

COGNITIVE AND SOCIAL CONSTRUCTIVISM: DEVELOPING TOOLS FOR AN EFFECTIVE CLASSROOM

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An effective classroom, where teachers and students are communicating optimally, is dependent on using constructivist strategies, tools and practices. There are two major types of constructivism in the classroom: (1) Cognitive or individual constructivism depending on Piaget's theory, and (2) Social constructivism depending on Vygotsky's theory. Similarities include inquiry teaching methods and students creating concepts built on existing knowledge that are relevant and meaningful. Differences include language development theory where thinking precedes language for cognitive constructivism and language precedes thinking for the theory of social constructivism. Understanding communicative tools and strategies helps teachers to develop individual learning methods such as, discovery learning, and social interactive activities to develop peer collaboration.

Introduction

Constructivism is a vague concept, but is currently discussed in many schools as the best method for teaching and learning. For many educators or teachers, it has a variety of meanings. In order for teachers to use it effectively, they have to know where the student is at a given learning point or the current stage in their knowledge of a subject so that students can create personal meaning when new information is given to them. When in the classroom, teachers have the potential to teach constructively, if they understand constructivism. Constructivist teaching strategies and practices are the next important step in educational reform. Constructivist teaching strategies have a great effect in the classroom both cognitively and socially for the student. A teacher must understand and use methods of both

cognitive and social constructivism, if he or she is to run an effective constructivist classroom.

In cognitive constructivism, ideas are constructed in individuals through a personal process, as opposed to social constructivism where ideas are constructed through interaction with the teacher and other students. While they are fundamentally different both types will ultimately form overall constructivism or constructed learning elements for students to easily grasp; the main concept being that ideas are constructed from experience to have a personal meaning for the student. To be effective, both theories of constructivism need to be explicit in communicating concepts so that students can connect to them. Teachers need to understand these theories, as well as, know how to incorporate constructivist teaching methods, strategies,

tools and practices to develop an effective learning environment.

Cognitive Constructivism

Many educators in schools throughout America are required to teach constructively in their classrooms. The term cognitive constructivism can connote ambiguous or puzzled reactions from teachers who are told that they should be using teaching strategies to promote this form of learning approach for their students. Substantial individual thought needs to be acquired in content or subject areas for students to actually understand the material instead of just being able to recite it. Providing classroom situations and activities that promote individual learning is required. Jean Piaget, a well-known French Swiss developmental psychologist, who wrote many books and articles on learning, construed this process. Piaget was originally a biologist and theorists state that he thought in terms of students becoming "little scientists," who learn voraciously as individuals who build conceptual structures in memory to store information. Initially, he built his theories observing his own children as they learned and played together.

Piaget's main focus of constructivism has to do with the individual and how the individual constructs knowledge. Cognitive constructivism came directly from Piaget's work. Piaget's theory of cognitive development proposes that humans cannot be given information, which they immediately understand and use; instead, humans must construct their own knowledge (Piaget, 1953). He stated that

children's schemas are constructed through the process of assimilation and accommodation, when going through four different stages of development (Wadsworth, 2004). Piaget's (1953) four stages of development are: Sensorimotor stage, which a child goes through from ages zero to two; preoperational stage (two to seven years old), concrete operational stage (seven to eleven years old), and the formal operational stage (eleven years old to adulthood).

In Piaget's sensorimotor stage children begin to discover their environment around them through their own senses and physical activity and then language, as they get older within this stage. Children in his next stage of preoperational develop their own language skills but still cannot grasp the thoughts of others. As Piaget described within this stage there is "symbolic function" where children begin to distinguish pictures or symbols for different objects in their immediate environment and another sub-stage of "intuitive thought" where children ask all sorts of questions about everything within their environment (Wadsworth, 2004). Within Piaget's concrete operational stage, a pivotal growth point in the brain in logical development, children begin to replace intuitive thought with their own logical reasoning. In Piaget's (1953) formal operational stage children, up to adulthood, will start using higher levels of thinking or abstract ideas to solve problems. Piaget's stages are well-known and are accepted as the basis for depicting the growth of logical thinking in children. Although there has been criticism of his specific stages, Piaget's theories still hold true and are revered by many the-

orists.

Piaget's theory includes assimilation and accommodation, which are processes children go through as a search for balance or "equilibration" (Wadsworth, 2004). When describing Piaget's theory, "equilibration occurs when children shift from one stage to another and is manifested with a cognitive conflict, a state of mental unbalance or disequilibrium in trying to make sense of the data or information they are receiving. Disequilibrium is a state of being uncomfortable when one has to adjust his or her thinking (schema) to resolve conflict and become more comfortable" (Powell, 2006, pp. 26, 27). According to Piaget (1953), assimilation is when children bring in new knowledge to their own schemas and accommodation is when children have to change their schemas to "accommodate" the new information or knowledge. This adjustment process occurs when learning, as one is processing new information to fit into what is already in one's memory. Teachers need to facilitate this process in the classroom.

