Prior Knowledge Accelerates Concept Mastery: A Piagetian Based Learning Theory

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THEORETICAL FRAMEWORK

Abstract

This paper examines the question does prior knowledge accelerate conceptual understanding and mastery in the disciplines of history and social studies? The study utilizes research in educational psychology development focusing on the work of Jean Piaget and Neo-Piagetians. The paper contains a synthesized theoretical framework that emulates the ideas of the United States Army “Be, Know, Do” model of learning and Liberty University’s conceptual framework of “Knows, Believes, and Implements.”
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Students do not need to understand or have knowledge of a subject’s facts in order to participate intelligently in concept discussions based upon those facts. This flippant statement made by an administrator, trained in religion, floored his Christian academy staff. No educator believes that a lack of prior knowledge experiences or rote learning leads to better discussions. Furthermore, this lack of prior knowledge does not provide a foundation for an adequate discussions over concept skills. Additionally, the educational philosophy of the academy centers on rote learning despite negative feedback from alumni currently enrolled in undergraduate programs throughout the country. Hence, the question “Does prior knowledge accelerate conceptual understanding and mastery in the disciplines of history and social studies?”

Theoretical Framework Background Information

A theoretical framework is a collection of interrelated concepts similar to a theory minus the rigidity. A rigid theory mandates a strict adherence to research methods, while a theoretical framework allows for explorative research allowing a discovery of previous unknown knowledge. The reason this works is that the framework construction begins with a person’s preconceived notions, even those of the most general nature. Hence, the theoretical framework guides all research determining what research occurs and the measurement criteria of data for acceptance. This framework is critical to education development theories and therefore well thought out with specific terms utilized in research databases.

It is easy to see that the preconceived idea that prior knowledge is required for conceptual understanding and mastery exists within the research question. Therefore, research begins with an examination of likeminded developmental theorists. The nature of the preconceived notion mandated a careful study of Jean Piaget’s theory of development. Since, the educator teaches
high school level courses the examination centered on Piaget’s formal operational period (approximately from 11 to 15 years of age). According to Dr. Patricia Miller (2011), Piaget theorized the prior schema of the concrete phase supplied the cognition to develop abstract thoughts over variances surrounding a concept prior to deciding to test their emerging conceptual ideas for reality. Since, this theory fits inside the preconceived ideas of the developmental question Piagetian styled theories receive a greater examination than opposing theories.

Additionally, another preconceived notion created a measurement criterion when examining possible theories for relativity. The theories could not deviate too far from the Christian worldview of God, scriptural morality, and the belief in absolute truth. Dr. Haro Van Brummelen (2002, pg. 51) reminds that “all truth is God’s truth,” and that truth is revealed in the Bible. Therefore, theories that did not bear a similitude to the Bible or received little biblical support received a stamp of disapproval. Of the four basic developmental theorists (Piaget, Vygotsky, Erikson, and Frued), three were determined viable as possible truth lenders. The work of Sigmund Freud did not receive a stamp of approval, and while the other theorist’s work received attention based upon biblical relevance, with Piaget receiving the greater attention.

These two notions formed the foundation upon which the theoretical framework rests. Therefore, all research terminology centered on Piagetian styled words and concepts. Furthermore, the attempt to limit research of Piagetian theories to the field of social studies occurred to fit the educator’s particular academic discipline.

**Research Terminology**

Believing that a Piagetian view supports the preconceived notion, research began utilizing key phrases. The first phrase searched was prior knowledge. This second phrase searched was concept mastery. These phrases combined with American History, World History,
World Geography, and Social Studies constituted the third phase of research. Finally, the fourth phase consisted of combining all previous key phrases with educational development.

**Prior Knowledge**

Prior knowledge is the area of cognition stored in long-term memory. As Miller (2011) points to the research work of Baddeley, this prior knowledge works with the episodic buffer to create a response to new stimuli. Hence, prior knowledge becomes an assessment tool for determining the validity of new concepts. As Van Brummelen (2002) describes this prior knowledge may exist as societal values instilled in a person. Likewise, prior knowledge is not limited to what a person knows, but includes what a person experiences. Therefore, prior knowledge is anything a person brings to the student desk.

