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Technology in Education: Revolutionizing Classrooms

Technology has changed many facets of our lives over the past quarter of a century. By using a wireless device, we can now communicate with friends and colleagues from almost anywhere. Because of the Internet, we now have data and information available at our fingertips, and our language has grown to include phrases such as “I’ll just Google the answer”. Just as technology has revolutionized other aspects of our lives, it has the power to revolutionize the teaching and learning that is happening in classrooms. Teachers and students now have access to a myriad of data sources, and teachers can use applications, videos, and games to engage students in ways never dreamed of before. However, technology has not always realized its potential in classrooms. While technology has the potential to revolutionize how children are educated, schools have focused more on providing adequate technology than on providing the professional development necessary for teachers to embrace a technological revolution in their classrooms.

Just as technology has proven revolutionary to other areas of our lives, such as communication, it has proven to be a revolutionary tool in education. Studies have found that when students and teachers have access to technology, several positive outcomes are the result. Technology leads to “increased student and teacher motivation, enhanced student learning, and more student involvement in instructional activities” (Lu and Overbaugh 90). Teachers often report that the available technology in classrooms allows students to “express themselves in

writing, improve their computer skills, do research using the Internet, use computers as a free-time or reward activity, [and] do practice drills” (Hixon and Buckenmeyer 132). Further, Dunleavy, Dextert, and Heinecke found that in classrooms where the student to computer ratio is 1:1, teachers are able to individualize instruction to a greater extent. Because the students all have individual devices, they are able to work at their own pace, access many data sources, and teachers can get a sense of the level of research skills of each individual student. When the ratio is 1:1, teachers can also use devices to individualize “drill and practice” activities (Dunleavy, Dextert, and Heinecke 446). In a 1:1 situation, devices add value to the teaching and learning process in several ways: “increased ability to formatively assess; an increased ability to individualize instruction and pacing; an increased ability to provide timely feedback; an increase in the student interaction and collaboration; and an increase in student engagement” (Dunleavy, Dextert, and Heinecke 446). Finally, in a 1:1 situation, devices can be used for “eCommunications,” such as “classroom websites and video to disseminate information” (Dunleavy, Dextert, and Heinecke 447). In classrooms where technology is effectively integrated, the learning experiences are more student-centered, as teachers are able to assess individual needs and differentiate instruction for students using technology. There is an abundance of research to suggest that technology does, indeed, have the power to revolutionize classrooms.

Because of this potential for revolutionizing teaching practice, schools have not been opposed to opening the door to technological devices. In fact, most schools have dedicated resources to adding technology infrastructure. Lu and Overbaugh note that “90% of schools now provide students with access to computers and broadband connections to the Web” (89). The student to computer ratio in the United States has reached “3.8 to 1 according to the reports of

the U.S. Department of Education” (Lu and Overbaugh 89). Dunleavy, Dextert, and Heinecke point out the growing initiative to provide 1:1 ratios in many schools and classrooms (440). It is not uncommon for most schools, even in rural areas, to have, at a minimum, desktop computers for all teachers, a desktop computer for student use in each classroom, at least one computer lab for scheduling entire classes, and even a cart of laptops or tablet devices that teachers can reserve to use with classes. Further, there are a growing number of schools that allow students to bring their own devices to school—Bring Your Own Technology (BYOT). Students who have their own wireless devices use them, and schools are able to provide devices for students who do not bring their own. Many schools and districts, realizing the power of technology to impact teaching and learning in positive ways, have dedicated resources to providing technological devices for teachers and students to use in their classrooms.

While schools have worked to provide additional technology infrastructure, teachers have not always integrated available technology in their classrooms. Even an abundance of technology does not “automatically add value” to the learning environment (Dunleavy, Dextert, and Heinecke 450). Teachers often express concern that additional technology adds additional classroom management problems, and when there are issues with hardware or software not working properly, lesson plans are derailed. Dunleavy, Dextert, and Heinecke found that when teachers do not already possess adequate “class management skills, the computers simply add another layer of management complexity that is possibly overwhelming” (449). Teachers cite the lack of “technical support” necessary to effectively integrate available technology (Lu and Overbaugh 91). When there are issues with managing technology—particularly ensuring the proper functioning of technological devices—teachers often do not have access to the support they need, so they simply do not use the technology devices. This is especially true in urban and

rural areas that lack the level of technical support available in suburban districts (Lu and Overbaugh 99). Teachers, moreover, readily admit that technology is underutilized in instruction, noting many factors:

lack of time to learn how to use the technology and/or prepare for using it with their students; lack of appropriate training that is offered at convenient times; lack of technical support to fix problems that may arise; and lack of access to the proper technological equipment. (Hixon and Buckenmeyer 133)

