1. Increased Engagement

First off, integrating a blended learning approach into your classroom can work wonders for student engagement. In fact, the U.S. Department of Education states that the use of technology in classrooms boosts student engagement and motivation by providing a wide range of experiences and learning materials. Rather than being taught in a monotonous, traditional way, students are able to switch it up and learn in innovative and exciting ways that keep things interesting. For example, the traditional approach to learning and studying more intense subjects like math can often be difficult or even boring for some students. By switching things up and bringing educational videos and games, interactive virtual lessons, online tutoring and other methods into the picture, students may become more engaged, motivated and successful learners!

2. Individualized, Student-Centered Instruction

Perhaps one of the most important benefits of blended learning is that it uses individualized instruction to support students' wide variety of strengths and weaknesses. Instead of a one-size-fits-all approach to teaching that may not be well suited to each individual student, students can grab their education by the reins and work at a pace that allows for personal growth and success. According to a P21 blog post written by Marcia Kish, blended learning also gives students the power to create their own learning path and learn in formats that work best for them. And since online materials are accessible anywhere there's an internet connection, students have more control over when and where to work on their studies. Information from an article published by the University of North Carolina's School of Education indicates that a blended-learning approach results in a student-centered environment where students gain knowledge through personal effort and more meaningful learning situations.

3. Future Preparedness

Blended learning may also help prepare students for the future by introducing them to technology-rich, innovative learning resources and by encouraging autonomy and collaboration with others. An archived report by the U.S. Department of Education supports this and states that technology in the classroom helps students--even elementary students--gain valuable computer knowledge that will help them as they grow up and eventually enter the world of (often technology-driven) work. By using blended learning in your classroom, you'll be helping to arm your students with technical skills that may benefit them throughout their lives.

4. Easier Collection of Student Data

Another bonus of blended learning is that it makes it much easier to evaluate students and collect meaningful data. Traditionally, this had to be done by spending countless hours grading papers or doing one-on-one evaluations, but when work is done online, grading and progress reports typically become an automatic process by way of specially designed software. This can help you better understand where students are struggling and excelling, which can then allow you to arrange earlier interventions and provide support when needed.

However, a July 2015 publication by the International Association for K-12 Online Learning (INACOL) reports that schools may face obstacles when implementing blended learning; more specifically, there may be issues with both technological and financial barriers, such as finding and purchasing usable and universally compatible software and hardware (often known as LMS, or 'Learning Management System') that supports the blended learning framework.

5. Freed-Up Time

Since students in a blended learning environment are given more control over their educations, you may begin to have more time in class. For example, when one group of students is working on their self-directed online work, you can work with another group on interventions in math. Or, if students are given pre-recorded video lectures for homework rather than listening to you lecture in class, more time can be devoted to answering questions or reviewing the material the next day. And going back to what we mentioned above, online grading and reporting can also be a big time saver for you.

Final Thoughts on Blended Learning

As you can see, there are various reasons why you should try blended learning in your classroom. From increased student engagement and motivation to individualized instruction and easier student reporting, blended learning may be the future of education. And with technology everywhere you look these days, is it really a surprise?

Lesson36: Requirements for Implementing Blended Learning Solutions

Teaching in a Technology-Oriented World

Have you ever considered the feasibility of blending online learning with traditional instruction in your classroom? Well, if you have, you have considered using blended learning solutions. With the incredible advances that have been, and continue to be, made in technology, avoiding computer use in the classroom has become virtually impossible.

Since not all students are motivated and disciplined enough to complete a fully virtual, online program, blended learning solutions offer a nice mix of traditional classroom learning with an online component. However, there are requirements that need to be considered for the successful implementation of blended learning initiatives. These include considering basic infrastructure, integration of information systems, professional development of staff, and access to technological support.

Infrastructure

In order to implement effective blended learning solutions, it is important to consider what takes place behind such an initiative. Issues related to infrastructure include broadband, power, networking equipment and management, and facilities.

Broadband

Essential to effectively integrating online learning with traditional classroom-based approaches is internet connectivity speed. It is therefore very important for schools to measure the broadband access in each area within their school. In order to determine whether a school's broadband width is suitable for incorporating an online learning component, the following actions should be performed:

- conduct a speed assessment on current broadband performance.
- define what can be offered in terms of blended learning solutions based on current broadband performance.
- identify the desired level of blended learning solutions.
- determine the feasibility of getting funding to improve broadband performance in order to offer the desired blended learning solution.

Power

It may sound elementary to say that power is an important consideration when determining the feasibility of offering blended learning, but it certainly can't be overlooked. Depending upon the age of a school building, power may be a very substantial consideration. In order to offer blended learning a classroom needs sufficient computers, and those computers in turn require electrical power in order to operate. Linking multiple extension cords is a fire and electrical hazard, and will not offer a satisfactory solution.

Networking Equipment and Management

Because technology is always changing, it is important to ensure that proper networking equipment is in place prior to implementing a blended learning solution. Wireless access points should be addressed as well as ongoing and continuous network management. Ideally a centralized location should be designated to manage the entire district but due to staffing, equipment and other costs, this may not always be practical.

Facilities

At times, implementing blended learning solutions can result in requiring actual structural changes in school buildings. This is almost always a considerable expense that the district may not necessarily be prepared for. It is important to consider current facilities and determine whether or not they will meet the needs for a blended learning program. It is equally important to consider school enrollment growth as facilities may experience increased capacity requirements in the future.

Integration of Information Systems

Crucial to any successful blended learning initiative is the ability to integrate systems. Most important is that educators have the resources to be able to integrate instructional systems with student information systems. The system should provide instructional content, opportunity for interaction, report generation, and grading capabilities based on a single sign in. Educators, students, and parents should all have appropriate access permissions to view academic content.

Why is broadband width an important consideration when implementing blended learning solutions?

Because internet connectivity and speed are essential for program success.

Because it helps secure funding for blended learning.

Because it will provide cheaper internet connectivity.

Because it relates directly to community support of online initiatives.

What is meant by considering power, as it relates to infrastructure, as a requirement for implementing blended learning solutions?

- Considering the power of school administration to support technology.
- Considering the power supply available to handle technology.
- Considering the power of teachers in the implementation of blended learning.
- Considering the power of blended learning solutions over traditional instruction.

Which of the following is a reason why professional development is an important requirement when implementing blended learning solutions?

- Because it's critical that educators pursue advanced educational credentials.
- Because educators are completely unprepared to incorporate technology in the classroom.
- Because educators need to establish their credibility in the virtual learning field.
- Because educators need to become proficient with the differences between online learning and traditional instruction.

Chapter7: Introduction to Management: Help and Review

Lesson37: Matrix Organizational Structure: Advantages, Disadvantages & Examples

Organizations are traditionally structured in a way that creates a system of reporting relationships where an employee reports to one manager. Explore the alternative matrix organizational structure, in which the traditional reporting hierarchy is replaced with a system that requires each employee to report to two managers instead, and learn about its advantages and disadvantages. Updated: 08/30/2021

Definition

A matrix organizational structure is a company structure in which the reporting relationships are set up as a grid, or matrix, rather than in the traditional hierarchy. In other words, employees have dual reporting relationships - generally to both a functional manager and a product manager.

Example

In the 1970s, Philips, a Dutch multinational electronics company, set up matrix management with its managers reporting to both a geographical manager and a product division manager. Many other large corporations, including Caterpillar Tractor, Hughes Aircraft, and Texas Instruments, also set up reporting along both functional and project lines around that time.

Advantages

In a matrix organization, instead of choosing between lining up staff along functional, geographic or product lines, management has both. Staffers report to a functional manager who can help with skills and help prioritize and review work, and to a product line manager who sets direction on product offerings by the company. This structure has some advantages:

- Resources can be used efficiently, since experts and equipment can be shared across projects.
- Products and projects are formally coordinated across functional departments.
- Information flows both across and up through the organization.
- Employees are in contact with many people, which helps with sharing of information and can speed the decision process.
- Staffers have to work autonomously and do some self-management between their competing bosses; this can enhance motivation and decision making in employees who enjoy it.

Disadvantages

The matrix structure is generally considered the toughest organizational form to work in, due to the conflicting pulls on resources.

Lesson38: What Is Motivation In Management? - Definition, Process & Types

Motivation in management describes ways in which managers promote productivity in their employees. Learn the definition of motivation in management and the process for managers to motivate their employees, and explore several types of theories relevant to motivation in management, including expectancy, equity, and Maslow's hierarchy of needs theory.

The Definition of Motivation

Often, people confuse the idea of 'happy' employees with 'motivated' employees. These may be related, but motivation actually describes the level of desire employees feel to perform, regardless of the level of happiness. Employees who are adequately motivated to perform will be more productive, more engaged and feel more invested in their work. When employees feel these things, it helps them, and thereby their managers, be more successful.

It is a manager's job to motivate employees to do their jobs well. So how do managers do this? The answer is motivation in management, the process through which managers encourage employees to be productive and effective.

Think of what you might experience in a retail setting when a motivated cashier is processing your transaction. This type of cashier will:

Be friendly, creating a pleasant transaction that makes you more likely to return

Process your transaction quickly, meaning that the store can service more customers

Suggest an additional item you would like to purchase, increasing sales for the store

In short, this employee is productive and delivers a high-quality output.

How to Motivate Employees

There are many ways to motivate employees. Managers who want to encourage productivity should work to ensure that employees:

- Feel that the work they do has meaning or importance
- Believe that good work is rewarded
- Believe that they are treated fairly

All of these tasks fall under one or more motivational theories.

Expectancy Theory

Expectancy theory outlines the connection employees expect between effort and reward. If an employee does very well and puts forth additional effort, they will likely expect to be rewarded accordingly. In a retail setting, for example, a cashier might offer to work a double shift when a manager is short staffed, but would expect praise and perhaps additional compensation for doing so.

Employees who do not feel rewarded become unmotivated. Think about how you might feel if you continually worked as hard as possible but never received additional recognition or compensation. Would you continue to work as hard as possible, or would you think 'why bother?'

Equity Theory

Equity theory indicates that employees are best motivated when they feel that they are being treated equally.

After their annual performance reviews, Stacy tells her coworker, Rachel, her new salary. Rachel is furious to find out that Stacy, who has only been at the company for one year, is now making just as much money as she is because Stacy is always gossiping instead of working. Rachel's reaction is an example of which motivational theory?

- Equity theory
- Fairness theory
- Expectancy theory
- Compensation theory

Which of the following is an outcome of highly motivated employees in the workplace?

- Reduced workplace conflict
- Increased delegation
- Increased employee turnover
- Increased sales

According to Maslow's hierarchy of needs, Harold, who is motivated and rewarded for his hard work, finds his needs met at the _____ level of the pyramid, while Rob, who just has a job for employment, finds his needs met at the _____ level of the pyramid.

- Safety; physiological
- Esteem; physiological
- Physiological; self-actualization
- Safety; esteem

Lesson39: Upward Communication: Definition, Advantages, And Disadvantages & Examples

What Is Upward Communication?

Communication is a very important part of working in the business environment. Managers must be able to communicate with employees and employees must be able to communicate with managers in order to have a profitable business. Upward communication is the flow of information from front line employees to managers, supervisors, and directors.

Advantages of Upward Communication

Upward communication keeps managers aware of how employees feel about their jobs, policies and procedures, and the business in general.

Some advantages of upward communication are:

- **Feedback:** Managers can get feedback from employees that can help improve organizational development. Employees who are encouraged to provide feedback feel respected and that they have a say in how the organization is run.
- **Mutual trust:** Mutual trust brings employees and managers closer to each other. As trust grows, relationships between employees and managers become stronger.
- **Introduction of new policies:** Front line employees do the work every day. They can usually tell managers if something works or doesn't work. Employees can be instrumental in forming new policies or changing those that are outdated.

Upward communication can be used to give feedback to managers. Upward Communication to Management

Disadvantages of Upward Communication

Upward communication seems easy enough. But sometimes, employees face significant barriers attempting to communicate with managers. Some disadvantages of upward communication are:

1. **Changes of information:** In upward communication subordinates may change their accurate information. So, the top executive cannot take an accurate decision.
2. **Unwillingness:** Sometimes subordinates don't send the information to their superior willingly. So, the communication system may be disrupted.
3. **Fear of inefficiency:** The main problem of upward communication is fear to superiors. Generally, superiors make a question about the employees work position and efficiency. Many employees fear to communicate and share their ideas, constructive suggestions and opinions with the superiors.
4. **Indiscipline:** Sometimes employees communicate directly to superior by avoiding proper channel or chain of command. Here disciplines are not properly maintained.
5. **Bypassing:** In the process of upward communication, sometimes workers directly approach the topmost authority with their suggestions or bypassing their immediate boss. This is harmful to any organization.
6. **Flattery:** In order to convince the superior bosses, subordinates can take the help of flattery and for this reason, subordinates may conceal the true and provide incomplete information to top level.
7. **Lack of initiative:** Generally subordinate is reluctant to take the initiative to upward communication for a different reason.
8. **Risk of distortion of messages:** In upward communication, subordinates willingly distort the message because they fear if they tell the original fact to their bosses, they may face some problems.

9. Delay: It is an important limitation of upward communication is the long and slow movement of information to the higher authority.
10. Supervisor's negligence: Sometimes top-level executives discourage the upward flow of information and neglect the constructive suggestions and opinions about the work-related issues of the organization.

_____ is the flow of information from front line employees to managers, supervisor and directors.

- Upward communication
- Managerial communication
- Intraoffice communication
- Interoffice communication
- Front line communication

Upward communication keeps managers aware of

- How employees feel about their jobs
- How the market is changing
- How the sales team is performing
- how the CEO is feeling

A disadvantage of upward communication is:

- Filtering
- Delays
- Cultural Differences
- All Answers Are Correct

Lesson40: Frederick Taylor: Theories, Principles & Contributions to Management

Frederick Taylor was an engineer and inventor who developed the theory of scientific management. Learn about Taylor, explore his theories and principles, and understand his contributions to modern management practices. Review the four main principles of scientific management theory, and recognize how these have influenced present-day industrial processes.

Frederick Taylor and Scientific Management

Frederick Winslow Taylor (1856-1915) was an American inventor and engineer that applied his engineering and scientific knowledge to management and developed a theory called scientific management theory. His two most important books on his theory are Shop Management (1903) and The Principles of Scientific Management (1911).

Frederick Taylor's scientific management theory can be seen in nearly all modern manufacturing firms and many other types of businesses. His imprint can be found in production planning, production control, process design, quality control, cost accounting, and even ergonomics. If you understand the principles of scientific management, you will be able to understand how manufacturers produce their goods and manage their employees. You will also understand the importance of quantitative analysis, or the analysis of data and numbers to improve production effectiveness and efficiency.

Principles of Scientific Management Theory

In broad terms, scientific management theory is the application of industrial engineering principles to create a system where waste is avoided, the process and method of production is improved, and goods are fairly distributed. These improvements serve the interests of employers, employees, and society in general. Taylor's theory can be broken down into four general principles for management:

Actively gathering, analyzing, and converting information to laws, rules, or even mathematical formulas for completing tasks.

Utilizing a scientific approach in the selection and training of workers.

Bringing together the science and the worker so that the workers apply the scientifically developed techniques for the task.

Applying the work equally between workers and managers where management applies scientific techniques to planning and the workers perform the tasks pursuant to the plans.

Frederick Taylor approached the study of management quantitatively through the collection and analysis of data. For example, he and his followers performed motion studies to improve efficiency. He analyzed the motions required to complete a task, devised a way to break the task down into component motions, and found the most efficient and effective manner to do the work.

An example of a motion study is observing the number of distinct motions required to shovel coal into a furnace. The task is then broken down into its distinct components, such as picking up the shovel, walking to the coal, bending over, manipulating the shovel to scoop the coal, bending back up, walking to the furnace, and manipulating the shovel to deposit the coal. The most efficient way to perform the task was developed and workers were instructed on how to apply the method.

Chapter8: The Importance of Motivation in an Educational Environment

Lesson41: Motivation

Motivation impacts the desired effect of learning by the student, including goals, effort, persistence, and performance. The importance of motivation in an educational environment can be characterized by indices that are fueled by situational motivation wherein the learner is already partial to specific subject matter. This lesson will discuss motivation and its influence in the classroom; including theories of motivation, indices, and the effects of motivation on students.

Motivation

Erik and Andrew are in the same first grade class. Erik loves any activity that involves coloring, drawing or illustrating. He spends all of his free time engaged in these sorts of activities, sometimes oblivious to other things going on in the classroom. Andrew, on the other hand, dislikes drawing and art and will avoid it at all costs. Both students are high achievers and good listeners, but they are motivated by completely different interests and activities. In the classroom, motivation drives many behaviors and it is important to understand the importance of motivation in an educational environment.

Motivation is described as a state that energizes, directs and sustains behavior. Motivation involves goals and requires activity. Goals provide the impetus for and the direction of action, while action entails effort: persistence in order to sustain an activity for a long period of time.

There are recognized indices of motivation that are important to be aware of. Indices typically place a value or quantity on an idea; in this case, we can understand the value or quantity of motivation for an individual by these four indices.

The selection of a task under free-choice conditions indicates the motivation to perform the task. In our earlier example, Erik chose to engage in art activities during his free time. This is indicative of being motivated by art and art-type activities.

High effort levels, especially when working on different tasks and assignments, are also indicative of motivation. For example, if a student diligently works on a difficult algebra problem again and again, this would indicate a higher level of motivation towards math activities.

Working for a longer period of time, especially after encountering numerous obstacles, is also associated with higher motivation. For example, John, a student in PE class, was unable to master jumping rope, but he chose to continue trying to jump rope during recess; this time on task indicates a high level of motivation towards mastering the activity of jumping rope.

Finally, level of achievement is affected by choice, effort and persistence. The higher these indices, the higher the motivation and the more likely task achievement will occur.

In the classroom, educators should be aware of these indices in an effort to reinforce activities and interests that students already show an existing partiality for. There is an actual term for this - it's called situational motivation.

Situational motivation is a phenomenon in which aspects of the immediate environment enhance motivation to learn particular things or behave in particular ways. Educators can do many things to create a classroom environment that motivates students to learn and behave in ways that promote their long-term success.

How Motivation Affects Learning & Behavior

Motivation has several effects on students' learning and behavior.

First, motivation directs behavior toward particular goals. Motivation determines the specific goals toward which people strive; thus, it affects the choices students make. For example, whether to enroll in an art class or physics, whether to attend a school basketball game during the week or complete an assignment that's due the next day.

Motivation also leads to increased effort and energy. Motivation determines whether a student will pursue a task (even a difficult one) with enthusiasm or a lackluster attitude.

Motivation increases the initiation and persistence of activities. In our first example, Erik continued with art-type activities in his free time and he also tried to perform these types of activities in relation to his other assignments. Motivation will increase students' time on task and is also an important factor affecting their learning and achievement.

Motivation enhances cognitive processing. Motivation actually affects what and how information is processed because motivated students are more likely to pay attention and try to understand the material instead of simply going through the motions of learning in a superficial manner.

Motivation determines what consequences are reinforcing and punishing. For example, students with a high level of motivation for classroom achievement and high GPAs are reinforced by receiving a grade of 'A' and they'll feel punished if they receive a grade of 'F.'

How does motivation affect learning?

- High levels of motivation will increase persistence, enhance cognitive processes, and lead to improved performance.
- High levels of motivation will increase competition among students, which may lead to lower performance.
- High levels of motivation will decrease persistence and competition, leading to improved performance.
- High levels of motivation will lead to more competition among students, which may lead to improved performance.

Maria studied hard and received an A on her history assignment. She felt proud and was reinforced to continue to study hard for every history exam. Which motivational perspective is represented in this scenario?

- Humanistic perspective.
- Trait perspective.
- Cognitive perspective.
- Behaviorist perspective.

How can educators use indices of motivation?

- In the classroom, educators should use the indices of motivation to reinforce activities and interests that students already show an existing partiality for.
- In the classroom, educators should use the indices of motivation to decrease the activities that students are interested in. This way they will be less distracted.
- In the classroom, educators should use the indices of motivation to know which students will perform best on standardized tests.
- In the classroom, educators should use the indices of motivation to know which students will perform best in sports.

Lesson42: Intrinsic and Extrinsic Motivation in Education: Definition & Examples

With intrinsic motivation, we do things because we want to do them, while with extrinsic motivation, we do things to earn a reward or avoid punishment. Explore the definitions and examples of intrinsic and extrinsic motivation, and understand their use in education. Review the over justification effect and the power of insufficient punishment.

Types of Motivation

Sammy and Dani are running buddies. Sammy loves to run and will often go running just to clear his head or blow off steam. Dani, meanwhile, hates to run, but she does it because her doctor told her that she needs to lose weight or she might end up with diabetes.

Sammy is intrinsically motivated to run. Intrinsic motivation is when you do something because you enjoy it or find it interesting. Compare that to Dani, whose reason for running involves extrinsic motivation, or doing something for external rewards or to avoid negative consequences.

Now, you may think that intrinsic motivation is better than extrinsic motivation, and you'd be right up to a point. Studies have shown that people are more likely to stick to a task, invest more time in a task, and be more successful at it if they are intrinsically motivated.

Exercising to prevent disease involves extrinsic motivation. Extrinsic Motivation Exercise

However, extrinsic motivation has its place, too. After all, without extrinsic motivation, many of us would never exercise, never go to work, and never clean our houses. Many day-to-day tasks that are required to live a healthy life are extrinsically motivated. Besides, who doesn't like to be rewarded for what they do?

The Over justification Effect

Still, there are some issues with rewards. Giving someone a reward for doing a task can actually decrease their intrinsic motivation for that task because they begin to feel like they should only do the task for external rewards. This is called the over justification effect.

One famous example of the over justification effect occurred when researchers rewarded nine-and ten-year-olds for playing with math games. Before they were given the rewards, many of the kids played with the games just because they thought they were fun. But, after being rewarded for playing with the games, the children spent far less time playing with the games than they did before being rewarded.

Why do people who are intrinsically motivated to do a task suddenly change their motivation? No one is exactly sure why the over justification effect occurs, but there are a couple of things that scientists do know about when it is most likely to occur. For one thing, the over justification effect really only happens with tasks that have a high intrinsic motivation to begin with. If someone isn't interested in doing the task before a reward, their interest won't decrease after being given a reward.

For another thing, rewards for performance are less likely to cause the over justification effect than rewards that are given just for doing a task. In other words, being given candy to play a game is more likely to decrease your intrinsic motivation for the game than being given candy to win the game.

Though psychologists aren't completely sure why the over justification effect occurs, there are some theories. One theory is that when people engage in a behavior, they justify their actions to themselves. If they don't get rewards, they decide that they must like doing it, but if they get rewards, they might decide that they only do it for the rewards. Thus, they convince themselves that they don't really like to do it. This is called self-perception theory.

Which of the following people is considered intrinsically motivated?

- A man who creates artwork for money
- A woman who paints because it's relaxing
- A guy who runs errands in exchange for free pizza

A student who completes all her homework so she doesn't get in trouble

Extrinsic motivation is defined as ____.

- doing something because it results in an external reward or avoids negative consequences
- doing something because it needs to be done
- doing something because it's interesting
- doing something fun with other people

Based on the over justification effect, which of the following is most likely to experience decreased intrinsic motivation?

- Someone who has no interest in playing a game
- Someone given a reward for winning a game
- Someone given a reward for playing a game
- Someone not given a reward for playing a game

Lesson43: The Role of Motivation in Self-Regulated Learning

Motivation plays a role in self-regulated learning. Explore the definition, cyclical process, dimensions, and influences on self-regulation, and explore methods for teaching self-regulation.

Introduction to Self-Regulation

Student 1: 'You look upset. That is probably not the grade you were expecting. Do you ever try to evaluate the way you are learning to see if there might be a better way?'

Student 2: 'What are you talking about?'

Student 1: 'I'm talking about the process of self-regulation. Haven't you heard of it before?'

Self-Regulation Defined

Self-regulation is the process in which students activate, take control of and evaluate their own learning.

Self-regulation is not the same as motivation. Although motivation and self-regulation share some common elements, there are some critical differences. In motivation, choice (specifically referring to autonomy and control over the situation) does not have to be central to the construct. Self-regulation, however, requires some degree of choice or intentional selection of strategies designed to help the learner achieve a goal or behavior.

Self-regulated learners:

Are aware of their strengths and weaknesses

Utilize metacognitive strategies, for example, questioning one's learning and monitoring one's learning, to approach academic tasks

Attribute their success or failure to factors within their control

Self-Regulation as a Process

Self-regulation is a cyclical process. Students who are motivated to reach a certain goal will engage in self-regulatory activities they feel will help them achieve that goal. The self-regulation promotes learning, which leads to a perception of greater competence, which sustains motivation toward the goal and to future goals. The specific stages of self-regulation will be covered more in-depth later in this lesson.

Dimensions of Self-Regulation

Researchers identified three critical dimensions, or characteristics, of self-regulation:

- Self-observation
- Self-judgment
- Self-reaction

Self-observation refers to the deliberate monitoring of one's activities. Self-observation may take the form of recording frequency, duration or quality of a behavior. Self-observation is also critical to the regulation of performance. Self-observation may also lead to higher motivation.

For example, if you realize your study habits were causing you to perform poorly on these tests, you may adjust the way you study, leading to higher test grades and more motivation to continue to improve your study habits.

A second critical dimension of self-regulation is **self-judgment**. Self-judgment refers to evaluating one's current performance levels compared to the goal level.

The third critical dimension is **self-reaction**. Self-reaction refers to one's behavioral, cognitive and affective responses to self-judgments. Self-reactions can be motivating if one believes they are making progress toward their goal. Negative **self-evaluations** are not necessarily demotivating if one believes they can still make changes and progress toward their goal.

Self-Regulation Cycle

Self-regulation is a cyclical process because during the process of self-evaluation and monitoring, the learner will make alterations to strategies, cognition and behaviors that will alter learning and ultimately, the end-goal.

