Confronting Barriers to P-12 Mobile Technology Integration

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Abstract

Mobile devices are not being utilized to their full potential in P-12 classrooms. Researchers have identified various barriers that prevent educators from effectively integrating technology in learning environments, such as resources, attitudes, and beliefs. This research brief investigates how district leaders can support P-12 educators in breaking down these barriers and examines how they can be addressed in order to create powerful 21st Century, learner-centered classrooms.

Research Question

This paper examines how P-12 school districts can best prepare teachers for effective utilization of mobile technologies in the classroom by confronting technology implementation barriers. As access to mobile technologies is increasing in schools, so are barriers to technology integration efforts. Such barriers as resources, attitudes, and beliefs must be addressed alongside mobile technology integration initiatives in education. This paper will address the question: How can school districts break down these barriers to mobile technology integration in the classroom in order to create the 21st Century learning environments?

Introduction

Preparing students for a future that we cannot imagine is not a new problem. In 1920, John Dewey stated, "we don't know what kids will need to know in 1944" (as cited by McCann, 2013, p. 3). Technology will always rapidly alter the world we live in. Unfortunately, education is still struggling to reflect the 21st century world. It has been a difficult task to leverage new technologies in order to engage the digital learners that are roaming the hallways of schools every day.

Summary of Findings

The mission statement for the Partnership for 21st Century Skills (2013) acknowledges that, "There is a profound gap between the knowledge and skills most students learn in school and the knowledge and skills they need in typical 21st century communities and workplaces" (para. 3). Being in the second decade of the 21st century this gap includes some fundamental disconnects between the students and the schools that serve them. Today's students do not know a world without the Internet. The lecture style, "sage on

the stage" approach of education does not provide quick access of information to students who have "Googled" their way through childhood. "The learning styles of these active, digital learners conflict with traditional teaching styles and preferences of educators" (Sheninger, 2014, p. 15). By acknowledging this gap and accommodating students' learning styles, P-12 education can start working towards creating 21st century learning environments that promote critical thinking, communication, collaboration, and creativity. Because, even in the mid-twentieth century Dewey (1944) warned, "If we teach today as we did yesterday, we rob our children of tomorrow" (p. 167).

Mobile technology

Mobile technology that supports learning has been a topic in education for years, especially since the introduction of the iPad in 2010. It has become apparent that this is a trend that is not going away. According to the New Media Consortium Horizon Report for K-12 (2013) mobile technology has become, "too capable, too ubiquitous, and too useful to ignore" (p. 17). Whether districts are implementing Bring Your Own Device (BYOD) or 1:1 mobile device initiatives, there is no denying that mobile devices have made their mark on education since the introduction of the iPad. Tablets, such as the iPad, have caused an onslaught of interest on how these devices can effectively engage 21st Century learners.

The presence of tablets in education is increasing, both locally and nationally and at all educational levels. Ever since the iPad was introduced in 2010, The New Media Consortium reported that the iPad sold more than 85 million units in 2013 and is predicted to sell over 377 million units by 2016 (2013, p. 15). Midwest universities such as Oklahoma State, Creighton, and Buena Vista are amongst several universities around

the nation that have started mobile device initiatives involving faculty and students (Educase, 2012). In response to the increase of mobile devices in higher education, many Midwest school districts are beginning to implement initiatives that will put technology in the hands of students in order to prepare them for these high-tech learning environments. For example in Nebraska, Springfield Platteview Community Schools' iPad initiative is for educational purposes and to recruit students to their district (Braden, 2012). Bellevue Public Schools has implemented an iPad Academy in which teachers can apply to participate in the academy and receive iPads for their classroom along with technology integration support from the districts instructional technology team. Westside Community Schools is currently awaiting school board approval of a plan that will provide iPads to Kindergarten through 6th grade students (Anderson, 2014). This access will put Westside Community Schools on the map as the only district in the Omaha, Nebraska metropolitan area that provides access to mobile devices for all students. Locally and nationally, districts are at various stages of planning the integration of mobile devices beyond iPads. Council Bluffs, Iowa; Leyden, Illinois; and Richland Two, South Carolina, all announced in 2012 that they were going 1:1 with Chromebook laptops (Vander Ark, 2012). As found on the Council Bluffs Community School District website (2014), Council Bluffs will expand their 6th-12th grade, 1:1 initiative to include 3rd-5th grade students in the fall of 2014.

