

Constructivism: An Overview

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1. Introduction

Constructivism is not just a learning theory but rather a psychological and philosophical perspective in which individuals construct what they learn and understand based on their experiences. Research in human development and theories from Piaget and Vygotsky have greatly influenced constructivism and form the cornerstone of the movement. Knowledge is not simply poured into the individual like an empty vessel being filled. Rather, from the constructivist perspective, knowledge is actively received as the individual processes and tries to make sense of their experiential world. Schunk (2012) states that “Constructivism does not propound that learning principles exist and are to be discovered and tested, but rather that learners create their own learning” (p. 230), while Yilmaz (2008) states “Constructivism postulates that knowledge cannot exist outside our minds; truth is not absolute; and knowledge is not discovered but constructed by individuals based on experiences” (p.162). This is reaffirmed by Blyth (1997), “constructivism rejects the idea that human knowledge is a direct reflection of an objective reality. A constructivist would argue that every human being constructs his or her own version of reality. As a consequence, multiple realities or multiple ways of knowing are to be expected in the classroom” (p.51).

Individuals form or construct their own understanding of experiences internally based on their prior knowledge, their beliefs, and new knowledge they acquire. Hence, their constructions are true to themselves but not necessarily to anyone else. In addition, knowledge is temporary, always changing, and always developing, for it is often influenced by social and cultural factors which renders it nonobjective.

2. Domains of Constructivism

Individuals construct their own knowledge, their own understanding of the world; therefore, just as there are various ways the world can be mentally constructed, there are also various perspectives of constructivism. Yilmaz (2008) writes that “the educational literature identifies eighteen different forms of constructivism in terms of methodological, radical, didactic, and dialectical considerations” (p.163). According to Schunk (2012), social constructivists place importance on social interactions with teachers, peers, parents, and others in the construction of knowledge and skills, while Yilmaz (2008) posits that social constructivists’ knowledge is derived from entities such as politics, ideologies, values, and religious beliefs. This approach considers the ways in which political and social factors affect how groups of people form understandings about their world. Psychological constructivists suggest that individuals construct meaning around phenomena making it idiosyncratic, depending on the individual’s background knowledge. Meaning may be developed in a social group that provides warrant for these meanings to become formal knowledge. Radical constructivists believe that meaning exists in the realm of the experiential world and not the

ontological or metaphysical world; therefore, the individual's mental world is the only reality. Exogenous constructivists place emphasis on the external world. The acquisition of knowledge occurs by reconstructing events that exist in the external world such as experiences, teaching, and modeling. With that in mind, exogenous views can be useful for teachers in determining how accurately learners perceive an event, such as a lesson. On the other hand, endogenous constructivism places more importance on the internal cognitive actions. Rather than reflecting the external world of experiences, teaching, and social interaction, knowledge is developed internally through mental activity at incremental stages of advancement. This perspective is useful for teachers in assessing how well learners are advancing. Combining both the exogenous and the endogenous, dialectical constructivists contend that knowledge is derived from dynamic interactions between the individual and the environment (Schunk, 2012; Yilmaz, 2008). Neither one nor the other are more influential in the construction of knowledge, but rather, they complement each other. Interactions with the environment that cause mental contradictions result in the construction or reconstruction of knowledge. This view is useful for designing exogenous events that endogenously challenge learners' thinking.

3. Piaget's Theory of Cognitive Development

Since constructivism is grounded on the premise that knowledge is constructed through experiences, social factors, and prior knowledge, Piaget's theory of cognitive development, which is based on biological maturation, experience with the physical environment, social interactions, and equilibrium, plays a significant role. The effects of the first three depend on the fourth. Individuals naturally strive for an optimal state of equilibrium between internal mental structures and external environment reality. Reaching and maintaining an optimal state of equilibrium is a major motivating factor in cognitive development; hence, it coordinates the actions of the other three factors (Schunk, 2012).

