Piaget's Theory of Cognitive Development: Part 2: Using

Slide 1	Research shows that attending to the cognitive development of children and adolescents supports better school learning. Piaget's theory of cognitive development describes how that potential is actualized. Hello and welcome to this overview of applications of Piaget's theory. My name is Bill Huitt and I am Professor Emeritus at Valdosta State University and Adjunct Professor at Capella University. The presentation is narrated by Geoff Huitt who is helping me produce these videos.
Slide 2	Before we start the discussion of the applications of Piaget's theory, it is important to reflect on some important concepts from the previous presentation.
Slide 3	First, Piaget describes his approach as genetic epistemology. By this he means he is investigating how biology impacts human beings' processes of knowing about themselves and the world around them.
Slide 4	An important concept derived from this approach is that biological maturation precedes learning. Human beings are innately prepared biologically to
Slide 5	adapt to the requirements within which they live and this potential qualitatively changes through biological maturation.
Slide 6	For human beings, this process of adaptation is guided by schema or mental representations that each individual creates as a result of experience.
Slide 7	The two processes used in adaptation are assimilation, in which an external object or an idea is brought into an existing schema or
Slide 8	accommodation, which is the process of creating a new schema.
Slide 9	Finally, Piaget proposed that abstract symbolic thought is the highest level of cognitive processing and this unique potential differentiates human beings from other animals; this potential develops in stages and each stage represents a qualitatively distinct way of thinking.
Slide 10	There are some general concepts that guide the application of Piaget's theory.

Slide 11	First, it is important that parents and educators provide experiences that create disequilibrium between the created mental representations and the demands of the environment.
Slide 12	This disequilibrium provides the motivation to create new schema that better fit with the requirements of the environment.
Slide 13	It is important to acknowledge that qualitative differences in thinking are exhibited at the different stages and sub-stages as the individual matures.
Slide 14	The first general principle is to provide a wide variety of experiences that are at the child's or adolescent's present level. This is especially important as the individual is making the transition from one stage to another.
Slide 15	A second general principle is to use language to describe the learner's thinking both by the parent or educator as well as the learner. This use of language facilitates the learner's ability to communicate the thinking processes that are used.
Slide 16	A third basic principle is the importance of providing corrective feedback. That provides the information the learner requires to understand the need to change in order to re-establish equilibrium between the schema and the environment.
Slide 17	Finally, it is important to ask questions one level or sub-level above the one the individual is exhibiting. Again, this is especially important when the learner is transitioning to a new stage or sub-stage. However, it is critical to refrain from summative feedback (that is, the learning process has been completed), but rather provide another way of thinking about the question that was asked.
Slide 18	This presentation on the application of Piaget's theory will start with the pre-operational stage related to the ages of toddlers and early childhood as that is where most children begin to experience formal education.

Slide 19	Remember that at the pre-operational stage, children are developing language and the use of imagination, and their thinking is concrete but non-logical. One of the most important principles is that learning must involve the use of concrete props such as physical objects and drawings and illustrations. Children do not understand ideas for which they have no concrete experiences.
Slide 20	A second principle is that instructions must be short, followed by some actual activity such as having a learner modeling specific instructions or the teacher acting out the role of a participant in an activity such as a game. Combining language with behavior makes the activity easier to understand.
Slide 21	A third principle is to recognize that learners will have difficulty in understanding someone else's perspective. Take the child's perspective and experiences into account when giving instructions (which is called proximal learning) and have them listen to and engage with other perspectives.
Slide 22	A fourth principle is to provide children with a lot of physical practice with facts and skills such as having children use plastic letters to make words or have them cut out letters for this purpose. It is important to avoid tasks that are simply paper-and-pencil activities.
Slide 23	A fifth principle is to have children work with physical objects that change shape such as clay, water, or sand and then talk with learners about those experiences. It is important for children to not only have concrete experiences but to also reflect on them.
Slide 24	Finally, it is important that children at the toddler and early childhood ages have a wide variety of personal experience such as those provided by taking field trips and having children use language to discuss their home experiences and TV viewing. Listening to others is as important as presenting or writing about their own experiences.
Slide 25	Remember that the major change from the pre-operational stage to the concrete operational is the ability to think logically regarding concrete experiences. This takes several years to fully develop and involves three different activities:
Slide 26	conservation or knowing that concrete objects involving mass or liquid remain stable even though the shape changes;
Slide 27	classification which involves groupings of objects according to different properties;

Slide 28	and seriation which involves grouping by order such as short to tall or thin to wide
Slide 29	Many of the concrete props and visual aids that were used for younger children at the preoperational stage can be extended for use at the concrete operational stage. For example, time-lines for history lessons or stories can be created and children can build 3-dimensional models that demonstrate concepts taught in science.
Slide 30	In addition to using concrete objects, learners can begin to systematically test out ideas in a logical manner. They might engage in experiments with everyday objects such as cutting up an apple to see which parts float and which do not or use craftwork and tools from earlier periods in history.
Slide 31	It is important to continue to keep any readings or presentations brief and well-organized although these can be extended as children grow older. There should be a step-by-step progression of ideas and short stories or books with short, logical chapters should be used.
Slide 32	When introducing new concepts or characters in a story, there should be a limited number as well as a small number of steps in any activity such as a science experiment. Again, these can be extended as the children enter the upper elementary grades.
Slide 33	An important principle is to engage learners with a wide variety of activities that require classification and grouping of concrete objects and ideas. For example, learners can develop outlines of stories, hierarchies of relationships in history, or analogies among science experiments. They should also have multiple experiences in grouping objects by color, size, and shapes.
Slide 34	Connecting personal experiences that are familiar to learners to more unfamiliar or complex ideas is another important principle. For example, children might be asked to compare their own experiences with characters in a story or solve story problems that relate to their personal experiences.
Slide 35	Finally, children should be provided with a variety of experiences with seriation. For example, they could be given sentences on separate pieces of paper held together with a paper clip and asked to arrange those into a paragraph. Or they could be asked to order different objects by size.