**Concept Mastery**

Concept mastery is the idea of understanding and properly responding to concepts in education. This level of cognition is similar to skill mastery on the physical level. This level of cognition occurs when a student can think in a spatial manner on abstract ideas. For Vygotsky, the emergence of concept mastery occurred in the zone of proximal development (Slavin, 2009). Likewise, in the Piagetian theories this process received the term assimilation, meaning every cognitive encounter measures against previous experiences (Miller, 2011).

**Research Terms Outcome**

In combination with the previous terms history course terms limited the research to the areas taught by the research educator. However, this combination did not provide an adequate qualitative research sample. Therefore, research includes other course disciplines when the studies centered on prior knowledge or concept mastery. Furthermore, research limits extended beyond the high school age student.
Research Importance

Prior knowledge provides a foundational starting point for concept mastery. Without prior knowledge, students possess no measurable criterion to adapt, assimilate, and formulate a new schema (Miller, 2011). Furthermore, a lack of prior knowledge on any given subject allows the students to default into their preferred learning styles or societal norms, and thus erroneously adapt a skewed concept (Parker, 2007). Additionally, prior knowledge provides a basis for interest. Topics that generate interest and topics that the learner holds in interest will generate accelerated learning; this occurs in adult learning models, and in undergraduate course work (Russell, III & Pellegrino, 2008). The research of Gurlitt and Renkl (2008) support the theory that both university and high school students’ ability to master new concepts accelerate when prior knowledge activation occurs. Hinde and Perry’s (2007) report on the educational changes occurring in Arizona demonstrate the wide acceptance of a Piagetian based theory on the necessity of curriculum that builds upon prior knowledge continuity. Thus, research demonstrates that an educator who desires accelerated learning among students utilizes a theoretical framework that engages prior knowledge.

A Christian Piagetian Developmental Theory

A Christian based Piagetian theory consists of two major elements in three developmental categories. The two major elements are the Christian worldview and the theoretical stages of development model after Jean Piaget’s development stages. When these two elements synthesize into a framework, the theory reduces to three simple stages. The United States Army incorporates these three categories in their “Be, Know, Do” framework for instruction. Simply stated this means, a person desiring a promotion in rank learns what the next rank is to be in appearance and action, learns what they most know to become that rank, and then begins to
perform accordingly. In similar fashion, the Liberty University School of Education adopted the conceptual framework of “Believe, Know, and Implements.” Liberty University emphasizes the concept that the prior knowledge of a person’s worldview synthesizes with their academic learning to form the “know” of the model. Once the student “knows” they can begin to teach, (implements) in a manner that honors God and recognizes the sensitivity of people. When this occurs, the inward beliefs (believe) of the student manifest visibly. It is only fitting given the connection to both organizations that those ideas form the three categorical areas of development within this Christian Piagetian Framework. These combine to form the proposed framework of “Believe, Know, and Master.”

**Worldview**

The Christian worldview formulates an adherence to absolute truth. Therefore, devote Christians approaches all learning is search of truth that fits within the Christian constructs of the Bible. The Christian rejects any supposed knowledge that does not fit within this construct as partial truth or false. The Christian then filters all partial truth from the source of knowledge, and discards the dregs of falsity.

The Christian accepts the foundation of truth as found in the person of Jesus of Nazareth, the Christ. The apostle John records in his gospel (John 14:6, KJV) that Jesus stated, “I am the truth.” This claim implies that Jesus embodied not the essence of truth, but truth in its ultimate state of absolutism. Thus, the Christian when accepting Jesus as the creator of the universe, the Son of God, and the very expression of God, known as the Word of God, then accepts that all educational approaches and goals return to Christ for the test of empirical acceptance.

Hence, the Bible becomes the key to educational curriculum regardless of the educational sector. In the public sector that disallows the direct teaching of the Bible, the Christian educator
approaches falsity or truth in the textbooks, and adapts learning to express alternate views that support the Bible without proselytizing. In Christian academies, this means the educator integrates Bible openly into all lesson materials as support or challenge, allowing the student to develop their beliefs. Thus, all educational learning in the Christian framework relies on absolute truth, believing that the prior knowledge of absolute truth accelerates development, due to the immutable nature of truth.