3.1 Equilibrium Through Assimilation and Accommodation

Equilibrium can be established through two methods: assimilation and accommodation. Assimilation refers to incorporating new experiences into old experiences. When we interpret, construe, and frame, we adapt or modify new information and experiences to fit into our existing schema. This is usually a gradual process where similar ideas and concepts are gathered over time. Accommodation entails altering our pre-existing schema because of a new experience or new information. This is usually a sudden change when faced with drastically conflicting ideas. In other words, accommodation corrects previous misunderstandings or develops new outlooks. Generally speaking, in assimilation, new ideas fit into already existing ideas, while in accommodation, the new idea changes the already existing idea (Schunk, 2012; Constructivism Learning Theory, n.d., McLeod, 2018). Hence, information is constantly being linked to previous knowledge, melded, and even reconstructed to harmonize with the individual's thinking. Moreover, individuals have the intellectual capacity to generate knowledge by posing questions and creating innovative solutions to problems (Constructivism Learning Theory, n.d.; Yilmaz, 2008; Alesandrini & Larson, 2002).

Learning occurs through assimilation and accommodation when disequilibrium occurs in the physical and social environments. Therefore, educators can purposely create or present conflicting

situations so that learners strive for equilibrium. Small degrees of disequilibrium will be optimal for learning as the learner must build prior knowledge which is the basis for constructing or altering internal structures. However, the educator cannot always predict how any particular learner will resolve the conflict to reach equilibrium, for that depends on their stage of cognitive development.

3.2 Piaget's Stages of Cognitive Development

From his research, Piaget concluded that children pass through four stages of cognitive development. Each stage is qualitatively different and dependent on the development of the previous stage. Although the order of development does not vary, the age at which the stages are attained vary from person to person (Schunk, 2012; McLeod, 2018).

The first stage is the sensorimotor stage, usually from birth to age two. The child is attempting to understand the world, and actions are spontaneous. At this stage, cognitive structures are constructed and altered at a rapid pace, for there is a great difference between the cognition of an infant and a toddler. One significant understanding achieved at this stage is object permanence, knowing that an object still exists, even if it is hidden. Once the child attains sufficient cognitive development, he progresses to the next stage.

The second stage, the preoperational stage, usually from age two to age seven is characterized by conceptual-symbolic thinking. The child begins to reflect on the past and imagine the future, though their perceptual orientation remains primarily in the present. They are capable of thinking in only one dimension at a time and display irreversibility. Once things are done, they cannot be changed. At this stage, they cannot distinguish fantasy from reality, their language skills rapidly advance, and they become less egocentric.

The concrete operational stage usually begins around age seven and lasts until approximately age eleven. This stage marks a major turning point in the child's cognitive development for there is remarkable cognitive growth. Basic skills and language acquisition dramatically accelerate for language becomes social. In addition, abstract and logical thinking begin to take form along with the understanding of reversibility.

The final stage is formal operational, an extension of concrete operational thought. Usually from around age eleven, children begin to grasp multiple dimensions, intangibles, abstracts, and hypothetical situations. Reasoning capabilities also improve. This stage lasts into adulthood.

Familiarity with these developmental stages is beneficial for educators, parents, and anyone who works with children along with the understanding that cognitive development across domains is typically uneven. Along those same lines, the same topic may be understood at a different developmental stage with different people.

Piaget's theory is constructivist because it assumes that children construct their understanding of the world through their experiences. Information from their physical and social environments are not simply received but rather are processed according to their stage of development. "Children make sense of their environment and construct reality based on their capabilities at the present time" (Schunk, 2012, p.239).

4. Vygotsky's Sociocultural Theory of Cognitive Development

Another theory that greatly influenced constructivism is Vygotsky's sociocultural theory of

cognitive development. Vygotsky believed that the social environment plays a greater role in development and learning which conflicted with the prevailing psychological theory at that time, behaviorism. Vygotsky contended that Pavlov's experiments with dogs failed to acknowledge the distinction between animals and humans. Animals only react to the environment, while humans have the capability to alter the environment for their own purposes.

