

21st CENTURY LEARNING SPACES FOR TEACHER PREPARATION

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Abstract

Learning, working, and living in the 21st century demands new types of knowledge, skills, and processes. College students are pursuing degrees for jobs that have not yet been created. New educational standards in the U.S. call for more rigor in curricula, instruction, and learning. They also require students to develop critical thinking skills, develop different types of literacies, be able to collaborate, problem solve, and apply knowledge in new settings. Media and technology are at the forefront of 21st century teaching and learning. In this issues paper, the author addresses the need for new, flexible, learner-centric, technology-rich, and collaborative learning spaces for teacher preparation and raises questions for future learning models.

Introduction

How are different institutions preparing teachers for 21st century teaching and learning? What is the role of new learning spaces and technology in teacher preparation? In 2014, 45 U.S. states, the District of Columbia, four territories, and the Department of Defense Education Activity will be implementing the Common Core State Standards, an initiative developed by the National Governors Association Center for Best Practices (NGA), Council of Chief State School Officers (CCSSO) (NGA & CCSSO, 2010). These new educational standards promise effective 21st century college, career, and workforce readiness.

The 2010 report developed by the American Association of Colleges of Teacher Education (AACTE) and the Partnership for 21st Century Skills (P21) titled, *21st Century Knowledge and Skills in Educator Preparation*, states that in order to meet the demands of the global economy, the mastery of 21st century skills such as critical thinking, problem-solving, communication, collaboration, creativity, and innovation is imperative. Students need to know how to apply and use technology to solve complex problems. In a recent report titled, *Our Responsibility, Our Future: Transforming Educator Preparation & Entry into the Profession* (Council of Chief State School Officers [CCSSO], 2012), CCSSO calls for teacher preparation that will prepare teachers and principals with the technological pedagogical knowledge they will need to provide instruction and organize learning environments to help students reach these rigorous expectations.

Teaching and Learning in the 21st Century

Communications, interactions, technologies, and learning are ever changing in the 21st century. Technologies used in learning, such as interactive whiteboards, personal learning environments, wireless networks and mobile devices, plus the Internet and high-quality digital learning resources--and the ability to access many of these from home and the workplace--are altering the experiences and aspirations of learners.

The notion of a teacher with 25-30 students isolated in a brick and mortar classroom with a teacher disseminating knowledge to students does not align with learning in the 21st century. Twenty-first century learning requires much networked learning, collaborative problem solving, knowledge of technology and use of Web 2.0 tools, and learning in a variety of learning spaces. Would those 25-30 students in traditional brick and mortar schools learn and be motivated to continue to learn if a number of teachers, instead of just one, taught them? Or, would they learn more if they had more time to explore, learn with peers, and use technology to research, learn, and collaborate? What if they were given choices to select the curriculum activities, materials, and tools? Would they learn better and learn more if they had more inside-class or outside-class time? And, what if they had opportunities to use technology not as an enhancement but as the driving, core vehicle, for learning, collaborating, and problem solving? What would learning look and feel like then?

Future educators need to learn how to use and incorporate technology in their instruction to meet all learners' needs. They need to learn in learning spaces that are:

- Learner-centric
- Pedagogically-sound
- Technology- and media-rich
- Motivating, creative, and relevant
- Personalized and flexible
- Collaborative, social, and interactive
- Enterprising: spaces that support different purposes

The pre-service teacher needs to become the focus of teacher preparation institutions. Technological advancements have contributed to learner-centered environments. Technology can be used to help teachers grapple with real educational problems. Twenty-first century learning views teachers as facilitators of student learning and not as "sages on stages." In the following sections, I will summarize three innovative instructional models for teaching and learning.

Mobile Technologies and Learning

UNESCO has published several reports on the status of mobile learning around the world. The reports that highlight the possibilities for educational opportunities, especially in underdeveloped countries, include the following: *UNESCO Policy Guidelines for Mobile Learning, Illustrative Initiatives and*

Policy Implications, Exploring the Potential of Mobile Technologies to Support Teachers and Improve Practice, Key Issues to Consider and Implications for Policy Makers and Planners.

(<http://www.unesco.org/new/en/unesco/themes/icts/m4ed/mobile-learning-resources/unescomobilelearningseries/>).

UNESCO views mobile technology as a viable avenue for meeting the needs of impoverished educational contexts and “making learning more accessible, equitable, personalized and flexible for students everywhere” in the world.

