21st Century Education and Technology

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"The landscape of classroom learning is shifting, and with it, districts, schools and teachers are learning new pedagogy to support a 21st century education through digital learning."

— J. R. Napier, 2015

Twenty-first century education is a topic of discussion and debate in K-12 and higher education as stakeholders examine the knowledge and skills required for success in a digital, global world. 21st century literacy has become a catchphrase for shifting perspectives on P-20 education at the national and state level. College graduates looking for employment need knowledge and competencies in a variety of areas, from digital literacy to critical and creative thinking.

The Michigan 21st Century Education Commission, under Executive Order 2016-6, is responsible for analyzing top-performing education systems in the U.S., identifying issues impacting Michigan academic success, and recommending changes to Michigan’s educational system. Thomas Haas, President of Grand Valley State University, is chair of this commission and Michigan was the first state to implement a high school graduation requirement for completing an “online experience” (Michigan Merit Curriculum Law, 2006).

Current trends in K-12 education highlight the shifts taking place: more than 450,000 Michigan students completed online courses in 2014-2015, with a majority...
of these supplementing existing on-campus offerings; projections of more than 2 million students completing online courses in the next few years, and more than 6,700 students enrolled in virtual charter schools in 2015.

Similar trends are occurring in higher education as an Internet-enabled revolution provides more opportunities with fewer resources required for buildings and educators (Anders & Raine, 2014). Massive open online courses (MOOCs), mobile and tablet computing, learning analytics, learning objects, and open educational resources are being adopted by colleges and universities (NMC Horizon Report, 2016). Predictions for more online and hybrid courses, 3-year undergraduate degrees, increased access from mobile devices, flexible offerings combined with a decline in traditional full-time enrollments, and a more diverse student population (non-traditional and professional students) are reshaping the landscape of college education (College of 2020: Students, 2015).

Project Zero (http://www.pz.harvard.edu/) at the Harvard Graduate School of Education conducted a national study identifying exemplary higher education offerings and examining efforts to define and promote intelligence, understanding, creativity, and ethics. The Association of American Colleges & Universities (AACU) describes changing pedagogies and curricula necessary for success in the future, including at administrative and faculty levels (Hainline, et al., 2010).

21st century learning environments (Perlman, 2010) provide opportunities for engaging all learners using rich, meaningful, rigorous experiences in preparation for the 21st century workplace, with an additional focus on one-to-one computing, digital content, and assessments (http://www.techplan.org/). How are educational institutions responding to these trends and opportunities?

Teaching and Learning in the 21st Century

Areas where 21st century education impacts K-12 and higher education institutions include expectations for student literacies and competencies. 21st century literacy, broadly construed, includes a variety of knowledge and soft skills, such as collaboration, communication, media and digital or information literacy, digital citizenship, and higher-order thinking skills (Pearlman, 2010). The Partnership for 21st Century Learning (http://www.p21.org/) recommends specific standards for students—content knowledge and themes, learning and innovation, information, media and technology, and live and career support systems necessary for success.

A variety of educational technology standards exist to address similar, and overlapping, student needs. At the national level, students are expected to demonstrate competencies from the International Society of Education (Standards for Students, 2016). At the state level, the Michigan Educational Technology Standards for Students (METS-S) provide a similar set of expectations. Teachers need to model, demonstrate, and assess 21st century skills, as described in the ISTE (Standards for Teachers, 2008), for these changes to occur.

This represents a major shift for teachers at all levels who need time, opportunities, support, and education focused on helping them effectively adopt these goals. An essential element of 21st century education is technology, and its fundamental role in supporting these efforts is becoming clear (Boyer & Crippen, 2014).

