

Reflection on Learning Theories

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One of the learning theories that I have identified the most with for most of undergrad and my career has been cognitivism. This theory has profoundly influenced my approach to teaching. That is not to say that other theories are not present in my classroom and could be used to improve how my students perform and learn. Reflecting on various learning theories such as constructivism, experiential learning, connectivism, behaviorism, and cognitivism in my classroom can provide valuable insights into enhancing my teaching methods and student outcomes.

Cognitivism focuses on information processing and how students both store and retrieve information, emphasizing how students encode that information into both short-term and long-term memory. In my mathematics classroom, students receive data, or input from a variety of sources. Additionally, much of mathematics is building upon material that we already know. To allow my students to better retain the information that they are using, I try to break down everything into smaller more manageable steps. This approach helps students process complex mathematical concepts. For example, during my introductory lesson in factoring, everything relates back to multiplying polynomials. We start by just guessing and checking to see how we can get two binomials that will end up multiplying together to give us the polynomial we want. Eventually, we end up with a process that students are able to break down so that they can use these techniques for other lessons. Another thing that I focus a lot on is metacognition. I want students to be able to describe how they get to answer.

While cognitivism is the theory that resonates most with me, other learning theories are also present. Constructivism grew out of cognitivism (“Learning Theories”, n.d.) and I definitely can see why. While I want students to be able to store what they do learn, I also feel that students

learn better when constructing that information for themselves. As Kivinen and Ristelä (2003) state, “the whole cycle of learning involves experimentation, trying one’s ideas out on things that discovering what can be done” (pg. 372-373). Often times, I will encourage students to continue working through a problem, even though I know that the method or direction that they choose won’t lead them to the answer. My hope is that eventually, even though they have worked themselves into a corner, as they retrace their work they will be able to identify where they have gone awry. Through this process, they often are able find their error, which has allowed them to better understand the material. Another large tenet of constructivism is student collaboration. I am a big supporter of students working with others to collaborate. It is my belief that students learn better when they learn with others. Collaborating with others allows students opportunities to engage in meaningful dialogue, share perspectives, and collectively work together. In these settings, students not only learn from each other's insights but also develop essential teamwork and communication skills that are valuable beyond the classroom.

Students being able to use skills beyond the classroom leads right into the next theory, connectivism. Siemens (2004) remarks about how learning is constantly changing as we are making decisions that are based on rapidly changing foundations. In some subjects, like history, it is easy to see how our learning is constantly changing and expanding. However, mathematics is not something that will fundamentally change. $1+1$ will always equal 2. What students will do with their math skills is something that will grow. Many students often ask wonder when they will use the mathematics that we learn in the classroom in “real life”. While students may not be solving using the Pythagorean theorem every day, it is important to know the process that led you to decide to use that particular method. Siemens (2004) emphasizes this by stating “the pipe is more important than the content within the pipe” (p. 5). This is why in my classroom, I am

constantly talking about problem solving strategies with my students. How can we take difficult problems, like word problems and break them down into more manageable pieces? Once we have those pieces, can we leverage our tools like graphing calculators or even the dreaded internet to help?

The two theories that I use the least in my classroom are experiential learning and behaviorism. In experiential learning, A. Kolb and D. Kolb (2005) remark that knowledge results from the combination of taking a concept, attacking it in different ways, reflecting on the learning, and repeating. It is often very interdisciplinary and requires learning from hands on experiences. Although occasional activities such as students creating surveys during our probability and statistics unit and then analyzing the data and answering questions have slight experiential learning tendencies, is not consistently present in my classroom. Additionally, behaviorism is occasionally applied through the use of positive reinforcement, such as occasionally offering extra credit points for students who complete assignments and turn in materials on time.

While some are more prevalent than others, all learning theories exist somewhere in my classroom. While cognitivism aligns closely with my teaching philosophy, I recognize the importance of incorporating elements of constructivism and connectivism to foster student engagement and deeper learning. By using collaborative learning, problem-solving strategies, and leveraging technology, I want to create a learning environment where students can not only grow their math skills but develop skills that will serve them beyond the classroom as well. While experiential learning and behaviorism currently play lesser roles, I now have more ideas about how to further implement aspects of these theories that I think will serve my students well.

References

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