

Position Paper: Contextual Learning Theory Applicability

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Position Paper

Exploring the varied learning theories that have been postulated over time, lead me to three conclusions: (1) no individual learning theory as yet defined can adequately define the learning process without the physical cognitive neuroscience research to qualify its veracity, (2) current learning theories need more study on larger demographic groups, and (3) no single learning theory is superior to another. Rather, in the examination of post secondary education, multiple learning theories could be applicable depending upon circumstances that must be evaluated within the context of the learner. The ones that seem the most appropriate in higher education, are those where the learner has a more active role in his own learning process.

Neuroscience Meets Theory

At the foundation of any learning theory is an assumption regarding how knowledge is acquired, retained and retrieved. However, constructing these theories by limiting learning experimentation to external stimuli and external observation of the learners responses could lead to erroneous conclusions. For example, when evaluating Behaviorism, it is noted that many of the student's responses could be influenced by the learner because of intrinsic student centric factors ranging anywhere from motivation or hunger. "Research shows that to explain learning—and especially higher-order and complex learning—we must take into account people's thoughts, beliefs, and feelings." (Schunk & Dale, 2016). Internal variables tendency to skew the observations emphasizes the need to observe the physical building blocks that control and encompass not only the learning process but all human thought processes: the human nervous system.

The cognitive neuroscience of learning requires knowledge of how auditory, visual information processing is translated into consciousness in a physical capacity and also retrieved for demonstration, application, critical thinking, etc. It requires the ability to understand how learning is processed, how memory is retained, how information is forgotten. The field of neuroscience has made great strides in this department. However, as evidenced in Dr. Nancy Kanwisher's TED talk in 2014, technological advancements still have not reached the ability to comprehensively explain the human brain, mind, and how learning, memory and forgetting relate to one another to the same physiological degree as other parts of the body (Kanwisher). Therefore, to assert that any one learning theory is more appropriate, because a particular group of theorists decide "this is how we learn" is inherently missing all known and unknown influences that could impact the learning process. The significant opportunity still left within the field of neuroscience, precludes me from stating any one theory is more right than another. In fact, even for what is known, "unfortunately, (...) learning theorists in various traditions, while acknowledging the importance of brain research, have tended to formulate and test theories independent of brain research findings" (Schunk & Dale, 2016).

It was worth noting, however, over the course of the semester Information Processing Theory, made the strongest attempt to align the physical structures of the brain with the theoretical learning acquisition process. Therefore, it was the first theory to resonate with me the most. The ability to physically identify and scientifically observe the portions of the brain which retain Working Memory, Long Term Memory and then further to show that through repetition and actively retrieving information from long term memory neural networks are strengthened, lent credibility to any theory that emphasizes the need to activate these processes as much as

possible. Focusing on the brain and neural systems, gives latitude for intrinsic motivations, attitudes and emotions to shape the learning and memory making process providing a more wholistic picture of how humans learn.

Demographically Inconclusive

Learning theory research is limited to the brain research science currently available, the technological innovations that facilitate such research, and theorists willingness to reference such findings in their learning process experiments. Additionally, there is also has a tendency to limit the breadth of learners demographically willing to be considered when performing evaluations. When studying learning styles, Bjork critiqued the proponents of learning style assessments, for not having researched all learning styles against all possible learning participant types using “factorial randomized research design” (Pashler, McDaniel, Rohrer, & Bjork, 2008). “[Our] search of the learning-styles literature has revealed only a few fragmentary and unconvincing pieces of evidence that meet this standard, and we therefore conclude that the literature fails to provide adequate support for applying learning-style assessments in school settings” (Pashler, McDaniel, Rohrer, & Bjork, 2008). This strong critique of members within the discipline made me consider what other limitations that might be hindering a full understanding of the learning theory process. The one that repeatedly frustrated me, was our tendency to test learning theories applicability on a subset of the human learners: school age children.

