STRATEGIES AND CHALLENGES IN IPAD INITIATIVE

Chientzu Candace Chou, Lanise Block* and Renee Jesness*
University of St. Thomas - 1000 LaSalle Ave., MOH 217, Minneapolis, MN 55403, USA
**Minneapolis Public Schools - 1250 West Broadway, Minneapolis. MN 55411, USA*

ABSTRACT

This study examines the impact of iPad integration on teaching and learning activities in a large school district in Midwest United States. Forty social studies classrooms received iPad carts to engage students in learning. Teachers received professional development opportunities in the forms of workshops, conferences, one-to-one coaching, and online communities. The findings showed positive impact on student learning in the areas of digital literacy, engagement, collaboration, productivity, and creativity. Facing shifting pedagogy to learner-centered learning, teachers have also found increased opportunities for collaboration and creativity. Technology anxiety and distraction remain the main challenges for teachers and students. School districts need to promote collaboration in learning circles, one-to-one mentoring, and transformative modeling as the best practice for iPad integration.

KEYWORDS

iPad, strategies, mobile learning, challenges, engagement

1. INTRODUCTION

Mobile learning with iPads has become a common scene in many primary and secondary schools in the United States. iPad allows the opportunities for educators to engage students in personalized learning and active collaborative learning in the classroom. iPads enables learning at a higher level with greater accessibility to online digital resources and the Internet. The implementation of iPad initiatives in K-12 schools (i.e., primary and secondary schools) varies from schools to schools. Some allow complete one-to-one access, in which students have access to the same iPads both at schools and at home. Other schools provide iPad carts for students to access iPads in specific classrooms. This study explores the strategies and challenges in implementing iPad cart initiative in a large K-12 school district in Midwest United States. The purposes of this research are to examine the impact of iPad initiative on teaching practices and student learning and the best practices for iPad implementation.

2. BACKGROUND

The school district in this case study is a large public school in a Midwest city in the United States. The school district has more than 32,000 students with 68% students of color. Sixty-six percent of the student population in the district received free or reduced lunch in the 2011-12. In Spring 2012, the school district began a pilot project to look at the efficacy of using iPads to teach Geography. Four teachers had access to an iPad cart in their classrooms as part of the pilot. In academic year 2012-13, forty teachers, including all 9th grade Geography teachers and 6th grade Studies teachers received iPad carts in their classrooms. All teachers participated in professional training workshops, conferences, and need-based mentoring. Enhanced teaching practice and sound pedagogy need to be embedded in the professional development opportunities for teachers. Professional development should focus on both the content and the performance improvement. Content refers to the pedagogical and technological contents that enable educators to advance student learning. Performance improvement refers to enhancing the educators' capability to do the job well. The following sections describe the PD model and framework.

2.1 SAMR: Pedagogical Model

For the content part of the professional development, Puentedura's (2009) SAMR model aims at transforming learning with technology. SAMR stands for *substitution, augmentation, modification, and redefinition*. At the basic levels, technology can be used to substitute print text and augment traditional face-to-face learning. At higher levels, the use of technology should aim at augmentation (i.e., digital tools as a direct substitution with functional enhancement), modification (i.e., digital tools encourages task redesign), and redefinition (i.e., digital tools lead to the creations of new tasks). Learners are encouraged to work with peers or experts in the field to engage in authentic learning. The project team has developed iPad curriculum and lesson plans to assist teachers to go beyond substitution level.

2.2 Faculty Performance Support Model

In addition to the emphasis on the pedagogical and technological content, faculty performance is also an essential part of the professional development. The Performance-Based Faculty Development model (Fang, 2008) has provided the framework to provide comprehensive support for teachers. The framework focuses faculty support in the five areas: (1) formal training, (2) community of practice, (3) performance support, (4) knowledge sharing, and (5) evaluation.