There are three phases of the self-regulation cycle:

- Forethought
- Performance (volitional) control
- Self-reflection

Self-regulation begins with the **forethought phase**. This pre-action phase refers to the processes that set up the learner for action toward their goal. This phase helps the learner to establish a positive outlook, set realistic expectations and address questions such as: 'When will the work begin? What conditions will help or hinder learning activities toward the goal?' and 'How often will tasks be completed toward the goal?' Short-term and long-term goal-planning occur in this stage.

The next stage is the **performance- (or volitional-) control phase**. This phase involves processes that occur during learning that affect action and attention. Specific strategies are established during this stage in order to help a learner be successful. Metacognitive strategies are identified, preliminary self-evaluation occurs and motivational strategies are identified. Questions such as: 'Am I accomplishing as much as I thought I would? Am I being distracted?' and 'What will motivate me to continue working?' are common questions during this phase.

Mr. Garcia wants to teach self-regulation to his students. Which of the following would you recommend him?

- Ask his students to test themselves once they finish a lesson.
- Ask his students to have a journal where they write what they learn in class every day.
- Teach his students how to make a chart of academic progress.
- I would recommend all of these.

The part of the self-regulation cycle in which learners establish short- and long-term goals is the _____ phase.

- forethought
- performance (volitional) control
- self-reflection
- self-reaction

A learner's evaluation of current performance level compared to desired performance level is known as _____.

- self-judgment
- self-reaction
- self-awareness
- self-reflection

Lesson44: Teacher Expectations & Attributions

Teacher expectations and attributions affect classrooms and student performance. Explore the definition of attributions, Bernard Weiner's theory, how attributions are communicated, the self-fulfilling prophecy, teacher self-efficacy, and setting expectations.

Introduction to Attributions

'You did it! Great Job! You are so smart!' 'Wow! Today must be your lucky day!' Teacher attributions and expectations affect learning in the classroom. Many times teachers are unaware of the statements or attributions they make toward student success and failure. These attributions can have a lasting impact on students' learning and motivation for future activities. This lesson will identify teacher expectations and attributions, explore teacher self-efficacy, and discuss how attributions affect classroom and individual student performance.

Attributions Defined

Attributions are the perceived causes that individuals select or construct for events in their lives. A basic assumption of attribution theory is that a person's understanding of the causes of past events influences his or future actions.

The psychologist Bernard Weiner developed an attribution theory that focuses on achievement. According to Weiner, the most important factors affecting attributions are ability, effort, task difficulty, and luck. He classified these attributions along three causal dimensions:

- locus of control (in which there are two poles: internal vs. external)
- stability (in other words: do causes change over time or not?)
- controllability (causes one can control, such as skills, versus causes one cannot control such as luck or others' actions)

If a student attributes a success or failure to be external (out of his control) or stable (won't change over time), and non-controllable (can't develop skills to be successful), then motivation and attempts to engage in similar tasks in the future will decline. However, if a student attributes a success or failure to be internal (within his control), unstable (may change over time), and controllable (he can make changes to increase that skill or knowledge), then motivation and engagement in similar tasks in the future will increase.

Attributions Communicated

Attributions for success and failure are communicated to learners by teachers. These attributions are communicated by verbal feedback, written feedback on assignments, grades on assignments and tests, and through classroom instruction.

Teachers can communicate attributes differently, depending on their personal beliefs about the particular student. For example, a teacher may say 'Great work on this assignment. It is clear you know this subject very well.' This would be an ability-based attribute.

Or, a teacher may say 'Well you didn't quite pass, but your hard work is evident, and if you try to study once a day your grade will improve!' This would be an effort-based attribute.

An example of a task-difficulty attribute may be 'You made a 100 on this assignment, but it wasn't a difficult task.' Or, 'Great job! This must be your lucky day!' is an example of a luck-based attribute.

All of these verbal statements are attributions of success or failure. When teachers communicate to students that failures are due to the use of inappropriate strategies or inappropriate effort, students are likely to be motivated to try harder or to use more appropriate strategies in the future.

For example, when a teacher says, 'Well you didn't quite pass, but your hard work is evident and if you try to study once a day your grade will improve!' In response, the student might think, 'I'm going to

study for an hour a day until the next test and see if I get a better grade.' Thus the teacher's attributions are deemed controllable and unstable, and the student is motivated and engaged.

Alternatively, if a teacher communicates attributes of students' success on factors that are uncontrollable (such as luck) or stable (the situation won't change over time no matter the effort put in by the student) the student will likely be unmotivated to make any changes to the situation.

The Self-Fulfilling Prophecy

Weiner classified attributions based on three dimensions

Weiner focused his attribution theory on achievement (Weiner, 1974). He identified ability, effort, task difficulty, and luck as the most important factors affecting attributions for achievement. Attributions are classified along three causal dimensions: locus of control, stability, and controllability.

Learners tend to explain their reasons for success or failure based upon three dimensions: 1) internal or external, 2) stable or unstable, and 3) controllable or uncontrollable. When examining an individual's attributions, one must first examine the influence that the individual has over the examined outcome.

A student's motivation will likely decrease if _____.

- The student thinks he cannot control his success.
- The student thinks he can improve his skills.
- The teacher attributes his success to a good effort.
- The teacher attributes his success to strong academic ability.

John took a test over multiplication facts. He earned a passing score. His teacher wrote the following attribution statement on his paper: You did much better this time, John! You must have studied more this week. Well done! This attribution is likely to _____.

- cause John to stop studying for his multiplication tests.
- cause John to continue studying for his multiplication tests.
- cause John to believe he only did well because the test was easy.
- cause John to feel degraded about his multiplication skills.

A statement from a teacher such as you scored well on this test. Did you guess the correct answers? Is an example of a _____ attribution?

- ability-based
- effort-based
- task-difficulty
- luck-based

Lesson45: What is Motivation? - Theories & Examples

Maslow's Hierarchy of Needs

What do you think is motivating you to read this lesson at this very moment? Motivation refers to the reasons that we act towards a goal. Psychologists understand that motivation can only be understood through behavior. Although only you can fully explain the many factors that have you reading this lesson right now, psychologists have created theories to try to understand and explain behavior.

From these theories we can make a few educated guesses about your present situation:

You are not worried about being hit by a car. Most likely you are at home or in another location where you feel safe.

You are probably not hungry to the point of starving. Perhaps you are even snacking while you read this!

You are not outside in freezing weather or a hurricane or sitting in a desert without water.

These are just a few of the guesses we can make based on a theory of motivation developed by famous behavioral psychologist Abraham Maslow. Maslow believed that basic needs must be met before we can satisfy our other, less basic needs.

This was structured as hierarchy of needs that is often shown in a pyramid and referred to as Maslow's Hierarchy of Needs. Just as the ancient Egyptians built a pyramid from the bottom up, we must satisfy our needs from the bottom up, fulfilling the most important needs first. Who would build the top of the pyramid before its foundation?

Human Drives and Drive Reduction

Although Maslow's pyramid mostly speaks to human motivation, all organisms act on drives, which are essentially motivator stimuli. We all have a drive to eat every day. Our bodies tell us when we are hungry with an empty feeling in our stomachs. When we are confronted by a feeling of hunger, what is our most common reaction? Eating! This reduces the drive for food, a motivation called drive reduction. The hungrier we get, the more likely we are to stop whatever else we are doing and find food. Other human drives include the need for water, air to breathe, elimination of waste and the biological need to have sex. Often without conscious thought, these drives are fulfilled before any other drives, such as hanging out with friends or achieving educational goals.

An excellent example of drives and drive reduction at work can be found in watching a dog that is both hungry and tired. Imagine the dog is resting but sees his owner bring food to his bowl. This dog is left to fulfill one need: sleeping or eating. Trying to do both would be funny but ultimately impossible. If the dog is too tired, he will ignore the food and go to sleep. Alternately, if the dog is more hungry than tired, he will get up and walk to the food.

Another example is a plant moving towards the sunlight. In satisfying it's need for sun, (food) it is operating on drive reduction.

Maslow's hierarchy of needs explains:

- That the motivation for shelter is stronger than the motivation for creativity
- That the motivation to eat is stronger than the motivation to be with friends
- That the motivation for health is stronger than the motivation for respect by others
- All of the answers are correct

Imagine you are bicycling in a race. Which of the following is the BEST example of an extrinsic motivation for this activity?

- Biking to enjoy the fresh air
- Raising money for a charity you believe in
- Crowds cheering when you get a trophy
- To increase your health through exercise

Which of the following needs creates the strongest drive to act immediately?

- The need for respect
- The need to make friends
- The need to eat
- The need of job security

Lesson46: Acquired Needs Theory: Need for Achievement, Power & Affiliation

The acquired needs theory was developed by David McClelland and is classified into three: need for achievement, need for power, and need for affiliation. Learn more about these three classifications of needs and how they apply to different types of people.

Acquired Needs Theory

David McClelland proposed that one's needs are acquired over time as a result of their experiences - a notion that soon turned into what is now known as the acquired needs theory. As McClelland studied the needs of various individuals, he was able to classify them as either being achievement-, power- or affiliation-based. That is, every person holds an aspiration for achievement, power or affiliation. Interestingly, each person has a tendency to be motivated by one of these needs more so than by the other two. Consequently, a person's behavior and performance at work are strongly influenced by the most meaningful of the three needs.

Need for Achievement

The need for achievement is greatest for those individuals who have a strong desire to excel. Achievers seek neither power nor approval; rather, their only focus is on success. Achievers prefer work that has a moderate chance for success (about 50/50) and tend to avoid situations that are low-risk and those that are high-risk. Low-risk situations are avoided because of the presumed ease of accomplishment related to low-risk activities and the belief that things which come easy are not a true measure of success. High-risk situations are avoided by achievers because of the fear that success might be more related to luck than actual effort. Achievers need to be able to see the correlation between the level of effort they exert and the success that results.

The achiever prefers to work alone or with other achievers. Managers of achievers should work to provide them with challenging projects filled with attainable goals. For example, because Maria has a high need for achievement, her manager Sam might ask her to work independently on projects that allow for her to use her knowledge and skills in a way that challenges her, but at the same time provide her with a clear path for how she can successfully accomplish her task. Additionally, achievers appreciate managers who provide frequent recognition of how well they are doing so that they can monitor their progress, making feedback extremely important to achievers.

Need for Power

Achiever

The achiever prefers to work alone or with other achievers.

Those with a **high need for power** seek agreement and compliance; approval and recognition are not of their concern. Managers of power seekers should provide them with an opportunity to manage others. However, they must pay special attention to the type of power seeker they are. Power seekers who are after personal power have a strong desire to control others or cause them to behave in a way that is consistent with the power seeker's wishes. For example, Shawn has a high need for personal power and often manipulates his employees to do his work for him. He later takes credit for it.

On the other hand, those power seekers who need institutional or social power work to use their power to help mobilize efforts aimed at organizational goals. For example, Marco has a high need for institutional power and is regarded as a person who is capable of bringing necessary changes to the organization due to his charisma and ability to assemble and motivate employees to work towards some organizational goal in a matter of minutes. As you might have guessed, because Marco is a manager with a high need of institutional power, he is far more effective as a manager than Shawn, who has a high need for personal power.

Rachel is applying to business school programs. She has been avoiding schools that do not require an entrance exam, because she thinks the program might not be rigorous enough if they accept too many people. At the same time, she is also avoiding the most elite schools in her area because she is worried those programs will be too challenging. Based on the acquired needs theory, what type of need is strongest for Rachel?

- Achievement
- Power
- Affiliation
- Status

An individual with the _____ will desire agreement and compliance.

- need for power
- need for achievement
- need for affiliation
- need for control

Tom is the manager of a sales team. Becky is one of his employees with a need for affiliation. What type of work environment would be most beneficial to Becky?

- A cooperative team environment
- A competitive team environment
- A self-directed environment
- A leadership environment

Lesson47: Self-Determination Theory: Capacity, Strategy & Control Beliefs

Self-determination theory considers intrinsic and extrinsic motivators to explain how humans are motivated. Learn about this theory and understand its perspective on capacity, strategy, and control beliefs. Explore ways to apply this theory's assumptions, three basic psychological needs, motivations, and practices in educational settings, including the classroom.

Introduction

Do you ever have trouble finding a way to motivate yourself? Maybe it is the end of a long day and you still have two hours of work ahead of you. Are you motivated by external forces such as money and praise you expect to receive after the work is complete? Maybe you are intrinsically interested in the work, so persistence is easy despite your state of exhaustion because you want to learn and finish the task.

Researchers spend a considerable amount of time and effort trying to understand the forces that drive motivation. Research shows that people are indeed motivated by external factors such as praise and rewards. But they are often motivated by internal factors as well, such as interest in the subject or task, personal values or curiosity. The interaction between these external and internal factors can be explained through a motivational theory discussed in this lesson: self-determination theory.

Self-Determination Theory: Definition and Background

Motivational self-determination theory

Self-determination theory is concerned with people's inherent and innate tendencies and psychological needs. The research on self-determination theory evolved from research on intrinsic and extrinsic motivation.

Briefly, extrinsic motivation is motivation promoted by factors external to the individual. Individuals who are extrinsically motivated work on tasks because they believe that participation will result in desirable outcomes such as rewards or praise.

Examples of extrinsic motivation are money and praise Extrinsic Motivation Illustration

In contrast, intrinsic motivation refers to motivation to engage in an activity for its own sake. People who are intrinsically motivated perform tasks and engage in behaviors because they find them enjoyable. Simply participating in the activity is reward enough.

Assumptions

In order to be self-determining, people need to decide how to act in their environment. Although it may sound counterintuitive, people will not be fulfilled if their needs are met automatically without choice and having a say in how they participate in an activity or behavior.

The three basic assumptions of self-determination theory explain this idea. First, humans are inherently proactive with their potential and the mastering of their drives and emotions. Second, humans have inherent tendency toward growth, development and integrated functioning. Third, optimal development and actions are inherent in humans, but they don't happen automatically.

Self-determination theory emphasizes humans' natural growth toward positive motivation; however, if people are not nurtured from the social environment they will not benefit and grow and their basic needs will not be fulfilled.

Three Basic Psychological Needs

Theorists propose that there are three basic psychological needs that underlie behavior. These include the need for competence, autonomy and relatedness. These needs are viewed as innate, or, in other words, not learned and are seen in humans across gender, culture and time. These needs must be met in order to foster growth and well-being.

The **need for competence** is similar to the need for mastery and understanding of the environment. Humans have an innate need to seek control of outcomes and experience mastery of any given situation. Humans also need to feel and be competent in their interactions with others and feel connected to the larger context

of a situation. Engaging in challenging tasks fulfills the need to feel competent, which encourages intrinsic motivation.

The **need for relatedness** is the universal need to interact, to be connected to and to experience caring for others. This can be satisfied by sharing thoughts and feelings with others, feeling accepted and receiving confirmation from others.

The **need for autonomy** refers to the need for a sense of control, agency or autonomy in interactions in the environment. Autonomy also refers to being self-governed and taking responsibility for the choices one makes. The need for autonomy is not the need to be detached, selfish or submissive to others.

The three needs of competence, autonomy and relatedness interact and form one's self-determination. Feelings of competence enhance intrinsic motivation only when they are supported by autonomy. For example, completing a project successfully, which leads to feelings of competence, will lead to that person being intrinsically motivated only if they believe the actions (such as staying up late to finish the project) were internally regulated or autonomous. If the person believes he only stayed up late and finished the project because his parents expected him to do well in school, the effects would not be intrinsically motivating.

Types of Self-Determined Behavior and Motivation

Self-determination, much like self-esteem, is specific to a particular behavior or activity. Individuals may hold differing types of self-determination, ranging from non-self-determined to self-determined, depending on the situation or behavior. There are different types of motivation that vary in their degree of autonomy depending on how successful the individual is at internalizing the external regulation of behavior.

On one end of the spectrum, we have amotivation. Amotivation is a lack of motivation. Individuals simply go through the motions to accomplish the behavior or activity. This results from not placing value on an activity, not feeling competent in the activity or holding low expectations for this activity.

The need for a sense of control is an example of what type of basic psychological need?

- Need for competence
- Need for acceptance
- Need for achievement
- Need for relatedness
- Need for autonomy

All of the following are assumptions of the Self-Determination theory, EXCEPT:

- Humans are inherently proactive in their mastering of emotions.
- Humans possess an inherent tendency toward growth and development.
- Humans are unable to control their potential and emotions.
- Optimal development is not automatic in humans.
- Optimal development is inherent in humans.

The need for mastery and understanding of the environment is an example of _____.

- need for competence
- need for acceptance
- need for achievement
- need for relatedness
- need for autonomy

Lesson48: Albert Bandura: Social-Cognitive Theory and Vicarious Learning

Albert Bandura's social-cognitive theory relates to vicarious experiences and learning. Explore Bandura's theory, the reciprocal causation model, the role of consequences in learning from models, and the four ways of developing self-efficacy.

Introduction

Do you have a fear of snakes or perhaps other animals? Do you think that you could get over this fear by observing other people that had snake phobias? This is exactly the experiment that was conducted years ago to help the psychologist Albert Bandura understand the importance of behavioral models.

Social Cognitive Theory and Bandura

The psychologist Albert Bandura discovered the importance of behavioral models when he was working with patients with snake phobias. He found that the patients' observation of former patients handling snakes was an effective therapy. The patients in treatment abstracted the information that others who were like them handled snakes with no ill effects. These patients considered that information in reflecting on their own behavior. Bandura found that these observations were more effective in treating their phobias than persuasion and observing the psychologist handle the snakes.

Bandura's social learning theory stresses the importance of observational learning, imitation and modeling. His theory integrates a continuous interaction between behaviors, personal factors - including cognition - and the environment referred to as reciprocal causation model.

However, Bandura does not suggest that the three factors in the triadic model make equal contributions to behavior. The influence of behavior, environment and person depends on which factor is strongest at any particular moment.

In the model, B, or behavior, refers to things like complexity, duration, skill, etc. The E stands for environment, and it's comprised of the situation, roles, models and relationships. P, or person, is comprised mainly of cognition but also other personal factors such as self-efficacy, motives and personality.

Here's a classroom example to help make this point more clear. In the classroom as a teacher presents a lesson to the class, students reflect on what the teacher is saying. This is where the environment influences cognition, a personal factor. Students who don't understand a point raise their hands to ask a question. This is where personal factors influence behavior. So, the teacher reviews the point (behavior influences environment).

Bandura's most famous experiment was the 1961 Bobo Doll study. Briefly, he made a video in which an adult woman was shown being aggressive to a Bobo doll, hitting and shouting aggressive words.

The film was shown to groups of children. Afterwards, the children were allowed to play in the room with the same doll. The children began imitating the model by beating up the doll and using similar, aggressive words. The study was significant because it departed from behaviorism's insinuations that all behavior is directed by reinforcement or rewards. The children received no encouragement or incentives to beat up the doll; they were simply imitating the behavior they had observed.

Through the Bobo doll experiment and others, Bandura grounded his understanding of a model's primary function, which is to transmit information to the observer. This function occurs in any of three ways:

- Modeled behaviors serve as cues to initiate similar behaviors in others.
- They also serve to strengthen or weaken the learner's existing restraints against the performance of a modeled behavior.
- They're used to demonstrate new patterns of behavior.

An example of behavior serving as a social prompt is the hostess at an elaborate dinner party. A guest, unfamiliar with the array of silverware, observes the hostess to select the correct utensil appropriate for each course.

Another example for strengthening or weakening behavior is when an observer's restraints against imitating a behavior are strengthened when the model is punished. For example, if a classmate violates a school rule and is punished, this will make the observer think twice before attempting to break the rule. In contrast, observers' restraints are weakened in one of two ways. One is lack of punishment for reprehensible behaviors. The other is the modeling of defensible violence, which adds legitimacy to the use of violence as a solution to a problem. Unfortunately, we see violence daily on TV and in media, which may lead to weaken the observer's behavioral restraints toward violent behavior.

The third influence of modeling is to demonstrate new patterns of behavior. Models are particularly important in the socialization of both children and adults. Language, social values and family customs, as well as educational, social and political practices, are modeled in countless situations. An example for children of symbolic models that portray both socially appropriate behaviors and sensitivity to others is Mr. Roger's Neighborhood.

The Role of Consequences in Learning from Models

Although Bandura believed that learning is not facilitated by reinforcement, behaviors enacted by others often do either reinforce or punish. These outcomes of the modeled behavior are referred to as vicarious because they arouse emotional reactions in the observer. For example, a teacher acknowledges a child who shares her crayons with others at a table, and a child who observed the situation experiences positive feelings.

The two components of vicarious reinforcement are: the behavior of a model produces reinforcement for a particular behavior, and second, positive emotional reactions are aroused in the observer.

While working with patients with snake phobias, Bandura found that _____ were more effective in treating phobias than persuasion.

- rewards
- conversions
- punishments
- evasive maneuvers
- observations

Self-efficacy is a term that refers to which of the following?

- Doing what you want, when you want and not worrying about the consequences.
- When self-esteem lowers to the point where people are unwilling to take risks.
- It is synonymous with self-regulation or being able to control one's desires.
- People's expectations that they are capable of performing a behavior that will produce desired outcomes in any particular situation.
- When a person begins to balance the outcome expectancy of any given situation.

Bandura's reciprocal causation model focuses on continuous interaction between the following three factors:

- behavior, reward, punishment
- behavior, environment, person
- learning, behavior, environment
- person, environment, reinforcement
- cognition, behavior, reward

Lesson49: Goal Orientation Theory: How Goals Affect Student Motivation & Behavior

Goal orientation theory is a social-cognitive theory which seeks to examine the relationship between goals and student motivation. Learn about goal orientation theory, the multiple goals dilemma, educational outcomes of goals, mastery vs. performance goals, and how goals affect student motivation and behavior.

Goals and Needs

Most of human behavior is directed by goals and needs. Goals range from personal to professional, from being happy to doing well in school, from short-term to long-term and the list could go on and on. Needs can be objective and physical or subjective and psychological. This lesson will distinguish between the constructs of goals and needs. We will also discuss differing types of goals as they relate to academics and learning.

You may understand the definition of need to be anything necessary for an organism to survive. For example, a plant needs sunlight to survive, or a human needs food and water to survive. In psychology, however, the concept of need assumes a slightly different definition. To psychologists, a need is a psychological feature that drives a human or animal toward a goal or behavior. Examples of this definition include a need for achievement, a need for affiliation with others and a need for attention.

Let's move on to goals. Goal orientation theory is a social-cognitive theory of achievement motivation. Goal theory became a particularly important theoretical framework in the study of academic motivation in the late 1980s. Whereas other motivational theories examine students' beliefs about their successes and failures, goal orientation theory examines the reasons why students engage in their academic work. A core goal is a long-term goal that drives much of what an individual does. These long-term goals help direct behavior toward achievement and success. Let's meet Jack. Jack is a freshman in college. Jack wants to go to medical school after completing his undergraduate degree. Jack's core goal is to get accepted into the most prestigious medical school in the country.

Short-term goals, referred to as proximal goals, are more concrete and can be accomplished within a short time period. One can think of proximal goals as a stepping stone toward a longer-range goal. Jack has many proximal goals in order to help him achieve his core goal of getting accepted into a prestigious medical school. He has a GPA goal of 4.0 for his first semester in college, a goal of taking the MCATs within two years and a goal of volunteering 50 hours a semester at the local hospital. All of these goals can be achieved in a short duration of time and will ultimately help Jack achieve his core goal.

Mastery vs. Performance Goals

The work of early goal theorists contrasted two types of goal orientations: mastery, which is a desire to acquire additional knowledge or master new skills, and performance, which is a desire to demonstrate high ability and make a good impression. Recent works of goal theorists have incorporated a second dimension of goal orientations: approach and avoidance.

Mastery-oriented goals are defined in terms of a focus on learning, mastering the task according to self-set standards or self-improvement. It also encompasses developing new skills, improving or developing competence, trying to accomplish something challenging and trying to gain an understanding or insight.

Performance-oriented goals represent a focus on demonstrating competence or ability and how ability will be judged relative to others. For example, trying to surpass normative performance standards, attempting to best others, using casual comparative standards or striving to be the best in a group or even avoiding judgments of low ability or appearing dumb are examples of performance-oriented goals.

Approach-oriented goals are goals in which individuals are positively motivated to look good and receive favorable judgment from others.

Avoidance-oriented goals are goals in which individuals can be negatively motivated to try to avoid failure and to avoid looking incompetent.

Let's explore these concepts and incorporate the second dimension of approach and avoidance. We are joining Jack in his freshman anatomy and physiology class.

For a **mastery approach** example, Jack's goal in the class is to learn all of the features of the human body because he is interested in anatomy and physiology and wants to be able to build his base knowledge of these principles.

For a **mastery avoidance** example, Ashley's goal in class is to avoid misunderstanding the features of a human body and principles of human physiology as presented to her by her teacher.

For an example of **performance approach**, Hillary's goal in class is to identify all of the bones, muscles and tissues in the human body more quickly and better than her classmates.

And for **performance avoidance**, Max's goal in class is to avoid appearing incompetent at identifying anatomy or applying principles of physiology.

It is important to note that students can hold multiple goals simultaneously; thus, it is possible for a student to be both mastery-approach-oriented and performance-approach-oriented. Such a student truly wants to learn and master the material but is also concerned with appearing more competent than others.

Which Is Best? Mastery or Performance Goals

Researchers agree that mastery goals are more productive than performance goals, and approach goals are more productive than avoidance goals. Controversy has arisen, however, about whether performance-approach goals should be considered productive and recommended by teachers as a complement to mastery-approach goals.

A _____ is a long-term goal that drives much of what an individual does, while a _____ is a concrete goal that can be accomplished in a short duration of time.

- proximal goal; core goal
- core goal; proximal goal
- mastery goal; performance goal
- performance goal; mastery goal
- avoidance goal; approach goal

Jerry's goal in class is to get more points on all assignments than any of his classmate. Jerry's goal orientation is _____.