4.1 Social Nature of Learning

Vygotsky maintained that human development was based on interpersonal, cultural-historical, and individual factors with an emphasis on socially meaningful activity. Different from Piaget's development of logical thinking, "Vygotsky focused on categorical perception, logical memory, conceptual thinking, and self-regulated attention. In contrast to Piaget's assertion that children's development must precede their learning, Vygotsky posited that social learning is likely to precede development. Vygotsky's social cognition learning model views culture as playing a key role in the development of cognition" (Yilmaz, 2011, p.207). The context of experiences, which include the cultural-historical aspects, affects learners' interactions and transforms their thinking. Interactions, such as collaborations, foster cognitive growth by constructing and reorganizing their mental structures. This is also the basis of cooperative learning (Yilmaz, 2008). In cooperative projects, participants not only exchange ideas, but can also learn thought processes from each other. For example, a successful problem solver can talk through ways to overcome a difficult problem, disclosing strategies of resolution that may have never occurred to other students. These social interactions transform learning experiences and unify behavior and mind. They heavily rely on language, signs, and symbols. Controversially, Vygotsky contended that thinking in symbols such as language, counting, and writing must be mastered first in order to influence and self-regulate thoughts and actions (Schunk, 2012).

4.2 Zone of Proximal Development

Another key concept of Vygotsky's socialcultural theory is the zone of proximal development (ZPD), the area between what a learner can do independently and what a learner can do with guidance from an adult or capable peer (Billings & Walqui, n.d.). Learning should be compatible with the child's level of development. Children learn best when their peers or mentors work at a slightly higher cognitive level but still within their zone of proximal development (Yilmaz, 2008). Hence, guided participation is necessary in the ZPD, the basis for scaffolding. Nevertheless, the learner must invariably take an active part in their learning and what they learn is not always an accurate reflection of the guidance, for the learner has their own interpretation of the social interaction and constructs meaning by melding this new experience with their own personal past experiences.

5. Howard Gardner's Multiple Intelligences

In constructivism, memorizing mere facts is not enough. Connections must be made with experience and those connections are fluid, ever changing as new experiences transpire. Based on that premise, constructivism meshes well with Howard Gardner's Multiple Intelligences (*Concept mapping and curriculum design*, n.d.). Multiple intelligences recognizes that everyone understands

the world in different ways. In other words, it recognizes and classifies different learning styles (Humphreys, 2004; Margulies, 1995; Tsuda, 1997). Most educational institutions concentrate on linguistic and logical-mathematical intelligences through lectures, data, and laboratory experiments. Meanwhile, Gardner recognizes that some people learn better visually, kinesthetically, socially, internally, musically, and even through nature. The way knowledge is constructed in the individual depends on their dominant intelligence. Lessons that draw away from passive learning lectures will appeal to those who are more kinesthetically inclined. Those whose dominant intelligence is interpersonal would benefit from activities such as discussions and group work that require more social interaction. Reflective activities are in tune with the intrapersonal intelligent learners. Reaching out to different learning styles will not only offer more equal opportunities for the students, but also greater variety to the lessons.

6. Examples of Constructivist Methods of Teaching

6.1 Collaborative Learning

Collaborative learning, an instructional method in which students work in small groups toward a common goal, is a clear example of Vygotsky's socialcultural theory of cognitive development. "In the collaborative learning environment, students interact with learning tools and other members in group activities; they express and conceptualize their viewpoints and also listen to others in order to solve problems, to complete their tasks, or to generate new ideas" (Wang, 2007, p.151). Through this social interaction where learners conceptualize and express ideas, their thinking transforms from the concrete to the abstract. Yilmaz (2008) posits that from the constructivist perspective "knowledge is not passively received from the world or from authoritative sources but constructed by individuals or groups making sense of their experiential worlds...knowledge is temporary, nonobjective, internally constructed, developmental, and socially and culturally mediated" (p.162). This can be clearly illustrated by the numerous interpretations of the same book, such as *Moby Dick*. Therefore, group work and discussions in which students exchange differing opinions on the same topic and share personal experiences related to that topic becomes an experience in itself in which knowledge is formed and molded. Pair work, group work, and discussions appeal to those who learn linguistically and socially. In addition, small group discussions provide scaffolding opportunities for stronger students to help weaker students more discreetly. One drawback for group discussions is difficulty monitoring if the students are staying focused on the topic, especially with a large class. In order to motivate students to stay on topic, all groups can make an oral presentation of a summary of their discussion and then hold a discussion with the entire class comparing the groups' opinions. During the entire class discussion, some students may further alter their own thinking or incorporate another way of thinking into their own.

