

SUBAREA I FOUNDATIONS, CHARACTERISTICS, AND ASSESSMENT

COMPETENCY 1.0 UNDERSTANDS HOW CHILDREN LEARN AND DEVELOP.

Skill 1.1 Demonstrates knowledge of human development, learning theory, neural science, and the ranges of individual variation within each domain.

It is important for teachers to consider students' development and readiness when making instructional decisions. If an educational program is child-centered, it will surely address the developmental abilities and needs of the students because it will take its cues from students' interests, concerns, and questions. Making an educational program child-centered involves building on the natural curiosity children bring to school and asking children what they want to learn.

Teachers help students to identify their own questions, puzzles, and goals, and they then structure for them widening circles of experiences and investigations of those topics. Teachers manage to infuse all of the skills, knowledge, and concepts that society mandates into a child-driven curriculum. This does not mean to imply that teachers are passive and only respond to students' explicit cues. Teachers also draw on their understanding of children's developmental characteristic needs and individual enthusiasms to design experiences that lead children into areas they might not otherwise choose, but that they do enjoy and find engaging. Teachers also bring their own interests and enthusiasms into the classroom to share and act as a motivational means of guiding children.

Implementing such a child-centered curriculum is the result of very careful and deliberate planning. Planning serves as a means of organizing instruction and influences classroom teaching. Well thought-out planning includes: specifying behavioral objectives, specifying students' entry behavior (knowledge and skills), selecting and sequencing learning activities so as to move students from entry behavior to objective, and evaluating the outcomes of instruction in order to improve planning.

Development in one domain affects learning and development in other domains

Elementary age children face many changes during their early school years, and these changes will impact how learning occurs in either a positive or negative manner. Some cognitive developments (i.e., learning to read) may broaden their areas of interest as students realize the amount of information (i.e., novels, magazines, non-fiction books) that is available. On the other hand, a young student's limited comprehension may inhibit some of their confidence (emotional) or conflict with values taught at home (moral). Joke telling (linguistic) becomes popular with children aged six or seven, and children may use this newly discovered "talent" to gain friends or social "stature" in their class (social). Learning within one domain often spills over into other areas for young students.

Likewise, learning continues to affect all domains as a child grows. Adolescence is a complex stage of life. While many people joke about the awkwardness of adolescence, it is particularly important to remember that this stage of life is the stage just before adulthood. While people do indeed develop further in adulthood, the changes are not as quick or significant as they are in adolescence.

Development within domains refers to the fact that different aspects of a human change as they mature. For example, physical changes take place (e.g., body growth, sexuality); cognitive changes take place (e.g., better ability to reason); linguistic changes take place (e.g., a child's vocabulary develops further); social changes take place (e.g., figuring out identity); emotional changes take place (e.g., changes in ability to be concerned about other people); and moral changes take place (e.g., testing limits).

The important thing to remember about adolescent development within each of these domains is that they are not exclusive. For example, physical and emotional development are tied intricately, particularly when one feels awkward about his or her body; when emotional feelings are tied to sexuality; or when one feels that he or she does not look old enough (as rates of growth are obviously not similar). Moral and cognitive development often go hand-in-hand when an adolescent begins to identify reasons for behavior or searches for role models.

It is important, as an educator, to be sensitive to changes in adolescents. Just because a change in one area is not apparent does not mean there aren't changes in another area, hidden beneath the surface.

Another area of extreme importance when dealing with adolescents is to realize that they may be deeply hurt over certain issues which may or may not be directly related to the changes they are going through at a specific time. It is particularly important for educators to be on the lookout for signs of depression, drug use, or other damaging activities, behaviors, or symptoms.

Range of individual development differences in students

Knowledge of age-appropriate expectations is fundamental to the teacher's positive relationship with students and being able to utilize effective instructional strategies. Equally important is the knowledge of what is individually appropriate for the specific children within a classroom. In this way, teachers are able to approach classroom groups and individual students with a respect for their emerging capabilities and meet the developmental needs of their students.

Developmentalists recognize the fact that children progress through common patterns, but may do so at different rates. These rates cannot typically be accelerated by adult pressure or input. Developmentally oriented teachers understand that variances in the school performance of different children often results from differences in their general developmental growth. With the establishment of inclusion classes throughout the schools, it is vital for all teachers to have a complete understanding of the characteristics of students' various disabilities and the possible implications on learning.

The effective teacher selects learning activities based on specific learning objectives. Ideally, teachers should not plan activities that fail to augment the specific objectives of the lesson. Learning activities should be planned with a learning objective in mind. Objective driven learning activities tend to serve as a tool to reinforce the teacher's lesson presentation. Additionally, teacher selected learning objectives should be aligned with state and district educational goals. State and district goals should focus on National Educational Goals (Goals 2000) and the specific strengths and weaknesses of individual students assigned to their class.