**Stages of Development**

*Historical*

Jean Piaget purposed that children develop through several sequential stages. Miller (2011) explained that according to Piaget, children passed through a sensory motor stage (from birth to 2 years) in which the entire world is experienced and learned through physical contact with objects. The child then moves to the preoperational stage (2 years to 7 years) where learning moves from overt physical interactions to mental determinations limited by linear thought and egocentrism. The next stage, concrete operational (7 years to 11 years), possesses the ability to reverse mental thoughts. Thus, the child begins to develop the ability for temporal-spatial operations. Finally, the child moves into the final childhood stage, formal operational period (11 years to 15 years). This period characterizes the disappearance of egocentrism and the ability to distinguish intent from actions. Beyond, this point the child develops adult like mental actions.

*Proposed Development Stages*

The first stage of development for this framework begins with the lower level learners (1 year to 11 years of age). The lower level learner incorporates all three categories (believe, know, master), but learning centers on “believe.” At this level, the student requires instruction in fundamental beliefs. Character training and social norms becomes a central portion of learning.
Thus, the child begins to develop the fundamental essence of learning, accepting or rejecting knowledge in coordination with the society (Van Brummelen, 2002). Once the belief system begins to solidify, it becomes the basis for determining what a child knows. Thus, as a child is presented with challenges in social studies where historical figure or event, the child compares the actions of these figures against their beliefs and generally assigns the proverbial “good guy” or “bad guy” label to the person or event. With this ability mastered the child moves into the higher learning stage of life (12 year to 16 years of age).

The higher stage of learning represents an emerging adult learning stage. In this stage, the child has established most of their beliefs and learned the general knowledge of education core disciplines. However, these rudimentary skills lack the refined ability to form a functional ability in society. Research indicates that this stage of learning is the fertile ground of concept mastery that will dictate what the child will learn as an adult (andragogy). While the range of support is greater for the lower age range of this spectrum, the amount of support required does not negate the fact that children build upon prior knowledge in a consistent cycle of mastery, new information confrontation, and mastery of concepts. The research of Dr. Pearson (1990) on reading scaffolding for fifth grade students, while outdated, is still vital to understanding the relation of prior knowledge scaffolding accelerating reading comprehension, especially in the realm of social studies. This mastery of reading comprehension is a vital component to further developments and the mastery of deeper concepts in history. It is important to pause here to ensure that everyone understands that in the discipline of history there is no ability to test concepts in an empirical manner. History concept mastery relies on an examination of historical documents and artifacts, thus, reading comprehension is the most vital portion of education in historical fields.
Therefore, research in history curriculum and courses emphasize the need for prior knowledge, either from a belief system or from former learning, for conceptual mastery to occur. Gurlitt and Renkl (2008, pg. 408) stated the “prior knowledge is one of the most important, if not the most important, prerequisite for learning.” In fact the research of Russell III and Pellegrino (2008, pg. 3) indicates that students on the older end of the stage spectrum “are noticing the lack of challenging content and mundane methodology presented to them in class and desire more engaging examination of the materials.”

This examination of historical materials allows the student to combine their prior knowledge of historical facts with their belief systems. This synthesis of knowledge helps the student to formulate concepts of social interaction within their societies. The research of Marino and Bolgatz (2010, pg. 366) reminds educators “knowledge of how the histories of people around the world are connected is critical for students’ understanding of humanity. The broad study of history can develop students’ sense of judgment, empathy, imagination, agency, and perspective.” This progressive manner of education from scaffolding (prior knowledge of beliefs and reading comprehension of basic facts) allows the student to develop higher order critical thinking skills. Evans (2008) reminds educators that critical thinking void of prior knowledge foundations creates a skewed pedagogy with vast viewpoints on common topics.

**The Young Adult Stage**

The young adult stage extends from about 16 years of age into adulthood. In this stage, nearly all fundamental learning ceases and the learner begins to concentrate on disciplines that focus on a student’s varied interests. In this stage what a student believes and knows combine in a final combination of what a student masters in life. According to Gurlitt and Renkl (2008, pg. 409), during this stage the educator’s control over learning decreases to in order for the influence
of prior knowledge to increase. Burkholder (2010) describes a learning model in which learners examine historical documents void of textbook influence, but relying on prior knowledge to formulate concepts of history.

The Question Answered

Does prior knowledge accelerate conceptual understanding and mastery in the disciplines of history and social studies? The answer is yes, prior knowledge serves as the fundamental basis for conceptual learning. A learner develops a belief system and assimilates knowledge into a schema to master concepts necessary for full integration into society. Research shows that students who develop a prior knowledge schema for concepts develop quicker than students left to wonder through the educational process.
References


Ohio: Pearson.