To implement the model, the project team has adapted specific ways to enrich teachers' learning experiences as described below:

- Formal training
    - Day-long conferences and summer PD workshops: Teachers participated in iPad conferences that took place in June, August 2012, and January, March 2013.
    - Webinar: Synchronous webinar sessions on specific topics were held for teachers who could not attend the monthly meetings
- Community of practice
    - Edmodo: A learning management system, Edmodo, was set up to provide opportunities for teachers to exchange information and share instructional materials.
    - Monthly user group: Teachers participated in the after-school monthly meetings that took place at different school each month.
- Performance support
    - One-to-one iPad innovator: The innovator provided in-class instructional support, curriculum brainstorming, tech consultation, and other instructional services for teachers.
    - Video on demand: The project team created several video tutorials to answer teacher questions when needed.
    - Building IT support: Building IT supports were trained to provide tech support and troubleshoots.
- Knowledge sharing
    - Online resources. The project team maintained a website with videos, instructional materials, educational apps, policy and guidelines for teachers.
    - Google Docs resources sharing: Instructional templates or lesson plans were shared through Google Docs ready for used in the classroom.
    - iPad Curriculum Guide: The guide was created to provide specific information on how to integrate iPad activities into the curriculum for the whole academic year.
    - Q&A via Edmodo: The project team utilized Edmodo to provide prompt replies to teacher questions.
- Evaluation
    - The evaluation included 40 classroom visits, five student focus groups, two teacher focus groups, and online focus group questions. The findings from the classroom visits between February and May also provided feedback for the project team to provide ongoing personalized support for teachers.

3. RESEARCH METHOD

This study has employed an exploratory case study method that examines how the implementation of iPad carts can contribute or inhibit teaching and learning activities in the classroom. This approach can provide a holistic account of the phenomenon under investigation (Yin, 2003).

3.1 Research Questions

This project will address the following research questions:

1. What are the factors that contribute to student learning and teachers' facilitation of learning with mobile devices? Specifically the researchers are interested in exploring the perceived and observable opportunities of iPad integration that enhance student engagement and performance.
2. What are the factors that inhibit student learning and teachers' facilitation of learning with mobile devices? The researchers are looking for lesson learned from iPad integration and participant experiences that are unique in the iPad initiative.

3.2 Data Collection Methods

The research team conducted evaluation of the iPad initiative by collecting data from multiple sources, including:

1. Teacher focus groups: Two teacher focus groups with the sixth grade teachers and ninth grade teachers separately. A total of 11 teachers participated in the face-to-face focus groups.
2. Student focus groups: Five student focus groups with three groups of ninth grade students and two groups of sixth grade students. A total of 25 students participated in the focus groups.
3. Online focus group: Students and teachers who could not participate in the face-to-face focus groups could complete the same focus group questions online. 212 students and 11 teachers completed the online focus group questions.
4. Classroom visits. A total of 40 class visits were made, of which 18 classrooms were observed twice. The research team used a classroom observation form to take notes on the SAMR integration, ISTE NETS alignment, and classroom activities. The pre-visits were conducted between February-March and the post-visits were conducted between April-May, 2013.

All focus groups interviews were recorded and transcribed. The transcripts and online responses were analyzed using NVivo, a qualitative research software program. Several themes on student learning, teaching practices, challenges, and best practices were extracted from the data.

3.3 Data Analysis

Based on the multiple data sources, the analyses focus on the opportunities and challenges in student learning and teaching practices. Participants-recommended best practices were also discussed.

3.3.1 SAMR Integration

Based on analysis of the classroom observation notes by the research team, the 18 classrooms that have received pre- and post-visits have shown improvement in SAMR integration. During the pre-visits, the iPad activities in nine out of 18 classrooms were at the substitution level such as website information look up or reading E-books. None was at the redefinition level. During the post visits, the majority (seven out of 18 classrooms) was still at the substitution level. However, there was an increase at the augmentation and redefinition levels, which indicated that more teachers were integrating activities that engaged students in project-based learning or critical-thinking (Figure 1).

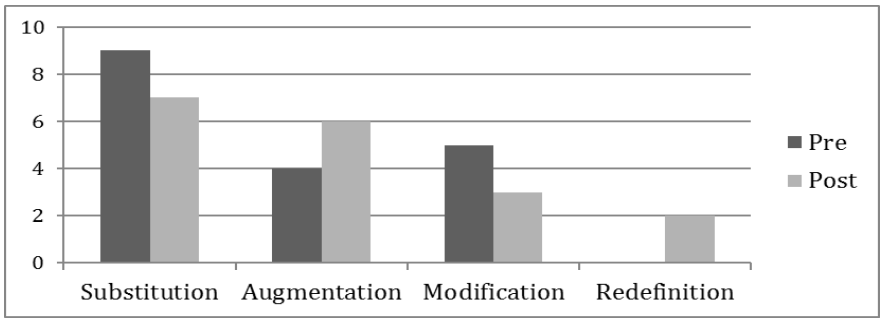

Figure 1. Comparison of SAMR integration level between pre- and post-classroom visits

