Bowling Green State University

From the SelectedWorks of Savilla I Banister

2014

Using digital resources to support personalized learning experiences in K-12 classrooms: The evolution of mobile devices as innovations in schools in northwest Ohio

Savilla I Banister, *Bowling Green State University* Rachel A Reinhart, *Bowling Green State University - Main Campus*



Available at: https://works.bepress.com/savilla_banister/4/

Using Digital Resources to Support Personalized Learning Experiences in K-12 Classrooms: The Evolution of Mobile Devices as Innovations in Schools in Northwest Ohio

Savilla Banister Bowling Green State University U.S.A. sbanist@bgsu.edu

Rachel Vannatta Reinhart Bowling Green State University U.S.A. rvanna@bgsu.edu

Abstract: The challenges facing the United States in educating its youth have been widely documented. The dropout rate in the past decades has been staggering, hovering around the 20% mark, with students of color and in lower socio-economic circumstances posting an even higher rate (Barton, 2005). Perhaps more troubling are the indicators that students who are staying in school until high school graduation are largely disengaged and disenfranchised with their experiences (Balfanz, Herzog, & MacIver, 2007; Henry, Knight, & Thornberry, 2012). However, educators are now beginning to embrace the promise of ubiquitous digital technologies in the classroom. This study examines the practice of adopting mobile devices in K-12 environments in a geographic region of the Midwestern United States. The findings suggest that active learning environments, addressing personalized needs and providing evidence of student competencies, may be accomplished effectively by integrating mobile technologies more prominently in K-12 classrooms.

The challenges facing the United States in educating its youth have been widely documented. The dropout rate in the past decades has been staggering, hovering around the 20% mark, with students of color and in lower socio-economic circumstances posting an even higher rate (Barton, 2005). Perhaps more troubling are the indicators that students who are staying in school until high school graduation are largely disengaged and disenfranchised with their experiences (Balfanz, Herzog, L & MacIver, 2007; Henry, Knight & Thornberry 2012). Finally, emphasis on standardized tests that may or may not be relevant in determining how successful or productive students will be in our information-age world, have created an ambiance of confusion and stress for both teachers and students. (Au, 2011; Hanushek & Rivkin, 2010; Sahlberg, 2008). Yet for all of the investment of time and money in public education in an effort to promote productivity and democracy throughout the U.S., the results appear to be dismal.

But there are signs that major changes are coming to our educational institutions; changes that will drastically alter the traditional models that have long held across the years and have, for the most part, been resistant to promising models of reform. These changes are largely fueled by the reality of the digital world we now live in. Since the advent of the World Wide Web (circa 1995), the digital generation and exchange of information has become the norm. In the past decade, the interconnectivity and collaborative possibilities in the use, reuse, and co-construction of digital texts, images, audio, video, and databases (loosely identified as "Web 2.0" functionalities) has forced teachers to abandon their long-held positions as the ultimate possessors and distributors of knowledge (Barnett, 2012; Drexler, 2010; Ertmer & Ottenbreit-Leftwich, 2010). Students come to school knowing that the "information is in the air" (Williams, Karousou, & Mackness, 2011) and that they have the ability to connect with experts around the world in multiple venues, in order to learn about all sorts of content, academic or practical.

Beyond the amount of resources available for learner consumption, in the support of educational growth, our digital tools now afford us the communicative and data-management power to truly provide individualized

learning experiences for students. In addition, state and national policies are directing districts and schools in how the ever rising expectations can met. The United States Department of Education (US DoE) is supporting the Digital Promise initiative, using their League of Innovative Schools as a conduit to encourage implementation of powerful technologies to support meaningful learning. The US DoE's Office of Educational Technology is promoting strategies including one-to-one mobile devices for students, personalized learning networks, a national registry of learning resources, data management learning dashboards and competency-based education models to provide direction for dramatic changes in our nation's schools (Hwang, Kuo, Yin, & Chuang, 2010; Miller & Lake, 2012; Wang & Liao, 2011). In the state of Ohio, educational legislation in recent years has pushed schools to implement a variety of initiatives: the Common Core, online state assessments, end-of-course exams, teacher evaluation systems, and district report cards (Lieszkovszky, 2012). These statewide initiatives have placed enormous pressure on districts to have the resources to implement online state assessments and increase student achievement growth especially among marginalized groups.

