

Using Technology to Create a Learner Centered Teaching Environment

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Abstract

The 21st century has seen a shift in traditional education. Educational facilities are beginning to place a focus on learner-driven environments that are intertwined with technology. Over the past several years there has been a focus on Constructivist teaching models and how to correctly implement teaching for effective learning. The articles discussed here vary in topic but are similar in that they each show a focus towards integrating technology into the learning environment. Each one presents a different educational model/theory, but their end results present a common theme. The theme within each of these articles is that technology can provide a foundation for increased student engagement and collaboration. This paper will examine the different themes across instructional designers in the Constructivist realm while also exploring that there is a trend in using technology within problem-based and inquiry learning environments.

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Several articles have been written on the studies and benefits of learner-centered teaching environments. Technology, when used in the setting of problem-based learning, gives rise to a more accessible and collaborative environment that is driven by student engagement. Driscoll (2005) provides the notion that learning via Constructivism solely depends on the learner. Whereas Reiser and Dempsey (2018) show the varying teaching models, which have risen out of the Constructivist theory, that place the educator at the center of learning design and acting as the guide for what will be learned. Hmelo-Silver, Duncan, and Chinn (2006) provide supporting facts about the use of scaffolding within problem-based (PBL) and inquiry learning (IL) in order to facilitate student learning. Dr. Bill Watson spoke on using technology, even video games, to help create personalized learning environments, environments that can only be created through the proper use of Constructivist ideology (Watson, 2014).

Literature Review

Keller (1979, 1987) discuss a personalized system of instruction-based approach to teaching. This approach is conducted by mixing educational theories to fit the learner's needs. The most important aspect of Keller (1979) is the discussion on mastery learning. One of the many focuses these articles bring to light is how learners engage with technology in order to form a sense of mastery on their chosen, or provided, subject matter. The want for mastery is present within the constructivist mindset as it requires students to learn self-directed learning skills. This is because "knowledge is constructed by learners as they attempt to make sense of their learning experiences" (Driscoll, 2005, p. 387). Driscoll (2005) also explains that many constructivist teachings are taught via problem-based learning which typically use construction

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kits which “are the tools of a rich learning environment” (p. 395). Other tools that are married to constructivist ideology are programming languages and virtual reality learning environments (Driscoll, 2005). This sets the foundation of constructivism involving higher executive function tools such as computers and other various technologies.

This brings us to the following teaching methodologies: Successive Approximation Model (SAM) and the Pebble in the Pond Model (PITP). Within their respected publications, each is presented as a teaching method used to teach software and business skills. What ties these methodologies to constructivism teachings is the amount of provided scaffolding that must be provided to the learner in order to solve their problem. Merrill (2002) places the learner at the center of the PITP method and uses the process of analyzing both the first wave of initial learning problems and then the following complex learning problems. Analyzing the appropriate amount of information required to guide instruction comes before the initial design. Similarly, the SAM model is explained as having an initial analyzation phase followed by a repetitive analyze, design, and implement stage. (Reiser & Dempsey, 2018). This brings us back to Driscoll’s (2005) teachings on constructivism. Driscoll (2005) found:

As students determine what sub-problems must be solved in order to solve the challenge presented in an instructional video (e.g., what is the fastest way to rescue an injured eagle from a meadow to which there are no passable roads?), they discover needs for further learning. (Driscoll, 2005, p. 393)

Within this PBL scenario, “students learn content, strategies, and self-directed learning skills through collaboratively solving problems, reflecting on their experiences, and engaging in self-directed inquiry” (Hmelo-Silver et al., 2006, p. 100). The similarities in these articles is that

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the learner is at the center of the learning process. The purpose of technology also being present at the center of this learning is because technology is a forever evolving platform. Utilizing Constructivist strategies helps to create lifelong learners who can adapt to a field that is forever evolving.

Tying these together, Arias (2014) discusses the positive cognitive benefits that technologies, such as video games, can foster within a classroom setting. One case study allowed students to oversee decision making for several countries leading up to the events of World War II (Arias, 2014). The study showcased how the focus changed from a teacher-focused lecture course to a learner-driven learning environment (Arias, 2014). Another case study showcased the use of the game Civilization which led to an increase in the understanding of history, politics, and even a better understanding of vocabulary amongst students (Arias, 2014). Each of these researchers has found an increase in higher cognitive function and academic adaption using technology and Constructivist teaching methods.

Conclusions

These studies are new within the education field and seem to gain more traction as technologies continue to advance. I predict that institutions will revise their teaching models to align with more Constructivist ideologies. Many of the articles and books referenced in this paper show a correlation between the integration of technology and the fostering of a learner who can adapt to their environment. Through PBL and IL, students develop learning environments that exist solely on their engagement. Furthermore, students' sense of collaborative efforts is fostered through a higher level of cognitive functioning which they develop through Constructivist strategies.

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