- mastery approach
- mastery avoidance
- performance approach
- performance avoidance
- performance-mastery

The psychological feature that drives a human toward a behavior or goal is known as a _____.

- need
- performance goal
- mastery goal
- achievement goal
- approach goal

Lesson50: The Importance of Knowing Your Students

Learner-centered classrooms require teachers who know their students well enough to use the most effective teaching methods for their class. This lesson explains how knowledge of learning preferences, cultural backgrounds, and individual interests can improve teaching and student motivation at the elementary, middle, high school, and college levels.

Knowing Your Students

If you walked into the hospital on the day you were scheduled to have a surgery, and the surgeon asked what he was doing for you that day, you'd probably be more than a little panicked. In many human-services fields, knowing the people you work with is integral if you want to do a good job and succeed. The same is true of learner-centered classrooms. These are classrooms in which the student is the focus of all activities and learning, with the teacher acting as a facilitator and guide on the side. In order to establish an effective, productive, learner-centered classroom, you must know your students - and not just their names.

What You Should Know

A doctor doesn't need to know your favorite color to treat you effectively. Likewise, in teaching, there are certain pieces of information that are more important than others when getting to know your students. Some of the most important include preferred learning styles, cultural backgrounds, important relationships, interests, and personalities.

All of these factors are things you should know about your students at any level of education. Having this information will help you to better serve and facilitate your students' learning. Let's look at how this information aids learning at several levels of education: elementary school, high school, and post-secondary education.

Elementary Level

If you are an elementary school teacher, you know how difficult it can be to motivate students. This is especially true if you are teaching in a learner-centered classroom, where students are responsible for much of their own learning and must be motivated to want to do the work. By knowing your students, you can come up with creative ways to motivate them to work.

For example, some of your students might prefer to learn information presented to them verbally instead of reading it. In this case, you can provide those students with resources they can use to find videos or recordings about the topic or concept of interest. But if you don't know their preferred learning style, you can't be a good facilitator in this way.

Family relationships are also incredibly important at the elementary level. Getting to know not just your students but also their families is key for helping them learn. By knowing your students' families, you can create partnerships so that the students are supported in learning, even when they are not in school. By taking the time to maintain these relationships, your students have a better chance of succeeding and learning.

High School Level

Students at the high school level can be incredibly difficult to get to know at times. However, doing the work will pay off for both you and the student. As a high school teacher, you are responsible for teaching your students the skills and knowledge they'll need to move on to college, a technical school, or a career. It's important that you tailor instruction for these students toward their interests so they can see how their education will impact their lives in the future.

What is a learner-centered classroom?

- One in which students teach
- One in which the teacher is the focus
- One in which students are responsible for their learning with the teacher acting as a facilitator
- One in which everyone does their own thing

At which level is it important that teachers know their students?

- Elementary
- High School
- College
- All of the answers are correct

Why is it important to learn about your students' family relationships at the elementary level?

- So you can raise more money during fundraisers
- So you can tell them when their children are behaving badly
- So you can create a partnership where student learning is supported at home and in school
- So the student knows that you can call their parents at any time

Lesson51: Instructional Planning: Quality Materials & Strategies

Instructional strategies and quality materials include the resources and methods teachers use to design lessons and instruct students. Become familiar with effective strategies and the criteria considered when selecting quality materials.

What Is Quality Instruction?

How can teachers make sure they are planning high-quality instructional experiences? To answer that, we first need to look at what makes up quality instruction. Though educators sometimes vary on instructional methods, or ways to teach, most will agree all quality instruction includes:

- Curriculum based on specific goals or standards, outcomes we expect students to master
- Engaging instruction that includes differentiation, or teaching with each student's needs in mind
- Use of data to drive lessons and objectives
- Opportunities for students to work in varying contexts, such as small groups and independently
- Support and guidance from the teacher during practice time
- A system or way to monitor each student's progress toward a goal

What resources does a teacher need to ensure quality instruction? Teachers rely on instructional materials and strategies to get the job done. Let's take a look at how they choose these materials and strategies.

Quality Instructional Materials

Teachers need high-quality instructional materials in order to plan effective instruction. Instructional materials are resources teachers use to teach students, like a textbook series or curriculum guide. When choosing instructional materials, teachers need to keep in mind the qualities we use to define quality instruction. Materials that fit the scope should:

- Be well-organized and easy to use to allow more time for differentiation
- Be aligned to the standards identified by the school or district
- Be diverse, including resources for students who struggle and opportunities for students to be challenged
- Include assessment pieces that allow the teacher both to track students' progress and assess them at the end of teaching
- Incorporate technology for instruction and student use
- Have materials and supplies to support a variety of learning styles

Quality Strategies for Instruction

All teachers, whether they are aware of it or not, use instructional strategies. These are methods teachers use to design lessons and instruct students. Some teachers are more strategic than others. What are they doing differently? They're thinking about their instructional methods before, during, and after teaching, asking important questions that lead them to quality teaching, such as:

Before instruction, teachers may plan instruction by asking:

- What is my educational objective?
- What are my students' strengths and struggles?
- How can I motivate, engage, and prepare students for learning?

During instruction, teachers may focus or adapt instruction by asking:

- How are my students responding to new concepts?

- Do I need to shift my focus or presentation style?
- What can I do to make sure I'm reaching all learners?

After instructions, teachers may reflect and adjust future plans by asking:

- Did students demonstrate understanding?
- How can I connect today's learning to future instruction?
- What evidence will I use to determine student mastery of skills?

Knowing good teaching methods and strategies doesn't mean teaching will be quality. Strategies that work in one lesson or for one group of students may not work for another.

What is differentiated instruction?

- It refers to teaching with individual student needs in mind.
- It refers to teaching a different topic each day.
- It refers to focusing learning on those students who are struggling.
- It refers to assigning homework on different days.

The most effective instructional materials _____.

- support a variety of learning styles
- have cute, age-appropriate themes
- entail homework
- support the learning of most of the students

Why should teachers use questioning techniques?

- It helps them provide the best instruction by gauging the students' learning before, during, and after the lesson.
- It is a way to measure the teacher's effectiveness and students' learning experience at the end of the lesson.
- It helps the students become self-directed in their learning when they ask the teacher questions during the lesson.
- It allows the teacher to better plan for constructive feedback on the quality of the students' work.

Lesson52: Communicating Assessment Expectations to Students

The expectations of a given assessment should be explained to students prior to being conducted. Learn how testing instruments, practice tests, assessment criteria, and rubrics can help students prepare to be accurately assessed.

Student Assessment Preparation

Let's face it: test-taking is a stressful business for students. Even the most prepared student will quiver in the face of a test, and much of this anxiety comes from not knowing what is on the test or how the test will be graded. The student may even end up studying the wrong information. That's why it is so important for teachers to prepare their students for a test in advance by mapping out the assessment and their expectations. There are a number of ways a teacher can accomplish this. For example, he or she can:

- Explain the testing instrument
- Practice question types
- Discuss the assessment criteria
- Provide a rubric
- Review the information being tested

Let's talk about how these strategies work.

The Testing Instrument and Practice Tests

Teachers assess student learning in several different ways. Whether it is showing your work on a math problem or writing a 5-paragraph essay, students do better when they know what testing instrument will be used to measure their knowledge. A testing instrument is a fancy term for question type and includes true/false, multiple choice, essay, and matching questions. Some students are better at decoding multiple choice answers, while others do better with long, written explanations.

The best advice for a teacher is to let students know what type of test will be given ahead of time. This gives the students time to practice and prepare for the test. One way students can prepare is by taking a practice test, which is simply an ungraded assessment that is similar to the actual test in form and content. It doesn't have to be lengthy; just a few questions will get students warmed up for the real test. The practice session will help ease any fears of what is to come.

Assessment Criteria

Right before the test, it is a good idea to discuss the assessment criteria, which are the standards by which the test will be graded. If a test is worth 100 points, the teacher should explain point breakdown. Start with the overall score, and then break down how students can achieve the highest score. For example, an assessment with a three-part structure including an essay question, ten multiple choice questions, and ten true/false questions, might be broken down as:

- Overall assessment is worth 100 points
- Essay is worth 50 points
- Multiple choice questions are worth 2.5 points each for 25 possible points
- True/false questions are worth 2.5 points each for 25 possible points

Which of the following is NOT a test-taking instrument?

- Rubric
- Multiple choice question
- True/False question
- Essay question

When a teacher discusses the number of questions, the point value for each question, and even the time for a test, he or she is actually doing what?

- Discussing the assessment criteria
- Discussing the grading criteria
- Administering a practice test
- Explaining the rubric

What happens when students are given an oral review or review sheet before a test?

- Students refresh their memory
- Students can mentally log information
- Students can recall information easily
- All choices are correct

Chapter9: Educational Leadership

Lesson53: What is Educational Leadership? - Concepts & Theories

An educational leader is the one other educators look to for guidance and an example. Discover the world of educational leadership, following major concepts, theories, and characteristics that define effective leadership.

Educational Leadership

An educational leader serves as a guide and influences other educators in an administrative setting. In some cases, it may be a team of educational leaders. Leaders in these executive roles work toward finding ways to improve learning and to improve the process of educating students. They serve in elementary, secondary, and postsecondary institutions as well as early childhood education centers. School site leaders, directors, principals, and assistant administrators are employed to work either as the sole educational leader or in small teams. Typical positions for educational leaders in administrative settings are:

- Principal
- Superintendent
- Academic dean
- Director
- Head of school
- Department chair
- Provost, or
- President

Major Concepts and Theories

Educational leadership theories borrow from business management principles. In the United States and other developed nations, leadership models from the business world were adapted to fit the educational setting. Since schools and their communities are diverse and change over time, theories regarding the role and function of educational leaders have likewise been reformed and remodeled.

Researchers continue to investigate leadership in different educational settings. One style of leadership isn't better than another. Each is more or less effective based on the context of the setting in which a leader works. Environmental factors such as size, school culture, staff, and personalities dictate the most suitable leadership style.

Leadership Characteristics

Most theories of educational leadership refer to the type of leader or style of leader based on essential elements such as capabilities, practices, and approaches. Theory components are classified into three categories: characteristics, concepts, and practices of educational leaders. These three components help in understanding leadership types as a theory.

Characteristics of educational leadership, which include behaviors, styles, and leadership traits

Concepts of educational leadership, which include management vs. leadership, power, coercion, and conceptual frameworks; and

Activities or practices of educational leaders, which include approaches or ways of leading

Through an understanding of these components, you can begin to understand yourself as an educational leader and understand the impact of leadership on student learning.

Leadership Theories

The authentic leader is self-aware, genuine, and leads with the heart. This type of leader puts the mission and goals of an educational institution above self-interests. Mrs. Ann, a principal, focuses on long-term results for the good of students and their learning. She isn't afraid to show emotions or vulnerability to connect with teachers, students, and parents. This makes her fit the profile of an authentic leader.

A transformational leader changes individuals and social systems. Positive change develops followers into leaders. Mr. Terry, a school director, improved morale, motivation, and performance by getting to know teachers well. He connected the mission and identity of the organization to each person's sense of identity. Teachers say he is a role model and inspires teachers, students, and other stakeholders in the school. Inspired teachers and motivated students have a positive impact on student learning and the norms of the school.

Mrs. Armendariz is perceived as a principal who is not afraid to show who she really is. She puts the long-term goals of her school ahead of her own. What type of educational leader is she?

- Authentic
- Distributive
- Transformational
- Transactional

Dr. Natividad is admired as a university president. She has brought about many changes in her 20 year tenure including ending discriminatory practices making university policies more fair to all. What type of leader is she?

- Transactional
- Transformational
- Servant
- Authentic

Mrs. Rojas took a position as a charter school director because she felt she could help others. It was never her intention to become a school leader, but she felt there was a need and she could help fill that need. What type of educational leader is Mrs. Rojas?

- Distributed
- Transactional
- Transformational
- Servant

Lesson54: Educational Leadership Theories in Practice

Educational leaders face complex issues daily. Explore the relationship between educational leadership theories and the practice of these theories in the context of contemporary educational issues to better understand leadership in practice.

Putting Educational Leaders to the Test

There are five types of educational leaders, and they all handle contemporary educational issues differently. Let's follow Authentic Al, Transformative Tina, Transactional Ted, Servant Sally, and Distributed Dan to understand the theories that describe each of them. Then, we'll look at contemporary educational problems to see how each of our leaders respond in practice.

Authentic Al - The Authentic Leader

- Self-aware, genuine, leads with the heart
- Puts school above self-interests
- Focused on long-term results
- Connects with others using emotion/vulnerability

Transformative Tina - The Transformational Leader

- Causes positive change on student learning
- Develops followers into leaders
- Improves morale, increases motivation and performance
- Knows teachers well
- Connects the mission and identity of organization to each person's identity
- Role model who inspires teachers, students, and other stakeholders
- Effects outlive tenure

Servant Sally - The Servant Leader

- Helps others first before herself
- Builds relationships
- Isn't consumed with the idea of being in charge
- Focuses on student learning and other needs
- Serves for the good of each person, not just the educational institution

Distributed Dan - The Distributed Leader

- Focuses on shared responsibilities by stakeholders
- Builds on the capacity of others to create change
- All levels in the school come together to improve student learning
- Not focused on one individual's actions associated with the formal leadership role

Transactional Ted - The Transactional Leader

- Concerned with keeping school running smoothly
- Uses motivational techniques such as disciplinary actions and incentives
- Concerned with what is happening now, and not the future

School Climate

Initiatives fail if your school's climate is not inclusive and supportive. Difficult issues facing schools require a climate where teachers, students, and other stakeholders want to participate in the process. A positive climate changes school cultures that fail to meet student needs effectively.

Leadership in Practice

- Authentic Al - "I will do everything I can to show teachers, students, parents and others in the community that our school cares about everyone."
- Transformative Tina - "I value the culture of my school and work to create a vision that matches what we all believe in as a staff."
- Servant Sally - "I want to make sure to meet everyone's needs, especially students."
- Distributed Dan - "We work as a committee to come up with the mission statement and values that reflect what our school community is all about."
- Transactional Ted - "I work to improve school climate by having lots of motivators such as rewards that will get teachers and students excited about being a part of the school community."

School Accountability

Every educational leader needs to lead in the planning and adherence to accountability measures that measure student performance set by federal and state governments. Policies are often unpopular, and the leader needs to get everyone behind a plan to meet challenges posed by school accountability.

Leadership in Practice

- Authentic Al - "We may not like testing. I am first to admit. But it is part of our job, and we need to do what is required of us."
- Transformative Tina - "I believe we can work together to bring about changes in the way we use accountability results to turn them into a positive learning tool for all."
- Servant Sally - "I will do my best to support teachers as they support students through the process of meeting requirements."
- Distributed Dan - "We brainstorm ways to deal with the hand we are dealt and do the best for kids."
- Transactional Ted - "I am a big advocate for evaluating teachers based on student performance. I think accountability is necessary."

School Policies

Educational leaders also try to get staff behind school policies. Some examples of policies include school uniforms, student retention, homework, curriculum and curriculum resource decisions, and ways to handle controversial topics.

A high-school principal recently told his staff, 'I would like to spend more money on curriculum materials, but we need to think about what will benefit our campus a year or two from now. It would be selfish of us to buy materials that we or future staff will not be able to use in a year when the standards change.' Based on the principal's response to the issue, what leadership style best fits him or her?

- distributed
- transactional
- transformational
- authentic

A high-school principal recently told his staff, "The standards are changing soon and these materials will become obsolete in a year. Nevertheless, I will buy them for you on the condition that you promise to raise academic performance on the state assessment!" Based on the principal's response to the issue, what leadership style best fits him or her?

- transactional
- distributed
- transformational
- servant

A high-school principal recently told his staff, "I would like to have all teacher leaders meet on whether or not to purchase the new curriculum materials. We need to understand if they will be practical for classroom use based on your expertise." Based on the principal's response to the issue, what leadership style best fits him or her?

- servant
- distributed
- transactional
- authentic

Lesson55: Student Achievement: Definition, Factors & Research

Student achievement refers to what students were able to learn in a determined period of time. Understand the definition of student achievement, explore what the research has to say about this topic, and discover the factors that impact student achievement.

What is Student Achievement?

Student achievement has become a hot topic in education today, especially with increased accountability for classroom teachers. The ultimate goal for any teacher is to improve the ability level and prepare students for adulthood. Defining student achievement and factors that impact progress is critical to becoming a successful teacher.

Student achievement measures the amount of academic content a student learns in a determined amount of time. Each grade level has learning goals or instructional standards that educators are required to teach. Standards are similar to a 'to-do' list that a teacher can use to guide instruction. Student achievement will increase when quality instruction is used to teach instructional standards.

For instance, you have a to-do list that involves three tasks: dropping off the cleaning, filling your gas tank, and studying for a final. Questions you may ask yourself are: In what order do I accomplish my tasks? How am I going to get each task finished? Should I study at the library where it is quieter or at home where I may be distracted? Is it worth it to purchase gas a few blocks from home at a higher price or drive a short distance to save money? Your goal is to get your to-do list finished in the most efficient and timely way possible.

When teaching, you must use the same process when addressing instructional standards. Questions you should ask to successfully complete your 'to-do list' or learning standards in a timely and efficient manner include: What type of students do I have? How am I going to teach the standard? Will they understand the vocabulary? How long do I think it will take for students to fully learn the material?

Successful instruction of standards results in student achievement. However, knowing the 'what' and the 'how' is just the first step to successful student achievement. Understanding the factors that can impact a student's ability to learn is equally important.

Factors that Impact Student Achievement

There are many variables that can impact successful student achievement, but the most critical are classroom instruction and learning disabilities. It is important to remember that all students do not learn the same way or at the same rate. Students are like leaves on a tree; there are no two exactly the same. Just as a leaf comes in unique colors, shapes and sizes, each student has their own unique learning style. You must use a variety of teaching methods and understand the background and individual needs of each student.

Classroom instruction is the most important factor that impacts student achievement. As a teacher you influence the quality of instruction, set expectations for learning, and measure the level of understanding. For example, when a standard is not presented in a way that a student can understand, or if it's taught in a way that is boring, it can be very difficult for a student to meet the required level of achievement.

A good teacher will use strategies such as discussion among students, videos, or stories, to gain student attention and to support the learning process. You should constantly be thinking of ways to make learning fun and appropriate. For example, in looking at our to-do list, you may pre-pay for your cleaning to get a discount or join a friend to make the study session more interesting. Likewise, student achievement involves well-thought out strategies to improve the quality of learning!

What does student achievement measure?

- The number of students in a class compared to the number of students in the school
- The amount of academic content a student has learned in a determined amount of time
- The percentage of correct answers that the student has earned over one school year
- The work required for a student to maintain an average GPA

Bob and Tom are both 4th graders at Summerville Elementary. They are in different classes, but they are taught from the same books and curriculum. They follow the same schedule, do the same assignments, and have the same amount of homework. However, Bob and Tom achieve at different levels. What is the most important factor determining their achievement?

- Classroom instruction
- Administrative support
- Inherited traits
- Summer activities

Jonathan is a first grader who is struggling in reading. His teacher, Mrs. Davidson, understands the research on student achievement. How will that impact Mrs. Davidson as she plans instruction for Jonathan?

- She will allow Jonathan to play games on the computer during reading time since he is further behind the other students in the class.
- She will make sure Jonathan spends more time studying math because he is strong in that subject.
- She will use a variety of strategies to maintain Jonathan's interest and keep trying until he is successful.
- She will encourage Jonathan to watch the top reading student and do things in that same way to improve his skills.

Lesson56: The Role of Leadership in Implementing School Vision

In this lesson, we'll discuss the role of school administration and faculty leaders in implementing school change, being accountable for progress, and monitoring growth toward goals using structures like grade-level teams and school wide leadership teams.

The Role of Leadership

Every district has those school leaders who aren't particularly effective. Some think all they need to do is show up with cupcakes and smile, never doing any actual work. Others seem like power-hungry megalomaniacs who enjoy being lord and overseer of the team and do nothing but delegate. The role of school leadership extends beyond that of cheerleader or overseer, though. Those in leadership roles at school are meant to assist in the school improvement process by collecting and sharing the data that should drive the school to progress toward improvement.

Effective school leaders take an active role in school improvement and an interactive, hands-on approach to ensure the school can reach its goals. Members of the school improvement team should be effective school leaders by providing guidance and feedback to faculty, staff, and students. By taking this sort of collaborative perspective of leadership, rather than a top-down authoritarian approach, faculty and students see those in positions of leadership as collaborating partners. Another role of leadership is to provide the necessary data so that faculty can make informed decisions about instructional methods and curriculum content based on available research. Those administrators and faculty members considered part of the school leadership should meet regularly to help guide others in the school through the challenges of the process of self-evaluation and making changes to promote progress.

Who Are Our Leaders?

A school leadership team should have representation from all grade levels and content specialties. For example, the department head of each of the subject areas should be included in the leadership team for that subject. This could be achieved by appointing someone to be in charge of math, language, social studies, and science, along with other subject representatives as needed. These key departmental staff will meet in workshop sessions with all the teachers in their department to discuss student needs and whether they're being met. The department heads will then share their findings with the school-wide leadership team to come up with suggestions for improvements.

Additionally, consider including representatives from each grade level to represent the needs of those specific grades. A grade-level representative can provide insight to their age group's particular needs so other faculty and administration can include their perspectives.

The school-wide leadership team should have grade-level and subject-specific representation on the team. Also include members of administrative staff who have the ability to provide information about the school vision; and who can therefore assist faculty leadership in developing curriculum and instruction protocols to carry out that vision.

Some people seem to be naturally born with the gift of effective leadership, but the truth is that leadership skills can be taught. Be sure to host orientation and training sessions periodically to go over expectations for the team so everyone knows what they're responsible for. Also, be prepared to share the team's findings with the rest of the faculty so they're up to speed on new programs and protocols.

Implementing School Vision

Now that we know who should be included in the leadership team and why their role is important, let's take a look at what they actually do. A school vision is the idealistic view of how school stakeholders see both themselves and the role they play in the lives of young learners. The leadership team will take input data from teachers, students, administrators, and families, as well as state and national education

standards to develop a vision and a set of goals for the school. The leadership team will then evaluate this data to develop a comprehensive plan to work toward those goals.

School stakeholders should perceive the leadership style of school improvement leadership as which of the following?

- Authoritarian
- Overseer
- Top down
- Collaborative

Which of the following groups is NOT considered school leadership?

- Representative guardians from a student's family
- Representative instructors from each disciplinary subject
- Representative instructors from each grade level
- Representative staff from administrative departments

Which of the following leadership responsibilities for implementing the school vision refers to using data for the purpose of providing a count of evidence that illustrates the school is keeping its promise?

- Disseminate data to school faculty
- Apply data to inform changes
- Ensure accountability for progress
- Gather and analyze data

Lesson57: What Is a Stakeholder in Education? - Definition & Examples

Stakeholders in education are those who are affected by the educational system or have a vested interest. Discover who these stakeholders are, the roles they play, and how reaching a common goal can lead to success.

Who Are Stakeholders in Education?

What is a stakeholder? One might think of a person holding a wooden stake, like the kind driven through the hearts of vampires in folklore. But the word stakeholder refers to a person who has an interest or concern in the organization at hand. So, in terms of education, a stakeholder is someone who has a vested interest in the success and welfare of a school or education system. This includes all parties that are directly affected by the success or failure of an educational system, as well as those indirectly affected.

Examples of Stakeholders in Education

Let's take a moment to brainstorm who some of these stakeholders may be. School board members, administrators, and teachers immediately come to mind. They each want their work to have a positive impact on children, and their jobs are directly affected by the success of the school system. Parents desire a successful education system for their children, while the students themselves have an interest in receiving a good education. It's also easy to imagine the influence the education system has on government officials, like city councilors and state representatives, as voters may base their decisions on the way such officials support the school system.

In fact, the community as a whole is a stakeholder in its education system. This is because local schools educate future employees, business owners, and community leaders. A solid education program builds a stronger community by better preparing its students to be successful community members.

Since all members of a community are stakeholders in its education system, you may be wondering how each individual stakeholder is important. Every different stakeholder plays a different, significant role in support of the education system. Let's explore those roles.

The Roles of Various Stakeholders

Let's use an example to illustrate how different stakeholders in education interact for the benefit of a school system. Say that the local school board wants to foster a greater interest in science and technology among students in the school district. The board passes a resolution requesting that each school in the district develop a program that will meet this goal, and along with administration, works to raise funds for such programs. How do the other stakeholders fit into this goal?

School administrators, such as the superintendent and principals, support the goal of the school board by developing a plan of action to meet the board's expectations. Let's say one school plans to provide a monthly science-and-technology night for students and their families.

Why are stakeholders in education important to the success of educational goals?

- Each stakeholder can help decrease support for local educational goals.
- A team effort on the part of stakeholders is involved in achieving educational goals.
- All stakeholders offer the same type of support for local education systems.
- All of these answers are correct.

Which of the following would be considered a stakeholder in education?

- Parents
- Local business leaders
- Teachers
- ALL of these answers are correct.

What do you call anyone who has an interest in the success of an education system?

- School administrators
- Community members
- Stakeholders
- Businessmen

Lesson58: Standards-Based Curriculum: Development & Implementation

Standards-Based Curriculum

A lead teacher, Mr. Sandoval, poses a question for his school's faculty: "What does it mean to you when you hear familiar phrases such as 'you're meeting the standard' or 'we're raising the bar'?" These phrases both relate to meeting set expectations, such as the state standards we teach through our curriculum. Mr. Sandoval explains:

Curriculum describes all the information students learn, plus experiences they have in acquiring that information.

A standards-based curriculum refers explicitly to specific knowledge, learning experiences to gain that knowledge, and assessments to check for mastery of that knowledge, developed by looking at the standards of a district, state, or nation.