Slide 36	In general, children in the concrete operational stage should be provided with activities that require logical, analytical thinking that become more complex as the children age. Fun activities such as brain teasers and riddles can be very useful at this stage. Most importantly, there should be an emphasis on open-ended questions that require learners to demonstrate logical thinking.
Slide 37	The fourth stage in Piaget's theory involves the ability to logically engage in abstract, symbolic thinking. Remember that while Piaget hypothesized the transition to this stage would begin at about 11-years of age and be completed by age 15, only about one-third of high school graduates actually develop the thinking potentials involved in this stage by the time they graduate.
Slide 38	Therefore, it is important to continue to use the principles discussed in the concrete operational stage throughout the middle grades and high school years. Again, the use of visual aids such as charts, illustrations, graphs, and diagrams as well as having well-organized materials is important. One activity that can be helpful is to engage learners in producing these themselves.
Slide 39	However, it is important to engage learners in the exploration of hypothetical questions after they have explored a topic using concrete examples. For example, teachers can have learners explore "what if" alternatives when discussing past and current social events. One of my favorite examples is a seventh-grade teacher who had learners pretend they were soldiers in Washington's army at Valley Forge and write a letter home to their parents, but do so in such a way that the parents would not be worried. This requires learners to engage their imaginations and go beyond the concrete facts while doing so in a logical manner. Another example is to consider hypothetical "other worlds" through the arts, especially through literature and film. The emphasis should be on learners thinking about personal connections to the people and events in these stories.
Slide 40	Another useful activity is to have learners explain the steps they used in problem solving when using symbols and abstract concepts. Learners can work in pairs with one person engaged in explaining while the other person is listening and providing comments about the thinking processes. Additionally, teachers should provide ample learning activities such as engaging in writing essays, giving presentations, and creating projects that require analytical thinking with abstract concepts and principles.
Slide 41	Finally, it is important to teach broad concepts such as what causes war or poverty and the basics of evolution in addition to the important facts and concepts of particular people and events. Sometimes the lyrics of popular music are good ways to connect learners' personal experiences to larger contexts such as cultural and generational differences.

Slide 42	It is important that those teaching adults in higher education or in adult education investigate the work of researchers such as Michael Commons and Gerald Young who have extended Piagets' theory into adulthood. The previous presentation on Piagetian theory provided some literature that supports this extension.
Slide 43	In summary, there are some important foundational principles that teachers can use when applying Piagetian and neo-Piagetian theories of cognitive development.
Slide 44	The first is that biology prepares the individual for using cognitive processes to adapt to the demands of the environment, but experience actualizes that potential in particular social and cultural contexts. It is therefore necessary for parents and educators to consider biological maturity when designing and implementing instructional activities.
Slide 45	Second, individuals use mental representations they have created when engaging in behavior that they believe will meet the demands of the environment while simultaneously meeting their own needs. There are qualitative differences in thinking processes as children mature into adolescents and adults, but it is the personal experiences of individuals that provide the material for the construction of the mental structures that are used.
Slide 46	Finally, it is the establishment of disequilibrium between the cognitive structures or schema that the individuals have already created and new ones needed to adapt to the demands of the environment that provides the motivation for learners to engage in the process of creating new schema. Too little or too much disequilibrium leads to non-activity; the right amount of disequilibrium is particular to individual learners which, as any classroom teacher knows, means there is a need for differentiation when teaching a group of learners. This is the art of teaching that must be applied as well as the theory and science discussed in these two presentations on Piagetian theory.
Slide 47	Huitt, W., & Hummel, J. (2003). Piaget's theory of cognitive development. *Educational Psychology Interactive*. Valdosta, GA: Valdosta State University. Retrieved from http://www.edpsycinteractive.org/topics/cognition/piaget.html Lutz, S., & Huitt, W. (2018). Connecting cognitive development and constructivism. In W. Huitt (Ed.), *Becoming a Brilliant Star: Twelve core ideas supporting holistic education* (pp. 45-63). La Vergne, TN: IngramSpark. Retrieved from http://www.edpsycinteractive.org/papers/2018-03-lutz-huitt-brilliant-star-cognitive-development.pdf McCarthy-Gallagher, J., & Reid, D. K. (2002). *The learning theory of Piaget and Inhelder*. Lincoln, NE: iUniverse. (Originally published in 1981). Piaget, J., Gruber, H. (Ed.), & Voneche, J. J. (Ed.). *The essential Piaget* (100th anniversary ed.). New York, NY: Jason Aronson.

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