The effective teacher is cognizant of students' individual learning styles as well as human growth and development theory. S/he then applies these principles to the selection and implementation of appropriate classroom instructional activities.

Learning activities selected for younger students (below age eight) should focus on short time frames and be in a highly simplified form. The nature of the activity and the content in which the activity is presented effects the approach the students will use to process the information. Younger children tend to process information at a slower pace than children aged eight and older.

On the other hand, when selecting and implementing learning activities for older children, teachers should focus on more complex ideas. Older students are capable of understanding more complex instructional activities. Moreover, effective teachers maintain a clear understanding of the developmental appropriateness of activities selected.

Skill 1.2 Demonstrates knowledge of how students construct knowledge, acquire skills, and develop habits of mind.

Historically, there are two main theories which readily help to describe how students construct knowledge, acquire skills and develop habits of mind. The first theory is behavioral learning. Behavioral learning theory suggests that people learn socially, by stimulation, or through repetition. For example, when a person touches a hot stove, they learn not to repeat that action. Another example would be when a person makes a social error which leads to teasing or taunting, they learn acceptable social conventions. Learning by watching another complete an activity would be a third example of behavioral learning theory.

The second broad theory is cognitive learning. Cognitive learning theories suggest that learning takes place within the mind. It goes further to explain that the mind processes ideas through brain mapping and connections with other material and experiences. In other words, with behaviorism, learning is somewhat external. We see something, for example, and then we copy it. With cognitive theories, learning is internal. For example, we see something, analyze it in our minds, and make sense of it for ourselves. Then, if we choose to copy it, we do, but we do so having internalized (or thought about) the process.

Today, even though behavioral theories exist, most educators believe that children learn cognitively. Based on this information, teachers introduce new topics by relating those topics to information students may have already received exposure or that with which they are already familiar. In this way, the teacher is expecting that students will be able to better integrate this new information into their memories by attaching it to something that is already there. Or, when teachers apply new learning to real-world situations, they are expecting that the information will make more sense because it has been related to a more real situation.

In all of the examples given in this standard, the importance is the application of new learning to something concrete. In essence, what is going on with these examples is that the teacher is slowly building on knowledge or adding knowledge to what students already know. Cognitively, this makes a great deal of sense. Think of a file cabinet. When we already have files for certain things, it's easy for us to find a file and throw new information into it. When we're given something that doesn't fit into one of the pre-existing files, we struggle to know what to do with it. The same is true with human minds.

Skill 1.3 Identifies differences in approaches to learning and performance, including different learning styles, multiple intelligences, and performance modes.

There are many factors that affect student learning including: how students learn, how learning is presented, amount of background knowledge and/or experiences. There are several educational learning theories which can be applied to classroom practices. One classic learning theory is Piaget's stages of development which consist of four learning stages:

- Sensory motor stage (from birth to age 2)
- Pre-operation stages (ages 2 to 7 or early elementary)
- Concrete operational (ages 7 to 11 or upper elementary)
- Formal operational (ages 7-15 or late elementary/high school).

Piaget believed children passed through this series of stages as they developed from the most basic forms of concrete thinking to the most sophisticated levels of abstract thinking.

Two of the most prominent learning theories in education today are Brain-Based Learning and the Multiple Intelligence Theory. Recent brain research suggests that increased knowledge about the way the brain retains information will enable educators to design the most effective learning environments. As a result, researchers have developed twelve principles that relate knowledge about the brain to teaching practices. These twelve principles of Brain-based Learning Theory are:

- The brain is a complex adaptive system
 - The brain is social
 - The search for meaning is innate
 - We use patterns to learn more effectively
 - Emotions are crucial to developing patterns
 - Each brain perceives and creates parts and whole simultaneously
 - Learning involves focused and peripheral attention
 - Learning involves conscious and unconscious processes
 - We have at least two ways of organizing memory
 - Learning is developmental
 - Complex learning is enhanced by challenged (and inhibited by threat)
 - Every brain is unique
- (Caine & Caine, 1994, Mind/Brain Learning Principles)*

Educators can use these principles to help design methods and environments in their classrooms to maximize student learning.

The Multiple Intelligence Theory, developed by Howard Gardner, suggests that students learn in (at least) seven different ways. These include: visually/spatially, musically, verbally, logically/mathematically, interpersonally, intrapersonally, and bodily/kinesthetically.

Another learning theory is that of Constructivism. The theory of constructivist learning allows students to construct learning opportunities. For constructivist teachers, the belief is that students create their own reality of knowledge and how to process and observe the world around them. Students are constantly constructing new ideas, which serve as frameworks for learning and teaching. Researchers have shown that the constructivist model is comprised of the following four components:

- Learner creates knowledge
- Learner constructs and makes meaningful new knowledge to existing knowledge
- Learner shapes and constructs knowledge by life experiences and social interactions
- In constructivist learning communities, the student, teacher and classmates establish knowledge cooperatively on a daily basis.