In the United States, most states use the Common Core State Standards, while the remaining states have developed their own state-specific standards. Both teachers and administrators are responsible for teaching these standards if they work in a public school. Mr. Sandoval knows it's important to develop a standards-based curriculum for a school or district because doing so helps teams of teachers work together to make sure they're teaching to the standards and preparing students for the next year. It helps administrators because it allows them to measure progress at all levels and over time.

Positive Culture of Learning

High achieving schools, like those where Mr. Sandoval serves, have a positive culture of learning. Teachers feel empowered and confident to help students prepare for interim assessments and end-of-year assessments. These are tools that help teachers and administrators measure progress. Classroom teachers display standards in student-friendly language so that students become familiar with what they're learning. Everyone in the school works toward the same goal as opposed to each teacher working for themselves and teaching random topics. A standards-based curriculum provides a clear direction for all stakeholders, including teachers, students, parents, and administrators, so everyone involved knows what the expectations are and how to meet them.

Implementation

Implementation of a standards-based curriculum requires districts and schools to work ahead of time to create mapping, commonly called a curriculum map, scope and sequence, or pacing guide. Each type of document is mostly the same with varying degrees of differences. They each describe:

- Units of study
- Standards aligning with each unit
- Curriculum materials needed
- Programs to be used

What are documents such as curriculum maps, scope and sequence, and pacing guides used for in a standards-based curriculum?

- They are curriculum materials that include textbooks and other essential tools.
- They are specific lesson plans based on standards that tell a teacher what to teach each day.
- They are the state standard documents issued by each state or by a national organization.
- They are planning tools where standards are organized into units so teachers can write

How can a standards-based curriculum promote a positive culture of learning?

- It empowers teachers and gives them confidence to prepare students to meet expectations.
- It empowers teachers to plan their lessons according to what they feel is important to learn.
- It helps administrators manage teachers by knowing what they are doing every minute of the day.
- It helps administrators pressure teachers to get students ready for the state assessment.

A standards-based curriculum is _____.

- based on the textbook purchased by the school or district and follows the sequence from cover to cover
- based on each teacher's preferences and includes knowledge, experiences, and assessments
- based on expectations created by the school district and measured by an end-of-year test
- based on state or national standards and includes knowledge, experiences, and assessments

Lesson59: What is Formative Assessment? - Strategies & Examples

Formative assessment helps teachers track student progress and plan effective instruction. Explore strategies, benefits, and examples of formative assessment before, during, and after a lesson.

Formative Assessment

As a new classroom teacher, I remember the confusion I experienced after a week-long math unit. I had been working with my students all week on multiplication. We spent Monday and Tuesday reviewing basic multiplication facts, and by Wednesday and Thursday we were engaging in multiplying 2-digit by 1-digit numbers. I was so excited because I had incorporated many activities into instruction: we used technology, students worked in groups, and we played games to review the skill. I was certain my students were ready for Friday's test!

However, as I graded their tests, I was shocked to see that some of my students were unable to solve the problems because they had errors in their basic facts. After some reflection, I realized that if I had incorporated formative assessment into my instruction, I could have made changes to my lessons so that my students were more successful.

Formative assessments are ongoing assessments that help teachers understand students' progress and their level of understanding during a unit of instruction. In contrast to a test given at the end of a chapter or unit (known as assessment OF learning), formative assessment is known as assessment FOR learning because this information can help teachers adjust instruction during the unit to help students experience success.

Now that we know what formative assessments are, let's look at some of the benefits of using them in daily instruction.

Benefits of Formative Assessment

There are many benefits of incorporating formative assessment into instruction. Some of these are that:

- Teachers can modify instruction based on the learning of their students
- They also can identify student errors early and provide re-teaching when needed
- Students can receive feedback about their learning in order to identify strengths and weaknesses
- They also are given opportunities to set learning goals and ask questions for clarification
- Students are challenged to think deeply about what and how they've learned
- They learn how to self-evaluate their own level of understanding
- Student learning and achievement increases

Examples of Formative Assessment

Because formative assessment can benefit students, let's examine some practical ways that teachers can incorporate these techniques before, during, and after instruction.

Before a Lesson

Entrance Ticket:

An entrance ticket is one way to incorporate formative assessment before instruction. Teachers can pose a question for students to respond to on a note card, sticky note, or slip of paper. This question can ask students to answer a factual question, solve a problem, or even rate their own level of understanding of the material they've learned so far.

4-Corner Assessment:

4-corner assessment is another formative assessment tool used before instruction. In this activity, teachers label each corner of the room with the labels: 'Strongly agree,' 'Agree,' 'Disagree,' or 'Unsure.' Teachers then pose a series of questions about the previous day's lesson, and students gather in the corner that represents their level of understanding.

During a Lesson

Colored Cups:

During a lesson, teachers might employ the colored cups method of formative assessment. Each student has a set of colored cups on their desk (one red, one yellow, and one green). A student displays his green cup if he understands the lesson, his yellow cup if he's a little confused, and his red cup if he doesn't understand at all.

Thumbs Up, Sideways, or Down:

Another formative assessment method that can be used during a lesson is thumbs up, sideways, or down. This is a very easy strategy that teachers can use multiple times throughout a lesson. Students give the thumbs up sign if they understand the content, a sideways thumb if they're a little confused, and thumbs down if they're very confused.

How do formative assessments and tests differ?

- Formative assessment measures learning, while tests assign grades.
- Formative assessment measures progress and understanding, while tests measure completion.
- Formative assessments measure progress throughout a unit of instruction, while tests assess learning at the conclusion of a unit.
- Formative assessments can't be graded, while tests can be.

Which of the following is the most important student benefit of formative assessment?

- It allows teachers to grade tests quickly.
- It allows students to use technology daily.
- It supports the use of cooperative learning in the classroom.
- It teaches students to self-evaluate their own level of understanding.

Formative assessments should be part of the classroom routine to _____.

- help student grades
- measure ongoing student learning
- keep students entertained
- fulfill state standards

Lesson60: Summative Assessments: Examples & Types

Summative assessments are used to test learning and can cause more stress than other types of assessments. Find out what summative assessments are and their purpose, examples and types of these assessments, their stakes, and how formative assessments differ.

Summative Assessments Defined

Summative assessments are used to evaluate learning. They are generally associated with grades, points, or percentages. Examples are exams, graded projects, and papers. Standardized tests such as the SAT are also considered summative assessments.

The Purpose

Summative assessments, such as exams, are used to evaluate learning as well as serve as comparisons for standards, like class averages. They are used to determine what the students know and what they do not know. They can help determine the effectiveness of teaching. Scores can be indicative of the quality of the curriculum as well as appropriate placement of students. For example, when students perform well in an English class, they are given the option to select the honors or advanced placement sections of English for the following cycle. However, summative assessments are used incrementally, and therefore, do not have immediate influence on instructional quality. For example, if your math teacher, Ms. B., gives an exam on algebra at the end of May after spending the entire month teaching algebra, she will know how you perform after she grades those exams. Once she begins teaching geometry in June, it would be difficult to revisit algebraic concepts that were misunderstood in May. She can only implement the changes when she teaches algebra the next time around.

These assessments are also used to form rankings of schools. If one school's students outperform another school's students on state or regional exams, that school is ranked as a better school for academics.

Formative Assessments

Some researchers believe that formative assessments are more effective than other tests because they can be incorporated into teaching methods. They seek to monitor learning instead of to evaluate it in the form of grades. Formative assessments are generally ungraded or are associated with low point values because they seek to check understanding. Students are less likely to cheat because they are not concerned with the grade, as they might be while taking summative assessments. Examples of these may come in the form of meaningful assignments like discussions with questions, group projects, individually completed graphs and charts, and reflections. When teachers conduct these activities, they know which areas of coursework are well-understood and which areas they should focus on a bit more.

An example of a summative assessment is:

- A song and dance.
- A test.
- A skit.
- A discussion.

The main goal of summative assessments is to:

- Evaluate learning.
- Check understanding.
- Monitor learning.
- Get ranked.

The main goal of formative assessments is to:

- Evaluate learning.
- Monitor learning.
- Grade harshly.
- Grade fairly.

Lesson61: What is Critical Thinking? - Definition, Skills & Meaning

Critical thinking is making reasoned judgments that are logical and well thought-out. Discover more about the definition, meaning, and core skills of critical thinking (curiosity, skepticism, humility), and how to develop and use critical thinking skills.

Critical Thinking Defined

Critical thinking means making reasoned judgments that are logical and well-thought out. It is a way of thinking in which you don't simply accept all arguments and conclusions you are exposed to but rather have an attitude involving questioning such arguments and conclusions. It requires wanting to see what evidence is involved to support a particular argument or conclusion. People who use critical thinking are the ones who say things such as, 'How do you know that? Is this conclusion based on evidence or gut feelings?' and 'Are there alternative possibilities when given new pieces of information?'

Additionally, critical thinking can be divided into the following three core skills:

1. Curiosity is the desire to learn more information and seek evidence as well as being open to new ideas.
2. Skepticism involves having a healthy questioning attitude about new information that you are exposed to and not blindly believing everything everyone tells you.
3. Finally, humility is the ability to admit that your opinions and ideas are wrong when faced with new convincing evidence that states otherwise.

Using Critical Thinking Skills

Many people decide to make changes in their daily lives based on anecdotes, or stories from one person's experience. For example, let's say that your aunt told you that she takes a vitamin C supplement every day. Additionally, she told you that one morning she was running late for work and forgot to take her vitamin C supplement. That afternoon, she developed a cold. She now insists that you take vitamin C every day or you will get sick, just like she did in her story. Many people hearing this story would just accept this and think, 'To avoid getting sick I should take vitamin C.'

Although this type of logic is very common, it lacks critical-thinking skills. If we examine this anecdote a little more carefully, you should be able to understand why. For starters, we don't know where the idea for vitamin C stopping illness even came from. Why did your aunt decide to take vitamin C rather than vitamin D, or any other vitamin?

Also, there was never any indication given that there exists a direct link between not taking vitamin C and developing a cold. At first glance, it may seem that way. However, there could be many other variables involved that have nothing to do with vitamin C. Maybe she was already developing a cold and that particular day it just happened to manifest itself. Maybe a sick person sneezed on her in the elevator that morning. Any number of possibilities could have happened, and from just this story, we simply do not have enough information. All of this speculation as to the validity of this particular observation is considered skepticism.

What is critical thinking?

- Making snap judgments in a life-or-death situation
- Rejecting or harshly criticizing everything
- Living life based on gut feelings
- Making well-informed decisions based on logical, supporting evidence

What are the three core skills involved in critical thinking?

- Skepticism, curiosity, and humility
- Skepticism, cynicism, and gullibility
- Curiosity, rigidity, and humility
- Curiosity, intuition, and cynicism

What is an anecdote?

- A remedy to poison
- A story told from a person's experience
- A myth or tall tale
- A forgotten memory

Lesson62: Identifying Opportunities for Creative Thinking in the Workplace

This lesson will go over a simple creative thinking model. Anyone can use it to help them decide when creativity is appropriate, or not, in the workplace.

Creativity in the Workplace

Creativity is now considered to be an important part of almost any kind of workplace. But that doesn't mean that every workplace demands, requires, or even needs creativity all of the time. In fact, creative thinking could be dangerous or destructive under many circumstances.

So when is creative thinking OK and not OK at the workplace? In this lesson, we go over a simple model anyone can use to quickly get to the bottom of this question.

A Simple Model

Here is a very simple model for figuring out if creativity is appropriate for a given task, job, or workplace and when it's not. Ask yourself the following questions:

Can It Be Automated?

Is this a repetitive task that is or could be, at some point, automated?

If you said yes, then creative thinking may not be appropriate here as a repetitive task, such as data entry, may have been designed for a very specific purpose that creative thinking might utterly disrupt in a negative manner.

Another example here would be an assembly line worker putting a car together deciding a bit of creativity would be a good idea when, in fact, it would probably create chaos in what is a very algorithmic and logical process.

There are exceptions to almost everything, of course. Even highly automated tasks are designed with creative thinking, but it's one thing to design the process using creative thinking and it's another thing to interrupt a highly linear task mid-way through its completion!

Is It Legal?

Is this something that involves adherence to a law, rule, or regulation of some sort?

Accountants and lawyers should be very careful with creative thinking that can get them or their clients in trouble. Yes, creative thinking in the sense of finding completely legal loopholes may be OK (we'll leave ethics aside). However, fudging a number by doing some creative accounting when it's completely illegal is a whole different ballgame.

All of this also applies to company-specific policies as well. Try not to be creative with something that runs counter to them!

Is It Safe?

Will creative thinking at this point in time endanger anyone?

A surgeon shouldn't come up with a new valve replacement procedure mid-surgery. Again, there are exceptions to even this danger-related question. In this specific case, no surgery is exactly like another and situations can arise during a surgery that require and fully justify some creative thinking.

But solving an unforeseen circumstance to save someone's life is completely different from experimenting in a manner that endangers another person's life without just cause.

Identifying Creative Thinking Opportunities

So when is creative thinking appropriate? The best opportunities for creative thinking arise when:

- The workplace rewards creative thinking.
- The creative thinking sessions occur in ways that do not endanger anyone in any legal, financial, or health-related manner.
- The creative thinking process will not disrupt what is a very logical, orderly, or objective task (especially mid-process).
- The creative thinking occurs in a manner consistent with the company's culture and policies.

- There's a low-stress environment

For instance, let's say that Jane works for a pet hotel's marketing department. The pet hotel's executive/management team rewards creative marketing ideas. Jane's work won't put any of the customers or pets in any danger, and it doesn't disrupt any orderly processes, such as feeding times.

Creative thinking should be avoided or carefully used in which of the following circumstances?

- When something illegal might happen
- When it might endanger someone's life
- When it disrupts a highly automated process
- I, II, and III
- I only
- II and III only
- III only

Which of the following professionals is LEAST likely to be engaged in creative thinking?

- Accountant
- Graphic designer
- Architect
- Software engineer

In which of the following situations would creative thinking be inappropriate?

- Midway through a linear process
- When the company seeks to create a new marketing campaign
- When the company rewards creativity
- When someone's life needs to be saved in a novel situation

Lesson63: Techniques for Group Decision-Making in Business

Having groups of workers come together to tackle a problem is intended to create an environment where the best options are presented. Often used are the Nominal Group, Delphi and Brainstorming techniques. Explore how these three techniques are applied in group decision-making in business.

Group Decision-Making

Messy Chocolate Company's new cricket candy bar packed with real crickets and chock full of protein is a huge success! Consumers are clamoring to purchase the chocolate bar with crunch. It has received enormous press and social media buzz.

The CEO of the company is now requesting the marketing, engineering, and management groups to develop, produce, and promote another new chocolate bar. Each team has decided to try different techniques for group decision-making in order to try and develop the best new candy bar. Hopefully it will surpass even the success of the Cricket Bar!

Group decision-making is where a group of individuals are brought together in hopes of determining a solution to a problem. The marketing team's first approach in developing a new candy bar will be to try an approach where the team does not verbally discuss the bar.

Nominal Group Technique

In the nominal group technique, members do not discuss the issue and potential solutions verbally. Instead, the group uses a written process to develop and curate ideas. The advantage to this type of group decision-making is that no one member of the group can dominate, and it eliminates the interpersonal aspect, which can sometimes distract from the goal. The steps of the nominal group technique consist of:

- Team members write down their ideas to solve the problem.
- Each idea is cataloged, and no idea is discussed between members at this point.
- An open forum is held to discuss each idea with no negative input allowed.
- Members then vote secretly for the final solution.

Messy Chocolate's marketing team met in the boardroom and decided to try this technique first due to some abrasive personalities in the department who tend to try and orchestrate meetings. The team went through each step and ended up with a fantastic idea for a new chocolate candy bar from one of the quieter team members. The marketing team will present the idea for a popcorn chocolate bar to the CEO. The engineering team is meeting later in the day to try a different group decision-making technique.

The Delphi Technique

The Delphi technique consists of the use of surveys to develop a final solution. A team of experts create a survey that is administered to the team. After each round of surveys, new questionnaires are created and administered until a final solution is able to be rectified. This technique is good for creating numerous alternatives, seeking additional information, developing new ideas and gathering many expert opinions.

A company seeking ideas for new products wants to generate as many ideas as possible from a group. Which group decision technique will they MOST likely use?

- Nominal
- Delphi
- Brainstorming
- Multiple
- Diversified

What are the three types of group decision making?

- Delphi, Questioning, and Nominal
- Brainstorming, Storyboarding, and Multiple
- Nominal, Delphi, and Brainstorming
- Nominal, Multiple, and Diversified
- Investigative, Delphi, and Brainstorming

The marketing manager at Speedy Cellular has just sent her analysts a third survey about advertising ideas for a new cellphone. Which group decision technique is she applying?

- Nominal
- Brainstorming
- Delphi
- Integrative
- Business Questioning

Lesson64: Group vs. Individual Decision Making: When to Use Each

Deciding when to use group versus individual decision making involves the factors of power, complexity, and structure. Explore the idea of going with the herd, the advantages and disadvantages of decision making, and when to use each model.

Go With the Herd

Every time I watch an old Western on television, there is at least one scene of a cattle drive. All the cattle moving together in one direction, being herded in the destination the cowboys want them to go. On occasion, we see a cow break from the herd and go out on its own, and it is usually tracked down and brought back to the herd. Now, it may not seem like much, but in many ways, this is an example of individual decision making versus group decision making. That one lone cow thought to herself: 'I am going to go over here and get away from the group.' Until that point, every decision the herd made, that cow followed.

Advantages and Disadvantages

In business, decisions are an everyday occurrence. The challenge we all face is when to make decisions based on group input as opposed to making a decision on individual input. There are advantages and disadvantages to both concepts, and truth be told, neither is really right or wrong.

You see, if we make a decision as a group, we are getting a consensus, which a cohesive, agreeable decision is made by more than one person. This consensus takes into account the different viewpoints, backgrounds and perspectives of the individuals that made the decision. Truly, it is a team decision and one that can bring individuals in an organization together to fix a common problem. Contrary to that, we have consultation, and it represents one person getting feedback from the group but making a decision on his or her own. While we are still using a group to help us make a decision, the final decision is made by one person and not by the group, thus there is no consensus being reached.

One person can make a decision much quicker than a group, but the information used to make that decision is limited to that one person and his or her perspective on the issue. In some cases, that can be a positive, as the decision needs to be made quickly, or the decision only requires one person to be accountable for making it, thus a consensus is not required.

A cohesive, agreeable decision made by more than one person is called a:

- Consensus
- Consultation
- Complexity
- Challenge

A _____ represents one person getting feedback from the group but making a decision on his or her own.

- consultation
- consensus
- complexity
- challenge

When to use group or individual decision making really comes down to these factors:

- Power, Complexity, Structure
- Power, Consensus, Structure
- Sales, Marketing, Power
- Power, Consultation, Structure

Lesson65: Encouraging & Facilitating Positive Change

The world can be changed within the classroom, once the teacher encourages positive change. This lesson explains how to create and evaluate change as well as overcome obstacles.

Changing the World Within the Classroom

Before heading to school, you likely begin your day with a cup of coffee and the newspaper. Some reporting you may find interest in, such as stories in the gardening or sports sections. Of course, you can't miss the most recent crisis in the world. Whatever the catastrophe may be, you might believe there is nothing you could do to change the world. However, you CAN change the world. You just need to change the world within your classroom. As Taliban survivor and Nobel Laureate Malala Yousafzai once stated, "Let us remember: One book, one pen, one child, and one teacher can change the world." When students grow up in an environment that supports their beliefs and raises them to be good individuals, they will want the same in whatever environment they come across. Educators should encourage and even facilitate positive change within their classroom environment. By doing this, the crisis of the world could change, and individuals can start respecting one another. Teachers should never underestimate the power they possess within the classroom.

How Educators Encourage Positive Change

When it comes to changing school environments, it is important for all teachers to understand that it begins first in the classroom. If students are given support to be positive within all the classrooms, the students cannot help but be positive throughout the school. This seems easier said than done, but by following the steps listed below, it may be quite possible:

1) Be the Example: For students to become positive, they need to see what positive character looks like. If every teacher sets a prime example, students can model off their behavior whenever certain situations arise. For example, a teacher who is having a frustrating day can show patience and joyfulness to his/her students. This does not mean the teacher can never have a bad day. It just means that they should learn to control their feelings to help those around them. Students who see this example, especially the joy you give, will want to imitate this behavior.

2) Set the Boundaries: Just as the world needs laws to keep everyone safe, the classroom is no exception. When there are rules and expectations, students will have a safe environment where they feel support and love. Teachers should explain the rules and expectations at the beginning of the year. Also, rules and expectations should be simple, not complex. There is always a temptation to make a million rules that cover every aspect of life. However, this could make matters worse because the students may think you are policing them around rather than letting them live life. When writing rules and expectations, keep to less than 10 points and make sure they are positive. Never state, "Don't be unprepared for class." Rather, say "Be ready at the beginning of class." Positivity leads to better outcomes.

3) Help the students understand themselves and others: Most problems that occur within a classroom (or outside the school) are a result of students not understanding themselves and others. When problems occur, there is a lack of understanding about why the situation occurred. For example, Jimmy is isolating himself from his best friend. His best friend may think that Jimmy hates him. Rather, Jimmy is upset because his parents are going through a divorce. Teachers should encourage their students to understand others and themselves. One way to help students understand themselves is by taking a personality test that helps them understand why they love certain things and tend to take certain actions. Having students share their personalities will help each student see how different but similar other

students could be. Also, teachers should give students multiple opportunities to share their thoughts in a nonjudgmental setting. This allows students to express their thoughts and openly communicate to other students what their thoughts are, which in turn will create relationships among the students.

Evaluating Change

Some schools have decided to add character to report cards; many of the schools wanted to emphasize the importance of character within the classroom. Without positivity, effort with work and kindness towards others may be forgotten. When evaluating behavior, teachers should use a rubric, or grading criteria with number values, to score each student's attitude and effort. The rubric should show what teachers expect of students.

Where does positive change in the world need to begin?

- Government
- Foreign Countries
- Classroom
- Bad Individuals

Teachers should _____, a step that means educators should set a prime example on how to be positive in every situation.

- Be the Example
- Set the Boundaries
- Help the students understand themselves
- Help the students understand others

Expectations and rules should be _____.

- Negative and specific towards students.
- Positive and supportive of each individual.
- Critical and harsh towards students.
- Empathetic and unsupportive of each student.

Lesson66: Management Techniques & Group Process Skills for School Administration

In this lesson, you will learn how you can use group process skills, strategies, and methods to support a highly effective collaborative culture in your school.

Collaborative Counseling

Two heads are better than one. Is this always true? Some would argue to the contrary. However, when implemented successfully, collaboration between team members can have a positive impact on any organization. The truth is, one individual (no matter how intelligent or experienced) can't possibly see every possible perspective. This is why effective leaders solicit feedback from a variety of people before implementing change, challenging the status quo, or evaluating successes or failures of a program. By structuring the collaborative processes, leaders can capitalize on the diverse talents and perspectives of their teams.

What Are Group Process Skills?

Group process refers to how team members of an organization work together to complete an assigned task. Group process skills, therefore, are the skills that one demonstrates to successfully collaborate with other team members. These skills include: active listening, conflict resolution, decision-making, and direct communication. Today, you will explore some examples of group processes and ways in which school administrators can successfully influence change by demonstrating these skills.

Building Your Group

The first step is establishing the members of the group. In order to incorporate multiple perspectives, you must ensure that your group is comprised of a variety of individuals across your organization. Think about your objective first.

If, for example, you wanted to implement an employee recognition program, it would not be wise to develop a group or committee comprised only of school administrators. How will you capture what the employees really want? In this case, you should make sure that your group has at least one representative from each group of employees (teachers, paraprofessionals, janitorial services, cafeteria workers, etc.).

Develop Group Roles

The next step in the process is assigning roles within the group. Depending upon the need, you can have as many roles as you wish to assign. Following are some basic group roles and their correlating responsibilities.

Facilitator: The facilitator is the leader of the group. He or she guides the discussion, following the agenda for the meeting. Often, the facilitator is responsible for bringing copies of the agenda and any other necessary materials for the meeting. The school administrator does not have to serve as the facilitator.

Time Keeper: The time keeper is responsible for (you guessed it) keeping time throughout the meeting. This does not only apply to start and end times. A well-crafted agenda will include the estimated amount of time that should be spent on each item. The time keeper makes sure that this time schedule is followed.

Scribe: The scribe, or recorder, takes notes during the meeting. These notes are then transferred to meeting minutes. The scribe is responsible for sending out meeting minutes to the group. This keeps the group members informed and provides a way to track progress toward goals.

Conflict Miner: This role can be very important, especially when tackling sensitive subjects. Not all group members will agree on the approach to solve the problem or complete the objective. The conflict miner should be able to mediate between group members, all the while ensuring that the discussion is focused on solutions, not problems.

As the educational leader, it is your responsibility to assign these jobs and delegate tasks as you see fit. Consider every group member's strengths and weaknesses when you are assigning group roles. If, for example, you have a group member who is very reserved and hesitant to lead a conversation, it would not be wise to assign this employee the facilitator role. Likewise, a highly combative person would not likely be a very good choice for the role of conflict miner.

You may not have a job for every committee member. That's okay. These roles can be consistent or fluid, depending upon the characteristics and needs of the group.

Group Process Methods

There is a wealth of information available about different group process strategies. Following is a list of group process methods, which can be implemented with relative ease.

Interactive Brainstorming

Interactive brainstorming is a technique through which collaborative decision-making takes place. During an interactive brainstorming session, group members make spontaneous suggestions and comments about how to achieve a particular goal or solve a problem. The agenda is generally vague, promoting creativity and limiting restrictions in their thought processes.

Which of the following is NOT an example of group process skills?

- active listening
- conflict-making
- decision-making
- conflict resolution

When considering group roles, the _____ is the leader of the group.

- Facilitator
- Administrator
- Time Keeper
- Conflict Miner

The _____ is able to mediate between group members, all the while ensuring that the discussion is focused on solutions, not problems.