This study sought to examine how schools are embracing the educational possibilities of the digital age. More specifically, the researchers studied regional K-12 Ohio schools and were guided by the following research questions:

- 1. What types of initiatives, related to the Digital Promise of DoE's Office of Educational Technology, are schools in this region exploring or deploying?
- 2. What are the identified priorities of these schools, specifically related to student learning outcomes?

Methodology

In order to address these research questions, the researchers employed a mixed methods explanatory design in conjunction with the Center of Excellence for 21^{st} Century Educator Preparation of a state university. The School Initiative Survey was distributed online in early Fall 2013. The survey consisted of 16 questions. The first three items garnered background information. Then 11 questions asked the respondent to indicate their use of 10 technologies and initiatives (BYOD--Bring Your Own Device, one-to-one laptops, one-to-one tablets, one-to-one handhelds, digital textbooks (in lieu of paper texts), flipped classroom models, blended or online course options, online assessment tools, a focus on individualized or differentiated instruction, and the alignment of their work with the Partnership for 21^{st} Century Skills. Three options were provided for these items: (1) Not familiar, (2) Exploring—talking about implementing, and (3) Deploying—actually doing. The final two items were open-ended and asked:

- What other initiatives are you investigating or implementing to support student learning?
- What are your highest priorities, connected to student learning, for your school/district at this time?

Surveys were not anonymous, but were confidential, as far as keeping individual responses from being distributed. Principals supplied their school names, addresses and an email contact, so that researchers could follow up on specific responses, and data was aggregated and shared back to the districts for comparison and conversation. This type of protocol was utilized to support a more open and collegial model of working towards meaningful change, grounded in the philosophy of the Open Source and Open Education mindsets.

The survey was sent to principals of all schools (n=657) within a 50-mile radius of the Center with an email requesting completion of the online survey, or an option to complete the survey over the phone. Administrators were informed that they could forward the survey completion task on to another teacher/administrator of their choice, and that they would receive a follow up phone call in upcoming weeks, in order to acquire their responses, in the event that the online survey was not completed. As a perk for completing the 5-minute survey, principals were offered a complimentary registration to a full-day technology symposium being hosted at the university in the spring. Fifty-six administrators accepted this offer and attended the event later in the year. The target population represents a variety of school settings ranging from rural, small town, suburban to urban. Out of 657 school principals invited, 110 completed the survey. This response rate of 16.7% represented a reasonable sampling of the schools in the region with 4 charter schools and 13 private schools with the remaining as public schools. Among the participating schools, most were located in districts with a Small Town (36.5%) typology followed by Urban (28%), Rural (18.7%), and Suburban (16.8%).

Because the survey included items that were both quantitative and qualitative in the response choices, a mixed methods explanatory approach was used in that the quantitative data was first analyzed, with qualitative results being used to explain the quantitative results. This paper present descriptive statistics regarding the initiatives being explored or deployed followed by a synopsis of themes that emerged from the open-ended items.

Results

Results (see Table 1) indicate that the surveyed schools are focusing on the initiatives of: 1) Individualized and Differentiated Instruction (M=2.64) and 2) the use of Online Assessment Tools (M=2.48). At least 90% of the respondents indicated that they were either exploring or deploying these initiatives. One-to-one student devices was also a top initiative, with 78% of schools exploring or deploying one-to-one laptop programs.

| | f | | | | | |
|---------------------------------------|--------------|-----------|-----------|-----|------|------|
| Initiative | 1 | 2 | 3 | п | М | SD |
| | Not Familiar | Exploring | Deploying | | | |
| BYOD (Bring Your Own | 20 | 40 | 30 | 90 | 2.11 | 0.74 |
| Device) | | | | | | |
| One-to-One Mobile Devices | 13 | 52 | 26 | 91 | 2.14 | 0.64 |
| for Students: | | | | | | |
| Laptops | 6 | 30 | 41 | 77 | 2.45 | 0.64 |
| Tablets (iPads, etc.) | 10 | 35 | 41 | 86 | 2.38 | 0.68 |
| Handhelds (iPods, cell | 12 | 29 | 27 | 68 | 2.22 | 0.73 |
| phones, etc.) | | | | | | |
| Digital Textbooks (online | 18 | 52 | 20 | 90 | 2.02 | 0.65 |
| academic resources) | | | | | | |
| Flipped Classrooms | 32 | 40 | 16 | 88 | 1.82 | 0.72 |
| Online or Blended Classes | 24 | 42 | 26 | 92 | 2.02 | 0.74 |
| Online Assessment Tools | 9 | 36 | 58 | 103 | 2.48 | 0.65 |
| Individualized/Differentiated | 3 | 30 | 68 | 99 | 2.64 | 0.54 |
| Instruction | | | | | | |
| P21 (Partnership for 21 st | 32 | 38 | 17 | 87 | 1.83 | 0.73 |
| Century Skills) Alignment | | | | | | |

 Table 1: Summary of initiatives being explored or deployed.

