TEACH MIDDLE EAST

Connecting, Developing and Empowering Educators

Term 2 Jan-Mar 2021 **VOL.8 ISSUE 2**

IS THE SCHOOL LEADER OKAY?

A CLOSE LOOK AT EXPATRIATE TEACHER RETENTION

STRATEGIES FOR EFFECTIVE SCHOOL DEVELOPMENT

HOW TO MAKE LEARNING A FAMILY ADVENTURE

COPING WITH ANXIETY AS A TEACHER

MISTAKES EXPAT TEACHERS MAKE WITH THEIR FINANCES

A MOMENT WITH ALISON LAMB

PEDAGOGY AND TECHNOLOGY: TEACHING AND LEARNING IN THE AGE OF COVID-19

BY: NATASHA COX

Globally, educators have altered their methods of instructional facilitation, due to COVID-19, prompting pandemic driven teaching and learning practices. As a result, technology has never played a greater role in education. Whether instruction is delivered face-to-face, virtually, or by hybrid method, the effective use of technology is critical to teaching and learning outcomes. A running theme in my observations during this crisis, is teachers wrestling with how to optimize time, resources and digital technologies at their disposal, despite compacted curriculum, loss of time, possible learning gaps, and lack of tech savvy that may exist in their specific environments. One of my recommendations to educators is to remember their training on pedagogy and seek out models of technology integration. There must be a synthesis of pedagogy, technology and practice, if we expect gains to be made in student achievement. Planning and instruction from this point of view, positively impacts teacher practices and learners in virtual environments. This article highlights Problem-Based Learning (PBL) and the Technology Integration Matrix (TIM) as examples that can be used to; engage, motivate, teach, and assess students at higher levels during an unprecedented time in education.

Problem-Based Learning

Problem-based learning (PBL) is a student-centered pedagogy, defined as a "teaching method in which students learn by actively engaging in real-world and personally meaningful projects" (PBLWorks, n.d.). PBL has been shown in multiple studies to promote student autonomy, goal setting and orientation, self-regulation, critical thinking at higher levels, self-efficacy, reflection, motivation, and increased competence in using collaborative and communicative educational technologies (Kokatsaki et al., 2016; Bloom et al., 2017). In the classroom, the PBL approach looks like student centered learning. Students work beyond simple recollection of facts and closed-ended challenges to answer driving questions through constructive investigations presented by the teacher (PBLWorks, n.d.).

An example of this might be an observation that there is a lack of student friendly resources to learn about the history of civil rights. To mediate this dilemma, students could role-play as historians, creating a virtual museum application, which is focused on the civil rights movement. Students would engage in an entry event (i.e., Field trip to an actual or virtual museum), and seek out answers to driving questions. During this phase, students would access primary resources and artifacts about civil rights. After further investigations, and reading of appropriately related literature, they would create "Need to Know" content for a web-based app. In the process, students could gain knowledge, understanding, and engage in collaborative discussions, using the Charrette Protocol and coaching sessions with their peers and teacher for reflection. The process could be monitored by the teacher with checkpoints to ensure students were on track with the identified goals of the selected tasks. While adding content in the form of tags on pictures, they might also defend their choices for resources included in the projects. Using feedback from others, projects could be fine-tuned, and a public presentation would then be made to a public audience, which is one of the most important components of problem and project-based learning (March Through Nashville Project, 2019).

Technology Integration

Liu et al. (2016) offer interpretations of technology integration as a process where "technology adds value to the curriculum not by affecting quantitative changes (doing more of the same in less time) but by facilitating qualitative ones (accomplishing more authentic and complex goals) (p. 797)," and involves "technology for instructional preparation, technology for instructional delivery, and technology as a learning tool" (p.797). Kolb (2018) posits research-based technology integration practices include using digital tools that make learning a social affair. The writer explains that Google Docs, or applications

like Scratchwork help students to engage in real-time, synchronous communication and collaboration. Furthermore, value added technology integration in the classroom may also look like applications that use data to differentiate, based on student data input from the teacher. Lastly, authentic learning can easily be accomplished with technology when teachers create learning experiences outside of the classroom. These may include digital resources for web quests, electronic pen pals, and virtual connections with students around the world.

The Technology Integration Matrix (TIM) characterizes five types of interdependent learning environments for the use of technology. They can be described as: Active Learning, actively engaged in the use of technology, rather than passively; Collaborative learning, which allows learners to use technology with others, instead of using it as an individual; Constructive learning, which allows learners to actively garner information, and connect it to prior knowledge; Authentic learning, which connects a learner's instructional activities to contextualized world experiences; and Goal-Directed learning, which assists learners in setting goals, planning activities, monitoring progress, evaluating their work and reflection with the use of technology tools (Winkelman, n.d.)

Relationship of learning environments and levels of integration

Aligned with the interdependent learning environments of the TIM, are the levels of integration, where the focus shifts from teacher-centered behaviors to learner-centered behaviors. These describe the ways, or degree to which, the teacher integrates technology into the learning environment. At the Entry level teachers are typically the only ones that use technology actively in the learning environment. The Adoption level includes learners in the use of technology, but with simple, activities, monitored by the teacher, who scaffolds and regulates learner's actions. During the Adaptation level, learners are allowed by the teacher to explore technology tools and choose how they prefer to use them for greater engagement. Self-directed use of technology is promoted at the Infusion level. Here, the teacher welcomes the ideas of learners about how to incorporate technology into topics that are relatable and authentic. Finally, the Transformation level involves the teacher being more of a coach or mentor to learners. Higher-order skills are incorporated into activities that might not be possible without the integration of technology, and teachers are there to allow learners freedom to create, produce products, collaborate and innovate (Winkleman, n.d.).

Discussion held by Shaw et al. (2018) notes one of the most important components of the TIM is based on individual differences, which focus on personality, demographics and other identifiable traits of learners. Other considerations to describe end users of technology might include observable professional skills delivery, cognitive capacity, social interaction, socio-economic status, age and culture. As technology integrations can vary from simple to complex, "all design should begin with an understanding of the intended users" (p. 208).

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