- Scribe
- Conflict Miner
- Time Keeper
- Facilitator

Chapter10: Curriculum

Lesson67: What is Curriculum & Instruction?

A curriculum is the academic material that is being taught through the act of instruction, typically involving a teacher presenting material to a group of students. Explore the significant role that both of these concepts play in implementing education.

Curriculum and Instruction in Schools

What is curriculum? What is instruction? Have you ever wondered about these two concepts? What we choose to teach in the classroom is based on curriculum. How we teach it is the instruction. That seems simple enough, right? Not as simple as it looks. Curriculum and instruction are elements that can change from one school to another, across school districts, across states, and even internationally.

Curriculum

What will my daughter's first grade teacher teach her this school year? This question can best be answered by understanding the term 'curriculum'. Curriculum is defined as the lessons and academic content taught in a school or in a specific course or program. There are varying forms of curriculum that help us understand its purpose more.

Imagine Sally is in her first year of teaching, and she has to make some curriculum decisions that will impact what happens in her classroom. When she reviews the state and local school systems' written curriculum, she gets an understanding of what she is expected to teach to her students. The written curriculum provides many details that outline the standards and learning objectives for that given school year. Additionally, she also has the opportunity to learn what supported curriculum is in place. The supported curriculum includes the textbooks or multimedia resources that can be used to teach her students. If Sally has Web-based resources that she can use daily to help students practice math facts, then that is an example of the supported curriculum. More curriculum considerations for Sally include the tested, taught, and learned curriculums. When Sally considers the information that students will be tested on, she is focusing on the tested curriculum. Testing that is designed by her, the district, or the state all play a part in the tested curriculum. Therefore, Sally must sometimes teach what she knows may be on an upcoming assessment. What Sally ultimately chooses to teach every day in her classroom is taught curriculum. From one classroom to another, this type of curriculum may vary. And lastly, what the students ultimately learn will be the learned curriculum.

Each of these curriculum types play a major role in the classroom. Understanding how each of them work, helps teachers make better classroom decisions.

Which of the following is a type of instruction method?

- Indirect
- Recommended
- Tested
- Taught

What teachers will teach depends on:

- Instruction
- Curriculum
- Individual ideas
- Colleagues

What is described as the act or practice of teaching?

- Curriculum
- Studying
- Instruction
- Differentiation

Lesson68: What is Curriculum Design?

Curriculum design is a teaching tool used to keep the main objectives and goals in mind without addressing the less quantifiable day-to-day needs of students. Learn the nuts and bolts of curriculum design, how to use it to see the big picture of classroom education, and explore its relation to the individualized teaching of children.

Curriculum Design and Teaching

Mr. Eliano is a fourth grade teacher who works at a public school in Illinois. He has been teaching for a few years, and he loves his job. He has great relationships with students and families, and his classroom management is wonderful. But, Mr. Eliano gets confused when it comes to curriculum. Sure, he can construct lessons on a day-to-day basis, but he struggles with the big picture. Mr. Eliano sits down with colleagues and supervisors to ask what curriculum design really is. Let's follow his journey as he seeks out the answer to this important pedagogical question.

Curriculum Design and Seeing the Big Picture

First, Mr. Eliano talks to his colleague Mrs. Chang, who has been teaching second grade at his school for more than a decade. Mrs. Chang tells him that the most important thing about curriculum design is to remember that it involves seeing the big picture. Mr. Eliano wonders what that really means. Mrs. Chang explains that when she designs a unit, she thinks in terms of what she wants her students to be able to know and do after the entire unit is over. She also checks herself by asking why these pieces of knowledge or skills are important. If she can't answer that question, she goes back to the drawing board. Mr. Eliano wonders why Mrs. Chang skips straight to the end of the unit, instead of thinking about what her students will learn that day. Mrs. Chang explains that the day-to-day planning falls into place much more easily once you have sketched out the big picture. She tells Mr. Eliano that some people call this method backward design, where you start at the end and work backwards to think about what particular activities and experiences will start moving your students toward where you hope they will be. Mrs. Chang reminds her colleague that if you don't have a big picture or end goal in mind, you might lose track of your own purpose. If you don't know where you're going, it's really hard to help your students get there!

The Nuts and Bolts of Curriculum Design

After his chat with Mrs. Chang, Mr. Eliano feels really excited to get started with designing a curriculum. In fact, he has been thinking about designing a unit around literature circles. He decides that his students will work on the following goals:

- They will listen to each other and respond in kind.
- They will be able to write a complete paragraph about a book.
- They will be able to describe to one another how characters have changed over the course of the book.

Thanks to Mrs. Chang, Mr. Eliano really feels like he understands the big picture. His curriculum will have purpose and a sense of direction. When he sits down with his lesson planner, though, he realizes he is stuck again. What comes next?

Mr. Eliano goes to talk with his administrator, Principal Kaplan. Principal Kaplan compliments Mr. Eliano on his clearly defined goals and his creative ideas. She reminds him, though, that curriculum is also about remembering the nuts and bolts of learning. For instance, there's a vacation coming up in a few weeks, and Mr. Eliano needs to decide whether he wants to finish this unit beforehand. He needs to think about how much time his students will spend on reading every day, and whether the unit will include homework. Will families be involved in this unit? Will other teachers or specialists play a role?

What does it mean to see the big picture in curriculum design?

- It means you should know exactly what you're going to teach each day.
- It means you should have some end goals in mind.
- It means that you should plan a big project for the end of the unit.
- It means you should always work collaboratively with other teachers.

Why is scheduling, such as creating a planning grid, relevant to curriculum design?

- When you design curriculum, you should think about how much time you have to devote to it.
- Curriculum design works better if you do it toward the beginning of the week.
- You should always leave plenty of time in your schedule to design your curriculum.
- You should design your curriculum on a regular schedule each week or month.

What should a teacher do when students' behavior disrupts her or his carefully designed curriculum?

- You should punish those students.
- You should rewrite your entire curriculum because it's clearly not well-designed.
- You should meet with those students' parents about moving them to another class.
- You should modify your curriculum to meet those students' needs.

Lesson69: Curriculum Planning Process & Development

Curriculum planning and development strategies are essential tools for teachers who must meet educational standards that vary from state to state. Learn more about curriculum planning and development, different standards for curriculum development, and the need to create annual lesson plans, unit lesson plans, and individual plans.

Preparation and Planning

When Mr. Nelson walks into his classroom at the beginning of the year, there are dozens of things for him to do. He needs to set up his classroom, organize supplies, put posters on the wall, arrange desks, decide on an appropriate behavior system, and most importantly, plan his curriculum. Curricular planning and development, the process of looking at the standards in each subject area and developing a strategy to break down these standards so they can be taught to students, varies according to grade level, subjects taught and available supplies.

In many districts, schools supply a complete curriculum in core subject areas, filled with teacher resources and student workbooks. In other districts, teachers are given a list of state, local or Common Core standards and asked to develop their own curriculum. Regardless of subject area or grade level taught, there are a few important factors for teachers to consider as they plan their curriculum, including standards and the breakdown of course material.

Standards for Curriculum Development

When planning and developing curriculum in any subject area, the first place to start is state, local or Common Core standards. Standards vary from state to state, and teachers are expected to know which standards to teach and how to teach them. Every lesson and unit should be tied to standards, and every grade level standard should be addressed at some point during the course of the school year. Standards should be presented sequentially, so students can build on previously learned skills.

Each subject area has specifically defined standards, but many times multiple standards are addressed within one project. For example, if a sixth grade student writes a research report on Thomas Jefferson, that student could be addressing reading, writing, and research and history standards, all within the same assignment. Such opportunities are beneficial for students because they demonstrate the overlap in various subject areas and give students the chance to synthesize their learning. The example below shows how a history research report could hit six or more standards at the same time.

Annual Lesson Plans

Planning curriculum has many layers and can be tedious at times. It's best to look at the standards that are required and start with a yearly plan. Students are expected to master several standards in every subject area, so having a general plan for the year that outlines the order in which skills will be introduced, instructed and repeated is important.

It would be helpful to have a calendar available to set up a timeline as a visual aid. Teachers who instruct all core subject areas and those who teach only specific subjects will likely approach this task differently. An elementary school teacher might find opportunities to hit standards in multiple subjects at once more often than a high school math teacher. With that said, there are often opportunities for cross curricular instruction in all subject areas.

To begin designing a yearly plan, an elementary teacher could start by looking at an individual subject, such as math, and sort through the resources provided by the school district. Oftentimes, teachers are given a textbook to use as a guide for instruction. However, textbooks are written for use in dozens of states and districts, so it's important for a teacher to examine the textbooks provided and look for which standards are addressed and which standards will require supplemental materials. Then, teachers can begin to plan accordingly.

Let's consider Mr. Nelson, a third grade teacher. As he is developing an annual plan for his math class, he would read through the standards and curriculum provided and plan his instruction from there.

When planning a curriculum, what should a teacher consider first?

- Individual lessons
- Instructional units
- Standards
- Supplies available

Curriculum planning and development is the process of looking at the _____ in each subject area and developing a strategy to teach them to students.

- important points
- most important information
- topics
- standards

Which of the following describes a reason why teachers should plan cross-curricular units or lessons?

- To help students synthesize their learning
- To make lessons look more complete for administrative review
- To make less work for themselves
- All lessons should be subject specific, not cross-curricular

Lesson70: Types of Curriculum Models

Curriculum, the methods and plans teachers use to determine how they will educate students, are designed after different models. Identify their components and the differences in product and process models, examine specific model frameworks, and see examples of popular models.

What Are Curriculum Models?

To understand curriculum models we need to take a step back and talk about curriculum itself. **Curriculum** can be defined as a plan used in education that directs teacher instruction. Many districts and schools use a tool designed to help teachers pace their lessons, called a **curriculum guide**. But a curriculum and a curriculum guide don't just come out of thin air. Time and energy goes into the creation of these documents. This process is known as **curriculum development**.

All of these things are based on a **curriculum model**. A model is really the first step in curriculum development. A curriculum model determines the type of curriculum used; it encompasses educational philosophy, approach to teaching, and methodology. The good news is, unless you've been hired to design curriculum, you won't come across many curriculum models. However, it's good for educators to be familiar with the models used in their schools.

Key Curriculum Components

Curriculum models have five areas they define, each looking at education from a different slant. The focus concept looks at a subject or a student and centers instruction on them. The approach component is a traditional or modern method and looks at the type of instruction that will be used. In the content component, a slant towards a topic-based or content-based is used, asking how units or strands will be written. The process structure looks at assessment: formative or accumulative. Finally, structure components focus on the system of review, determining how the curriculum will come up for revision.

Product and Process Models

Curriculum models can be broken down into two very broad models, the **product model** and the **process model**. Luckily, these two models are just as they sound.

- **The Product Model** - You may see this in portions of your curriculum. This model is focused on results, like grades or reaching an objective. The majority of the weight is focused more on the finished product than what is happening in the learning process.
- **The Process Model** - Conversely, this process model focuses on how things happen in the learning and is more open-ended. Curriculum focusing on the process model emphasizes how students are learning, what their thinking is, and how it will impact future learning.

Curriculum Model Frameworks

To dive in a bit further before we look at specific models, let's talk about how some curriculum models are framed. Five broad categories can be used to define the focus of curriculum models:

- **Subject- or discipline-centered** - In this framework, the curriculum is organized around subjects, like math or science.
- **Integrated** - Just like it sounds, this framework pulls many subjects together. We see this model used in problem-based learning and experiential learning.
- **Spiral** - In this framework, the content is presented several times across the span of the school year. Seen mostly in math, using this design allows students to be introduced and then revisit material often.
- **Inquiry- or problem-based** - Not to be confused with integrated models, this curriculum focuses on a central problem or question. In this frame, all curriculum is problem-based, while in integrated it may or may not be.

- Experiential - Using this framework allows students to participate in real-life ways with their work such as, experimenting with hypothesis, working through problems, and finding solutions.

You may recognize some of the above frames in your own lesson plans. Now, let's look at three models we also see in our current curriculum.

Popular Curriculum Models

There are countless models of curriculum, many of them blends of several styles. There are, however, two main models looked at as the basis for all curriculum. And to make things easy for us, each is named after its creator.

The Tyler Model

The Tyler model was created by Ralph Tyler in 1949. He guided his model with four questions:

1. What educational purposes should the education strive for?
2. What educational experiences can be provided to attain these purposes?
3. How can we organize these educational experiences?
4. How will we know if these purposes are being attained?

What is curriculum?

- the stuff teachers teach
- a guide for how teachers should behave
- a philosophy of instruction
- the method of instruction

What is the function of curriculum models?

- to organize what to teach and when
- to provide a framework for curriculum guides
- They serve no function.
- They are outdated and don't serve a function.

Which of the following is true about the Tyler model?

- It puts an emphasis on teachers
- It puts an emphasis on administration
- It outlines four major questions

Lesson 71: What is Core Curriculum?

Core curriculum refers to the classes and coursework that all students are expected to take, regardless of their educational goals. Learn about core curriculum, including its definition, meaning, and repetition as a curriculum standard. Understand the government's requirements as they pertain to common core, the core curriculum required in all schools throughout the U.S.

Repetition Is a Curriculum Standard

Normally, on the first day of school, teachers will not hand students a comprehensive sheet that lists all categories and subcategories of what they will learn during the semester and year. All of these categories are just too overwhelming (sometimes for teachers as well as students). Instead, curriculum content expectations emerge as topics are covered and connections are made.

Jared, one of Ms. Berger's 8th grade students, asks why they are learning about protagonists again. He explains to Ms. Berger that they learned about protagonists last year. Miss Berger smiles and explains to the class that each year they may see some repeat topics, but it is because each time they cover a topic, they will go a little more in depth with the topic. She explains that, 'Each year we will read different, higher-level books, going a little more in-depth into all the devices and terms used to understand what we read.'

This is true of the core curriculum. These are the main topics or learning domains that kids will learn about each year. Each year they will dive deeper into a topic as they are able to learn more detailed and complex information about the topic.

The Meaning of Core

The simple definition for the word core is central, and this perfectly describes the intention of core curriculum. While unlimited sets and subsets of new information are available to learn between kindergarten and college, the core curriculum movement has organized all those items that educational researchers have determined are best learned at each grade level and decided which concepts are central to the learning experience. It is important to note that core curriculum is what is taught, not how it is taught.

What Is Core Curriculum?

Content for each grade is not mutually exclusive, which means students don't visit it just once. Instead, the units or domains are taught in a spiraling fashion year to year. This means there is an increasing focus and difficulty, and instructional units wrap back around a concept many times, building upon what becomes prior knowledge. Students take frequent informal and formal diagnostic quizzes, known as formative assessments, to determine their degree of understanding before the introduction of new material. More thorough summative assessments, or tests, are given at the end of a course, a semester, or a complete school year to ensure students are ready to progress.

Once students reach grades 9-12, United States schools have traditionally separated student content in mathematical and language arts domains into titled courses that group the domain information accordingly. For example, elementary and middle school students are introduced to such literature topics as fiction, nonfiction, plot and theme. However, once in high school, these topics are driven by universally accepted, fundamental authors and teacher-selected content to ensure knowledge acquisition. This design is intended to mirror content delivery in higher education courses as well as career-based expectations.

In education, core curriculum:

- delivers quality standards and expectations
- builds in levels of difficulty from kindergarten through grade 12
- delivers the expectation of what needs to be learned and in what order to ensure academic success
- All answers are correct

In education, the rationale for spiraling content is _____.

- to allow students to build on prior knowledge in increasing levels of difficulty
- to simply develop the list of all the things students need to learn - the order is not important
- its use as an organizational tool
- not entirely clear

The suggestions and decision for content inclusion in core curriculum other than English language arts and mathematics originates with:

- professional subject-based organizations and committees
- local teaching teams
- research-based analysis via content teams
- All answers are correct

Lesson72: What is Creative Curriculum?

A creative curriculum is a curriculum where students learn through active and creative methods. Discover how adding engaging activities and creating continuity can boost your creative curriculum in this lesson.

Making a Curriculum Creative

Curriculum is the knowledge, skill, and concepts that children learn, implicitly as well as explicitly, as a result of direct instruction. Creativity is the use of innovation, enthusiasm, and individuality. So what do creativity and curriculum have to do with one another? Simply put, a creative curriculum is one in which students learn through creative and active teaching strategies. Creative curriculum gets beyond rote learning and focuses on big ideas, interesting projects, and individual students' passions and needs. Often when we think of creativity, we think about tangible art, such as literature and music. These things can be an important part of a creative curriculum, but just about every element of a curriculum can be approached creatively, from science to math to history.

A creative curriculum is all about focusing on big concepts or ideas. For example, let's say you're working on a science curriculum about plants and how they grow. It's important for students to learn the stages of photosynthesis. Depending on their age range, you may want students to memorize things such as what a plant needs to survive, or even different types of plants, or plant reproduction. But a creative curriculum isn't really about memorizing facts. Instead, a creative curriculum is one that is oriented toward what is conceptually important. Take a few minutes to jot down what concepts about plants you think might be important to the age group you work with. Some examples of big ideas might be things like:

- Plants have things they need in order to survive.
- Different plants grow in different places, and this happens for a reason.
- There are different categories of plants.

Once you have pinpointed three to five big, abstract ideas that outline your curriculum, you will be better prepared to get creative with specific activities.

Engaging Activities

A creative curriculum should include engaging activities that captivate students' attention and work to formulate an understanding of the big ideas. Of course, you could stand up in front of your students and lecture them about the attributes of plants. Or, you could get creative. Take them on a neighborhood walk and ask them to sketch and observe the plants they see. Borrow botanical guides from your school and local library. Build time into your lessons to go online and do virtual learning modules pertaining to plants. In general, the more varied activities you can incorporate into a unit of study, the more creative your curriculum will be. Varied activities will also appeal to and engage different types of learners.

If you have trouble coming up with ideas for activities, here are some starting points:

- Get outside of your classroom or school building.
- Incorporate art, music, and/or movement.
- Incorporate dramatic role plays and other performances.
- Invite guest experts, family members, or other outside speakers.
- Incorporate technology in appropriate doses.

These guidelines can be great starting points for developing activities, whatever the topic you're exploring might be.

Which of the following is an example of creativity?

- Feeling passionate about your subject
- Drawing a beautiful picture
- Thinking outside the box with lesson plans
- All of the answers are correct

Memorization:

- Is the key to a creative curriculum
- Is the most important aspect of learning
- Is usually not the most creative part of a curriculum
- Is what teachers should really focus on helping students with

Why are big ideas important in curriculum planning?

- They can help you figure out what's most important about a curriculum.
- They can help you get students to memorize information faster.
- They will justify your curriculum to parents and administrators.
- They are the key to developing good assessments.

Lesson73: Multicultural Curriculum & Instruction Development

Developing a multicultural curriculum and inclusive instruction will meet students' diverse needs. Explore the development of multicultural curriculum and implementation of inclusive instructional strategies through the use of resources and cultural influences.

Parts of Multicultural Curriculum

You've heard of the melting pot, right? Well, it's time to make some soup! Imagine yourself living in a place that was not native to you where you went to school and learned in a culture that was completely different than your own. This scenario is what some of our students experience in schools today. Culturally responsive methods of teaching make learning accessible. In other words, it makes the content realistic to what students encounter on a daily basis through their own heritage. The material is presented familiarly and is integrated across all subjects. Developing multicultural curriculum can be as easy as adding a little salt to your soup with a simple addition, to as much work as putting more meat and potatoes in your soup with larger changes.

Consider these scenarios:

- **Minor Addition** - Students scratch the surface and get to know different cultural contributions through learning about diverse cultural holidays. Students learn about important people of diverse cultures such as Cesar Chavez and Barack Obama.
- **Major Addition** - Without changing curriculum, themes and concepts are added, such as incorporating a culturally relevant topic related to the primary objective. For example, if teaching a reading unit about myths and folktales, you could include a Chinese myth. Students often find it difficult to make a connection with the overall unit.
- **Complete Change** - Curriculum structure changed to reflect different cultural perspectives. Students view what they're learning through the eyes of others who may not share the same cultural identity. For example, students learn about a topic through first-hand accounts from people who live in different parts of the world.

Multicultural Curriculum Resources

Every good chef has a kitchen full of tools, as every teacher should have just the right resources when developing multicultural curriculum. There are some ways to get started with developing a multicultural curriculum in your classroom. Tap into available resources to help you implement a multicultural curriculum. Try to go above what the textbook has to offer and look for resources to help you. Think about using news and events that pull from the outside world and diverse cultures. Ask students to work on a multicultural project in a background different than their own. Beg your principal for multicultural education professional development for your school and engage the community for participation and ideas. You can also do an independent study using materials such as the following:

- The National Association for Multicultural Education, which assists teachers with resources to help with diversity in education.
- The book *Becoming Multicultural Educators* by Geneva Gay
- The book *Beyond Heroes and Holidays* by Enid Lee

Mrs. Engel integrated the Chinese abacus into her math class because she has several Chinese-American students and some of the parents requested that she offer it to students. When developing her multicultural curriculum, what kind of change did she make?

- She made a complete change, in which students begin to think about a concept through another cultural perspective.
- She made a major addition, in which the curriculum is not changed, but a culturally relevant topic is added to the content.
- She made an inclusive change, in which the parents are included in the curriculum development.
- She made a minor addition, in which students begin to learn about cultural contributions.

Which are some inclusive instructional practices a new teacher can use to meet the needs of culturally diverse learners?

- use only paper and pencil tasks all day
- cooperative learning, dialogue, and student teaching
- tests, quizzes, and multiple choice questions only
- whole group and independent practice

Mr. Natalicio is teaching about theme in literature but is only using texts by Hispanic and Latino authors. What type of multicultural curriculum has he developed?

- A complete change because students are learning the concept through a different cultural perspective
- A minor addition because the only change was around the books so students only scratch the surface
- A minor addition because the complete curriculum has been changed to reflect a different culture
- A complete change because the objective of the original lesson has changed from the original intent

Lesson74: Using Integrated Curriculum to Prepare Students for the Real World

While the concept of integrated curriculum has been in practice and studied in educational circles for over 100 years, it has recently become a buzzword for teachers and administrators. Learn why adopting an integrated curriculum can be an effective approach for teachers and how to implement integrated lessons in your classroom.

Why Integrated Curriculum?

Adopting an integrated curriculum approach allows students to learn and retain information at a faster pace by helping them make connections between subjects and providing real-life applications of curriculum. This can make it a valuable tool for teachers facing challenges including:

Between implementing Core Curriculum and preparing students for high-stakes standardized testing, teachers have more to teach in less time.

The push to raise math and reading scores in many districts has slashed classroom time for social science, humanities and science instruction.

Today's typical classroom includes English language learner students as well as students with differing learning styles and abilities who require different methods of instruction to ensure comprehension and retention of subject material.

Teachers are being asked to not only teach their prescribed curriculum, but also to help prepare students for the modern, global job market where employers are looking for candidates with top-notch written and verbal communication, problem-solving, project management, and leadership skills.

Example of Using Integrated Curriculum in an Interdisciplinary Unit Unit on Ancient Greece

Have students research the life of a famous Ancient Greek mathematician (Reading/Research), write a short biography of the mathematician (Composition), and then create a cover for their book using crayons or collage materials (Art).

Discuss how the mathematical theories of Pythagoras influenced the building of Ancient Greek temples (Math), show pictures/videos of how the temples looked when they were built and how they appear today (History), and then have students build small structures out of blocks, clay, or other materials using the Golden Ratio (Art).

In groups, use theories created by Ancient Greek Pythagoreans to solve geometry problems (Math). Study the observations of Pythagoras on how music can be translated to mathematical equations (Math) and listen to examples (Music).

Lesson75: What is Curriculum Mapping?

In this lesson we will discuss what a curriculum map is. Topics we will cover include what to include in a curriculum map, who writes a curriculum map, and what things to consider when writing a curriculum map.

Road Trip

Imagine going on long road trip with no GPS. You have written down which route numbers you need to take, but you don't know in what order the turns should be made or how long you need to stay on each road. It probably wouldn't be a very successful road trip! Knowing the order of the turns and how long to drive on each road would help you reach the final destination much more efficiently.

Essentially, in education, that is what a curriculum map does. Such a map provides a teacher with an understanding of the order in which the major units of study should be taught. It also dictates how much time should be spent teaching each state standard in order to fully cover the required information in the time available. Most importantly, it helps teachers plan to complete their instruction before end of the year or the standardized tests.

Curriculum Maps

In the same way that different GPS and mapping systems vary, there is no standard format for a curriculum map that is widely accepted, although a chart layout is commonly used. Each school district may have its own requirements for a curriculum map or teachers may be allowed to create their own in whichever format they desire.

However, regardless of the format, there are essential pieces of information that will be included in every curriculum map. These components include the order in which units of study should be taught, state standards that are covered in those units, and approximate amount of time to be spent on each topic.

Some curriculum maps are very detailed and also include a resources section with references to corresponding textbook chapters, books, lab equipment, and websites for more information. An activity section might also be included on a curriculum map with specific lesson ideas within the major ideas. A few other sections that might be included are skills, essential questions, and assessments.

The authors of such maps vary widely, as well. Some states provide a sample curriculum map with an example of the order in which the standards could be taught. Other districts, especially large ones, may employ district or school level specialists for each of the core subjects whose job is to make curriculum maps for each grade level. The subject area department chairperson in secondary schools may design the maps or, within a school, a group of teachers may work on designing maps together. In some cases, if there is only one teacher assigned to a certain course, he or she could even write the curriculum map for that class!

Things to Consider

When deciding how much time to spend on a particular unit or standard, it is important to consider both the complexity of the topic and the percentage of the standardized test that will address that topic. State education departments usually publish standardized test guides with this information.

For example, let's imagine that in a life science class, the scientific method has been previously taught to students and the map indicates that most of the unit should be a review of previously-learned material. Separate from the scientific method, mitosis (a process of cell division) is an entirely new concept for students. However, the standardized test spends 30% of the questions on scientific method and only 10% on cells. Even though the scientific method should be a previously known concept, a bit more time should be spent on it to make sure students fully remember it due to the weighting of the test, even if the curriculum map recommends spending more time on mitosis.

