

## Comparing Piaget and Vygotsky

Methods and approaches to teaching have been greatly influenced by the research of Jean Piaget and Lev Vygotsky. Both have contributed to the field of education by offering explanations for children's cognitive learning styles and abilities. While Piaget and Vygotsky may differ on how they view cognitive development in children, both offer educators good suggestions on how to teach certain material in a developmentally appropriate manner.

Piaget proposed that cognitive development from infant to young adult occurs in four universal and consecutive stages: sensorimotor, preoperational, concrete operations, and formal operations (Woolfolk, A., 2004). Between the ages of zero and two years of age, the child is in the sensorimotor stage. It is during this stage the child experiences his or her own world through the senses and through movement. During the latter part of the sensorimotor stage, the child develops object permanence, which is an understanding that an object exists even if it is not within the field of vision (Woolfolk, A., 2004). The child also begins to understand that his or her actions could cause another action, for example, kicking a mobile to make the mobile move. This is an example of goal-directed behavior. Children in the sensorimotor stage can reverse actions, but cannot yet reverse thinking (Woolfolk, A., 2004).

During a child's second and seventh year, he or she is considered to be in the preoperational stage. Piaget stated that during this stage, the child has not yet mastered the ability of mental operations. The child in the preoperational stage still does not have the ability to think through actions (Woolfolk, A., 2004). Children in this stage are considered to be egocentric, meaning they assume others share their points of view (Woolfolk, A., 2004). Because of egocentrism, children in this stage engage in collective monologues, in which each child is talking, but not interacting with the other children (Woolfolk, A., 2004). Another important aspect of the preoperational stage is the acquisition of the skill of conservation. Children understand that the amount of something remains the same even if its appearance changes (Woolfolk, A., 2004). A child in the preoperational stage would not be able to perform the famous Piagetian conservation problem of liquid and volume, because he or she has not yet developed reversible thinking – "thinking backward, from the end to the beginning" (Woolfolk, A., 33).

Concrete operations occurs between the ages of seven to eleven years. Students in the later elementary years, according to Piaget, learn best through hands-on discovery learning, while working with tangible objects. Reasoning processes also begin to take shape in this stage. Piaget stated that the three basic reasoning skills acquired during this stage were identity, compensation, and reversibility (Woolfolk, A., 2004). By this time, the child learns that a "person or object remains the same over time" (identity) and one action can cause changes in another (compensation) (Woolfolk, A., 2004). This child has an understanding of the concept of seriation – ordering objects by certain physical aspects. The child is also able to classify items by focusing on a certain aspect and grouping them accordingly (Woolfolk, A., 2004).

Piaget's final stage of cognitive development is formal operations, occurring from age eleven years to adulthood. People who reach this stage (and not everyone does, according to Piaget) are able to think abstractly. They have achieved skills such as inductive and deductive reasoning abilities. People in the formal operations stage utilize many strategies and resources for problem solving. They have developed complex thinking and hypothetical thinking skills. Through hypothetico-deductive reasoning, one is able to identify the factors of a problem, and deduce solutions (Woolfolk, A., 2004). People in this stage also imagine the best possible solutions or principles, often through the ability to think ideally (Woolfolk, A., 2004). The acquisition of meta-cognition (thinking about thinking) is also a defining factor of those people in formal operations.

Based on Piaget's proposed stages and ability levels at each, certain teaching strategies have been offered for teaching in the Piagetian school of thought. In the preoperational stage, the teacher would have to use actions and verbal instruction. Because the child has not yet mastered mental operations, the teacher must demonstrate his or her instructions, because the child cannot yet think through processes. The use of visual aids, while keeping instructions short would most benefit the child in this stage (Woolfolk, A., 2004). Hands-on activities also aid with learning future complex skills, as the text mentions, reading comprehension (Woolfolk, A., 2004). The teacher must be sensitive to the fact that these children, according to Piaget, are still egocentric and may not realize that not everyone shares the same view (Woolfolk, A., 2004).

Teaching children in the concrete operations stage involves hands-on learning, as well. Students are encouraged to perform experiments and testing of objects. By performing experiments and solving problems, students develop logical and analytical thinking skills (Woolfolk, A., 2004). Teachers should provide short instruction and concrete examples and offer time for practice. With skills such as classification, compensation, and seriation developing during this stage, teachers should provide ample opportunities to organize groups of objects on "increasingly complex levels" (Woolfolk, A., 37).

Teaching those in the formal operations stage involves giving students the opportunity to advance their skills in scientific reasoning and problem solving, as begun in the concrete operations stage. Students should be offered open-ended projects in which they explore many solutions to problems. Opportunities to explore hypothetical possibilities should be granted to these students often. As the text states, teachers need to teach the "broad concepts" of the material while relating it to their lives. Idealism is assumed to be acquired by a person in the formal operations stage; therefore, understanding broad concepts and their application to one's life aid in the realization of ideal concepts.

Piaget also proposed that a child acts on his own environment for learning. Social interaction takes place mainly to move a young child away from egocentrism. It is also important to note that Piaget stated that a child either held the mental structure for conservation, for example, or he did not. A child in the preoperational stage could not be taught to understand the liquid volume experiment; she does not possess the mental structure of a child in concrete operations.

As part of their cognitive development, children also develop schemes, which are mental representations of people, objects, or principles. These schemes can be changed or altered through what Piaget called assimilation and accommodation. Assimilation is information we already know. Accommodation involves adapting one's existing knowledge to what is perceived. Disequilibrium occurs when new knowledge does not fit with one's accumulated knowledge. When one reaches what Piaget called equilibrium, assimilation and accommodation have occurred to create a new stage of development (Woolfolk, A., 2004). When learning the concept of conservation, a child must first "struggle" with the idea that the liquid amount in the cylinders has not changed (disequilibrium). After accommodating the new knowledge, equilibrium occurs, and the child may advance to a new cognitive stage (concrete operations).