While a teacher may want to try a technology application in a lesson, this requires time to learn how to use the application and think about how to effectively design the lesson, as well as access to proper technical support, such as someone to help load the application onto devices for students to use. With the presence of all of these perceived barriers, teachers rely on their tried and true methods of instruction rather than integrating technology that may or may not add value to their lessons.

Hixon and Buckenmeyer argue that issues with management of technology and technical support are not the true reasons that teachers do not integrate technology in their classrooms. Rather, technology represents a challenge to teachers' concepts about the teaching and learning process: "At the heart of the issue are teachers' fundamental beliefs about the teaching and learning process . . . teachers fear technology will change the core values upon which education is based and dehumanize the process of teaching and learning" (Hixon and Buckenmeyer 136). In essence, teachers fear that technology will replace them as instructors in the classroom. If a computer program can provide the instruction, as well as the remediation and enrichment activities that students need, then why would schools need teachers? Teachers fear that integrating more technology would remove the "creativity,

feelings, compassion, individualism, passion, and understanding” from classrooms (Hixon and Buckenmeyer 136). Research on what teachers value points to the importance of the teacher-student relationship. If technology becomes the main method of instruction in the classroom, it begins to erode the relationship between teacher and students.

Schools, overall, have not focused enough thought on how technology integration changes the core practices and values of teachers; therefore, they have not provided the level of professional development that is needed for teachers to integrate available technology effectively. Instead of merely ensuring access to technological infrastructure for teachers and students, schools must also provide “teachers with high-quality professional development to ensure effective teaching . . . teachers need opportunities to learn what instruction and assessment practices, curricular resources, and classroom management skills work best” in a classroom infused with technology (Dunleavy, Dextert, and Heinecke 450). Professional development that focuses on how technology can be used to enhance instructional and assessment practices could ensure that teachers move beyond using technology just as a tool for word processing assignments, and begin to use technology in more meaningful ways in the classroom. However, Hixon and Buckenmeyer point out that no amount of professional development will help unless training also addresses teacher values and beliefs related to technology:

Changes in beliefs, not additional access or improvement in technical skills, are required for advancing into the higher levels of technology integration . . . Teachers’ underlying beliefs about technology’s relationship to teaching and learning are supported when technology drives the curriculum. This is the message that is

continuously reinforced in teacher training that focuses on learning technical skills.

(141)

Professional development that only focuses on increasing teachers' technical skills can actually work to make teachers less likely to integrate technology because the focus is on the technology and not what value it might add to teaching and learning. Instead of focusing on how to use technology as an isolated skill, teachers must "be able to see how technology can fit into a specific instructional idea and be allowed to reflect on how technology will impact their lesson/unit, classroom, and teaching. Technology must be married to the curriculum from the beginning" (Hixon and Buckenmeyer 143). In order for teachers to be receptive to technology integration, school leaders must realize that technology integration is not the ultimate goal. The focus should be on how teaching and learning can be improved through incorporating technology.

As the technology revolution has swept across society, every facet of our lives has been affected. Education is no exception. Technology—in the form of desktop computers, tablets, information systems, learning platforms, and interactive whiteboards—has entered school buildings. Many schools have worked to ensure a low ratio of students to devices, and districts like to measure their level of technology integration in terms of student to computer ratios. However, the availability of technology in schools does not mean that teachers are using the technology effectively to enhance teaching and learning. Research would show that there are often barriers to effective technology integration. The effective use of technology is hindered by external barriers such as management issues, time, and lack of training. In addition, technology use is hindered by teacher values and beliefs about the process of teaching and learning.

In order to move toward more effective integration of technology, schools must work to provide professional learning for teachers related to technology. Professional development should be designed to focus on the teaching activities that educators often engage in, and how technology can be used as a tool to support their professional practice. When the focus is on technology as the tool rather than technology as the end goal, teachers and students will benefit from effective technology integration that adds value to their experiences in the classroom. Teachers do not need to have more information on using technology; they need to have more information on how technology can be integrated effectively and used to improve their professional practice of teaching.

Works Cited

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