What information does a curriculum map provide to teachers?

- The general order and pace of the curriculum.
- The instructional level of the students in the class.
- A detailed description of the state standards.
- A summary of how students have performed on past standardized tests.

What information could be included on a curriculum map?

- Resources
- Assessment ideas
- Essential questions
- All of the answers are correct.

Which statement is correct?

- Curriculum maps are always written by district content specialists.
- Curriculum maps are always written by the state.
- Curriculum maps are always written by individual teachers.
- District content specialists, school department chairs, a group of teachers teaching the same subject, or an individual teacher could all write curriculum maps.

Lesson76: Curriculum Implementation: Steps & Challenges

As teachers, we are sometimes tasked with implementing a curriculum that has already been developed. This lesson outlines some typical steps and challenges in the curriculum implementation process.

What It Means to Implement Curriculum

All of the teachers in Mr. Simpson's district are excited. Last year, a committee at the district level came together to choose a new math curriculum. The curriculum is evidence based, and all teachers and students are provided with the materials they need.

Mr. Simpson, a fourth grade teacher, is thrilled to have a solid curriculum in front of him, but now he is starting to worry about implementing it properly. He and some colleagues come together to learn more about curriculum implementation, or what it means to put a curriculum into practice.

Mapping Curriculum On to Time

First of all, Mr. Simpson realizes that he will have to do some careful mapping, or determining how the curriculum will fit within the calendar of the school year. After getting to know the curriculum well, he determines how much time he has to devote to each unit.

Then, he figures out how much time within each unit he can grant to each lesson in the unit. He tries to leave some wiggle room, accounting for the fact that unknown obstacles sometimes come up in schools.

Mr. Simpson takes care to try to end units before vacations as well.

Considering Your Students

One of Mr. Simpson's colleagues points out that it is hard to implement a curriculum properly without knowing the specific students you will be teaching! Mr. Simpson heartily agrees. He tells his colleague that while their map will serve as an outline, only after getting to know their students well will they be able to determine how much time they need for each lesson.

Mr. Simpson plans time for informal assessments at the beginning of each unit in the curriculum, and a slightly more formal assessment at each unit's close. As he begins to implement his curriculum, he sees that some students will require modifications, or altered goals that are either more or less advanced than those of their average peers. A strong curriculum often offers ideas for modifications.

Mr. Simpson also learns that some of his students need accommodations, or adjusted processes that will help them achieve the goals of the curriculum.

Knowing his students well and considering their needs, learning styles, strengths and struggles helps him implement the curriculum effectively. He strives to remain flexible and make adjustments in his map over time.

Mr. Simpson is also careful to document, or keep track, of the adjustments he makes, so that he does not have to reinvent the wheel next year.

Communicating with Families

Another important aspect of curriculum implementation is communication with families. Particularly at the elementary school level, it is important to keep family abreast of curricular goals and instructional methods. When families understand the curriculum, they are better positioned to support their children at home.

Understanding a curriculum also helps parents trust in the school and maintain an open conversation with teachers about their children, their values, and their needs. Families sometimes surprise Mr. Simpson by having expertise of their own to contribute to his curriculum!

What is curriculum implementation?

- Developing a curriculum
- Assessing a curriculum
- Discussing a curriculum with families
- Putting a curriculum into practice

What might you do when mapping out a curriculum?

- Talk to colleagues about assessment
- Consider your students' special needs
- Develop strong essential questions
- Look at your district's calendar

What is a modification?

- An altered goal for a specific student
- A way of scaffolding a child's attainment of goals
- A strategy for mapping curriculum
- Another word for implementation

Lesson77: Curriculum Evaluation: Process & Models

Curriculum evaluation is the process of examining the content of a curriculum to determine its impact on student achievement. Explore the process and models of curriculum evaluation and understand why evaluation of curriculum is necessary.

Is the New Curriculum Any Good?

Mrs. Brown is a math teacher at a local junior high school. Her school has recently adopted a new math curriculum, and Mrs. Brown has her doubts as to whether or not the choice of curriculum was a good one. Several of the parents have also expressed their concerns. Mrs. Brown is in need of a method for evaluating the effectiveness of this new curriculum. She is looking to conduct a curriculum evaluation.

What Is Curriculum Evaluation?

The purpose of curriculum evaluation is to determine whether or not the newly adopted curriculum is producing the intended results and meeting the objectives that it has set forth, and it is an essential component in the process of adopting and implementing any new curriculum in any educational setting. Another purpose of curriculum evaluation is to gather data that will help in identifying areas in need of improvement or change.

Why Is It Necessary?

There are several parties, or stakeholders, interested in the process and results of curriculum evaluation.

- Parents are interested because they want to be assured that their children are being provided with a sound, effective education.
- Teachers are interested because they want to know that what they are teaching in the classroom will effectively help them cover the standards and achieve the results they know parents and administration are expecting.
- The general public is interested because they need to be sure that their local schools are doing their best to provide solid and effective educational programs for the children in the area.
- Administrators are interested because they need feedback on the effectiveness of their curricular decisions.
- Curriculum publishers are interested because they can use the data and feedback from a curriculum evaluation to drive changes and upgrades in the materials they provide.

In the end, the goal is always to make sure that students are being provided with the best education possible. Because the curriculum is a huge part of this, curriculum evaluation is a means of deciding whether or not the chosen curriculum is going to bring the school closer to that goal.

Models for Curriculum Evaluation

Let's take a closer look at several of the models available for curriculum evaluation:

The Tyler Model

The Tyler model, a curriculum evaluation model that takes into account information from the active learner and pays close attention to how well the goals and objectives of the curriculum are supported by the experiences and activities provided, was named after its creator, Ralph Tyler, and focuses on four main areas:

- The purpose of the curriculum being evaluated (the objectives)
- The experiences that are provided to support that purpose (the strategies and content)
- How these experiences are organized (organization of the content)
- How the outcomes are evaluated (assessment)

It has been criticized, however, for its simplicity and because assessment is a final step rather than an ongoing part of the process.

The Taba Model

The Taba model, a curriculum evaluation model emphasizing inductive reasoning, was created by Hilda Taba who believed that true curriculum should be developed by the teacher, rather than decided upon by administration or another authority. The Taba model, also called the "Inductive Approach," uses a series of stages or steps, which can be applied in both the development and evaluation of curriculum. These stages are:

1. Deciding on objectives
2. Selecting content
3. Organizing content
4. Selecting learning experiences and activities
5. Organizing learning experiences and activities
6. Deciding what and how to evaluate

Stake's Model (Countenance Model)

In the 1950s, Robert Stake formulated the Countenance model, also known as Stake's model, which looks at curriculum from a more scientific point of view by examining three distinct areas of the curriculum. The Stake Countenance model is often used as a framework for evaluation. This model involves two major operations or countenances which are complete description and judgement of the program. The Stake model provides a framework for evaluators in collecting, organizing and interpreting data.

Stufflebeam's CIPP model

The CIPP model was created in the 1960s by Daniel Stufflebeam and is considered a decision-oriented model that systematically collects information about a program to identify strengths and limitations in content or delivery, to improve program effectiveness or plan for the future of a program.

What is the purpose of curriculum evaluation?

- To find a second, supplemental curriculum
- To follow a model for curriculum reform
- To determine whether or not new curriculum is meeting the objectives it says it will
- To develop new students assessments for use in the classroom

In the CIPP curriculum evaluation model, CIPP stands for:

- Context, input, process, product
- Content, input, product, presentation
- Content, instruction, practice, presentation
- Context, instruction, practice, portfolio

Which curriculum evaluation model is also known as the Countenance Model?

- The Tyler Model
- The Taba Model
- Stake's Model
- Cronbach's Model

Lesson78: Refining Curriculum to Promote Student Learning

Have you ever encountered curriculum that caused more headaches than it cured? This lesson outlines strategies teachers can use to refine curriculum after it has been implemented.

A Refined Curriculum

No matter which subject you teach, finding the perfect curriculum is likely impossible. The sheer diversity of learning styles and student personalities in a classroom practically guarantees that there is no one-size-fits-all lesson plan or content. However, there are several ways that you can refine your existing curriculum to promote student learning.

If you can't personally choose the curriculum you use in class and instead have to use materials chosen by your school administration, you may find yourself in a position where you need to make the best of a bad situation. The first step you should take is to assess the curriculum at your disposal. Hopefully, you will have some discretion of which elements of the material to keep and which elements can be ignored or given less precedence.

One of the best tools you have at your disposal is the ability to evaluate how students react to curriculum through classroom observation, exam scores, and homework assessment. If you notice upward or downward performance trends using these criteria, you'll be better able to make the needed curriculum refinements.

Curriculum Refining Strategies

It's important to keep in mind that no matter how much you may dislike the curriculum you are using, don't let students know this. If you make comments deriding the curriculum, students may be turned off when you attempt to deliver the content you have already identified as being poor. Students should feel confident in the materials and information they receive in class, and publicly airing any curriculum grievances you have can quickly reduce student confidence and engagement.

When you are faced with classroom curriculum that is less than ideal, it's up to you to make the best of the situation to ensure that student learning is promoted. The strategies outlined below can be used both individually and in tandem depending on your needs and the type of materials you are trying to refine.

Refine the Pace

If you find yourself in a situation where the curriculum is either too advanced or too easy for your students, don't be afraid to slow down or speed up the pace at which you deliver the content. For example, if a lesson that is scheduled to take one day will actually take two days, it's better to slow down and have students understand the material rather than make them confused by going too quickly. If you have to stick to a specific timeline, consider the following time-saving techniques:

- Ask students to pre-read material before the lesson.
- Make homework assignments shorter.
- Provide students with an outline of the key content and main points of a lesson.

By using time flexibility, you can make the curriculum fit into your schedule, instead of the other way around.

Remove the Excess

If you won't have enough time to cover the entire assigned curriculum in a quarter or semester, you may need to think about which lesson's unit components need to be removed. Your ability to skip certain parts of curriculum will depend largely on which subject you are teaching. For instance, the curriculum in a math subject typically builds cumulatively from lesson to lesson, whereas an American History course may allow the teacher a bit more freedom to pick and choose which events and figures to study.

If you need to get permission from school administrators in order to remove certain parts of curriculum due to time concerns, be sure to come prepared with reasons and examples, such as student homework assignments and/or test scores, to support your argument. If you can provide concrete evidence that demonstrates students will be unable to complete the preset curriculum timeline successfully, you'll be more likely to make a convincing case.

Supplement and Change

Depending on how much prep time you have, consider incorporating your own materials and ideas into the lessons to supplement curriculum deficiencies. This is also a great way to help students understand challenging materials.

Why is it highly unlikely that you will be able to find and use the perfect curriculum?

- School administrators are unlikely to provide the necessary funds.
- Textbook publishers change curriculum too quickly.
- The perfect curriculum only exists for certain subjects.
- A class is made up of different student personalities and learning styles.

Why is it important that you don't let students know if you dislike curriculum?

- If students know you dislike the curriculum, they will tell school administrators.
- If students know you dislike the curriculum, they may lose interest and confidence in the material.
- If students know you dislike the curriculum, they will try harder to cheat.
- If students know you dislike the curriculum, they will not complete homework assignments.

Which of the following is NOT a time-saving technique you can use when delivering curriculum?

- Ask students to pre-read material before the lesson
- Make homework assignments shorter
- Skip chapter introductions and summaries
- Provide students with an outline of the main points of a lesson

Lesson79: Comparing Learning Goals & Learning Objectives

Learning goals are general learning targets while learning objectives specify what students will learn. Compare and contrast the nuanced differences between learning goals and learning objectives, along with their roles in education.

Planning for Instruction

Brad is a teacher who tries to help his students learn by planning lessons and activities based on learning goals and objectives. This planning stage is important. It is necessary to identify exactly what is expected of students. This makes learning meaningful and measurable, two vital aspects of learning.

Why is this? By identifying measurable goals and objectives, parents and students will know what is expected. When learning is meaningful, Brad's students retain more information and are more successful. Brad is better able to stay on track because he is teaching with an end goal or objective in mind.

Brad has a meeting today with his administrator to talk about his planning. Turns out, Brad is confusing learning goals and learning objectives. He thought they were the same thing. Let's explore with Brad the important difference between these two.

Goals and Objectives

Depending on the context, the words 'goals' and 'objectives' can often be used interchangeably. Like we see with Brad, they're often confused. In fact, we see many terms that mean similar things when talking about identifying student outcomes in education, like:

- Performance outcome
- Instructional objective
- Learning point
- Competency goal
- Teaching purpose

Sound confusing? It certainly can be. The real difference in these words is found in the level of application. Brad learns that objectives are concrete and goals are broad.

Learning Goals & Objectives

Brad is still a little confused, so his administrator zooms in to define learning goals. They are overall general targets for learning. Learning goals are overarching and require effort. They can be long or short term, and include differing skill levels such as learn, solve, or analyze.

Brad learns that all instruction should focus on a goal. The goal is what Brad's students will experience or do in the process of learning. Instructional goals include a verb that covers one learning outcome. Learning goals are vague and don't cover specific subject matter. Instead, they focus on basic knowledge. In other words, a learning goal is like a target. Brad writes them to guide students forward in a specific direction. For example, a learning goal for science may be 'Know about the solar system.' Brad is starting to catch on and is ready for learning objectives. In education, they are detailed statements of what students will know at the end of a learning experience. Learning objectives are clear statements used to describe what Brad wants his students to understand. They include specific skills or behaviors students will display in relation to learning goals. Learning objectives are like the arrows being thrown towards the target, or goal. They help learners reach the goal, like 'Students will be able to name all planets in the solar system and tell specific characteristics of each.'

Which statement best describes learning goals?

- Overall general targets for learning
- Specific skills
- Activities for below-level learners
- Portfolio requirements

Which is NOT a component of learning objectives?

- Concrete
- Measurable
- Precise
- Broad

Which of the following statements is an example of a learning objective?

- Learn about the Byzantine Era
- Be able to solve equations
- Use knowledge of onset-rimes to decode three-letter words
- Know how to build a computer

Lesson80: Learning Environment in the Classroom: Definition, Impact & Importance

Establishing a positive learning environment is one of the most important things a teacher can do to provide a good learning experience for students. Learn about the definition and importance of a classroom learning environment, explore what the elements of a positive learning environment are, and discover the impact that positive and negative learning environments have on students.

What is a Learning Environment in Classrooms?

Almost all of us have spent a great deal of time in the classroom, beginning in kindergarten and extending for years beyond. Have you ever noticed what the teacher did to make learning more inviting? Was it colorful posters, clear and consistent rules, and fun and interesting teaching methods? If so, you were lucky to have a teacher who paid close attention to the learning environment, or the physical, psychological and instructional atmosphere. Ms. Martin is a teacher skilled in providing her students with a positive learning environment. Should we peek in and see what's going on in her classroom? Here we go.

Why Are Learning Environments Important?

Ms. Martin has learned over the years that the learning environment in her classroom is vital to student success and impacts students in many ways. A negative learning environment, or setting that adversely affects student learning, can affect Ms. Martin's students in many ways, such as low student achievement, poor behavior, student anxiety, or depression. Ms. Martin works hard to maintain a positive learning environment, or one that allows students to feel comfortable and confident as learners. Her students are hard workers and have high achievement levels. What does she do to make her classroom-learning environment one where students thrive? Glad you asked!

Elements of a Positive Learning Environment

Like we said, Ms. Martin is a smart cookie. She's picked up some handy tools of the trade along the way that help her keep her classroom environment humming with positive energy.

Those bright posters, organized spaces and cooperative learning arrangements aren't an accident. Ms. Martin pays a lot of attention to the physical environment in her classroom. The use of space includes how furniture is arranged and organized, how materials are stored and maintained, how clean the classroom is and the overall color and brightness. Imagine a classroom that has little light, dirt on the floors, messy bookshelves and broken supplies. Sound like a fun place to be? Ms. Martin recognizes that children need a clean, bright, organized space to strengthen learning experiences.

We've all had a teacher or two that has been a little more vocal than we liked. Teachers who yell at students, are random about consequences, and embody an overall negative attitude aren't good for student learning. The psychological environment in the classroom is how students feel about their learning. Ms. Martin has specific rules and consequences posted in her classroom and clearly explains each to students. She has a calm, patient demeanor and is focused on helping students learn, both intellectually and socially. She maintains a positive control of her classroom by being a role model for kind words and actions. She knows that students react negatively when they feel things are unfair, unclear or are worried about getting in trouble. Because she is clear and consistent, offers praise and gratitude, and sets a good example, her students are confident and comfortable in the classroom.

What is a learning environment?

- the place students do homework
- the physical, psychological and instructional atmosphere in a classroom
- a way to describe the universal classroom
- how the classroom looks

What areas are important for the learning environment?

- physical, psychological and instructional
- physical and emotional
- emotional and instructional
- instructional and physical

How can teachers create a positive learning environment with classroom space?

- create bright, clean and organized spaces
- buy lots of posters with cute kittens
- make sure students bring materials from home
- only let students use materials that don't cost too much

Lesson81: How to Create a Challenging Classroom Environment

The classroom environment can be designed and managed to present students with challenges that motivate them to learn. See the ways critical and creative thinking, as well as various learning styles, can be addressed in the classroom.

A Classroom Conducive to Learning

Let's say you've just been hired for your first teaching job. You're excited, and you immediately begin to think about your classroom and what it will look like. You begin thinking about how you will decorate it and how you'll manage your students. As you imagine teaching, you begin formulating ideas about how to promote students' learning. How will you motivate students to learn? How will you create a classroom conducive to learning?

Because every teacher is different and teaches differently, there is no magic formula. However, there are some general strategies that can be used to create a challenging classroom environment. Let's look at them!

Critical and Creative Thinking

Two essential approaches toward education to cultivate are critical thinking and creative thinking. These are foundational skills that can be applied in many ways.

Critical thinking is thinking logically about content and understanding cause and effect. Sometimes, it means thinking skeptically to understand how or why. Students who use critical thinking do more than just memorize terms: they understand the concepts behind the terms.

Say you're teaching about the American Revolution in a history class. If you help a student develop critical thinking skills, she'll be able to do more than tell you the Declaration of Independence was signed in 1776. She'll be able to explain how the French and Indian War helped lead to the American Revolution and trace the lines of cause and effect between the Stamp Act and the rebellion that followed.

Critical thinking involves developing one's own views and opinions on an issue. As you're teaching, be sure to encourage questioning, instead of only memorization. Encourage students to think about content and ask questions like:

- How?
- Why?
- To what extent?
- What caused this?
- What is the impact or effect?

Creative thinking is also key. It involves thinking outside the box and developing new ways to communicate, complete a task, or solve a problem.

Let's say you're a science teacher, and you're teaching about the earth's crust. Instead of just teaching from the textbook, you could engage students in making a model of the earth with its layers. Other possible creative projects include:

- Building Lego structures
- Making art projects
- Science experiments
- Making poster-board displays

Learning Styles

Good teachers make use of a variety of learning styles. Kinesthetic learning is learning by doing. Many students learn best by actually engaging in an activity instead of just listening to an instructor. Learning

through listening is called auditory learning. Visual learning involves learning by seeing. Photographs, videos, and other forms of visuals are excellent tools that help students learn.

Think about it: you might be great teacher, but it's hard to compete with a National Geographic video. Educational films are tremendous asset to teachers and are a favorite method of learning for many students. Just make sure you don't overdo it! Don't show a video every day. Mix it up so that each day is new, different, and exciting. Group discussions are another fun way to engage the entire class. Mock trials, in which students play the role of judge, attorney, defendant, etc., can also help bring content to life.

Thinking 'outside the box' and developing new ways to solve problems is referred to as ____.

- critical thinking
- creative thinking
- visual learning
- classroom management

How is kinesthetic learning different from auditory learning?

- Kinesthetic learning is learning by doing while auditory learning is learning by hearing.
- Kinesthetic learning is learning by hearing while auditory learning is learning by seeing.
- Kinesthetic learning is learning by hearing while auditory learning is learning by creating.
- Kinesthetic learning is learning by creating while auditory learning is learning by doing.

Which relates to a teacher's ability to control the behavior of students in class?

- Discipline
- Critical thinking
- Classroom management
- Positive reinforcement

Lesson82: Safe & Supportive Learning Environments: Design & Maintenance

A good learning environment is vital to student education. Learn how to design a safe and supportive learning environment, focusing on what to do before students arrive, getting to know the students, and maintaining the positive community created.

Positive Learning Environment

You have just planted a beautiful flower garden in your backyard. What would happen if you planted the flowers where they receive too much sunlight? What if you do not water the flowers? In either case, it is unlikely that the flowers would grow well. Do you blame the flowers for this? Of course not, you know that the flowers were not provided the right conditions to thrive.

A classroom is a lot like your flower garden. If you take care of your students, they will succeed. Students must feel protected and be nurtured if they are going to grow their abilities. You want your students to feel relaxed and safe. You want to encourage participation. In short, you want the classroom to be a positive environment for them.

How do you foster a positive learning environment in your classroom? To answer this question, let's look at what you should do before the students arrive, when you meet the students, and how to maintain a safe and supportive learning environment after it has been established.

Before Students Arrive

If we want our garden to grow, we must plan it out before we start. We have to ensure that the soil is good. We need to know the proper amount of sunlight our plants should receive. Once you know what you need and how you plan to do it, you are then ready to begin planting.

The same idea is true of developing a safe and supportive learning environment. Before the students arrive, you must have a plan. The first step to this plan is being organized. Imagine how a new student might feel if they walk into a classroom not knowing where to go or what to do. You can help ease this initial stress through good organization of the physical environment and your classroom procedures.

A teacher must be proactive about organizing the physical environment. Materials should be easy to locate and put away neatly. It should be easy to identify different areas of the classroom. If you are teaching younger children it is important to label their personal areas. You should also be able to easily supervise students in any area of the room.

Additionally, it is important to establish what your classroom procedures are before the students arrive. Make sure the students have answers to the following questions: How will I know what my assignments are? Where do I turn in homework? What is expected of me when I come into the classroom? Students will feel more secure if a routine is in place.

Getting to Know Each Other

Now you have your plants! You carefully place them in the soil that has been prepared. You gently pack the soil around them to hold them steady. You watch the plants grow stronger as their roots begin to take hold. Before long, your flowers will begin to bloom.

When the students first arrive in a classroom, they must also be supported until they find their place and settle in. Two things can help a student successfully make this transition. First, a positive initial experience is essential. Second, students need to feel a strong sense of community within their classroom.

How would it feel to walk into a classroom for the first time and immediately fail at something? You may feel frustrated or angry. You may even feel depressed. It definitely would not be a positive experience. Creating initial assignments that ensure a student's ability to be successful can prevent negative first impressions and start building student confidence.

Which of the following is NOT a characteristic of a safe and supportive learning environment?

- Organization
- Rules
- Sense of community
- Sense of uncertainty

Why is a safe and supportive learning environment important?

- It increases the chances that students will succeed.
- It is mandated by law.
- It reflects well on the teacher.
- It increases the chances that students will be gifted.

When should a teacher determine what classroom procedures will be used?

- Before students arrive.
- Upon student arrival.
- After an initial routine is established.
- Once the students have been consulted.

Lesson83: Modifying Learning Environments Based on Performance Data

In this lesson, learn some basic strategies for modifying learning environments to meet the needs of learners who are struggling, gifted, multicultural, or physically impaired.

Varied Learning Experience

Just as no two snowflakes are the same, no two students learn the same. Okay, so this isn't a revelation, but it certainly is a focus of modern educational theory. Antiquated approaches to teaching and learning are being replaced with multiple and varied learning experiences simultaneously taking place in one single classroom.

There are many practical methods that you can use to modify and personalize the learning environment to benefit all your students, including struggling, gifted, multicultural and physically impaired students.

Instruction and Environment

Differentiated instruction adapts to the different needs of students by modifying one or more of three aspects:

- product - how the student demonstrates knowledge
- process - how the student learns the information
- Content - what information the student is learning.

As each student's individual strengths and weaknesses vary and fluctuate, the ways in which you differentiate instruction will vary and fluctuate as well.

You may also modify the learning environment, which is not necessarily the same as differentiating instruction. Modifying the learning environment is the act of changing the learning environment with physical changes to the layout, instructional changes, or some form of targeted differentiation.

Students with Learning Disabilities

Students with diagnosed learning disabilities often require accommodations and modifications both inside and outside of the classroom. Modifications are changes that are made to the learning materials, assessments, or expectations for the student.

For example, you might assign a less complex reading passage for a student with a diagnosed disability in reading comprehension.

Students with Physical Impairments

Meeting the needs of students with physical impairments must be specific to each individual student. Students who are:

- Visually impaired may need preferential seating and larger print on all of their materials.
- Wheelchair-bound may need special desk arrangements that are wheelchair accessible.
- Hearing impaired may need specific devices, like personal frequency modulation (FM) systems that amplify sounds.

Also, flexible seating provides students with choice in deciding where they learn best. You can get very creative with these choices. Consider exercise balls, special stools that allow for additional movement, bean bags, and a variety of crates.

Have a clearly defined set of expectations and procedures when implementing flexible seating. If structured successfully, it can accommodate the needs of a wide variety of learners with both physical impairments and learning disabilities.

Flexible seating can accommodate a wide variety of learners. Classroom Seating

Multicultural Students

When teaching students from diverse cultural backgrounds, exhibit cultural competence, in other words, recognize personal cultural beliefs and take an active role in learning about and celebrating them.

Teachers should make every effort to learn about the cultural backgrounds of each of their students. Teachers can modify the learning environment to exhibit cultural competence by:

- Selecting texts that reflect a variety of cultures.
- Allowing students to read passages with which they identify.
- Being mindful of vocabulary that may require specific cultural awareness or regional knowledge (i.e. 'pop' or 'soda', 'hoagie' or hero').
- Implementing literature circles or reading groups that are connected thematically, but are culturally diverse.