Regardless of the type of mobile devices that are used in a district, they are not being utilized to their full potential in P-12 education. In response to this phenomenon, researchers have identified various barriers that prevent educators from creating effective

mobile learning environments, such as access, resources, attitudes, and beliefs (Ertmer, 1999; Hew & Brush, 2007).

Technology Integration Barriers

Ertmer (1999) identifies two types of barriers that block any technology implementation efforts in the classroom. First-order barriers are extrinsic and include a lack of access to technology, insufficient time to plan and inadequate technical and administrative support; whereas, second-order barriers are intrinsic and include teachers' beliefs about teaching, computers, classroom practices, and confidence in skills (Ertmer, 1999). First-order barriers, when eliminated can lead to an "adjustment" of current practices, which can lead to a more effective way to teach, but does not change teaching practices or adjust any underlying beliefs held by the teacher. While first-order barriers (access, support, and time) seem manageable to address, technology integration cannot be sustained without confronting the second-order barriers. Teachers' attitudes and beliefs towards technology need to be addressed during professional learning in order for technology integration to occur in classrooms. Bandura (1997) identifies achieving success as the most effective way to shift one's beliefs, but how do technology trainers get teachers to take a risk with technology in order to achieve success? Start with removing first-order barriers first.

Mobile Technology Access

In the past, access to technology has been a barrier to technology integration. However, as we progress further into the 21st Century, access seems to be less of a problem. Teachers and students, have more access to technology than previously thought. In response to the 25th anniversary of the Internet, Pew Research measured the rapid

adoption of the Internet. In 1995, only 14% of adults polled were users of the Internet. In 2014 that number grew to 87%. Even more staggering is that 97% of young adults (ages 18-29) utilize the Internet today (Fox & Rainie, 2014). According to a study released by Nielsen (2013), 70% of teens (ages 13-17) own a smartphone. For a frame of reference on the rapid increase of smartphone adoption amongst this age group, 58% of American teens owned a smartphone in 2012, and 36% in 2011 (Kerr, 2012). Students are accessing the Internet at home and on the go, utilizing various mobile devices for entertainment and communication purposes. Educators must leverage technology that is already in the hands of our students in order to engage learners. This can be accomplished through building teacher self-efficacy with technology.

Teacher Self-Efficacy

In order for technology to be utilized in the classroom, district leaders need to ensure that teachers' attitudes and beliefs towards technology are positive. Pajares (1992) emphasizes the importance of this second-order barrier by identifying a strong relationship between teachers' educational beliefs and their planning, instructional decisions, and classroom practices. Teacher beliefs influence professional practice, which is why confronting these beliefs is an integral step in integrating new technologies in the classroom. Bandura (1997) defines self-efficacy as the belief about one's capability to learn or perform actions at certain levels. Bandura emphasizes that self-efficacy is not based solely on an individual's skill-level, but on the *belief* that one can complete a task. This makes self-efficacy a predicament for technology integration in that if a teacher believes he/she can accomplish technology integration then he/she will attempt it. But, if the teacher does not have the skills to do so, then he/she will not even try it. A 2010,

Science, Technology, Engineering and Mathematics report to the President captures this predicament of technology integration, "Some teachers who are early [technology] adopters do this routinely, selecting materials they feel fit their students' needs and their own instructional goals and preferences. But most teachers lack the time, confidence, content knowledge, and inclination to do so" (President's Council of Advisors on Science and Technology, p. 80).

Increasing teacher self-efficacy with technology can be accomplished in various ways. Vicarious learning, or learning through watching others successfully complete a task, with technology can increase efficacy (Bandura, 1997; Wang, Ertmer, & Newby, 2004). Utilizing early adopters or teacher leaders to demonstrate examples of effective technology integration will create this learning environment, which could also lead to Professional Learning Communities (PLCs). These learning communities can lead to collaborative discussions and networking that can grow and build self-efficacy with and amongst teacher colleagues. Another way to increase self-efficacy with technology is to differentiate technology training based on teachers' levels of skill and confidence—just as one would differentiate instruction in a K-12 classroom. Technology professional learning should meet and challenge teachers at their current level of skill and comfort, so not to intimidate or frustrate them. Sheingold (1991) suggests this type of technology training- through "iterative interventions" would be responsive and flexible in order to meet the needs of the learners (in this case, teachers) in order to respond to individual levels of use. Educators utilize differentiation in the classroom to meet P-12 students' needs, this also needs to be done during technology professional learning in order to meet and respect individual teachers' needs. This is just good teaching practice. Technology

professional learning must address teachers' beliefs and concerns about technology in order to increase the likelihood of technology adoption in individual classrooms.