(<http://www.unesco.org/new/en/unesco/themes/icts/m4ed/mobile-learning-resources/unescomobilelearningseries/>)

Mobile learning (or m-learning) is learner-centered learning. It involves learner choice that allows them to be actively engaged in how, where, when, and what they study. Mobile learning allows students to choose the activities, the time, and the space(s) to learn and perform tasks. Mobile learning allows students to create new learning contexts. Sample mobile learning technologies include the following: handheld computers, MP3 players, notebooks, mobile phones, tablets, and e-readers. Apple, Android, and Blackberry are still the most popular operating systems. In 2012, multi-device authoring tools became available (e.g., Captivate, Articulate Storyline, Lectora, GoMoLearning). Mobile learning is convenient, accessible from anywhere, synchronous and asynchronous, free from geographic boundaries, and flexible on a 24/7 basis. It also provides one-on-one communication and collaboration and allows sharing of information and receiving of immediate feedback.

The definitions of mobile learning have varied over the years. Quinn (2000) and Pinkwart, Hoppe, Milrad, and Perez (2003) define mobile learning as e-learning that utilizes mobile devices. Laouris and Etheokleous (2005) call for a new definition of mobile learning that goes beyond mobile phones. Mobility should allow the learners to *move* their learning environment as they move (Barbosa & Geysler, 2005). Mobile learning is not bound by space and time. Mobile learning has been introduced in many classrooms although some teachers still believe that what students do to learn outside the classroom should not be brought into the classroom.

Mobile learning can also be used as part of blended learning. Its benefits include the lower cost (when compared to PCs and laptops), motivation and engagement for all students; mobile devices are lightweight, and students can use them to receive immediate feedback from teachers as well as collaborate with peers. Challenges include screen size, connectivity and battery life, bandwidth, content security and copyright issues. In addition, many teachers do not know how to fit mobile learning into their existing curriculum, how to support student learning, and how to engage students in learning. Mobile learning can be disruptive to some educators because it transforms traditional roles and processes. Many colleges and universities do not provide mobile learning training for instructors. A successful mobile learning initiative requires a comprehensive analysis of the

capacity of the existing technological infrastructure (e.g., broadband access, hardware, software, and technical support); security and privacy must also be considered.

Teachers need to learn how to use mobile learning effectively so they are not just replacing print resources with digital versions. Mobile learning can make instruction and assessment of student learning practical, relevant, individualized, and differentiated. It can release the instructor/teacher to provide individualized assistance and extra learning support to students. The 21st century society will need to be ‘a learning society’ in which knowing ‘what’ is less important than knowing ‘how to.’ This shift in teaching will require instructors/teachers who are well prepared for change. What role will mobile learning play in 21st century learning institutions, in delivering materials and promoting learning, in fostering communication and collaboration, and in assessing student learning? In addition, what role will mobile learning play in equitable accessibility of information, economic development, and in social transformation? The question is would universities support the development and dissemination of free intellectual material to all?

Flipped Classroom and Blended Learning

The flipped classroom model is a form of blended learning that “flips” the way time is used in the classroom. As part of this instructional model, the teacher spends more time on an individualized basis with students demonstrating, explaining, and extending their understanding of subject matter. So, what becomes flipped in the learning process? Rote lecture content is delivered online for students to study outside the classroom and class time is used for discussions, applications, and practice; lecture is moved outside the classroom and homework is moved inside the classroom. In 2007, teachers, Jonathan Bergmann and Aaron Sams, at Woodland Park High School, in Woodland Park, Colorado, US, discovered software to record PowerPoint presentations and post them online for students who missed class. Many teachers have been using online videos and video podcasts to teach students outside of class. In 2012, Bergmann and Sams published their book, *Flip Your Classroom: Reach Every Student in Every Class Every Day*.

The flipped classroom model uses teacher (or other, such as, Khan Academy)-developed instructional videos that students can view outside the classroom. Students go over the topic first using these videos and then practice solving problems in the classroom. The teacher plays the role of the facilitator and uses “class time” for additional practical learning activities; in addition, this model reduces time spent on lecturing and makes time for application of knowledge and problem solving. This model allows for better developed lessons, more hands-on, project-based, authentic learning, promotes student motivation, and it also places more accountability for learning on the student. Results have shown increased student motivation and interactions, decreased high school dropout rates, less classroom management problems, and improved student performance. Schools

and teachers nationwide have embraced the flipped classroom model and it has been transforming teaching and learning.