Personalized Learning and Technology

Personalized learning is at the nexus of 21st century education and includes three elements: “(1) systems and approaches that accelerate and deepen student learning by tailoring instruction to each student’s individual needs, skills and interests; (2) a variety of rich learning experiences that collectively prepare students for success in the college and career of their choice; and (3) teachers’ integral role in student learning: designing and managing the learning environment, leading instruction, and providing students with expert guidance and support to help them take ownership of their learning” (Pane, Steiner, Baird & Hamilton, 2015, p. 2).

This perspective places students’ strengths, needs, and interests at the center of education, allowing for choice and flexibility in pursuit of individual plans for learning. In this model, educational institutions provide the tools and feedback necessary to motivate and support individualized
learning while satisfying external requirements (Grant & Basye, 2014). Similar efforts are underway to incorporate personalized learning (Dobbin, 2016) into the college experience.

Early research on the impact of personalized learning on student achievements reveals some promising results (Pane et al., 2015). A study of 32 public and charter urban K-12 schools that implemented this approach reported larger achievement gains for students in lower grades, and the majority of schools saw statistically significant positive results. Participating schools focused on five core attributes of personalized learning: learner profiles, learning paths, competency-based progression, flexible learning environments, and an emphasis on college and career readiness.

“The schools that exhibited the greatest achievement growth were all implementing three personalized learning features—student grouping, learning spaces that support personalized learning, and opportunities for students to discuss their learning data with teachers” (Pane et al., 2015, p. 34).

Student information required for personalized learning includes traditional forms of assessments, such as test or quiz results, as well as individual students’ strengths, needs, motivations, progress, and goals. Technology is required to support flexible learning, authentic, project-based instruction, and competency-based assessments (Vogt, 2014; Wolf, 2010).

Personalized learning also supports access and choice, applying principles of Universal Design for Learning (UDL) to ensure all students have the resources needed for success, as well as alternative methods of assessment. UDL allows for multiple entry points for learning and minimizes barriers for all students (Grant & Basye, 2014).

**Issues and Challenges**

Outstanding questions or challenges for successful personalized learning are student readiness, teacher preparation, and organizational or institutional responsibilities. Students might be unprepared to accept responsibility for their own learning or might lack the requisite motivation for this type of education. Likewise, teachers might be unable to effectively support 21st century teaching and learning, especially if pre-service teacher education programs do not provide opportunities to acquire these skills. Educational institutions might not have the resources or expertise to support students and teachers for 21st century education or lack the vision and leadership required for success.

The Office of Educational Technology in the U.S. Department of Education published a synthesis of research regarding future reading schools, including an evaluation rubric (Future ready learning, 2016). Elements include collaborative leadership, personalized learning, infrastructure, and professional development. This document also situates personalized learning within a five-part collaborative implementation framework: vision, plan, implement, assess, and refine.

**Future Ready Schools** ([http://futureready.org](http://futureready.org)) provide planning and implementation resources targeted at school district administrators in support of adopting personalized digital learning. Administrators in Michigan and other states have pledged their commitment to implement substantial structural changes and adopt digital learning. Mobile technologies, online and blended instruction, and MOOCs offer alternatives to traditional higher education courses and programs. Dabbagh and Kitsantas (2012) examined research on use of social media, self-regulated learning, and personal learning environments. They also offered a three-level framework for implementation: personal information management, social interaction and collaboration, and information aggregation and management.

**Conclusion**

It is clear that 21st century education offers opportunities and challenges for students, teachers, and educational institutions responding to the shifting landscapes in Michigan and elsewhere. It is also clear that technology, in its many forms, has a pivotal role in these plans in the areas of literacy, personalized learning, and support for organi-
zational changes. At the university level, there appears to be no sense of urgency for planning and implementing policies and practices that will ensure success in light of these changes.

The GVSU Strategic Plan (2016-2021) includes technology under Institutional Outcome D: “supports innovative teaching, learning, integrative scholarly and creative activity, and the use of new technologies,” with a goal of at least 20 percent of faculty using technology in their teaching. What is unclear is how technology can support personalized learning and offer GVSU a strategic advantage in the next five years.

References


