Introduction to Constructivist Learning Theories

By Jeff Barbee D.M.A., M.A.

The instruction of teaching pedagogy is overlooked and undervalued in many academic degree programs. Students are taught modern day theories and pedagogies in the degree background but rarely receive meaningful instruction of how to bestow knowledge to a classroom of students. Even with course content well mastered and understood, instructors and professors seem to lecture students without finding ways to make the learning meaningful. The traditional lecture was the way many teachers were taught and now expecting their students to learn. As education has advanced, more effective ways to teach students that go beyond the traditional lecture have been developed. This article will highlight some basic methods of the Constructivisit theory and why implementing it should become a serious consideration.

Using a constructivists approach incorporates high level engaging activities for students through assignments that require more than rote memorization of facts. Constructivistism focuses on the importance of “learning as you learn” (Hein, 1991). This can be attributed that learning is best when it is contextualized, using high level of thinking, such as those listed in Bloom’s taxonomy, to understand how new knowledge connects with old knowledge. This growth is aided by communication and working with instructors or peers. Being able to exchange ideas will also aid in using upper level thinking skills which are often oppressed in a traditional lecture hall. To put learning in a students’ hands will allow the discovery of knowledge and lead to a higher level of motivation. Which can drive students to take a greater interest in the course (Hein, 1991).

The basis of teaching collegiate courses begins with a solid understanding of the Bloom’s Taxonomy (1956). This is a common source that Centers of Teaching and Learning around the country promote, as well as those who focus on student learning. When designing courses it may be helpful to examine the assignments that have been selected and identify which skills students will have needed to master. This taxonomy is often presented in a triangle form. With “lower” level skills making the foundation, while “higher” level skills completing the top. These “lower” and “higher” level terms are accepted now but were not used by Bloom himself (Adams, 2015).

The bottom level of this pyramid is knowledge. This level states that students understand fragments of information or content. Such examples could be memorizing the alphabet, or a multiplication chart. Students demonstrate knowledge by recalling desired facts or statements without a deeper understanding. Such examples of assignments that complement this level would be multiple choice exams, or fill in the blank questions. An example of this type of application, a true or false style quiz or test would represent this level. Many traditional lectures students sit through will fall in this level of thinking. Little interaction and application of the content is required.

The next level of Bloom’s taxonomy is comprehension. This level requires students to use what they have absorbed through the knowledge portion of the taxonomy, and comprehend the meaning. Students use cognitive skills to understand what this information represents. An example is understanding how the multiplication chart works, or summarizing what a reading assignment means in their own words (Adams, 2015). This type of application would be a multiple choice quiz or exam. Requiring students to think about the possible answers to the question. This level is often viewed as the peak of thinking skills required of students in traditional lectures (Vuchetich, 2006).

Application is the next level. Students now know the course material and understand the material enough to put it in their own words. The next step is to use this information in a meaningful manner. An example is to use a math problem to apply the multiplication chart, or to apply a new theory to a learning situation such as a constructivist approach to an old assignment.

After the application process has been completed, the next step in the pyramid is analysis. This step is associated with the beginning of critical thinking skills. Students should be able to examine the problem and understand if the facts are correct, or if mistakes or opinions are interwoven (Adams, 2015). This is a common practice for music majors to analyze musical scores to understand what type of chords are used, and when they are used. This step requires the knowledge gained in the previous steps to use as a foundation of the student’s analysis.

Synthesis, the step after analysis, will require students to build their own example of the course material. For music majors this could be writing their own piece of music, or for a writing student could be to write their own story or narrative (Adams, 2015). This level is excellent to use a problem-based assignment for students to use highly cognitive skills developed with the course content.

The final step of the Bloom’s Taxonomy is the Evaluation. This process is usually used at the end of a course or project. The cognitive skills will be required to use the previous steps in this taxonomy, and reflect on how and if the learning objectives were met. Students will be able to critique work and understand if it has met the requirements (Adams, 2015).

An additional approach to student learning that has been developed recently is Webb’s Depth of Knowledge (1997, 1999). This can be used in coordination with the Bloom Taxonomy as a focus of how deep the desired level of each skill is being challenged. Webb’s Depth of Knowledge has four levels: Recall and Reproduction; Skills and Concepts; Strategic Thinking; and Extended Thinking. The DOK approach will help develop activities that will involve deeper cognitive skills at the desired Bloom’s level. (Hess, 2010).

The first level, Recall and Reproduction, requires students to know a simple answer or procedure. The student either knows the needed information, or does not. The second level, Skills and Concepts, students will make a decision on how to handle or approach the problem. The third level, Strategic Thinking, students will use higher level of thinking skills, such as the ability to reason or plan. The problem may be complex and have multiple answers. The final layer, Extended Thinking, students will think at the highest of levels and complete tasks that often take an extended amount of time. Students will have to make connections from several related points and design a solution to an issue that could be solved in multiple ways (Hess, 2010).

One learning theory that can be applied in classroom teaching is the Social Development Theory by Russian Psychologist Lev Vygotsky (1896-1934). Students are guided through a “hands-on” approach which helps them internalize the content more efficiently than if received through a traditional lecture. Social interaction plays an important role with this theory. Vygotsky believed that learning material used two stages. The first, within a social context, an interpsychological approach, then was ingrained within the student, an intrapsychological approach. Overall, learning helps advance development within students.

