Perspectives on Learning:

History as a Guide to Modernize Digital Learning

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To learn is to change. At the most fundamental level, the purpose of education is to change people and prepare them as capable humans. While various instructional traditions characterize the process, environment, and motivation for learning differently, they all agree on this basic premise (Driscoll, 2004, p. 9). As learning science moves deeper into the digital age, however, the pace of modernization is quickly forcing a revolution in what society requires from its educators. Doing things that were "good enough" for our parents is no longer adequate to ensure current and future generations are armed to compete in the age of big data (Baig et al., 2020). As hybrid learning becomes more the expectation than the exception, we as learning professionals must continuously reflect on the field's origins and question how to improve instructional design.

Today's teaching methods draw direct lineage from three prominent theories of psychology and education: behaviorism, cognitive information processing, and constructivism. To explore how appropriate these foundations are for driving modern learning design, I compare their value as theoretical frameworks to understand how knowledge is created as well as their practical application in digital learning spaces. My analysis focuses on how each tradition transforms environmental inputs into effective results through its prescribed lens of assumptions and learning principles. Lastly, my assessment describes how each tradition fairs against the demands of today's modern learning environment, which is often asynchronous, geographically dispersed, and heavily dependent on high-speed data. These insights will reveal opportunities for strengthening our teaching strategies around a philosophy focused on the best potential student outcomes.

In the 1930s, B.F. Skinner expanded John Watson's work on psychological behaviorism by applying association concepts to learning (Driscoll, 2004, p. 32). Principles of behavior management, or **reinforcement**, became synonymous with learning management. Behaviorists see learning as a behavior to be regulated by providing the appropriate **stimulus-response (S-R)** controls. A key assumption driving this belief is that behavior relies exclusively on external factors, and not the individual. Ignoring any perception of a learner's interpersonal thoughts, behaviorists maintain physical experience alone causes learning. As a result, only outcomes that are both observable and measurable are prescribed to learning.

In the behaviorist model, instructors retain primacy in identifying the purpose of learning, developing the reinforcement strategy, and implementing programs designed to change behavior. While students actively negotiate the consequences of the S-R strategy, their main learning role is reacting to a stimulus. The inputs to this model are exclusively physical, from either the environment or the learner's own abilities. The learning process is simply described as an external stimulus driving a reciprocal response. Obvious shortcomings in the theoretical model include a lack of inputs that can't be physically measured, such as a learner's cognitive and emotional abilities as well as social and economic factors in the environment. The learning process is a bit of a "**black box**" (Driscoll, 2004, p. 33) with no explanation on why certain stimuli fail to produce the expected response. The results side of the model lacks any outcomes that are internal to the learner, such as the ability to solve multi-step problems, self-regulate, or develop follow-on learning objectives.

The behaviorist model has proven useful in several learning scenarios. Managing individual or small group behavior and implementing individualized learning plans are positive examples for young learners. Additionally, the model can be applied to simple learning tasks

guided by very specific, directed steps. Lastly, the model is widely used to develop performance objective and feedback programs in the professional world. While the theory can be applied broadly, each of these applications also has drawbacks. The resource cost of managing behavior at the individual or small group level is high. This solution is bound to fail in a large class without multiple teachers. With a heavy reliance on rewards/punishments, how can learning be accurately assessed? Is learning being evaluated or the learner's desire to be rewarded? While some learners respond well to the guided nature of objective-oriented study, many complain that learners only focus on what they're told to do and nothing more. This has the potential to stifle exploration and creativity. Some additional areas that the model struggles to address are intrinsic motivation and language skills (Driscoll, 2004, pp. 64-65).

Answering a critical gap in behavioral approaches to learning, cognitive psychologists were eager to recognize the human mind as a factor in achieving understanding. Advances in technology and entry into the information age post World War II gave them the vocabulary to introduce information processing as a concept explaining how the mind retains information like a computer (Driscoll, 2004, p. 74). While still beholden to behaviorist concepts of association and environmental influence, cognitivists introduce the mind as a new variable in the learning process. Instead of just reacting to a stimulus, cognitive information processing (CIP) recognizes a capacity to recall prior experience, putting the stimulus in context and enabling the learner to decide how to respond. As a result, responses are difficult to predict through environmental factors alone. The capacity of the mind, though limited, plays a role in choosing what to retain.

Like behaviorism, CIP advocates primacy for the instructor to lead and reinforce learning. However, recognizing the mental capacity to store information significantly changes how lessons are organized and delivered in a way that builds upon previous experience. Learners play a more active role by practicing techniques to improve their ability to store and recall information through multiple stages of **memory**. Instead of the environment dictating their attention, learners choose the stimuli that holds meaning or interest. This **selective attention** explains how students can focus on an important activity while still processing other, less demanding efforts. The products of cognitive learning expand to encompass not only how to do something, but also knowing what things mean at the conceptual level. Maintaining this type of knowledge has big implications for improving individual performance in higher order tasks.