3.3.2 ISTE NETS Alignment

The International Society on Technology for Education's (ISTE) National Education Technology Standards (NETS) have been adapted by all fifty state as the criteria for technology integration. In examining how the iPad activities have addressed the ISTE NETS, the research team observed the classroom activities and came to an agreement on the standard(s) that the activities addressed before recording the results on the observation form. The research team may mark more than one ISTE NETS in each classroom visit because the instructional activities might address multiple technology standards. The data indicated that the majority classroom activities have focused on research and information retrieval during the first classroom visits. However, during the second visits, the data showed an increase of activities in communication, collaboration, creativity and critical thinking. The findings reveal that although using iPad for research and information retrieval were common practice in most classrooms, teachers have gradually moved beyond the basic level of technology integration and strived to engage students at multiple levels (Figure 2). Notably, all ISTE NETS activities have increased during the post visits except for digital citizenship. The reason is that the figure is based on observable activities. Observers checked all relevant ISTE NETS criteria based on the activities during the visits. The observers noted that digital citizenship was emphasized strongly at the beginning of the iPad initiative. Once students have demonstrated understanding of the concept and applied to their learning, teachers focused less on digital citizenship and more on other ISTE NETS activities.

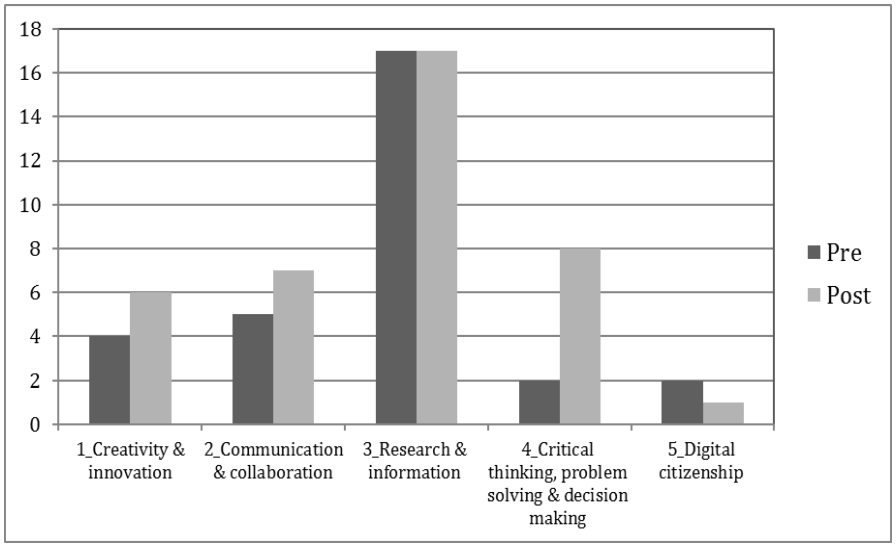

Figure 2. Comparison of ISTE NETS integration: pre- and post-classroom visits

3.3.3 Student Learning

Based on the student focus group data, student responses revealed four major themes on the impact of iPad activities on their learning (Figure 3):

1. Collaboration and creativity: 11% of the responses showed that students had more opportunities to collaborate with each other through small group projects on iPad. The multimedia features of iPad allowed students to brainstorm with their peers and be more creative in their projects.
2. Engagement: 14% of the responses indicated that students have strong interest in utilizing iPad for more classroom activities. They found that the class went by much faster when iPads were in use.
3. Productivity and Apps: Students found themselves more efficient in producing projects and completing assignments. The multitude of multimedia apps such as camera, poster, presentation, and screencast apps afford them the opportunities to produce projects that were not available on paper.
4. Digital Literacy: The majority of students responses (23%) indicated that they have increased knowledge in digital literacy and become more efficient in retrieving information.