Kelly (1969) states “human beings construct knowledge systems based on their observations; this parallels Piaget’s theory that individuals construct knowledge systems as they work with others who share a common background of thought and processes.” Constructivist learning for students is dynamic and ongoing. For constructivist teachers, the classroom becomes a place where students are encouraged to interact with the instructional process by asking questions and posing new ideas to old theories. The use of cooperative learning which encourages students to work in supportive learning environments using their own ideas to stimulate questions and propose outcomes is a major aspect of a constructivist classroom.

Yet another learning theory is that of metacognition. The metacognition learning theory deals with “the study of how to help the learner gain understanding about how knowledge is constructed and about the conscious tools for constructing that knowledge” (Joyce and Weil 1996). The metacognitive approach to learning involves the teacher’s understanding that teaching the student to process his/her own learning and mastery of skill provides the greatest learning and retention opportunities in the classroom. Students are taught to develop concepts and teach themselves skills in problem solving and critical thinking. The student becomes an active participant in the learning process and the teacher facilitates that conceptual and cognitive learning process.

Finally, social and behavioral theories look at the social interactions of students in the classroom that instruct or impact learning opportunities in the classroom. The psychological approaches behind both theories are subject to individual variables that are learned and applied either proactively or negatively in the classroom. The stimulus of the classroom can promote conducive learning or evoke behavior that is counterproductive for both students and teachers. Students are social beings that normally gravitate to action in the classroom, so teachers must be cognizant in planning classroom environments that provide both focus and engagement in maximizing learning opportunities.

Skill 1.4 Demonstrates understanding of the cognitive processes associated with various kinds of learning and how these processes can be stimulated and developed.

Students learn through a variety of methods. Efficient teachers are able to alter their instructional methods to present material using range of methods in order to meet the needs of students. Below are some of the diverse ways teachers can implement instruction.

Direct Instruction

Siegfried Engelmann and Dr. Wesley Becker, and several other researchers proposed the direct instruction method. Direct Instruction (DI) is a teaching method that emphasizes well-developed and carefully-planned lessons with small learning increments. DI assumes that the use of clear instruction eliminates misinterpretations will therefore improve outcomes. Their approach is being used by thousands of schools. It recommends that the popular valuing of teacher creativity and autonomy be replaced by a willingness to follow certain carefully prescribed instructional practices. At the same time, it encourages the retention of hard work, dedication, and commitment to students. It demands that teachers adopt and internalize the belief that all students, if properly taught, can and will learn.

Discovery Learning

Beginning at birth, discovery learning is a normal part of the growing-up experience. This naturally occurring phenomenon can be used to improve the outcomes within classrooms. Discovery learning, in the classroom, is based upon inquiry, and it has been a factor in many of the advances mankind has made through the years. For example, Rousseau constantly questioned his world, particularly the philosophies and theories that were commonly accepted. Dewey, himself a great discoverer, wrote, "There is an intimate and necessary relation between the processes of actual experience and education." Piaget, Bruner, and Papert have all recommended this teaching method as well. In discovery learning, students solve problems by using their own experiences and their prior knowledge to determine what truths can be learned. Bruner wrote "Emphasis on discovery in learning has precisely the effect on the learner of leading him to a constructionist, to organize what he is encountering in a manner not only designed to discover regularity and relatedness, but also to avoid the kind of information drift that fails to keep account of the uses to which information might have to be put."

Whole Group Discussion

Whole group discussion can be used in a variety of settings, but the most common is in the discussion of an assignment. Since learning is peer-based with this strategy, students gain a different perspective on the topic, as well as learn to respect the ideas of others. One obstacle that can occur with this teaching method is that the same students tend to participate over and over while the same students also do not participate time after time. However, with proper teacher guidance during this activity, whole group discussions are highly valuable.

Case Method Learning

Providing an opportunity for students to apply what they learn in the classroom to real-life experiences has proven to be an effective way of both disseminating and integrating knowledge. The case method is an instructional strategy that engages students in active discussion about issues and the problems inherent in practical application. It can highlight fundamental dilemmas or critical issues and provide a format for role playing ambiguous or controversial scenarios. Obviously, a successful class discussion involves planning on the part of the instructor and preparation on the part of the students. Instructors should communicate this commitment to the students on the first day of class by clearly articulating course expectations. Just as the instructor carefully plans the learning experience, the students must comprehend the assigned reading and show up for class on time, ready to learn.

Concept Mapping

Concept mapping is a common tool used by teachers in various disciplines. There are many different kinds of maps which have been developed. They are useful devices, but each teacher must determine which is appropriate for use in his/her own classroom. Following is a common one used in writing courses:

