

# Educational Research and the Psychology Underpinning this Methodology

Much of the methodology embraced in our resources is based on the work of educational psychologists Benjamin Bloom, Jerome Bruner, and Lev Vygotsky. Understanding the basic tenets of their work is critical to the potential effectiveness of your teaching. You are encouraged to do your own further research into these master teachers and the tenets they espouse.

## Benjamin Bloom: Domain Learning, Mastery Learning, Automaticity, and Three Stages of Development

### DOMAIN LEARNING

“Bloom’s Taxonomy of the Cognitive Domain” is often referenced in university education courses. Dr. Bloom believed that all learning started with the cognitive domain which then led to the physical and the emotional. He left the study of the remaining two domains to others who later published work based on his theories. As a student of Dr. Bloom, Dr. Lonis learned there was much more to be gained from this than simply memorizing the development stages. In fact, if the learning process engages all three domains then *all* learning is enhanced. The three domains they are as follows:

#### ***Cognitive Domain (Bloom 1956)—Thinking***

- △ Knowledge—remembering previous learned information
- △ Comprehension—ability to grasp the meaning—interpreting, explaining, summarizing, predicting
- △ Application—ability to use in what has been learned in new situations including applying rules, methods, concepts, principles, laws, and theories
- △ Analysis—ability to deconstruct material into its component parts to understand its organizational structure—requires understanding of both content and structural form
- △ Synthesis—combining elements to form a new whole often including creative behaviors to formulate new patterns or structures
- △ Evaluation—ability to judge the value of material for purpose combining all elements of the other categories using clearly defined criteria as the basis for judgment

#### ***Affective Domain (Krathwohl 1964)—Feeling***

- △ Receiving—willingness of the individual to pay attention
- △ Responding—active participation by the individual—not only attending to information, but showing signs of a willingness to seek out opportunities to enjoy the activity
- △ Valuing—willingness of the student to attach worth to a subject as displayed by behavior
- △ Organization—combining separate or disparate values, resolving conflicts between them as required and comparing, relating or synthesizing the values
- △ Characterization by a value or value complex—individual having developed a value system and applying it over time such that it defines them by their behavior

#### ***Psychomotor Domain (Simpson 1972)—Doing***

- △ Perception—using sense organs to gain clues that guide motor activity

- △ Set—includes mental and physical readiness and emotional willingness to act
- △ Guided Response—imitation of an observed action and possibly using trial and error
- △ Mechanism—learned responses have become habitual with movement generally confident and proficient—mostly gross motor skills
- △ Complex Overt Response—skillful performance of motor skills involving complex movements using a minimal amount of energy and automatic performance
- △ Adaptation—the ability to modify movement as required by the situation
- △ Origination—creating new movements to fit the situation based on highly developed skills

## MASTERY LEARNING

Three specific premises are seminal to the concept of mastery learning:

1. The success of the teaching shifts away from the ability or willingness of students to learn and instead, becomes a measure of the teacher's ability to effectively teach and engage students such that they have a strong desire to learn what is being taught.
2. With enough time and the appropriate learning conditions nearly all students can reach a high level of achievement.
3. A regular and highly organized assessment strategy, including a value and transfer proposition, is critical to understanding if teaching and learning has occurred most effectively.

Also fundamental to the approach:

- △ Best results occur when all basic building blocks are mastered along the way; missing components or lack of mastery of isolated skills will decrease success
- △ Emphasis on basic isolated skills—best monitored in small group settings
- △ Emphasis on larger units composed of the isolated details already learned
- △ Emphasis on a series of units/processes built on previous units
- △ Requires a thorough mastery of basic isolated skills
- △ Requires mastery or threshold level use of larger unit
- △ Requires possibility of using larger units voluntarily when the occasion arise
- △ Summative tests are given to evaluate the effectiveness of the teaching and the mastery of skills, information, or values

In this setting, *mastery* is defined as the complete understanding of a concept and the skill to apply it without error.

## AUTOMATICITY

Automaticity occurs when we have mastered skills or processes to the point of their being accomplished without thinking and to the highest level of each domain.

**Cognitive**— Evaluation—being able to understand and transfer the knowledge

**Affective**—Characterization by a value—not only understanding the knowledge, but believing it to be important to you such that you will use the information

**Psychomotor**—Origination—being able to transfer a fundamental physical skill to a new use, without thinking

Benjamin Bloom was “spot on” about this tenet of his teaching philosophy: “*What we learn to automaticity stays automatic*”. The only way to break a habit is to replace it with a new habit. Replacing old or bad habits takes far

more energy and time than having never had that habit. The automaticity methodology urges the user to establish *making music* and *interpreting the musical/emotional intent* at every step along the way so there will be no need to “replace the bad habits of not interpreting music” later.

The concept of automaticity is also central to turning theory and methodology into highly effective practice. Automaticity is reached when any thought, action, or feeling is brought to a level of accomplishing it *without thinking*. This allows us to better use our mental capacity for other activities.

### THREE STAGES OF DEVELOPMENT

It is clear from Bloom’s work through case studies that most successful people go through three stages of development to reach that pinnacle of success. Teachers can use these stages to not only influence teaching philosophy to determine how and what is taught, but also on a more specific level, how to plan individual lessons. A synopsis of Bloom’s thoughts on these three stages are:

**Inspiration**—the period up to approximately the time of puberty when the primary goal of teaching should be to engage children’s imaginations such that they love the learning of the subject and envision their future pursuing that subject—during this period children often imagine futures in a variety of professions and activities

**Drill**—the period after inspiration where it is crucial that mastery learning procedures are followed to ensure that literally all aspects of the subject matter are based on a solid foundation—this stage continues into mature adulthood and is required to reach the highest levels of talent development

**Creativity**—the final stage where all the learned and practiced skills and concepts are applied at the level of automaticity—in particular, when innate talents have been supported by a solid foundation in the first two stages, then greatness can occur.

## JEROME BRUNER: Constructivism, Spiral Curriculum, and Cognitive Development Theory

### CONSTRUCTIVISM

Succinctly stated—knowledge base is constructed on the variety of ways information is received — visually, aurally, kinesthetically, socially, etc. We choose to select information that we either consciously or subconsciously determine to be of value to us. This information is then transformed into usable foundational knowledge to become the basis for decision making, asking questions, and bringing order to the world around us. Bruner believed that best learning occurs when students are motivated to learn or, in other words, value the learning process as well as the information.

### SPIRAL LEARNING

To learn anything new the fundamental elements must be considered. The next step is to build on these fundamentals by constantly revisiting them until the concepts and tenets are understood. Learners will then find their own voices to execute and transfer the elements, concepts, and skills to other purposes and situations. The end goal is to move from beginner/novice to the highest level possible—which means not only comprehending, but being able to create new combinations using the information and skills acquired. An analogy for this would be to consider a child learning to play cello and working until they reach the level of YoYo Ma. What makes Mr. Ma different than literally every professional cellist is that each time he performs he takes the same music as others may be performing and brings his own creativity to the performance in ways that are uniquely his own interpretation. Every child must learn the fundamentals so well that they can reach the “creation stage” of learning

as quickly as possible. Teaching children to transform themselves from beginner into their own version of YoYo Ma is our lofty goal.

## COGNITIVE DEVELOPMENT THEORY

Research tells us that children learn primarily in three ways:

**Enactive Learning** — “Action based or participatory” learning is when the student is involved not only in thinking, but doing. Research supports that this learning begins prenatally making it an automatized and fundamental way of learning for all humans.

**Iconic Learning** — “Image based” learning occurs when the student stores visual images of information in their “mind’s eye”. Students use iconic learning as early as age one making it a trusted and often used way of sorting out the world around them.

**Symbolic Learning** — After the age of seven children begin to represent knowledge in their minds symbolically. By creating cognitive conflict, the mind stores information by codifying it and assigning it to a specific meaning (a quarter note on the third line represents either an A, a B, a C, or a D dependent upon its clef).

## LEV VYGOTSKY: Social Development Theory

Central to Dr. Vygotsky’s theory is the combination of cognitive constructivism (where students develop an understanding of the world around them) and social constructivism (where meaning evolves through engaging in social activities). His research strongly supports that when tested alone children rarely do as well as when they are working among their peers. Particularly important is the notion that placing the knowledge set or skill set into a social AND cultural context is critical to the learning process and leads to greatest success. In the world of music, the teachings of Orff, Kodaly, and Suzuki are living examples of this foundational tenet.