Piaget's stages of development are all about the ability to learn at different ages in childhood based on logical development. His theory on equilibration, assimilation and accommodation all have to do with the children's ability to construct cognitively or individually their new knowledge within their stages and resolve conflicts (Piaget, 1953). Recognizing that this process occurs within each individual student at a different rate helps the teacher facilitate constructivist learning. Piaget's cognitive constructivism theory incorporates the importance of understanding what

each individual needs to get knowledge and learn at his or her own pace. Observing students and comprehending their level of difficulty is paramount to this process. For example, when teaching complex concepts, some students in the classroom may grasp them quickly while others can be struggling. Asking questions of students to know where they may have difficulty is part of the inquiry method to alleviate misinterpretation. Understanding these stages and teaching within the ability of students to grasp concepts logically and intellectually is a main goal of all teachers. Effective learning occurs when clarity begins.

Social Constructivism

Social constructivism is a highly effective method of teaching that all students can benefit from, since collaboration and social interaction are incorporated. This type of constructivism was formed after Piaget had already described his theories involving individual or cognitive constructivism. Lev Vygotsky, the founding father of social constructivism believed in social interaction and that it was an integral part of learning. Social constructivism is based on the social interactions a student in the classroom along with a personal critical thinking process. All of Vygotsky's research and theories are collectively involved in social constructivism and language development such as, cognitive dialogue, the zone of proximal development, social interaction, culture and inner speech (Vygotsky, 1962). Understanding his theories or building a classroom where interaction is prominent helps develop effective classrooms.

Vygotsky's theory of development and all of its language aspects are various concepts that are part of social constructivism. One of Vygotsky's main theories is the zone of proximal development, or ZPD. This part of child development controls how a child learns. ZPD is explained in educational psychology books and Vygotsky's theory focuses on the different psychological functions that emerge as a child grows. ZPD has been described as a zone where learning occurs when a child is helped in learning a concept in the classroom (Vygotsky, 1962). By assisting children in learning, many theorists and educators have proven that Vygotsky's theory works. Often children will learn easiest within this zone when others are involved. An example would be an activity where a student works on the assignment with aid from the teacher. Once students achieve the goal of the initial activity, their zone grows and the students can do more. This involves the social constructivist method where students act first on what they can do on their own and then with assistance from the teacher, they learn the new concept based on what they were doing individually.

Along the same lines of cooperative learning, Vygotsky (1962) also used scaffolding in his theory, to understand that children learn more effectively when they have others to support them. Scaffolding is an assisted learning process that supports the ZPD, or getting to the next level of understanding, of each student from the assistance of teachers, peers or other adults. For example, when a child learns to count objects alone he or she may miss a num-

ber; however, if a teacher holds their finger and points directly to the object with them, counting out loud together, the child can then do the counting correctly by themselves. In scaffolding a unique type of internalization or "getting it" will occur for each student. This process occurs when a student will be asked to perform a task that has some meaning to the student and with assistance, will complete it. While this task may be difficult to perform, there is a support system available from the teacher. This support system will ultimately allow the student to solve the problem.

According to Vygotsky cooperative learning is an integral part of creating a deeper understanding. Cooperative learning is a part of creating a social constructivist classroom. Students should not only work with teachers one-on-one, but they should also work with other students. Students have a lot to offer one another. When students master completion of projects or activities in a group, the internalization of knowledge occurs for each individual at a different rate according to their own experience. Vygotsky believed that internalization occurs more effectively when there is social interaction. "A common question about knowledge is whether it is constructed internally, depending on a situation in a point of time or generally and some theorists claim that social constructivism and situated learning confirm Vygotsky's notion that learning is inherently social and embedded in a particular cultural setting" (Woolfolk, 2004, p. 326). Various perspectives on material could open up completely new and exciting opportunities for a student. Teachers

can create work experiences for students to collaborate with each other to construct cognitive or individual internalization of knowledge.

Vygotsky is a firm believer that social interaction and cultural influences have a huge effect on a student and how learning occurs. Teachers should recognize the diversity of the class and embrace their differences. Diversity can be defined as different ethnic backgrounds, but in the classroom is it a combination of ethnicity, identity and biological differences that give varied experiences and understanding to each individual (Woolfolk, 2004). Students have to understand themselves and others around them before they can start learning the curriculum. A teacher that embraces the various cultures can have students discuss their different backgrounds to one another. Just as students talk about their different cultures, they should talk about the material being taught. Some teachers are under the impression that talking during class is detrimental to learning. It is not that mindless chatter should be tolerated, but teachers can use the verbal energy that students have to their advantage. Teachers should promote dialogue of the material so that students can critically think about what they are learning. If they think critically, they will walk away with personal meaning that was constructed on their own. The idea of discussion is echoed throughout social constructivism and is enriched through diversity.