The following student quote sums up well on student creativity:

"*The iPads have increased my creative learning by giving me a chance to come up with new ways of learning. By letting me create websites that people could visit to learn new and interesting facts that they didn't even know about.*"

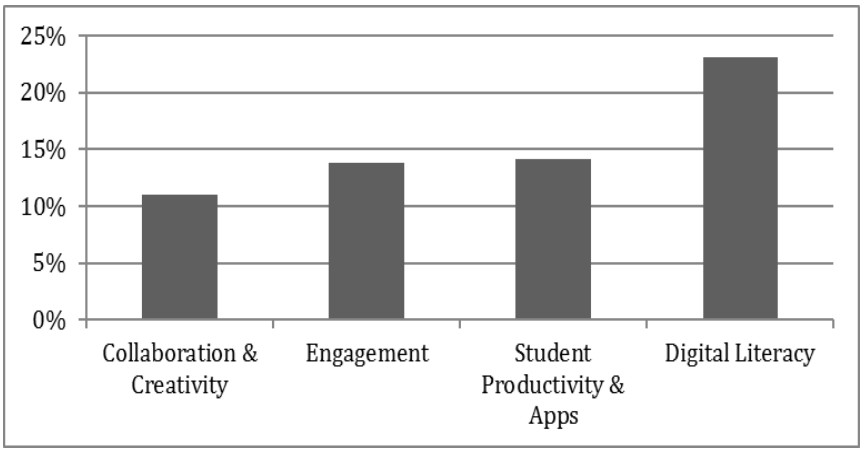

Figure 3. Areas of improved student performance

3.3.4 Teaching Practices

The teacher focus group data showed that through iPad integration teachers have enhanced their teaching in the following ways (Figure 4):

1. Creativity and Productivity: With iPad integration, teachers found themselves more creative and productive in the instructional activities. Many apps such as Haiku Deck or Educreations have presented opportunities for them to be more creative with presentation and students assignments.
2. Professional Development: Through district-sponsored PD and learning circles, teachers were able to receive continued support in improving their skills and knowledge in iPad integration.
3. Shifting Pedagogy: Teachers recognized a needs to integrate more student-centered activities and personalized learning for students through iPad.
4. Modeling: Teachers found it most efficient to have other teachers modeled lessons, project, or classroom management ideas.
5. Teacher Collaboration: The PD workshops and online community of practice have provided opportunities for teacher collaboration. Five teachers from three high school collaborated on an international project-based learning in which their students used iPads to develop a neighborhood project to exchanges information with international students in Taiwan and Philippines.

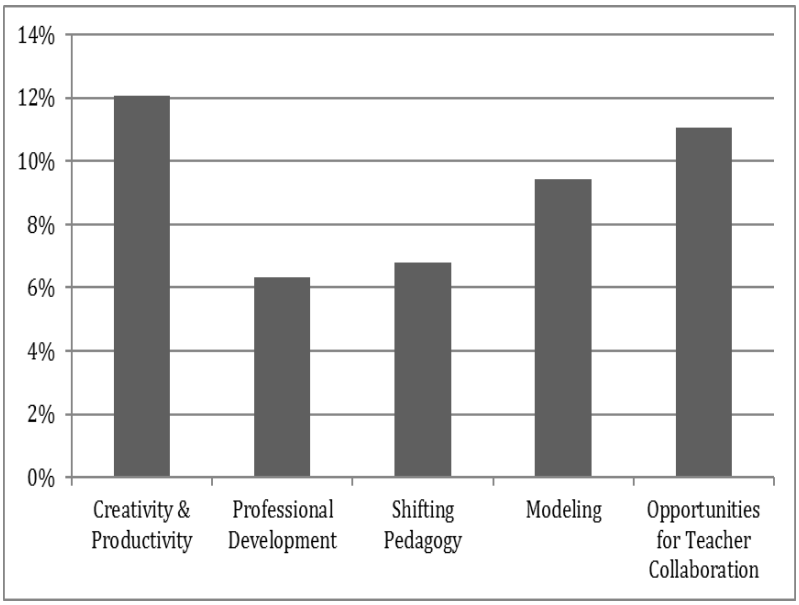

Figure 4. Opportunities for teaching practices

The following quotes from the teacher focus group provided the supporting evidence on the pedagogical shift in their teaching practices:

> *" I use it all the time. To have something extra, to have something they really have the desire to get on, instead of opening a book and getting a worksheet, they're like I'm going to get on and make something and do something- 'look at mine, no look at mine!', it's so much bigger. I can go and take my iPad with me on a field trip and take tons of pictures and make something and get them geared up. It really does evoke some of that motivation for learning."*

> *"I know I used my teacher iPad a lot and when the apple TV was installed a whole new world was opened for me and I could show them the globe on the Smartboard or I could show them a clip of the Sioux{Dakota} Indians from the History Channel and it just allowed me to bring so many things into the classroom that I didn't have to carry or lug or go to a different website."*