Technology Support

Other effective teaching practices that support students in the classroom, and will do the same for teachers as technology learners, are follow-up and support. When students learn a new concept or skill, they have to work independently to practice their new learning, and the teacher provides feedback and guidance throughout the student's learning process. Technology professional learning for teachers does not always follow this effective teaching practice. Massive, large-group, stand-alone technology trainings are not an effective use of professional learning funds if teachers are not expected to follow-through and do not have an identified support system. Support can be provided through the establishment of PLCs, the awareness of technology teacher leaders in the building, identified personnel that provide technology support, online tutorials and examples, books, etc. Having a variety of support access points that accommodates the variety of teacher learners and their stages of concern will provide a return on investment in these support systems in that teachers will accommodate the variety of teacher learners in a district. "Teachers' abilities to identify the human and digital resources, within and outside their school, that can provide the help they need, can have a dramatic impact on the success of technology integration" (Groff & Mouza, 2008, p. 31). Having a support plan in place that is clearly communicated to teachers in a variety of different formats will indicate that technology integration is a priority and expectation and respect the individual teachers' learning styles.

Conclusions

Implications of the Findings

It is clear that in order to fully capitalize on an investment in technology, barriers to technology integration need to be addressed. Otherwise dollars spent on devices are all for naught. Having a shared vision and technology integration plan is identified as the one of the most effective ways to implement technology throughout a district (Hew & Brush, 2007). Having a plan in place that addresses barriers and builds teacher efficacy proves to be a consideration that is just as important as what device to put in the hands of students and teachers. Otherwise this technology will collect dust alongside the dictionary in a classroom. This awareness calls attention to which central office departments in a district should be involved with technology integration plans.

Often times in the structure of a district office, the technology department, staff development department, and the curriculum and instruction office operate as separate entities. However, the technology that is implemented must support and enhance the curriculum and staff development must work to teach teachers how to effectively use technology. If these departments worked together, then a technology integration plan can be made that could include the selection and deployment of new devices (technology department), the necessary training and support for teachers (staff development department), and the integration of technology within the existing curriculum (curriculum and instruction department). If the technology integration plan is built into the curriculum in a meaningful and strategic way at every level, P-12, then barriers to integration will begin to crumble. Since an effective technology integration plan that builds teacher efficacy can be applied to any technology-hardware, software, web 2.0, etc., it seems

natural that the curriculum and instruction team can share what types of technology would best support the curriculum. The technology department can search for the best device that would accomplish this while the staff development department can create a plan to reach teachers at varying levels of ability in order to build efficacy. This central office collaboration truly models the type of collaborative efforts that teachers and students do every day to expand learning and problem solve.

Applications for Metropolitan Omaha Educational Consortium

Currently, Metropolitan Omaha Educational Consortium (MOEC) has task forces created for assessment, curriculum and instruction, executive steering, human resources, staff development, student services, and technology. MOEC districts should take further advantage of the professional networks that are already established within the task forces and go beyond idea sharing, but consider resource sharing as well. Even though these task forces meet regularly and have productive discussions on current happenings, the discussions need to shift to a larger perspective on how to improve more teachers' practices and ultimately impact more students' learning throughout the districts in the consortium. In turn, more productive and innovative learning environments can be created to truly ignite the paradigm shift that needs to occur in all classrooms across the city. Pockets of innovation in one classroom, one school, one district, are no longer acceptable when innovation should be occurring in every classroom, school, and district. MOEC has the potential to work together to create this visionary learning environment. Otherwise each district is in it alone, figuring it out in isolation, when as educators our charge is to educate all learners!

Utilize the partnership with the University of Nebraska at Omaha for collaborative research endeavors in which the effectiveness of professional learning practices can be measured and data can be used for future decision-making. Large research grant proposals can be submitted in order to receive additional funding for professional learning and technology support for multiple districts. Research could lead to training for district personnel on how to effectively deliver technology integration professional learning in districts across the city. This would pool together the knowledge and resources of the cooperating MOEC district's technology integration personnel and research-based practices from UNO. This partnership would be able to create effective technology integration training plans that seem less expensive and more effective than flying in internationally known motivational speakers whose message is forgotten days later.

The Partnership for 21st Century Skills (2009) articulates that a focus on creativity, critical thinking, communication, and collaboration is essential to prepare students for the future. It is imperative for MOEC and district leaders to focus on these 4C's in order to break their own paradigms and find ways to work together to create innovative learning environments for all learners in the Omaha metropolitan area.

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