There is a distinct connection in all of these aspects of social constructivism. In ZPD and in scaffolding there is a corre-

spondence between the teacher, peer or other adult and the student. To embrace diversity, students must interact socially. The key is communication and for communication to occur at its most effective point; all participants must be on the same common ground. Language usage in the classroom is the most important process in a social constructivist setting. Vygotsky stated that language enhances learning and that it precedes knowledge or thinking. Vygotsky believed "it is incorrect to consider language as a correlative of thought; language is a correlative of consciousness. The mode of language correlative to consciousness is meanings. The work of consciousness with meanings leads to the generation of sense, and in the process consciousness acquires a sensible (meaningful) structure" (Kozulin, 1990, p.190). Social interaction is important to effective language usage and the development of efficient communication in the classroom. Students should use language as much as they use oxygen.

Comparing Cognitive and Social Constructivism

As students are learning in the classroom, the approaches of cognitive and social constructivism have similarities and differences. Both value the inquiry or question and answer method, as introduced by the Greek philosopher Socrates in the fifth century B.C. (documented by Plato) and made popular in America by John Dewey, a twentieth century progressive educator. "Inquiry learning is an approach in which the teacher presents a puzzling situation and students solve the problem by gather-

ing data and testing the conclusion. John Dewey described the basic inquiry learning format in 1910 and many theorists have emphasized different forms" (Woolfolk, 2004, p.329). Both theories claim that guided forms of teaching or facilitation are necessary, as students construct their own concepts and understanding of what is being taught. Students need guidance when teachers explain complex topics and knowledge has to be brought out of them since they have their own experience to draw on. Piaget's theory has a heavy emphasis on the reasoning ability of individuals and how individuals interpret knowledge. Vygotsky believed that there were variables such as, social interaction, culture and language that affected how the individual learned knowledge. These different theories admired today led to the two major forms of constructivism that have a common ground and history.

Piaget's theories celebrate the individual and his or her own personal process to gain knowledge building on experience. In cognitive constructivism, Piaget stated that thought precedes language and evolves from inner activity as information is processed based on what already exists, as well as, through inquiry. "Inquiry learning methods are similar to discovery learning and share some of the same problems, so inquiry must be carefully planned and organized, especially for the less prepared students who may lack the background knowledge and problem-solving skills need to benefit" (Woolfolk, 2004, p. 332). Cognitive constructivism will focus more on facts and constructing knowledge within one's own schemas. For

Piaget, social interaction does occur and may be part of the learning process; but it is the individual who constructs knowledge based on his or her personal experience. Piaget also believed that inner speech or reading to oneself is not a prerequisite to thinking and that one outgrows this process; whereas, Vygotsky believed that inner speech was part of the integral process of learning and thinking.

Vygotsky would say that social interaction and culturally organized activities are necessary in the classroom for proper psychological development. For these activities, people that have more knowledge than the individual must be involved in these activities, or in the zone of proximal development. Therefore, the social constructivist environment includes activities where students experience their level of understanding and seek assistance to get to the next level. Bigge and Shermis (2004) stated that Vygotsky's theory of learning and teaching was based on the relationship of children's social experience and that learning was a part of human development. Social constructivism will engage students in activities creating relationships that will directly affect what they learn. Students need activities that help them express their personalities such as, a group projects, where they pick the piece that represents their interests. As stated, Vygotsky believed that language preceded knowledge and the process of social interaction using language helps individuals learn.

Vygotsky's theory includes the relationship of thought and language and how language usage through interaction was

required before thinking could even exist. He described his zone of proximal development (ZPD) as a discrepancy between a child's actual mental age and the level a child could reach with assistance through a cognitive experience, where human beings learn through a highly empirical theory of intellectual development (Bigge & Shermis, 2004). The key concepts in Vygotsky's ZPD theory are 'assistance' and 'experience' at the level a student can handle so that he or she can learn. Social constructivism has more of an emphasis on the relationship between the individual and social requirements or interaction. Both cognitive and social constructivist teaching methods must be used by teachers interactively so that students can process individually what they learned in a group or from another adult or peer.