Around this time, another psychologist was offering his views on child cognitive development. Lev Vygotsky offered an alternative to Piaget's stages of cognitive development. Vygotsky's Sociocultural Theory of Development became a major influence in the field of psychology and education (Woolfolk, A., 2004). This theory stated that students learn through social interactions and their culture – much different from Piaget's theory that stated children act on their environment to learn. Through what Vygotsky called "dialogues," we socially interact and communicate with others to learn the cultural values of our society. Vygotsky also believed that "human activities take place in cultural settings and cannot be understood apart from these settings" (Woolfolk, A., 45). Therefore, our culture helps shape our cognition.

Through these social interactions, we move toward more individualized thinking. The co-constructed process involves people interacting during shared activities, usually to solve a problem (Woolfolk, A., 2004). When the child receives help through this process, he or she may be able to utilize better strategies in the future, should a similar problem arise. The co-constructed dialogues lead to internalization, which in turn leads one to independent thinking (Woolfolk, A., 2004).

Scaffolding is another Vygotskian principle for the sociocultural perspective. Scaffolding involves providing the learner with hints or clues for problem solving in order to allow the student to better approach the problem in the future (Woolfolk, A., 2004). While Piaget would assume the student does not yet have the mental structures to solve such a problem, Vygotsky would offer encouragement or strategies, in the form of scaffolding, in order for the student to attempt the problem.

The development of language is considered to be a major principle of Vygotsky's sociocultural theory. The language of a certain group of people indicates their cultural beliefs and value system. For example, a tribe with many words meaning "hunting" indicates that hunting is an important aspect of their lives. The text states that children learn language much the same way that children learn cognitive skills. Vygotsky states that humans may have "built in biases, rules, and constraints about language that restrict the number of possibilities considered" (Woolfolk, A., 2004). A child's thinking regarding these language constraints is very important in language development (Woolfolk, A., 2004).

Another aspect of language development involves private speech. Private speech is self-talk children (and adults) may use to guide actions and aid in thinking. While Piaget may view private speech as egocentric or immature, Vygotsky understood the importance of self-directed speech. Private speech is considered to be self-directed regulation and communication with the self, and becomes internalized after about nine years (Woolfolk, A., 2004).

Vygotsky also emphasized the importance of cultural tools in cognition. Cultural tools can be any technological tool or any symbolic tool which aids in communication (Woolfolk, A., 2004). Language, the media, television, computers, and books are only a handful of all the cultural tools available for problem solving or learning. Higher-level processing is "mediated by psychological tools, such as language, signs, and symbols" (Woolfolk, A., 2004). After receiving co-constructed help, children internalize the use of the cultural tools, and are better able to utilize the tools in the future on their own (Woolfolk, A., 2004).

Another Vygotskian principle for teaching involves the zone of proximal development. Like Piaget, Vygotsky believed that there were some problems out of a child's range of understanding. However, in contrast, Vygotsky believed that given proper help and assistance, children could perform a problem that Piaget would consider to be out of the child's mental capabilities. The zone is the area at which a child can perform a challenging task, given appropriate help (Woolfolk, A., 2004).

Piaget and Vygotsky also differ in how they approach discovery learning. Piaget advocated for discovery learning with little teacher intervention, while Vygotsky promoted guided discovery in the classroom. Guided discovery involves the teacher offering intriguing questions to students and having them discover the answers through testing hypotheses (Woolfolk, A., 2004). The students are engaged in the discovery process; however, they are still receiving assistance from a more knowledgeable source.

A teacher utilizing Vygotskian methods for teaching would be a very active member in her student's education. The teacher would apply the technique of scaffolding by providing assistance and offering feedback when relating new information (Woolfolk, A., 2004). Teachers should also make sure that students are provided adequate tools for learning. Students should be taught how to use tools such as the computer, resource books, and graphs in order to better utilize these tools in the future (Woolfolk, A., 2004). Teaching in the Vygotskian method would also incorporate group or peer learning (Woolfolk, A., 2004). By having students tutor each other through dialogues and scaffolding, the students can begin to internalize the new information and come to a better understanding of the material.

I believe that both Piaget and Vygotsky provided educators with important views on cognitive development in the child. Piaget proposed that children progress through the stages of cognitive development through maturation, discovery methods, and some social transmissions through assimilation and accommodation (Woolfolk, A., 2004). Vygotsky's theory stressed the importance of culture and language on one's cognitive development.

Regarding the two cognitive theories, I would be more apt to apply Vygotskian principles to my classroom. I believe that principles such as scaffolding, co-constructed knowledge, dialogue, and cultural tools are all important components of a student's knowledge acquisition. By helping students within their zone of proximal development, we offer them useful learning strategies which they internalize and utilize later. Piaget proposed many applicable educational strategies, such as discovery learning with an emphasis on activity and play. However, Vygotsky incorporated the importance of social interactions and a co-constructed knowledge base to the theory of cognitive development.

In conclusion, a teacher's focus should be to provide assistance to students in need, and provide cultural tools as educational resources. Teachers should provide for group and peer learning, in order for students to support each other through the discovery process. Especially in today's diverse classroom, the teacher needs to be sensitive to her student's cultural background and language, and be an active participant in his knowledge construction.

### Works Cited

Woolfolk, Anita. (2004). *Educational Psychology*. (9th ed). Boston: Allyn and Bacon.

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