6.2 Peer Reviews

Peer reviews are another constructivist activity that can be applied in the classroom. When one student gives a presentation or speech, the other students must fill out an evaluation sheet and add constructive feedback for that student. This process helps the presenter and the observers simultaneously. The presenter can read how several people viewed their presentation, not just the teacher. The other students must attentively listen and watch the presentation to make an accurate

fair assessment, giving them something to do while listening to the presentations. According to multiple intelligences, this procedure may help students who are less linguistic and more kinesthetically inclined. In addition, students learn a great deal by observing others (Zhou & Brown, 2015). Hopefully, they will learn to discern what qualities make a presentation better than others and what to avoid. By evaluating their peers, students are using higher-order thinking (Burton, 2010; Bloom's Taxonomy, n.d.). They must compare and determine an appropriate assessment and then justify their evaluation in the comments. Moreover, peer reviews help the teacher discover what the students notice and find important. The teacher can also note if one student is being exceedingly harshly evaluated, possibly a victim of bullying, or if some students are evaluating based on who they like and dislike. Such observations can help the teacher gauge where those students stand in Piaget's cognitive development stages (Zhou & Brown, 2015).

6.3 Inquiry Learning

Questions are always encouraged and reasons behind the opinions must always be explained. Again, referring to multiple intelligences, students must delve into their intrapersonal intelligence to explore their own thoughts and feelings and critically examine their opinions to present substantial reasons to justify their point of view. No matter what opinions or ideas are presented in class, respect for differences must always be upheld. Even if someone does not agree with the opinion, if the reason behind the opinion is sensible, the opinion can be accepted. For some students, their opinions are based on feelings, or they have not given their opinions great thought. For those students, learning to articulate the reason in words may prove to be difficult. However, honing this higher-order thinking skill will be quite useful when they become active members of society, especially to prevent potential misunderstandings in an intercultural community where concise clear explanations are essential.

7. Implications for Future Teachers

Students who will become teachers must learn how to resolve problems quickly as they arise in their classes. Since there are countless problems that teachers face and each problem has its own unique situation, there is no one solution. Teachers must instantaneously assess the situation, analyze the options, and propose a solution. Therefore, an education that consistently spoon feeds solutions is insufficient to prepare future teachers. Higher-order thinking skills of analyzing, synthesizing, and evaluating are indispensable for authentic, high-quality instruction (Burton, 2010, Wilson, n.d.). Piaget's theory of constructivism is applied to challenge students to become critical thinkers, develop their skills to analyze classroom situations, create their own ways to resolve or prevent potential problems, and then justify their process of resolution (Constructivism Learning Theory, n.d.). The students must also understand Piaget's cognitive development stages, especially those who will become elementary school teachers, for their students will most likely be a mix of children in the preoperational and concrete operational stages (Zhou & Brown, 2015). Recognizing that children will be at different developmental stages and even display behavior of a combination of stages is essential for elementary school teachers. When creating their lesson plans and ways of instruction, educators must take into consideration the students' zone of proximal development and their different learning styles. In addition, pairing students of differing cognitive levels can help

raise the overall maturity level of the class so that it goes more smoothly.

8. Conclusion

Although there are several definitions and characteristics of the constructivist theory in educational literature, “at the heart of the constructivist approach to education is the understanding that students are in control of their own learning” (Milbrandt, Felts, Richards, & Abghari, 2004, p.20). They are not empty vessels into which information is simply poured. Rather, they actively construct and reconstruct their own understanding of the world around them through observations, interactions, and reflection. Drawing away from traditional passive lectures, notetaking, and rote memorization by incorporating constructivist approaches into the curriculum can motivate students to get more directly involved in their own learning with the hopes of becoming a catalyst for future responsible, productive members of society.

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