The professor of a course, serves as the “More Knowledgeable Other” (MKO). This is because the instructor has the most experience and knowledge of this course content. The role of the MKO is to guide students through the Zone of Proximal Development (ZPD). This zone represents the progress of a student from needing the instructor to complete a task, progressing to the ability to accomplish the task independently. A student’s ability is divided into three layers. The base layer representing what the student can do independently, the middle being tasks the student can accomplish with help, and finally the area that students have no chance in succeeding. The middle zone, or the ZPD, is where students are presented with tasks that are just outside of the student’s ability to complete independently. With the help of the MKO, through what is known as “Scaffolding,” the student is able to grow their base level of knowledge.

The ZPD is viewed in four stages. In the first stage the student will need the help of a MKO. As learning grows, the student will move into stage two. Here the student grows independence and is able to comprehend the task at hand. Stage three is where the student has mastered the content and is no longer in need of assistance. The acquired skills have become automatic. The final stage is where the newly learned skills are not frequently applied and thus diminish. This will cause the student to re-visit an earlier stage to regain these skills.

The Discovery Learning Model can be used to help guide students to use the knowledge they already know to discover more by applying this knowledge (Lee, 2016). This theory was introduced by Jerome Bruner (1915) in 1961. Based from the foundation of Constructivist theory of Piaget, Bruner brings added depth to this aspect of learning from his point of view. Like Piaget, his views use both mental and physical approaches to reach a point of development (J. Bruner, 2016 ).

The Discovery Learning theory involves five principles: Problem Solving; Learner Management; Integrating and Connecting; Information Analysis and Interpretation; Failure and Feedback. The benefits of this model includes the involved motivation and creativity, it can be adjusted to meet the learners pace, promotes independence and has a high retention rate (Bruner, 2016). This theory will require solid planning to implement and firm framework to reduce wondering that could lead to subpar results. Due to the limitations this model has, it is not recommended to be used as the primary source of delivery of instruction, but as an excellent supplement (Bruner, 2016).

The overall goal of the discovery learning theory is for students to have hands on, physical, and engaging learning opportunities to discover new knowledge, retain it efficiently, and have students discover the end point of the material on their own. However, because of the possible wondering students could experience, the instructor must have a well-designed course that keeps students on task.

Principle one: Problem Solving. Having student use previous, and newly acquired information to apply in problem solving. This encourages students to critically think using the knowledge and skills they have, and invite them to take risks in applying these skills to these problems.

Principle two: Learner Management. Allowing students to work at their own pace. The instructor can have students work alone or in groups. This aspect should remove the stress of forcing some students to keep up with a certain progress speed, but instead build confidence in themselves by learning on their own.

Principle three: integrating and connecting. Instructors guiding students to combine newly acquired skills with previous knowledge. Students being placed in familiar situations will become more confident in using these skills and begin to explore and discover new knowledge.

Principle four: Information analysis and interpretation. This stage allows students to discover knowledge not through a content delivered method, but by applying their knowledge instead of trying to memorize facts.

Principle five: Failure and Feedback. The learning process not only prevails through successes, but also through failures. Providing students with feedback increases the chances of students gaining knowledge.

Constructivist theory has the potential to connect students with course material through cognitive interaction. Understanding how to design assignments to meet the desired level of Bloom’s taxonomy or Webb’s Depth of knowledge will help instructors identify the skills their students have developed or need further work. Students will also enjoy the benefit of understanding the skills that will be needed for assignments.

References

Adams, N. (2015). Bloom’s Taxonomy of Cognitive Learning Objectives. *Journal of the*

*Medical Library Association, 103*(3), 152-153. Retrieved from:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4511057/>

Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, D. (1956). Taxonomy of Educational

Objectives. *Handbook One,* 201-207.

Bruner, J. (2016). *Instructional Design Models and Theories: The Discovery*

*Learning Model.* Retrieved from: https://elearningindustry.com/discovery-learning-model

Hess, K. (2010). *Applying Webb’s Depth-of-Knowledge Levels in the Science.* Retrieved from:

http://www.nciea.org/publications/DOKscience\_KH11.pdf

Hess, K., Jones, B., Carlock, D. & Walkup, J. (2009). *Cognitive Rigor: Blending the*

*Strengths of Bloom’s Taxonomy and Webb’s Depth of Knowledge to Enhance Classroom-*

Hein, G. (1991). Proceedings from CECA (International Committee of Museum Educators)

Conference 2001: *Constructivist Learning Theory.* Jerusalem, Israel.

J. Bruner. (2016). Principles of Learning. Retrieved from:

https://principlesoflearning.wordpress.com/dissertation/chapter-3-literature-review-2/the-

constructive-perspective/discovery-learning-jerome-bruner-

1961/?utm\_campaign=elearningindustry.com&utm\_source=/discovery-learning-

model&utm\_medium=link

Lee, J., Ng, J., Rabinovich, A., & Wu, J. (2016). *Learning Theories.* Retrieved

from: <http://www.learning-theories.com/discovery-learning-bruner.html>

Vuchetich, P., Hamilton, W., Ahmad, S., & Makoid, M. (2006). Analyzing Course

Objectives: Assessing Critical Thinking in the Pharmacy Curriculum. *Journal of Allied*

*Health, 35*(4), 253-275.