While social and cognitive constructivist theories are different there is one major similarity; the way constructivist classrooms should be run. "Both Piaget and Vygotsky agreed that the teacher's role was that of a facilitator and guide, and not of a director or dictator. Piaget saw children gaining knowledge from organizing and reorganizing data as they receive information. Vygotsky saw social interaction or collaboration as the chief method for learning and placed more emphasis on language development" (Powell, 2006, p.54). Both views of constructivism can be incorporated in to the classroom and should be incorporated for the best personal development of the students. Teachers and students must communicate to convey information and for learning to take place. Constructivism should not only happen

sometimes in the classroom, or happen in one or two of the student's classes, but in all of the student's classes and in every teaching activity so that true learning can occur.

Tools and Practices for the Constructivist Teacher

Teachers from every subject area need to develop psychological or strategic tools to create a constructivist environment for all students. In order to ensure an effective constructivist environment, teachers need to learn teaching strategies or activities that employ the theories of both Piaget and Vygotsky when assigning tasks or imparting information. Allowing students to discover knowledge individually helps this process such as, including question and answer periods after every significant topic, as well as having the teacher be able to assess where students are formally through testing and informally through discussion or dialoguing. Bigge and Shermis (2004) described Vygotsky's view of psychology, where every word is a generalization or a concept, as an act of thought, and meaning is a result of thinking. The more prepared and comfortable teachers are in using effective tools such as conversation, discussion, and inquiry; the more they will use them and students can become adept at thinking and communicating.

There are different perspectives on learning and what constitutes an effective constructivist classroom. However, acquiring knowledge, experience or understanding is common to all of them. How to create an effective constructivist classroom and measure the successful

results of students' learning, would include alternate teaching practices. For example, creating a constructivist strategy involves establishing a common interaction in the classroom, such as a debate on nature versus nurture, or Darwin's theory of evolution. Learning can occur when students are challenged, open, and comfortable, while giving their full attention. It is important that teachers and learners develop trust and openness in the classroom for all students to become engaged and attentive. When students are not engaged, an ineffective classroom can be subject to disruptive students, and learning will not occur.

Effective teaching methods include creating an environment where students feel free to create unique concepts and structures to place in their memory for further retrieval. The components of a constructivist environment include providing means for students to experience real world or meaningful practices. Students learn through examples that they can relate to on an emotional, or on a cognitive basis. Students can experience their world using meaningful practices that connect emotional or affective, as well as thinking or cognitive parts of self. For example, students who write essays could select their own topics corresponding to their reading assignments so that creative expression can follow. Real or meaningful knowledge is based on one's ability to accept, reason, or acquire information. The ability to retrieve this new information when needed implies that one constructed personal meaning, which will remain in memory until required. Effective teachers

beget effective learners.

The teacher and student dynamics include honesty and trust so that teaching and learning becomes effortless. A common ground must be secured in the classroom where teacher and student discussions are free and where the students feel comfortable to discuss their ideas or concepts without inhibitions or fear. "A concept is formed, not through an interaction of associations, but through an intellectual operation within which all of the elementary functions participate in a specific combination. For example, a child cognitively unites diverse objects into groups under a common name", (Bigge & Shermis, 2004, p. 127). This common ground, where the dynamic flows, allows learning or individual construction to become liberated and this contagious atmosphere can fill the classroom. The constructivist classroom allows effective learning where light can be shed so that imagination, knowledge and inspiration can glow within each individual student.

Conclusion

It is possible to understand and apply constructivist teaching strategies and practices in the classroom. There are two major types of constructivism: Piaget's individual or cognitive constructivism and Vygotsky's social cognitive constructivism. Many theorists discuss advantages and disadvantages; but the actual process of learning with meaning and students constructing concepts to create knowledge is common to both types. We have explored both the cognitive and social interactive learning environment and various teaching

strategies or tools that can help procure this process to ensure an effective classroom. Knowledge has to be built on existing knowledge and one's background and experience contributes to this process. There are similarities and differences with both, as well as, situational advantages when using one method over the other; however, they both have their place in the classroom and occur interactively in an eclectic learning atmosphere. Teachers need to be familiar with these constructivist theories.

Cognitive constructivism can be considered the grandfather of this teaching and learning style and many theorists throughout the years have added and subtracted to this method; however, the basics of constructing knowledge stays the same. Social constructivism is also historically parallel to Piaget's theory and evolved to include a more dynamic and social interactive environment for learning. Both methods use the inquiry method to facilitate learning and can be used alternatively and interactively to produce an effective learning environment. The goal is to produce an inquiring and accepting atmosphere that leads to each student reaching his or her full potential, if the teacher is attentive and guides each student through the process. Developing tools that secure inquiry and social interaction in the classroom, along with cooperative skills and individual discovery learning, helps teachers produce an effective constructivist environment. Students and teachers involved in an interactive facilitating environment can both benefit from this dynamic and effective learning atmosphere.

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