

Learner-Centered: Principles and Instructional Implications of Constructivist Design

1	Title Slide	Welcome to this module, Principles and Instructional Implications of Constructivist Design, in the Learner-Centered teaching series. To advance to the next slide, select the “forward” arrow located on the play bar at the bottom of your screen.
2	Introduction	<p>In the first module in this series, we discussed general applications of using constructivism in the classroom, including teaching "big concepts," providing multiple representations of material, avoiding oversimplification of instruction, and presenting authentic, real-world experiences. Some teachers may face challenges when implementing these applications into their science-based classrooms, as they may encounter a lack of experience or awareness to be able to effectively use constructivist practices (Elkind, 2004). Certainly, the current structure within schools also makes it challenging for teachers to design a classroom based on constructivist principles, as standardized tests employed in schools are often written to test low-level knowledge and do not provide students with the opportunity to use critical thinking skills to think deeply about a concept.</p> <p>This module will help illustrate how teachers can overcome the challenges associated with constructivism and begin to implement constructivist teaching into their science-based classrooms.</p>
3	Learning Objectives	By the end of this module, the learner will be able to incorporate constructivist principles into their instruction.
4	Principles of Design	<p>Before we begin discussing specific instructional strategies we can incorporate into our classroom, let’s first start by reviewing principles of constructivist design that should guide our thinking. Principles of constructivist design should challenge teachers to:</p> <ul style="list-style-type: none"> • Create real-world experiences that employ the context in which learning is relevant • Focus on realistic approaches to solving real-world problems • Stress conceptual interrelatedness, providing multiple representations or perspectives on the content • Negotiate instructional goals and objectives with students
5	Discovery Learning	<p>Let’s now transition to exploring constructivist instructional strategies. The first instructional strategy we will discuss is discovery learning, which is a process that requires students to construct and test hypotheses. According to Schunk (2012), “discovery is a type of <i>inductive reasoning</i>, because students move from studying specific examples to formulating general rules, concepts, and principles” (p. 266).</p> <p>By design, discovery learning is minimally-guided instructional approach, however, discovery learning is not an opportunity for students to do whatever they choose. The teacher is responsible for providing direction, arranging learning activities that provide students the opportunity to search for information, manipulate their findings, and to explore through investigation.</p>
6	Teaching for Discovery	When teaching for discovery, teachers must provide students an opportunity to resolve problems in the form of questions or challenging situations. Important

		<p>factors teachers should consider before using discovery learning in their classroom include the applicability of the learning objectives, the time available – as discovery learning takes more time than traditional methods, as well as the students’ cognitive ability.</p> <p>While there are many advantages to using discovery learning, such as an increase in student motivation and creativity, independence, and variability in being adjusted to a student’s pace, there are also disadvantages to this approach. If not structured carefully, students can experience cognitive overload from trying to answer confusing questions. Additionally, instructors must be well-prepared to answer students’ questions and provide guidelines.</p>
7	Discovery Learning Techniques	<p>Some techniques for discovery learning include using stories, visual aids, or other attention-grabbing techniques both inside and outside the four walls of the classroom to build curiosity and interest in students. Techniques for discovery learning can vary, but the goal is always the same: For learners to reach the end result on their own.</p> <p>Click the link to learn more about the principles of the discovery learning model.</p> <p>See file</p>
8	Inquiry Teaching	<p>Within discovery learning lies a more specific strategy: inquiry teaching. According to Schuck (2012), “inquiry teaching is a form of discovery learning, although it can be structured to have greater teacher direction” (p. 268). Inquiry teaching requires the student to formulate reasons, create principles, and apply the principles to future situations (Collins, 1977; Collins & Stevens, 1983).</p> <p>To learn more about inquiry-based learning strategies, click the links within the slide.</p> <p>See files</p>
9	Peer Tutoring	<p>Let’s transition now to peer tutoring as a constructivist principle. Peer tutoring is a strategy that emphasizes the role students play as mentors and coaches to their peers through social interaction within their zones of proximal development (Vygotsky, 1978). Peer tutoring rests on the belief that learning occurs through “social negotiation within a cultural context, with language as the primary enabling tool” (Clarkson & Luca, 2002, p. 2).</p> <p>For recipients, peer tutoring enhances knowledge construction in students by promoting communication and dialogue. On the other hand, tutors also benefit from these social interactions as “learning is enhanced through teaching.”</p> <p>In a study conducted by Goodlad (1999), some benefits of classroom interactions that involved peer tutoring were:</p> <ul style="list-style-type: none"> • Tutoring recipients found lessons more interesting and engaging • Tutors were able to practice communication skills in an applicable way, befriend students from different social backgrounds, gain insights on others’ perspectives, and develop an increased self-confidence and reinforced content knowledge