In the twenty first century we live in an age where life long learning is more acceptable and expected. Therefore the learning theories that might be appropriate for school age children might not be appropriate for adult learners. Children, college students, working learners and mature adults all are at different stages of their life and have unique circumstances and goals

motivating their learning experience. Even from a brain research perspective it is noted that the brains of each of these groups have distinctive developmental markers that can impact their ability and ease to acquire new information (Schunk, 2016). Yet our learning theories only tend to focus on the set of students with the most malleable changing brain structure and least amount of motivation for garnering practical experience. Again, it is this disparity in learning theory research participants across the age groups discourages me from attaching myself to any one learning theory.

As we age from 5 years old to 50, our learning goals shift from remembering foundational knowledge (ex. A, B, Cs) to synthesizing information to develop complex project plans that can be communicated and implemented by individuals other than ourselves. While Bloom's taxonomy is represented in its components at all stages of life, more and more of an individual's time is spent at the higher levels of learning at later stages in life because of the responsibilities their personal circumstances now demand: jobs or activities supervising, leading, developing other individuals with important consequences and downstream ramifications. Learning principles that focus on this depth of higher level learning are obviously more appropriate for those students when they need to be applying those critical thinking skills. However, if an ESL mature adult is just trying to remember the building blocks to formulate words in English, behavioristic principles would suffice.

The tendency for one theory to seem more appropriate at a different stage of life, does not seem to be the answer. I visualize learning as a spectrum that transcends time. The brain however is a finite muscle with repetitive function. Chemical processes may make things harder or easier to do at different moments in our life, but the brain will continue to work as it always has and

learn according to its defined process. So whatever theory that is the best reflection of our brain's processes, should be able to encompass the totality of the human learning experience, not just the first eighteen years due to societal constructs.

A Theory To Rule Them All?

The ideal learning theory would encompass select principles of each of the umbrella theories: Behaviorism, Cognitive and Constructivist. These principles would be leveraged based upon the type of knowledge sought to be gained in the most efficient manner appropriate for learner's age and goal. While possible, constructivist principles of using the environment to come to certain conclusions or asking your neighbor, could help one learn the English alphabet. But for the sake of time, and particularly the maturity & experience level of the individual in question (Kindergartener vs middle aged foreign language student), behaviorist principles might be more appropriate. However, a constructivist exercise might be worth pursuing if the learning knowledge to be acquired is applicable for immediate demonstration in a work environment (Continuing Education or Senior Design Portfolio) as opposed to a theoretical conversation (Undergraduate Calculus). The key to employing these principles effectively would be to never forget the underlying neurological system that governs the information processing. Therefore, regardless of the principle being employed, one would ensure that constantly stretching the "retrieval muscles" to create "desirable difficulties" would solidify long term memory retrieval, making what was learned easily accessible (Bjork & Bjork, 2011).

Until such time a theory exists that reflects the comparative complexity of the brain learning processes over a lifetime of goals and motivations, I will find myself more open to employing principles of theories where the student is actively engaged in their learning process:

from ensuring they understand why their learning is relevant, encouraging them to set their own goals and learning by exploration. I am a naturally curious person who loves to learn but also immediately finds ways to apply what I've just learned, so constructivistic based classes I enjoy the most. However, as a community adult educator passionate regarding the importance of computer and digital literacy, it is imperative that my students can use not only the new technology devices that seem to pop up every eighteen months, but also how to critically assess what type of skills they've leveraged before that could translate to a new digital medium years down the road when interface inevitable changes. This requires us to lay a strong foundation that many in my classes tend to lack. A constructivist theory would not work in beginners classes, because they wouldn't get anywhere very quickly. And time is an important factor, when your learners are working adults who motivations and goals for being in the class tend to be career advancement related rather than casual personal enrichment. I will tend to start a class using cognitive principles and switch to constructive principles as they become more familiar with the material and gain confidence in what they are trying to achieve. The constructivist portions of the class are activities that enforce recall and help them make connections that at their own pace.

Through personal concerns about the comprehensiveness of learning theory research to define human experience, and my personal interests and expectations when attaining knowledge, I've come to the realization I don't have any one learning theory preference. As long as the mind, regardless of age, is actively engaged with meaningful student centric activities that work with the brain and not against it, I can find a satisfactory solution.

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