Gifted Students

It can be more difficult to modify the learning environment for gifted students than for struggling learners. Gifted students require learning activities that go beyond the basic standards and expected performance of a typical student in their grade level. The challenge is to challenge them.

While some programs offer enrichment periods during which gifted students are taken out of the traditional classroom, it is entirely possible to challenge gifted students in the traditional classroom as well. Teachers can implement a variety of differentiated strategies to serve the needs of this population, including

- extension activities involving independent research and reporting findings
- leading peer groups through an activity
- providing more challenging texts

Which of the following best defines differentiated instruction?

- The act of changing the learning environment to meet the needs of your students
- One's ability to recognize personal cultural beliefs and take an active role in learning about and celebrate the cultural beliefs of others
- An instructional strategy that adapts to and creates learning experiences that reflect different needs
- The act of performing an educational evaluation on a student identified as 'at risk'.

Teachers can differentiate instruction by modifying the _____, _____, and/or _____.

- personality, preference, standards
- product, process, content
- expectations, relevance, character
- similarities, differences, standards

What might a teacher need to change to accommodate a visually impaired student? (Choose the best answer)

- Provide large print materials
- Select that student to lead peer groups through a reading activity
- Selecting texts that reflect a variety of cultures
- Provide more challenging texts

Chapter11: Innovation & Continuous Process Improvement for Supervisors

Lesson84: Setting Goals for Innovation & Continuous Process Improvement

This lesson will go over how managers can set goals for innovation and continuous process improvement in organizations. We'll cover SMART goals and prioritization.

Continuous Process Improvement

There is always room for improvement in any business. The most successful businesses recognize this and make improvement a core strategy. One of the key responsibilities of front-line managers is to identify opportunities for innovation and continuous process improvement and to set goals to leverage those opportunities.

Continuous process improvement is about making incremental, sustainable changes in how things are done that can lead to improved efficiency, performance, and profitability.

Innovation involves new ideas or processes, better solutions to meeting customer needs, or achieving a goal in a new way. Combined, they are key to providing businesses with a competitive edge.

Continuous process improvement by innovation consists of several steps:

- Focusing on desired end results
- Exploring options
- Selecting the best options based on an analysis of possible outcomes
- Designing how to implement the options
- Taking action
- Assessing results
- Repeating the process based on what has been learned.

That last step is how process improvement then becomes continuous.

SMART Goals

The best goals are SMART goals. The SMART acronym provides a guide to evaluating goals.

S - Specific. Goals need to be well-defined for people to understand what is expected.

M - Measurable. A goal must include a standard for how it is to be measured in order to determine whether or not it has been achieved.

A - Attainable. Goals must be realistic if people are going to commit to their achievement. Goals do not have to be easy, but there must be a belief that they can be reached.

R- Relevant. Why a goal is important must be clear. Relevant goals help motivate people.

T- Time-bound. Setting deadlines is important for motivating people. The time-frames also have to be realistic.

Let's imagine that you are the General Manager of A to Z Sandwiches with 80 employees working in four stores.

A need has been identified to improve the speed with which customers are served. You schedule a meeting with the managers of each store to discuss the problem and identify possible changes to the process for serving customers.

You want to develop a SMART goal that can be used as a start for improving and innovating how customers are served. The first goal the group identifies is: Decrease customer wait time on sandwich orders. You ask yourself and the group, 'Is it SMART?' In other words, is it:

Specific? No. How much do you want the time to be decreased? 30 seconds? Five minutes?

Measurable? Yes and no. Your ordering system can measure time from the start of an order to its delivery, but there is no target to measure against.

Attainable? No. If there is no specific target, whether or not it is attained cannot be measured.

Relevant? No. With no specific target, it is hard for employees to see its relevance and why they should change versus what they are doing now.

Time-bound? No. No target date for meeting the goal has been set.

So with those thoughts in mind, the group refines the goal: Decrease the current 8-9 minute average customer single sandwich order wait time to an average of 5-6 minutes in the next three months. This meets all the SMART requirements.

With your SMART Goal in place, you and your team can begin to identify those incremental changes and process innovations that can result in shorter customer wait times and happier customers.

Prioritizing Goals

Making sandwiches more quickly is not your only goal. You know there are lots of opportunities to improve the overall operation of the business, its profitability, and customer satisfaction. They range from reducing waste on ingredients to making sure that the customer tables are always cleaned as soon as a customer leaves. Prioritizing goals is a critical responsibility of managers because all goals are not equal in terms of their effect on the overall business. Goals may also compete for the same resources, whether financial or employee time.

Why are continuous process improvement and innovation important in the business management of goals?

- They can provide companies with a competitive advantage.
- They solely focus on ensuring that all processes are correct and up to date.
- They can guarantee market success.
- They can guarantee organizational profitability.

Why should goals in business be SMART?

- SMART goals guarantee success and profitability.
- SMART goals provide clear targets and expectations.
- SMART goals are easy to achieve.
- SMART goals evaluate risks.

What should be an over-arching consideration when prioritizing goals in business?

- What are the human resources that will be required?
- What are the costs of failing to meet the goal?
- What are effects on customers?
- What are the key strategic priorities of the organization?

Lesson85: Organizing for Innovation & Implementation

This lesson will discuss management's role in the process of organizing for innovation and continuous process improvement. It will also explain the steps a manager can take to ensure a smoother transition in innovation and implementation.

Innovation in Your Organization

James, a manager at Tech For You & Me Inc., created a new innovative way for his employees to work together. Although they have their offices, he also brought in a large conference table and comfortable chairs to encourage the team to work together. He made sure there were plug-ins so that his team could at any time unhook their laptop in their office and move to the conference table. He believed this environment would make his team more cohesive, as well as promote new ideas.

Some of his team have started to use this new set up, and others have not. The three employees that utilize the table have begun to stick together in the office, while the rest have become even more standoffish than before. Unfortunately, this innovation backfired because James had not prepared and organized for potential issues.

In this highly competitive business market, innovations can be the one thing that sets your company apart. An innovation is a new idea, process, or product. Innovations can make your processes quicker, or your products and services more exciting. The struggle with innovations is to keep them adapting, relevant, and used by your employees. The most unique and astounding innovation means nothing if your workforce does not use it.

Planning and Organizing

No matter whether you are creating service or technical innovations, there are a few steps that will help you plan and organize for the implementation of your innovation. Planning will allow you to combat resistance, foresee obstacles, and strategize for consistency in the future. As a manager, it is your responsibility to help lead and inspire your employees to use innovations created by your company. Here are some steps to follow in order to organize and plan for the future innovation implementation.

Assess Your Workforce

When looking at a future innovation, you should analyze your employees to understand how they may use or not use the new idea or product. Perhaps customer service will use a new chat feature to communicate with consumers, but quality assurance won't. It's important to keep this in mind.

Communicate

As early as possible, it is essential to communicate with your team about the new innovation. This gives you the time to sit down and listen to concerns or create excitement. The more open dialog you have, the easier the transition will be.

Organize Trial Runs

If possible, allow your workforce to experience or use the new innovation. If you and your team get the chance to try out a new product, jump at it. The more you know, the easier it will be for you and your team to integrate it into your daily routine.

Create an Innovative Environment

If all employees within an organization feel empowered to create and invent new ideas, then your environment transforms into one that accepts and encourages innovation. This, in turn, will help your employees to consistently accept and use new innovations with less resistance.

Educate

If there are large innovations being implemented, then continuing education may be necessary. Perhaps your team needs training on new technology or processes. In any case, this will help take the mystery out of the transition.

Implementation and the Future

Now that you are organized and set up for the implementation process, it is important not to forget that innovations will need consistent reinforcement. Much like James' story above, if his team was consistently persuaded to use the large communal table for work, then the whole team would be more cohesive, instead of a select few. Here are some other steps to take to improve implementation success.

Evaluate Employee Morale

If the innovative idea implemented largely affected your employees, it will be vital to check how they are working and how they feel. This is a good time to create encouragement and continued excitement about the possibilities of this change.

What is the best definition of an innovation?

- An innovation is a new process that changes your work environment
- An innovation is a new exciting product that is created by your organization
- An innovation is any new idea, process, or product
- An innovation is a new process brought into your business from an outside source

Which of the options below will help your employees to consistently accept and use innovations with less resistance?

- Assessing your workforce
- Communication
- Education
- Creating an innovative environment

Which of the options below will NOT help you plan and organize for innovation implementation?

- Organize trial runs
- Brainstorm new ideas
- Educate
- Communicate

Lesson86: Deliberate & Experimental Approaches in Innovation & Continuous Process Improvement

To remain viable, organizations must constantly update their operations. Learn about deliberate and experimental approaches to innovation and continuous process improvement and discover how each approach can benefit an organization.

Continuous Improvement

Hari is the owner of a company. He wants to promote creativity and encourage his employees to constantly seek to make the company better. Hari is promoting innovation, which involves finding new approaches and solutions to problems. Many companies seek continuous improvement and innovation, which is an approach to business wherein the organization is always trying to innovate and improve itself. Essentially, companies engaging in continuous improvement and innovation are constantly asking, "What's the next thing? How can we be even better tomorrow than we are today?"

To help Hari implement continuous improvement and innovation at his company, let's take a look at the two main approaches to change: deliberate and experimental.

Deliberate Approach

One way for Hari to approach innovation and improvement in his company is to steer his employees the direction he wants the company to go. For example, he could say that they're going to try out new customer service programs. He could then set metrics and have his employees create, try, and evaluate new programs. This is the deliberate approach, wherein leaders offer a vision for where the company is going and what it is going to do. The deliberate approach is top-down, meaning that it starts at the top of the company and filters down. As the head of the company, the vision of how improvements and innovations will work starts with Hari. Then it filters down to the other workers in the company.

The deliberate approach to continuous improvement and innovation asks the questions, "What do we want to accomplish?" and "Where do we want to go?" From there, the vision is established and the actual 'how to get there' comes from the employees. But the process and vision comes from the top.

The good thing about the deliberate approach is that it allows a company to align its improvements and innovations with the company's vision. However, it requires a lot of time and does not adapt well to changes or disruptions in the industry. For example, if there's a big change in Hari's industry, his company will not be able to change quickly if they are taking a deliberate approach.

Experimental Approach

So if the deliberate approach doesn't allow Hari's company to respond quickly to changes, what does?

The other major approach to continuous improvement is the experimental approach, also called the emergent approach, which involves everyone in the company engaging in constant experimentation. That is, everyone is continuously looking at what's going on and trying different things to respond.

Aligned approach

According to Creately, "strategic alignment is the prudent arrangement of the various internal and external elements of an organization—from its business strategy to its organizational structure—to best support the achievement of its long-term goals and purpose.

Adaptive approach

Adaptive Planning is an approach to planning in the commonsense domain. An adaptive planner takes advantage of the habitual nature of many of the planning situations for which to plans by basing its activities on a memory of pre-stored plans.

Derek owns a company. Every quarter, he puts out a document to all his workers outlining the areas where he wants the company to innovate and improve. His vision for the company is clearly spelled out for all team members. Derek is taking the _____ approach to improvement and innovation.

- deliberate
- emergent
- aligned
- adaptive

Janet is the CEO of a large organization. It is very important for her company to be able to quickly respond to changes in the industry. As such, the _____ approach to innovation is probably best for her company.

- emergent
- deliberate
- aligned
- adaptive

Ling is the head of a large, multinational corporation. She believes that changes in the company should come from managers, not from the front-line workers. Ling is using a _____ approach.

- top-down
- horizontal
- bottom-up
- emergent

Lesson87: Trial & Error Methods in Innovation & Continuous Process Improvement

Trial and error refers to a process of exploring options and trying different approaches to determine the best way to achieve a goal. Learn about trial and error methods in innovation and continuous process improvement and explore the steps in the trial and error cycle. Innovation for Improvement

Felicia owns a business that creates outdoor gear for hikers and campers. They've done really well and captured most of their target market, so many people would relax and enjoy success. But not Felicia! She's not satisfied with what her company has done. She wants them to make even better products and continue to grow and improve their processes.

What Felicia is thinking about is continuous improvement, which is the process of actively trying to increase efficiency and achievement. It's a key driver of business growth.

How can a company like Felicia's continually improve? A core tool for improvement involves finding new solutions to problems, a process known as innovation. For example, if Felicia wants her designers to create a new and better backpack for hikers, she'll want them to try new things. That is, she'll want them to innovate.

To help Felicia understand how to create a culture of innovation and continuous improvement at her company, let's take a look at one specific method of innovation: trial and error.

Trial & Error

Felicia doesn't just make gear for hikers, she loves to hike. She knows that sometimes while hiking, things go wrong. Maybe a trail is closed, or you take a wrong turn. Sometimes, you aren't sure which way to go. In those cases, Felicia knows, you have to try different things and see which one works. Try going one way and if the trail becomes impassable, modify your route and try a new one.

When Felicia tries new things on her hike, she is engaging in trial and error, a type of problem-solving that focuses on trying out new things and learning from them. Trial and error can also be thought of as a type of experimentation where you're testing new ideas and solutions.

Hiking isn't the only place trial and error works. Trial and error can drive innovation in business as well. Take Felicia's goal to design a new backpack. Her designers might want to try out a different material that's lighter weight and see if it holds up to hiking. If it doesn't, they'll have to modify their plans. Just like with Felicia's hike, they'll be using trial and error in their design process.

Thus, trial and error is a valuable method for business. Not only does it promote innovation, but it also allows businesses to try new things and discover what works and what doesn't.

The Cycle

Felicia thinks that trial and error sounds like a great idea for her company. But how does she get her employees to do it? Is there a formal process for trial and error? Well, trial and error is really a cycle. It involves four stages that feed into each other. They are:

1. Define and Design

During the first stage, it's important to define the problem you're trying to solve and conceive of and design a solution. For example, Felicia's designers want to make their backpacks lighter because it's easier to hike while carrying less weight. They decide to try a new material that's lighter weight.

2. Test and trial

3. Analyze the results

4. Build a prototype

Caleb owns an advertising company. He wants his company to grow by figuring out new ways to maximize clients' advertising dollars. By stressing the importance of finding new solutions to problems, Caleb is focused on ____.

- innovation
- continuous error
- define and design
- prototyping

Khadija is an app designer. She wants to create a really impactful app. To do that, she's trying to figure out the biggest problems that people have and figure out how her app can solve those problems. Khadija is in the ____ stage of the trial and error cycle.

- define and design
- analyze the results
- test and trial
- build a prototype

Lori makes clothing for women who love their curves. She's designed a new dress meant to smoothly accentuate the curves of a larger woman's body while still staying comfortable. Now it's time to actually make a version of the dress. Lori is in the ____ stage of the trial and error process.

- build a prototype
- analyze the results
- test and trial
- define and design

Lesson88: Pilot Testing in Innovation & Continuous Process Improvement

In business, a pilot test evaluates and ensures the quality and reliability of a program, product, or service before it is implemented. Learn about pilot testing in innovation and continuous process improvement, and review the steps to plan and implement a pilot test.

Pilot Test

Megan, the CEO of Softshoes, Inc., decided to align her business with agility principles in order to eliminate all unnecessary actions and instead focus on her customers. She spoke with her workforce and executed the change throughout the organization. However, after a few weeks, productivity is down, communication with clients is stalled, and workforce morale is terrible. Once she assesses the issues, she realizes that the agility principles don't work in her business due to how she has departmentalized. She will have to reorganize her people into smaller teams that integrate skilled employees from every department.

In Megan's scenario, an initial pilot test would have been helpful. A pilot test, or pilot project, is a scaled down version of a change that a business wishes to establish. These pilot tests allow you to assess potential obstacles or needs before you integrate the change organization-wide. Pilot tests focus either on a department or a small team, and they usually span a specific period of time, say four to six weeks. Once the pilot is finished, you can compare the results to your normal day-to-day business operations and see if you think the change was successful.

Pilot Testing Planning

For a pilot test, you want to make sure to organize, plan, and review before you implement it. Here are some steps to follow:

Choose a group or department

First, you want to determine which department or team should be involved in your pilot project. They could be volunteers or a specific group that best represents your business.

Scale down the change

If you're looking to pilot test a switch to agility, you will have to scale down the change to fit the team that will test its efficacy.

Communicate

Talk to the people who will be involved and get them on board. Everyone in the project must be invested in its success, otherwise it may fail.

Determine a timeline

Make sure to lay out a specific timeline: beginning date, deadlines for deliverables, and the end date. This provides your test group with a good framework. The timeline should represent how your how business will be required to act if the change is implemented site-wide.

Once you have the planning phase finished, you can start the implementation.

Pilot Test Implementation

Once you start your pilot test you will need to continually watch its progress in order to address any issues that arise. These steps will help you during implementation.

Hold weekly meetings

Keep a constant flow of communication; this will help you assess the validity of the change. It will also enable you to check on morale and head off any potential conflict.

A pilot implementation allows an organization to validate its approach for full application deployment. Executing an application pilot can uncover operability issues associated with production-like conditions and provide an opportunity to address these issues before full application roll out.

advantages of pilot implementation?

With a pilot project, you get the chance to see how the technology works before choosing to invest in a full-scale solution. It lets you “try before you buy,” if you will. With minimal investment, a pilot project lets you mitigate the risk of upsetting customers or wasting resources

What is a pilot test?

- A large-scale experiment to determine the efficacy of a potential change
- A small-scale experiment to determine the efficacy of a change
- The start of a change process before it gets implemented organization-wide
- The end of a change process before it gets implemented site-wide

During a pilot test, _____ are a great learning tool before the large-scale implementation.

- Obstacles
- Meetings
- Timelines
- Adaptabilities

If you are looking at continuous improvement innovations that will change the whole culture of your business, what should you do in order to plan for your pilot test?

- Choose the right people
- Determine a timeline
- Scale down the change
- Watch for conflict

Lesson89: Practical Application: Pilot Testing Plan

This template will help you when carrying out a pilot testing plan. The template can be used to make sure you cover all of the steps needed for a successful pilot.

Why Use A Pilot Test?

Before implementing a large scale solution, it can be helpful to try it out on a smaller scale first. This is where pilot testing comes in. Pilot tests are smaller versions of your solution implemented before the full scale implementation.

Pilot tests are helpful because they can help flush out any problems. This can save companies time and money. However, to successfully implement a pilot test, there are some steps to follow. The template that follows will help ensure you cover all the necessary steps for a successful pilot test.

Pilot Test Template

| Prior to Conducting the Pilot Test | | |
|--|--------------------|----------|
| Step | Who is Responsible | Date Due |
| Determine the root cause the solution is trying to solve. | | |
| Determine the solution to be implemented during the pilot test. | | |
| Decide the logistics of the pilot test. Who will be participating? What supplies are needed? Where will the test be carried out? | | |
| Decide how the pilot test will be evaluated? What are the quality indicators? How will you know if the test was successful? | | |

| During the Pilot Test | | |
|--|--------------------|----------|
| step | Who is Responsible | Date Due |
| Record data as established by quality indicators during the test. | | |
| Make any adjustments necessary during testing to improve the quality of data collected | | |

Lesson90: Continuous Improvement & Planning in Innovation

How can companies implement incremental change in order to improve? In this lesson, we'll take a look at continuous improvement, including an in-depth exploration of the planning stage of continuous improvement for innovation.

Continuous Process Improvement

Samidha owns an office furniture business that designs beautiful and ergonomic pieces. She wants to create new processes that allow her employees to innovate so that they can improve the products they are making. Samidha is thinking about continuous improvement, which is a business technique that is focused on getting better incrementally rather than implementing large-scale change all at once. Businesses can focus their continuous improvement efforts on products, solutions, or processes.

As Samidha has already guessed, innovation is a key driver of continuous improvement. But how can she help her employees be more innovative, and how can she implement a continuous process improvement for innovation? To help her out, let's take a look at the continuous improvement cycle and then zoom in on the planning stage.

Plan-Do-Check-Act

Continuous improvement sounds great to Samidha. Refining her business processes will help her organization grow. But how can she do this? Continuous improvement often follows plan-do-check-act, a four step process that allows companies to implement changes. The four stages are:

Plan: The first thing to do is identify an opportunity and plan for change. For example, Samidha knows that she wants to improve innovation at her company. Now, she just has to come up with a plan for how to do it. Maybe she decides that she's going to incorporate regular brainstorming sessions. Now she has an opportunity (more innovation) and a plan (regular brainstorming sessions).

Do: The second stage is to implement the plan on a small scale. For example, Samidha might begin by having weekly brainstorming sessions with just a few of the designers at her company.

Check: Next is to analyze how the plan is working. For example, Samidha might find that the designers participating in the brainstorming sessions are more creative and productive. That would be an indicator that the plan is working.

Act: The final stage involves rolling out a plan that's working on a larger scale. For example, Samidha might want to involve all of her company's designers in the brainstorming sessions if they're working with the small group.

Following the plan-do-check-act process allows Samidha to continually implement new changes to her processes.

The Planning Process

Samidha likes the idea of following plan-do-check-act, but it seems that the first stage is vitally important. After all, if you don't get the planning right, everything that comes after will be a mess. So how can Samidha plan for innovation and improvement?

The planning stage of continuous improvement has its own process. This process is define-discover-develop-deploy.

Bruce owns a technology company. While many of his competitors implement large-scale change from time to time, Bruce prefers his company to improve incrementally by implementing small changes over time. In other words, Bruce favors _____ for his business while his competitors do not.

- continuous improvement
- innovation
- planning
- deploying

Mina is implementing continuous improvement in her department. She has already tried out a small-scale change and it seems to be working well. Now she's ready to implement it department-wide. Mina is in the _____ stage of the continuous improvement process.

- act
- do
- plan
- check

Van's boss has asked him to implement a small change on his team in order to try it out before the change is implemented across the company. Which stage of the continuous improvement process is Van in?

- do
- plan
- check
- act

Lesson91: Common Operational Performance Metrics

Operational performance metrics examine the success of all of a process's components, from production to consumer. Learn the important metrics and calculations involved in production, service, and customer satisfaction.

Operational Performance Metrics

Ever watch a baseball pitcher? Each pitch is amazing. An excellent pitcher with good mechanics will meet the marks on control, smoothness, stride, arm strength, speed, timing, stretch, and balance. These metrics can be analyzed to predict not only wins, but also longevity. Although we are familiar with common operational performance metrics for pitchers, let's look into those that apply to entire operations. We actually apply the same principles.

Operational performance metrics means we look at the performance of an entire production process, from creation to consumer. We want to know if all parts of the operation are working efficiently. Each part is a piece of a large machine. This ranges from inputs to outputs and includes looking at inventory, personnel, management, maintenance, quality control, production, packaging, and distribution. All should function fluidly and without interruption.

The key to analyzing operational performance metrics is that you must have numbers that tell the story about how things are working. These quantifiable outputs will answer a lot of questions about how your operation is functioning. For baseball pitchers, scouts look at strikeouts, walks, hits, wins, pitch distribution, fly balls, and contacts made. Once all these metrics are measured, the pitcher's efficiency can be evaluated. This is similar to analyzing an operation.

From a strategic standpoint, a company might measure time, errors, excesses, incidences, faults, breakdowns, returns, and costs. These are areas that are important and relatable to stakeholders within the company. They can also cause problems with customers. Any problems receiving a quality product is going to drive customers elsewhere and directly reduce profit.

If there is a way to quantify something, you can use it as a performance measure. We want to use performance measures and discover problem areas before they affect quality and sales. Common operational metrics fall under the umbrellas of measures of production, service measures, and customer satisfaction. Let's look into each of these.

Measures of Production

Measures of production are those that are used to evaluate the efficiency of converting inputs into outputs. These outputs are the goods and services a company produces and consumers purchase. We can measure one person, department, division, subsidiary, or company. Usually it's more cost effective to measure the production of departments or divisions.

Depending on what a company wants to measure, it can be a very simple measurement. Let's use Sam, a baseball pitcher, as an example. His efficiency can be measured by an earned run average, which is the number of earned runs allowed per nine full innings. In simple terms, productivity = output / input, or ERA = earned runs / number of nine full innings.

Let's say we want to know our total productivity per week. We have \$100,000 worth of output from \$20,000 of input. So, we go back to our productivity equation and get productivity = 100,000 / 20,000 = 5. For a business, we may want to measure widgets made, waste discarded, time per unit, labor efficiency, or breakdowns per month. Anything that evaluates the efficiency of the production process is a measure of production.

Service Measures

Service measures are similar to measures of production in that we can apply metrics to different parts of a company. These measures can also vary depending on what a company sees as important. Most often companies do agree on certain important elements of service performance.

Customer satisfaction

Customer satisfaction is defined as a measurement that determines how happy customers are with a company's products, services, and capabilities. Customer satisfaction information, including surveys and ratings, can help a company determine how to best improve or changes its products and services. Customer satisfaction (CSAT) is a measure of how well a company's products, services, and overall customer experience meet customer expectations. It reflects your business' health by showing how well your products or services resonate with buyers.

What are operational performance metrics?

- A type of measurement we can use to evaluate a production process.
- A type of measurement used exclusively in the medical field.
- A type of measurement we can use to evaluate customer service.
- A type of measurement we can use to evaluate potential revenue.

What do the three most common operational performance metrics focus on?

- Production, service, and customer satisfaction.
- Personnel, service, and customer satisfaction.
- Management, production, and service.
- Waste, service, and production.

When analyzing the efficiency of converting inputs into outputs, what operational performance metrics do we need?

- Measures of production.
- Service measures.
- Customer satisfaction.
- Cyclical measures.

Lesson92: SMART Performance Metrics for Business Innovation & Improvement

Evaluating innovation and continuous process improvement needs to be SMART. That means being specific, measurable, attainable, relevant and time-based. In this lesson, we'll talk about each principle.

Get SMART

As the leader of the innovation team at ABC Cool Products, Janice is focused on creating products and services that her company's consumers will find fun and useful. As part of her job, she's also concerned with continuous process improvement, the ongoing endeavor to make existing products better.