		<ul style="list-style-type: none"> • And teachers were able to more easily navigate lessons and enjoy teaching <p>Click the link to learn more about Goodlad’s Seven Golden Rules for designing and implementing peer-tutoring in your classroom.</p> <p>See file</p>
10	Cooperative Learning	<p>Let’s now briefly discuss cooperative learning. Cooperative learning is a “student-centered, instructor-facilitated instructional strategy in which a small team of students is responsible for its own learning and the learning of all team members.” Cooperative learning is more than placing students in teams and expecting them to discuss a topic and report to the class or another group. Cooperative learning holds each team member accountable for their team’s outcomes.</p> <p>A few examples of cooperative learning include the commonly used “Think-pair-share,” in which students are posed a question by the teacher, think and write about their individual responses, discuss with another student, and then share their thoughts with the entire class.</p> <p>For additional strategies regarding cooperative learning, as well as how some guidelines on how to think about team formation or implementation, we have attached some useful links that could be beneficial in the future.</p> <p>To learn more about cooperative learning strategies, click the links within the slide.</p> <p>See files</p>
11	Review	<p>As we come to a close, let’s consider all we have covered so far. We started this module by discussing some principles of constructivist design and challenges associated with this design. We then transitioned into different strategies, including discovery learning, inquiry teaching, peer tutoring, and cooperative learning. Of course, we only scratched the surface of the broad spectrum of constructivist strategies that exist in the education world today. Hopefully, starting with the strategies discussed in this module will create a starting point to help you incorporate constructivist design in your classroom.</p>
12	Sources	<p>Armstrong, D. G., & Savage, T. V. (2002). Teaching in the secondary school: An introduction (5th ed.). Upper Saddle River, NJ: Merrill/Prentice</p> <p>Bruner, J. (1973). Going Beyond the Information Given. New York: Norton.</p> <p>Clarkson, B & Luca, J. (2002). Promoting student learning through peer tutoring – A case study. Retrieved from http://ro.ecu.edu.au/cgi/viewcontent.cgi?article=4913&context=ecuwor</p> <p>Collins, A., & Stevens, A. L. (1983). A cognitive theory of inquiry teaching. In C. M. Reigeluth (Ed.), Instructional-design theories and models: An overview of their current status (pp. 247–278). Hillsdale, NJ: Erlbaum.</p> <p>Elkind, D. (2004). The problem with constructivism. The Educational Forum, 68, 306–312.</p>

		<p>Enhancing Education. (2002). The 5 E's. Retrieved from http://enhancinged.wgbh.org/research/eeee.html#constructivism</p> <p>Ginsburg-Block, M. D., Rohrbeck, C. A., & Fantuzzo, J. W. (2006). A meta-analytic review of social, self-concept, and behavioral outcomes of peer-assisted learning. <i>Journal of Educational Psychology</i>, 98, 732-749.</p> <p>Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problembased, experiential, and inquiry-based teaching. <i>Educational Psychologist</i>, 41, 75-86.</p> <p>Rohrbeck, C. A., Ginsburg-Block, M. D., Fantuzzo, J. W., & Miller, T. R. (2003). Peer-assisted learning interventions with elementary school students: A meta-analytic review. <i>Journal of Educational Psychology</i>, 95, 240-257.</p> <p>Schunk, D. H. (2012). <i>Learning Theories, an Educational Perspective</i> (6th ed.). Boston, MA: Pearson Education Inc.</p> <p>Tuovinen, J. E., & Sweller, J. (1999). A comparison of cognitive load associated with discovery learning and worked examples. <i>Journal of Educational Psychology</i>, 91, 334-341.</p> <p>Windschitl, M. (2002). Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. <i>Review of Educational Research</i>, 72, 131-175</p>
13	Credits	Thank you for viewing this module.