Practical application of the CIP model is most notably seen in how instructors organize lessons to be methodically consumed in easily digested sections or **"chunks"** (Driscoll, 2004, p. 87). This delivery style enables learners to process small amounts of information, gradually putting the pieces together to understand a larger concept. To facilitate retrieval of these chunks, learners are encouraged to practice **active learning** and **note-taking** which imprint new information more firmly into memory. This **encoding** gives some semblance of control on environmental stimuli, facilitating better focus on critical learning objectives. While I see numerous positive aspects to increasing a person's recall ability, there are noticeable drawbacks to this model. The first is capacity. At some point, most of us have a limit on what we can memorize. Retention exercises on small bits of a larger whole may produce expanded recall but does little to increase our ability to apply critical thinking beyond either our experience or facts memorized (Huitt, 2003). This style of learning is woefully inadequate to handle complex, multi-stage problem solving. Additionally, learners conditioned by chunking struggle to identify key concepts when faced with unstructured learning tasks. In sum, this model is great for learning simple facts and figures but results in a superficial grasp of any deep meaning on complex subjects.

The transition from the information to the digital age brought forth a social consciousness that directly impacted learning theory development. As the world became more connected, constructivists like the Russian psychologist Vygotsky and Swiss child psychologist Piaget, described knowledge creation as a building exercise where learners attempt to make sense of their interaction with the society around them (Driscoll, 2004, p. 387). Students arrive in learning spaces each with their own perspectives heavily influence by personal, sociocultural factors. Constructivism, nascent as a model, is more clearly explained as a patchwork of ideas drawn from the **collaborative** nature of social interaction. In the constructivist philosophy, learning is the result of shared experience and challenging each other's perspectives.

Contrary to objectivist traditions, constructivists see personal experience as the key driver to restructure and create new knowledge. Knowledge doesn't exist in the cosmos, waiting to be learned; rather, we build meaning as we experience things. The instructor plays the role of facilitator ensuring students are challenged through complex and realistic **problem-based learning (PBL)** activities. For effective PBL, however, teachers must come armed with enough knowledge and resources to allow the students space for learning at their own pace and interest level (Rosenfeld, 2006). Learning outcomes have the potential to greatly surpass the other traditions as this model builds on their best attributes. When applied appropriately, students grow in their capacity to reason, think critically through complex problems, and **reflect** on how they choose to use this newly acquired understanding.

Constructivist thinking is at work with the advent of more **open-ended** instructional design strategies. These models usually begin with foundational **scaffolding** to impart initial concepts or learning tools, but then the students are allowed to guide where their interests take them. The sessions tend to be more collaborative, driven by informal discourse on complex scenarios. Having assumptions and beliefs challenged through debate is an effective method to drive a deeper understanding of how to apply logic and reason. The loose interpretation of constructivism leads to one of its most widely acknowledged critiques in that it resonates more as an ideology or philosophy than a learning tradition. If knowledge creation is left to the learner, then who are the experts who will teach and lead them? In more complicated subjects, instructors must be highly experienced if they are going to guide such flexible learning sessions. This is problematic for new and inexperienced teachers. How do you grade these problem-solving sessions? Objectively measuring this type of learning competence is extremely difficult. Lastly, resourcing these flexible learning environments with technology, equipment, and time is not going to be viable for small institutions that may be fiscally constrained.

The last 18 months of struggling through the COVID-19 pandemic is but a taste of the wicked problems that await our students. Instructional design frameworks we use must be flexible enough to adapt to the unknown. This paper examines three foundational schools of learning design through a filter of inputs, process, and results. While behaviorists and cognitivists see knowledge as finite and something to be delivered to the student, it's the constructivist that places the learner at the center of the knowledge creation process. Learning outcomes remain how educational institutions are judged. Both behaviorist and cognitivist methods are challenged to push learners from parroting memorized lessons to an ability to recognize and reflect on knowledge applied in the real world.

To change is to grow. As education endeavors to produce change in how students sense, internalize, and respond to the world around them, all of these learning traditions have the potential to contribute. If education's goal is to produce agents of change prepared to succeed in a data driven, politically diverse, and socially connected world that's constantly evolving, then a

constructivist-like philosophy for instructional design is required. As a distance learner, a parent of a distance learner, and a future professional in the field, I struggle to visualize a learning landscape that accepts all knowledge and understanding as objective and already in existence. Technology changes reality too fast and our students must be prepared to adapt and manage the unknown.

References

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