Janice is always trying to measure her department's success in both its innovation and improvement initiatives. However, she hasn't landed on any metrics that seem to work. She needs something that's easy to understand, able to be communicated to team members and stakeholders, and can give insight and direction into both successes and failures.

She finally stumbles across an article about SMART performance metrics, a concept she's not familiar with. She thought she was already being smart! Well, there's a difference between being smart and being SMART, as Janice found out. Let's take a closer look at these SMART metrics Janice learned about.

SMART Performance Metrics

Lots of businesses use the SMART acronym, for everything from setting organizational goals to conducting performance reviews to evaluating innovation and continuous process improvement. While SMART metrics are, ultimately, also 'smart', they represent something much more detailed: Specific, Measurable, Achievable, Relevant and Timely performance metrics that can be used to measure success.

Specific: The specific metric can help Janice's department move away from vague goals or objectives to a clear and targeted direction. Instead of saying, 'We want to sell more of our products,' Janice's team could say, 'We want to make improvements to one particular product to increase its sales.' Being specific helps to define exactly what you want to achieve and sets the path for how you're going to get there.

Measurable: Innovation and improvements, to be successful, should be measurable, meaning that you can put a number or figure to what your department is doing. For example, Janice's department may want to increase sales of its pet products, but they need to set a more measurable objective. Instead, they might determine to create two new products for dogs that will increase sales by 20 percent. Creating measurability allows a business to clearly see what's working and what isn't.

Attainable: It's easy to want to set lofty goals, but if they aren't attainable, it can set a department up for discouragement and failure. Attainable objectives should be challenging enough to encourage and motivate Janice's team, but still within reach. In evaluating innovation and improvement, a focus on attainability will help keep Janice's team focused. For example, they may choose to focus on creating five new products in the course of the year instead of 50 new products.

Relevant: What's relevant to Janice's department requires asking a few important questions: Do the department's priorities align with overall business objectives? Do the innovations and improvements they see as necessary fit with current market trends? Focusing on being relevant helps to guide every action that a department takes to be sure it stays on track for both the business and its customers.

Time-based: Every goal needs a target date, so that you have a deadline to focus on and something to work toward. This part of the SMART goal criteria helps to prevent everyday tasks from taking priority over your longer-term goals. All goals that are set should be timely, meaning that there is a set deadline attached to

the goal. This gives employees motivation to meet the goal within a certain time period. It also provides the information needed to develop an action plan so that the goal can be met within the stated timeframe.

Which of these is an example of the Specific principle in product innovation?

- A department that innovates new products year-round.
- A department that wants to create new products.
- A department that wants to create three new pet products.
- A department that makes plans to innovate.

What is the purpose of having measurable objectives?

- Being able to discern what's successful and what isn't.
- Loosening restrictions on department employees.
- Determining a timeline for achieving improvements.
- Making sure objectives can be achieved.

Failing to abide by this objective can cause team encouragement and failure:

- Time-based
- Specific
- Attainable
- Measurable

Lesson93: The Balanced Scorecard Strategy

The balanced scorecard strategy focuses on assigning behaviors to goals that represent the business's values, to improve organization and effectiveness. Explore three real-world examples to identify which types of organizations typically use this strategy and why.

What Is a Balanced Scorecard?

A balanced scorecard is an aid for measuring business performance for the purpose of meeting goals and making changes to behaviors to meet these goals. The scorecard helps track all areas the business finds important to measure.

For instance, a business may want to know how many customer transactions there were for each day, and it may want to see trends and make sure enough transactions are being done. In addition, the business may want to track and measure sales performance for each transaction. It may also want to know what the customers think. Overall, the balanced scorecard serves as a simple, clear, and precise way of measuring goal accomplishment.

Who Uses It and Why?

Many businesses, non-profit organizations, and even government organizations (such as hospitals, banks, universities, and towns) use a balanced scorecard. Each business or organization has a purpose that can be used to understand what aspects need to be measured, and there are many different points of view that can be measured. Therefore, the specific business or organization determines the most important things to measure to reach its aims.

For example, a non-profit entity can use a balanced scorecard to keep track of peoples' opinions. Non-profit organizations have many supporters that keep their organizations alive, so the scorecard can be a good tool to both manage all their supporters and determine the best ones.

Many businesses use the balanced scorecard to measure their operations, customer/client service, finances, goals, employee development, and internal strategies. If used properly, the balanced scorecard can be used as a way to run daily operations, monitor progress, and manage and save information.

For instance, a sales company has a mission to provide customers with the best products and solutions. This company may use the balanced scorecard to understand customer behavior, track employee performance and behaviors, track what products customers bought and why, keep count of the number of products sold, track the company's progress towards goals, analyze the way the company is run in every department, and measure profit growth.

Example 1: Financial Institution

Let's take a look at an example of a balanced scorecard being used in a financial institution. Sam is a director of a financial institution, and one of his jobs is to check branch performance on a monthly basis. Additionally, he has to check year-to-year performance and see how branches are doing, what needs to be changed, and what areas need more focus. Luckily, Sam's management team thoroughly uses the balanced scorecard to track performance. One of Sam's employees checks the scorecard daily and weekly to ensure he is on track to meet his personal goals, and the manager checks the branch's performance in sales, operations, volume, and customer service.

Why is the balanced scorecard used?

- To give employees coaching to ensure they will be effective in their jobs.
- To determine what the business finds important to ensure it reaches its goals.
- To provide benefits to employees to ensure they stay with the company for a long time.
- To give customers advice to ensure that they buy products that are actually useful to them.

Businesses use a balanced scorecard to track all of the following, EXCEPT:

- Operations.
- Employee development.
- Employee loyalty.
- Goals.

What is a non-profit organization able to track using a balanced scorecard?

- Extra cash
- Credit offers
- Supporters
- Profit

Lesson94: Progress Reviews for Innovation & Continuous Process Improvement

How do you know if a process or program is working? In this lesson, we'll take a look at how to conduct a progress review for innovation and continuous improvement, including how often to do it and what steps to take.

Continuous Improvement

Nazy is running an umbrella company. About three months ago, she implemented a new process meant to improve the time it takes her customer service reps to respond to a customer complaint. Nazy's process was about changing one small thing at a time, and she's wondering how things are going now that they've rolled out several incremental changes over several months.

Nazy's new process is a continuous improvement process, which is about instituting incremental change meant to improve one aspect of an organization. In other words, continuous improvement is about innovating products and processes over time instead of all at once.

As with most programs, continuous improvement processes need to be reviewed periodically to see what's working and what's not. To help Nazy do that, let's take a look at the plan-do-check-act cycle and how to perform a progress review for continuous improvement and innovation.

Checking In

Continuous improvement and innovation follow a specific cycle. For example, Nazy didn't just jump right in, trying any old thing. She thought first about what changes she wanted to make and then implemented them one at a time.

The cycle most often followed with continuous improvement is the plan-do-check-act cycle. This involves first planning out what change will be implemented, then implementing (or doing) the change. After that, it's time to check how things are going through a progress review. Finally, the progress review informs how the organization acts, such as whether they roll the change out to an even larger extent or whether they try something new.

Nazy is interested in the check stage of the plan-do-check-act cycle. That is, she wants to find out if the changes she's made so far have been working. If not, she wants to know what she should change. For example, if she changed the way her customer service team is structured, she needs to know if the new structure is helping or hurting their response time.

Remember that Nazy started the continuous improvement process three months ago. This is about the right timeline for her to do a progress review since they are often done every quarter (or three months). Alternatively, she could check in more often, such as once a month or bimonthly. But she shouldn't let more than three months go by without doing a progress review.

Remember, too, that continuous improvement is an ongoing process. Nazy will want to conduct progress reviews at regular 1-3 month intervals for the entire time the continuous improvement program is running. This is to make sure that everything is still working and to continue to fine tune the implementation.

Progress Review

Nazy understands that she needs to do a progress review to check in on how things are going. But she's still unsure of how to do that. What are the steps to set up a progress review? How should she judge success in the program?

There are several steps to setting up a progress review. They include:

1. Set up a timeline. The first thing Nazy needs to do is to set up a timeline. How often will her progress reviews occur? As we said before, three months is a good timeframe, though she might want to do it more often.
2. Choose metrics. Next, Nazy needs to choose her metrics, or ways she'll measure success. There are a few important things to remember here. First, the metrics need to align with the goals of the program. It does

Nazy no good to use sales numbers as a metric for this program if the purpose was to reduce response times for customer complaints!

Zara is a software designer. She wants to drastically improve her software, but instead of revamping the whole thing, she's decided to change just one or two things at a time and release updates to the software regularly. Is Zara engaging in continuous improvement?

- Yes, because she's introducing incremental change.
- Yes, because continuous improvement is always about software design.
- No, because she's introducing incremental change.
- No, because continuous improvement is never about software design.

Jamal has decided to institute continuous improvement at his company. What's the first thing he should do according to the cycle often used in implementing continuous improvement?

- Plan
- Do
- Check
- Act

Hussein is implementing a new continuous improvement program to increase sales revenue at his company. What's the best time for him to do a progress review for the program?

- Every three months
- Every week
- Every year
- Every six months

Lesson96: After-Action Reviews for Innovation & Continuous Process Improvement

Any business project or event can generate important lessons that lead to new knowledge. This lesson outlines how after-action reviews can be used in future operations so that quality is constantly improving.

Learn From Situations

In early 2018, the treatment of two African-American individuals at a Starbucks coffee shop sparked a firestorm of controversy. One of the two men asked to use the restroom but was denied on the grounds that he was not yet a paying customer. When the men declined to leave, as they were waiting for a friend, the manager called police and the men were arrested, and the event soon went viral.

Starbucks quickly conducted an after-action review, a retrospective reflection in which reviewers seek to gain insight from an event under review. The lessons learned from this incident resulted in an apology to the men, but the findings of the after-action review resulted in something else that was remarkable. Because of lessons learned in review, on May 29th of 2018, all Starbucks stores in the US market were closed so that the chain's 175,000 employees could receive additional training on situations like this.

The after-action review is a mainstay of business improvement. Projects large and small, implementations, and contract negotiations are all important events that contain a treasure trove of information that can be harvested for use the next time around. These reviews are often associated with failures, but can certainly be used for successes as well.

Structure of an After-Action Review

An after-action review needs to follow a structured pattern to avoid becoming free-for-all finger-pointings or back-slapping events. After-action reviews are about processes and outcomes, not people.

1. Prerequisites

The benefits of an after-action review are directly tied to the quality of the documentation during the event that is being reviewed. Unfortunately, a lack of documentation during a major project or event is common. After-action reviews lose a great deal of value when the reviewers do not have the information necessary to make an informed analysis.

For this reason, a prerequisite to actually conducting the review is gathering and vetting documentation created during the event. If no documentation exists, it may be beneficial to take the time to create some before the review.

2. Facilitation

At the beginning of an after-action review, the objectives should be laid out at the onset. To keep the focus squarely on these goals, use an agenda or other tool created thoughtfully in advance of the review.

During the review, if the discussion starts to wander, it is the responsibility of the leader/facilitator to redirect the conversation, as many times as is necessary, to ensure the goals of the review are met.

3. Ground rules

Once the objectives have been determined, it's time to build the ground rules for the review itself. Ground rules are the standards that establish how the session will be moderated - minute-by-minute. All review sessions should have ground rules that:

- Establish that the moderator will open, conduct, and close the meeting in a manner consistent with the objectives.
- Create a time management plan that allows for the enforcement of a respectful but firm time table for speaking.
- Prohibit interrupting a presently recognized speaker.
- Require that remarks are relevant to the event being reviewed.
- Provide for proper documentation of the review (written notes, audio or video recording, etc).

4. Review the lessons learned

When the moderator opens the review session, they should explain that the meeting is for the purpose of sharing lessons learned. Those lessons that make someone on the team say, "Well, now I know what I won't (or will) do next time." If previously unknown lessons learned appear in the review, document them at this time.

Warren is the team lead for a company that won a contract to replace the computers in six elementary schools. If Warren wants the best material for an after-action review, _____ are superior to other methods.

- notes and recordings at the time of the replacement
- hiring consultants to offer insight
- verbal reflections from participants
- a review in 6 months

The characteristics of good ground rules for after-action reviews include all of the following EXCEPT:

- Prohibiting interruptions
- Determine who failed during the project
- Reminding participants about the session's objectives
- Establish a time table so that no one person or issue monopolizes the time

Which statement below is most closely aligned with the vocabulary of after-action reviews?

- John should never have hired or listened to that consultant.
- Everything that was assigned to Hussein's team was doomed from the start.
- Joann's project plan left a lot to be desired.
- Our company didn't do a great job communicating with our vendors.

Lesson97: Reporting Business Innovation & Improvement Results

A major part of program implementation involves communicating results of that implementation to top decision-makers. In this lesson, we'll look at ways to report on business innovation and improvement results.

Continuous Improvement

Harold is nervous. A year ago, he implemented a new process in the customer service and sales department that he oversees. The process was focused on continuous improvement, or incremental change over time. This type of process is meant to encourage innovation and agility in organizations, and Harold implemented it to help his team respond better to customer needs and, therefore, sell more and keep customers happier.

But, some people in senior management were skeptical when Harold implemented the program and now it's time to report the results. He needs to explain how things have changed in his department since they began continuous improvement. How can he do that? To help Harold out, let's take a look at how to report business innovation and improvement results, including the types of reports and how to communicate results effectively.

Types of Reports

Harold knows he needs to communicate to senior management the results of his continuous improvement implementation. But, how should he do that?

The first thing that Harold needs to figure out is the type of reporting he'll be doing. There are two major types of reports, written and presented. Examples of written reports include memos, formal reports, and emails. Meanwhile, presented reports are presentations which can be in person or via video or phone conference.

Harold has been invited to do a presentation for the senior management team at their monthly meeting. This means he'll be doing an in-person, presented report. However, he still might want to include a brief memo or other written report to summarize what he'll present and give attendees something to take with them and look over later.

Both written and presented reports should include three major sections. These are:

1. **Introduction:** The introduction should clearly outline the program goals and where the organization was before the implementation. For example, Harold's main goal in implementing the program was to better respond to customer needs. This led to the two sub-goals of more sales and happier customers. He'll want to outline these in the introduction. He'll also want to talk about where they were in terms of each of those goals before he implemented the program. For example, he might want to talk about sales figures for the year prior to the program implementation and/or what their customer service ratings were for that time period.
2. **Evidence of measured change:** The main part of the report will provide facts and figures of measured change. That is, Harold will want to communicate the results of any assessments he's done on the program's efficacy. For example, he might show how sales have increased since implementation or how customer service ratings have improved. He should balance quantitative data, such as sales figures, with qualitative stories, such as customer testimonials. The key thing in the middle section, though, is to outline how things have changed.
3. **Conclusion:** The final section should include a brief summary of the change he's demonstrated in the report. In particular, it should highlight the trends seen since implementation. It should also

include future projections. For example, Harold might want to point out a few trends in the data, such as increased sales revenue from upselling current customers, and then talk about what he believes will happen in the future thanks to the continuous improvement process.

Communicating Results

Okay, Harold understands the types of reports and what each one should contain. But, he's still not totally sure of himself. How can he most effectively communicate with senior management the successes his team has seen over the past year?

There are several things that Harold can do to effectively communicate in his report. The first is to tell a story with measured results. Numbers are nice, but what do they mean? Harold needs to clearly explain what happened and how it relates to company goals and initiatives. This means choosing metrics that are most relevant to both company and department goals.

Kari emailed a memo to her boss to outline the progress her team has made since she introduced radical new changes last month. This is an example of a ____.

- written report
- presented reports
- continuous improvement
- incremental improvement

Henna is writing a formal report to demonstrate the efficacy of a program she implemented last year. The bulk of her presentation, or the main part of the report, should focus on ____.

- measured change
- explaining disappointments
- outlining goals of the program
- presenting future projections

Lu is giving a presentation via video conference about a program she implemented six months ago. What is the BEST way for Lu to begin her presentation?

- by explaining the goals of the program
- by demonstrating measured change since implementation
- by analyzing data collected before and after implementation
- by explaining any unflattering data

Lesson98: Go/No-Go & Resource Decisions in Innovation & Process Improvement

Process improvement aims for efficiency by bettering organizational processes whereas innovation entails changing the process to stay competitive in the marketplace. This lesson will describe the decision making involved in innovation and process improvement projects.

Innovation and Process Improvement Projects

Soylent Corporation is a startup that is looking to improve their internal operations, so they can efficiently deliver web development services. Soylent Corporation has two choices to make their internal operations better. They can try process improvements or innovation. Improving existing processes, reducing waste and enhancing working systems are typically the activities included in process improvement projects. A stable organization that is in mature stages may benefit more from process improvement. On the other hand, innovation is needed to adapt to a highly dynamic market.

How to make a Go/No-Go decision

Soylent Corporation responds to public requests for proposals (RFP) as part of their sales process. Currently, they have realized that this process can be improved. They have started to look at how they will respond to this.

Typically, projects for which RFP is requested require the commitment of time and resources. Before undertaking such a project, certain factors might need to be considered to make a Go/No-Go decision. A meeting is used to decide if it is worth moving the project from planning into implementation. The meeting needs senior stakeholders as attendees to make the decision.

The outcome of such a meeting may be: Go which means the project can move into implementation. No-Go which means it is not worthwhile to move forward with this project. The third outcome involves moving forward with certain conditions and restrictions. An example of this situation may involve minimum resources and restricted budget to move forward.

The Go/No-Go meeting needs a specific set of criteria by which the project could be evaluated. These involve how the team judges the outcome of a project. The criteria can involve measuring the cost vs. benefit, risks involved, and opportunities in the project, resources strength and availability to take on the project and so on. All these criteria must be sufficiently analyzed by the project lead to present to the senior stakeholders, so everyone can collectively make the go/no-go decision.

To efficiently run this process, a document can be created with all the criteria and a column to record the decision against each criterion.

During the Go/No-Go meeting, every criterion must be analyzed and discussed, and the decisions recorded in the document created.

Considering all these factors, Soylent Corporation has come up with the following process when an RFP comes in.

Soylent Corporation has received a request to submit a proposal for web development services for a new hospital. Soylent Corporation has realized that they do not have the resources with the specific skillsets that this project requires. How should they make their decision if they want to move forward with this project?

- Analyze the cost of acquiring the resources and the long-term benefit of doing a hospital project.
- They should hire a resource with the skill set.
- They should not respond to the proposal.
- They should have their current resource test the project

Which of the following is a criterion based on which the Go/No-go decision is made?

- Cost vs. Benefit
- Stakeholder preferences
- The project is undertaken only if it does not involve any additional costs
- The project is undertaken only if it finished within a one month duration.

What kind of commitment does a process improvement or innovation project require?

- Time and Resource
- Stakeholder's interest
- Skills
- Knowledge

Lesson 99: Extreme Failure & Success in Innovation & Process Improvement

All organizations deal with successes and failures in the course of doing business. In this lesson, you'll see a few examples and learn strategies for navigating both the low periods of failure and the high times of success.

To The Extreme

Did you know that one of the most brilliant minds of the 20th century was considered, by some, to be a failure? A late bloomer who didn't speak until the age of four, Albert Einstein struggled at test-taking, nearly quit his university education, and held a series of pedestrian jobs as he attempted to find his place in the world.

It wasn't until Einstein was in his 40s that he received his Nobel Prize and made many of his contributions to the disciplines of physics and mathematics that we recognize today.

Individuals aren't the only ones who struggle with failure and realize success along life's journey. Businesses often take a loss - or get credit - for extreme failures and successes as they innovate and seek to improve their processes. Let's take a closer look at some examples. See how many you've heard of before.

Failure and Success

Just as with individuals, businesses will experience both "high" highs and "low" lows, culminating in either failures or successes for brands big and small. Here are some mini-case studies of businesses that have seen both.

New Coke

When a failure at your business comes to be known as your company's "New Coke," you know you had a disaster on your hands. The time was the mid-1980s and Coca-Cola was attempting to revitalize its brand. To do so, it created New Coke, which the company touted as having a "smoother, sweeter taste."

Even large corporations have experienced failures in innovating. new, coke, coca cola, failure, success

What Coca-Cola did in its effort to gain ground on its competitor Pepsi, was to retire the old recipe in hopes that the new recipe would become a smashing success with consumers. Unfortunately, Coca-Cola didn't get the reception they anticipated.

Fans of the original Coke complained, staged protests, and gathered signatures on a petition for the company to return to its regular recipe. It took less than three months for Coca-Cola to get the message and return the original Coke to stores.

Newton

We often associate Apple with innovation success with its new ideas and devices, but even this tech giant is not immune to a product failure. The Newton, which Apple unveiled in the early 1990s, may have been a gadget ahead of its time. The company wanted to make a portable, palm-sized computer that consumers could put into their pocket and spent roughly \$100 million developing it; they named the device the "Newton."

The problem with the Newton was that the device was the wrong size, both too small to be effective and too big to be easily portable. It lasted on the market for a few years before Apple pulled it from its product lineup. Of course, this failure was short-lived as Apple came out a few years later with what may be a better-conceived version of the Newton - the iPhone. And, the rest, as they say, is history.

Toyota

Toyota believes so much in process improvement that the company has given it its own name: "kaizen." At Toyota, kaizen is a philosophy its employees adopt that ensures productivity and quality are high and waste is low. They have succeeded in standardizing many workplace procedures, enabling employees to take ownership of problems and solve them immediately as they arise.

The idea of kaizen, adopted by Toyota from Japanese business, has helped make Toyota one of the most successful and lucrative automobile manufacturers in recent history.

Strategies for Handling Failure and Success

Whether you're experiencing a setback from a business failure or living on the sunny side of success, it's imperative that each be handled and managed appropriately. Here are some strategies for dealing with both extreme failures and successes.

How did Coca-Cola handle its extreme failure in New Coke?

- Increasing its advertising to overtake its competitor.
- Listening to its customers and reinstating the original.
- Pushing forward in hopes of converting its consumers.
- Refining the recipe yet again and creating a new product.

Apple's Newton device was considered an extreme failure for which of the following reasons?

- Its size was ineffective.
- It was the wrong color.
- It had no competition.
- Its price was too high.

How has Toyota used kaizen in its process improvement?

- By decreasing its workforce to increase profits.
- By increasing necessary waste to make money.
- By increasing efficiency and eliminating waste.
- By creating more management oversights.

lesson100: Standardization of Improvements & Innovations: Importance & Process

Innovation is great, but it isn't enough to transform a great idea into a sustainable business process. This lesson details the ways standardization can ensure that innovation and improvement is captured and maximized.

It Takes More Than a Great Idea

Few things compare to the feelings of satisfaction and accomplishment that come when an innovative idea is transformed from some notes scribbled on a napkin into a real, sustainable product or process. The journey is usually long, and there are usually many setbacks along the way. If the innovative idea was yours, seeing your idea become wildly successful is euphoric. But don't count your chickens before they're hatched. Until your great, innovative idea is standardized, there's no guarantee that your innovation will still be going strong in the future.

Defining Standardization

Standardization is the process of minimizing risk and uncertainty by ensuring that a process will produce the expected benefits. Although there are a number of reasons why standardization is a great business practice, one of the most important is that standardization helps organizations ensure that their innovations and ideas will continue producing the benefits that brought the idea to fruition in the first place.

Southwest was already standardizing before 9/11. While nearly all the other major carriers flew smaller and less expensive turboprop planes on short routes, Southwest's fleet consisted of only the Boeing 737. Many scoffed at Southwest's standardization strategy because the 737 was so much more expensive to maintain and operate than smaller planes. These critics, however, stopped laughing at Southwest when the company survived and thrived during incredibly hostile business conditions.

Benefits of Standardizing

When innovative ideas are born, they are very hard to standardize because, by definition, an innovative idea will be new and will lack comparisons with others doing the same thing. Standardization therefore helps companies discover if their innovative ideas can return even more benefits to them by reducing costs associated with variance.

When a process is not standardized, chances are great that the process will be constantly changing, thus leading to increased costs and waste. And, because you cannot improve upon a process that is not consistent, continuous quality improvement (CQI), the ability to make something increasingly efficient and effective, cannot happen. By standardizing, CQI can then be used to carefully examine and enhance each step in the process to bring about even greater benefit. These enhancements and improvements then become the new standard, which can then be improved upon again.

Reduced Labor Costs

Although the 737 was more expensive in some aspects, Southwest's standardized fleet saved hundreds of millions of dollars. These reduced costs included things like eliminating the need to train pilots and mechanics on multiple aircraft. And, the ability of the company to utilize any pilot or mechanic on any plane, anywhere, and at any time, made customer loyalty skyrocket because Southwest was able to offer better-than-average performance by decreasing delays and cancellations associated with variances in the availability of qualified personnel.

Reduced Waste

Waste is the enemy of an efficient process. When new or innovative ideas are rolled out, it is not necessarily clear which specific parts of the process are most responsible for the favorable results. Without a standardized process, a company cannot know if they are wasting resources on the improvement or idea since they don't yet know for sure which parts of the process are responsible for good outcomes.

By having a standardized fleet, Southwest was able to reduce the number of parts that had to be kept in inventory and reduce the amount of lag time from ordering the part until it's arrival where it was needed.

The standardization of the fleet also reduced waste in the form of aircraft downtime since mechanics had their parts available immediately, and they were always able to work on the job in front of them quickly and efficiently. Because mechanics had to deal with only one kind of aircraft, they required far less time to diagnose and fix problems.

During times of rapid innovation, _____ is important because it is the only way to ensure reliable and measurable outcomes.

- standardization
- prioritization
- stratification
- documentation

Standardization is the foundation for:

- Profit sharing
- Risk management
- Return on investment
- Continuous quality improvement

Which statement about standardization is TRUE?

- Standardizing a process is the final step in quality improvement, and no further analysis is necessary.
- Only a few categories of processes, like manufacturing processes, will benefit from standardization.
- Standardizing reduces cost associated with both labor and waste.
- Standardizing a process is important, but it is not a critical priority until benefit realization starts to reverse.

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