A number of higher education faculty have been using the flipped model in their courses through video tutorials and use in-class time for open discussions, featured guest speakers, or hands-on problem solving. Video tutorials and prerecorded lectures allow students to watch and re-watch material as needed. At Harvard University, one physics professor not only uses the flipped model but has also developed a correlative site, Learning Catalytics, that provides instructors with free interactive software that enable students to discuss, apply, and get feedback from what they hear in lecture.

Massive Open Online Courses (MOOCs)

The future university classroom might be comprised of a few hundred thousand instead of 25-30 students. A Massive Open Online Course (MOOC) is an online course designed for massive (or large-scale) interactive participation and open access via the World Wide Web. MOOCs often use open educational resources and do not typically offer academic credit; they are tuition free (see Appendix A for sample resources about MOOCs). They provide interactive forums that help build a global community. MOOC providers include Coursera, Udacity, edX, Futurelearn (in the UK), Open2Study (in Australia), etc. MOOCs are based on connectivism learning principles—i.e., learning emerges from connections. MOOCs are offered by top universities and also by high schools (e.g., University of Miami's Global Academy, an online high school, offered a course in SAT preparation in 2012). MOOCs allow students to network in autonomous, open, and interactive ways. What role would MOOCs play in the future in K-12, postsecondary education, and teacher preparation, and teacher professional development sectors? Why not consider developing MOOCs to provide teacher professional development, promote educator networks, and facilitate the creation of new knowledge from teachers around the world?

Conclusion

Knowledge creation, access, and dissemination in the 21st century are key issues around the world. Although many technological advancements are making living and learning outside the classroom easier, accessible, and collaborative, learning inside the higher education classroom is changing ever so slowly. Technology is creating new spaces that are disrupting how, where, and when learning will take place. That disruption needs to become a reality in teacher preparation programs.

Higher Education needs to build global learning communities. Could virtual global communities be the way to help students in K-12 and postsecondary grades to learn how to become global citizens? Globalization in the 21st century will continue to create new political, economic, social, and technological changes, partnerships, and paradigm shifts. Globalization will also require new learning spaces, tools, ways of thinking and collaborating, and dispositions for accessing, co-constructing, and disseminating knowledge and resources around the world.

Learning in the 21st century can no longer be “fenced in” the walls of our learning instructions or even our fully online courses. The Open Access movement around the world has been striving to remove restrictions for “access and entry” and make knowledge accessible to all. One of the outcomes of globalization and the global financial crisis might be more open access to learning, to scholarship, to research, and to materials. MOOCs are a recent phenomenon that will continue to change learning especially at higher education institutions. In addition, more and more generations of digital native students who arrive at our learning institutions are also placing increasing demands on educators to develop contemporary learning environments, and provide learner-centered, experiential, and authentic programs. Blended learning is being shaped and re-shaped; more effective models of blended learning are being developed constantly.

The three models I described in this paper provide exciting opportunities for teacher preparation but they also require careful and comprehensive preparation, technological access, resources, and support, a pedagogical framework that moves technology from the periphery to the center of teacher learning, room for experimentation, and professional development in technology for instructors. What are the possibilities for 21st century teacher preparation? What are the challenges? How should we reengineer learning in teacher preparation? How can we best prepare teachers to support the needs of 21st century learners? Let’s collaborate and create partnerships that will “flip” the traditional models of teacher preparation and will create new, 21st century, learner-centric, and technology-rich learning spaces and models.

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Appendix A

Sample Resources about MOOCs:

- Peter Norvig presentation, *The 100,000-Student Classroom*, June 2012 at the TED Conference. Retrieved from http://www.ted.com/talks/peter_norvig_the_100_000_student_classroom.html
- Daphne Kohler presentation, *What We Are Learning From Online Education*, August 2012 at the TED Conference. Retrieved from http://www.ted.com/talks/daphne_koller_what_we_re_learning_from_online_education.html
- Coursera (<https://www.coursera.org>) is an educational technology company developed by computer science professors from Stanford University, Andrew Ng and Daphne. Coursera works with universities to make courses from various disciplines available online and offers them globally for free. In 2013, the American Council on Education approved five courses for college credit (Algebra from the University of California, Irvine; Pre-Calculus, from the University of California, Irvine; Introduction to Genetics and Evolution from Duke University; Bioelectricity: A Quantitative Approach from Duke University; Calculus: Single Variable from the University of Pennsylvania).
- Harvard's Class Central <http://www.class-central.com>

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