The qualitative results of the open-ended response items provided more descriptive details as to the actions and priorities of the school districts. Sixty-four participants responded to the first open-ended question, which asked about other initiatives being implemented. Many participants (n=26) elaborated on their technology initiatives, further discussing their one-to-one programs. However, 16 of these 26 spoke of technology in relation to other initiatives, such that the technology was a means to fulfilling other goals. Three other themes emerged from the data: 1) state-wide initiatives; 2) curriculum changes; and 3) meeting the needs of all students. The theme of statewide initiatives was the focus for 13 respondents and included the topics of Ohio Teacher Evaluation System, Race to the Top, Formative Instructional Practices, and the Third Grade Reading Guarantee. Many mentioned the PARCC (Herman & Linn, 2013) assessments specifically and the challenge of administering these assessments online in upcoming years. Curricular initiatives were also identified by many respondents (n=10), as many discussed Common Core, the new Ohio Academic content standards, STEM, project-based learning, and curriculum mapping. Finally, equally important was the emphasis on meeting the needs of all learners. Many school leaders (n=10) identified initiatives that addressed interventions, enrichment, credit-recovery, ESL support, individualized instruction. The desire to have students and teachers perform well, as gauged by these state standards, assessments, and value-added parameters was paramount among approximately 20% of the responses submitted in this area. The following quote is representative of the comments received:

Our focus has been directed at improving scores in the state mandated assessments. (OAA< OGT). We are also preparing for new statewide, end-of-course exams that will be implemented in the next few years. The development of new learning standards, formative assessments, and preparation for online assessments (PARCC) is also a priority. The implementation of Ohio's New Learning Standards

(Common Core State Standards, Ohio Revised Standards), technology integration included in curriculum maps, measuring student growth, and evaluation are all connected in this plan.

Finally, when asked about their school's highest priority related to student learning, 95 educational leaders responded, with 33 indicated technology as a top priority, followed by student achievement. Other priorities echoed the initiatives identified in the previous question.

Discussion and Implications

While research is lacking that identifies the initiatives that schools are implementing, the literature regarding educational initiatives focuses on state and national policies and guides. These results show that school leaders are exploring or implementing a variety of initiatives that are parallel to state legislation and policy. Along with their commitment to the standards and legislated assessments, principals espoused a strong allegiance to innovation, personalized learning experiences for students and 21st century skills. They spoke of "giving our staff the tools for learning that allow them to teach our students the way the students are learning with their personal devices at home while all the while maintaining the high standard of excellence that we demand from both staff and students." The commitment to connect the curriculum to student success beyond the classroom was evident in the explanations associated with the one-to-one deployments, which were mentioned in detail, providing the names of the devices (Chromebooks, iPads, laptops, BYOD, cell phones, etc.). One school leader stated, "Our priority is that students will learn the curriculum necessary to be successful in life. We are preparing students for the future. We want to make sure our students are receiving the best education possible with the best tools that are available."

In other words, school principals connected one-to-one deployment initiatives to providing more personalized learning environments for students and ultimately increasing student success. One commented that, "We want to see more individualized strategies, one-on-one teaching time...we want to spend more time making learning relational, but also use higher level thinking skills." Another said, "We want to raise the rigor of our instruction in order to prepare our students better for life after high school. We are implementing a more challenging curriculum, and we need to do more with lesson planning and assessing learning objectives." Finally, a principal described their broader vision, explaining,

Regarding student learning, our focus is on creating/maintaining student centered classrooms that foster and promote creativity, communication, and collaboration. Instructional goals should always include relevance; students should utilize 21st century learning skills to solve real world problems. Learning best takes place during the application of knowledge to accomplish real work.

These statements provide context for the infusion of the digital technologies in these schools. A context that connects curriculum and standards to meaningful, personalized learning. Of course, not all comments were as lofty and promising, as one principal noted, "...but we also need to work on getting more use of technology by our teachers in their instruction. We have gone to BYOD, but our students have indicated they see no value in bringing such devices to school because they can't use them in the classroom." This observation ties in to multiple comments related to professional development for teachers, and these will be unpacked and addressed in another article, as they are currently beyond the scope of this piece.

Results have implications for teacher preservice and inservice training. With 78% of participating schools exploring or deploying one-to-one technology initiatives, teachers need training on instructional methods that capitalize on a one-to-one learning environment while meeting the needs of all learners. While most teacher preparation programs include technology integration courses and experiences, preservice teachers are likely receiving inadequate preparation to teach within a one-to-one classroom. Teacher education courses need to address the instructional ramifications of a one-to-one environment as well as blended and online environments (Yoon & Chang, 2012).

Conclusions

While it is apparent that school leaders are working to accommodate the legislative demands of the national Common Core curriculum, online PARCC achievement testing and value-added criteria for teachers, they are doing so with an eye towards preparing students for a future outside these parameters and restraints. Implementing one-to-one mobile device initiatives, while providing an infrastructure for online testing (PARCC) and access to other state and national assessment systems, creates opportunities for teachers and students to individualize, customize and differentiate instruction for students. Teachers continue to need professional development, not only to learn more about how to integrate the digital tools and resources being provided in their schools, but to "retool" as educators that facilitate personalized learning environments for all of their students. The interconnected, communicative, responsive, data-rich world in which we live now makes this possible. It is up to these pioneers to lead the way.

References

- Au, W. (2011). Teaching under the new Taylorism: High-stakes testing and the standardization of the 21st century curriculum. *Journal of Curriculum Studies*, 43(1), 25-45.
- Balfanz, R., Herzog, L., & MacIver, D. J. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades shools: Early identification and effective interventions. *Educational Psychologist*, 42(4), 223-235.
- Barnett, R. (2012). Learning for an unknown future. Higher Education Research and Development, 31(1), 65-77.
- Barton, P. E. (2005). One-third of a nation: Rising dropout rates and declining opportnities (pp. 1-47): Policy Information Center.
- Drexler, W. (2010). The networked student model for construction of personal learning environments: Balancing teacher control and student autonomy. *Australasian Journal of Educational Technology*, 26(3), 369-385.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and cluture intersect. *Journal of Research on Technology in Education, 42*(3), 255-284.
- Hanushek, E. A., & Rivkin, S. G. (2010). Generalizations about using value-added measures of teacher quality. *American Economic Review, 100*(May), 267-271.
- Henry, K. L., Knight, K. E., & Thornberry, T. P. (2012). School disengagement as a predictor of dropout, deinquency, and problem substance use during adolescence and early adulthood. *Journal of Youth and Adolescence*, 41(2), 156-166.
- Herman, J., & Linn, R. (2013). On the road to assessing deeper learning: The status of Smarter Balanced and PARCC Assessment Consortia CRESST Report 823 (pp. 20). Los Angeles: CRESST.
- Hwang, G.-J., Kuo, F.-R., Yin, P.-Y., & Chuang, K.-H. (2010). A heuristic algorithm for planning personalized learning paths for context-aware ubiquitous learning. *Computers and Education*, 54(2), 404-415.
- Lieszkovszky, I. (2012). State Impact: What's coming up in Ohio education in 2013. stateimpact.npr.org/ohio/2012/12/24/whats-coming-up-in-ohio-education-in-2013
- Miller, R., & Lake, R. (2012). Federal Barriers to Innovation (pp. 1-14). Seattle, Washington: Center for Reinventing Public Education.
- Sahlberg, P. (2008). Rethinking accountability in a knowledge society. Journal of Educational Change, 11, 45-61.
- Wang, Y.-h., & Liao, H.-C. (2011). Data mining for adaptive learning in a TESL-based e-Learning system. *Expert* Systems with Applications, 38(6), 6480-6485.
- Williams, R., Karousou, R., & Mackness, J. (2011). Emergent learning and learning ecologies in Web 2.0. International Review of Research in Open and Distance Learning, 12(3), 1-11.
- Yoon, H.J. & Chang, H.M. (2012). Instructors' modeling of technology integration in preservice teacher preparation program with one to one laptop initiative. In P. Resta (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2012* (pp. 4910-4916). Chesapeake, VA: AACE.