3.3.5 Challenges

Technology integration requires multi-layer support in a large educational institution. The challenges faced by the teachers and students are summarized below:

1. Technology anxiety: The iPad cart was a completely new technology for the majority teachers. There was a high degree of anxiety among teachers in adapting the new technology and revised curriculum in addition to their regular teaching responsibilities.
2. IT Support: Many teachers have reflected that requests for tech support were not always resolved in a timely manner, which led to high degree of frustrations and stoppage in utilizing iPad carts.
3. Pedagogical applications: Teachers have indicated that one key challenge is to locate more pedagogical sound examples for adaptation into their own teaching. It takes time for teachers to integrate best practices into the daily classroom activities.
4. Distraction: Students have indicated that it is easy to get off task with so many different apps and easy access to websites on iPad. It is also difficult for teachers to manage the iPad when students went off tangent onto other tasks that are not central to their assignments.

3.3.6 Best Practices

After eight months of iPad integration, teachers have made the following recommendations for best practices:

1. Opportunities for teacher collaboration: Teachers appreciated having time to explore and collaborate with each other during professional development workshops. Having the opportunities to explore new apps, try new activities, bounce ideas back and forth, and learn from other's mistakes could all provide valuable lessons in the integration process,
2. Exemplary projects and peer modeling: Teachers felt strongly about seeing more exemplary works and effective teachers in action. They want to see or hear how other teachers implement a lesson plan that results in quality student work.
3. Learning circles and mentors: Learning in small groups or with a mentor are also efficient ways for continued professional development. Team members can keep each other updated on their project ideas and share results of their projects. They could also implement the same project and compare notes on student performance.

One teacher has summed it up well on the best practice:

> "making the teachers the kids, getting them to find out what's fun about this app or how it can be used or actually-- I know when I first got my iPads, they were messing around and going to places they shouldn't go. I showed them another student's work, and they were like 'I can do better than that!', and it was so good that I think if teachers had that opener to see how it can be used practically, it would be used more."

4. CONCLUSION AND RECOMMENDATIONS

The iPad initiative has no doubt generated high degree of learner engagement and led to fundamental shift in teaching practices. At the conclusion of the first year iPad rollout, there were many lesson learned.

- Lesson 1: Teaching modeling through one-to-one mentoring or small group conferencing proves to be the most effective way to encourage novice teachers. It is important not to overwhelm beginning teachers with multiple apps or lesson ideas. Starting with one small project on one app that shows result would be the best practice. For example, using Edmodo to collect student assignments or encourage small group activities could reduce issues associated with paper assignments and enhance student communication.
- Lesson 2: Teachers have observed improved student engagement and performance improvement when iPad activities are at the level of modification or redefinition based on the SAMR level. A well-prepared lesson that promotes student communication, collaboration, and problem solving would keep students on task. Instructional activities that required students to work on substitution task such as information search or completing worksheets would yield a higher rate of student distraction to none-relevant activities.
- Lesson 3: Technology anxiety could decrease both student and teacher interests in iPad-related activities. When faced with technical challenges without the appropriate IT or instructional support, teachers and students would quit and minimize the use of iPads in the classrooms. A teacher might have a wonderful lesson idea, however, without appropriate tech support, the project idea would not move beyond the conceptualization stage.

Based on the findings on the opportunities and challenges in the iPad initiative, the project team would make the following recommendations:

1. Better infrastructure support: The success of the iPad initiative requires concerted effort from all parties involved. The project team needs to continue working with leaders in Teaching and Learning and the IT Divisions at the central office. On the ground, school principals and IT tech support also need to be on board to support the student learning and teacher performance.
2. Integrated professional development opportunities: Teacher feedback on the multiple professional development opportunities has been extremely positive. The use of 1:1 iPad Innovator, the day-long conferences, and immediate feedback through classroom visits will continue to lend strong support to faculty in iPad integration.

3. Innovative pedagogy through best practices: iPad the device can be used as an E-Reader, entertaining gadget, or personalized learning tool. As many teachers pointed out that one cannot continue the same instructional practices with iPads. Educators need to leverage the innovative features of iPad to engage learners. Promoting best practices that advocate authentic and innovative instructional strategies through teaching grants, awards, or coaching could encourage more meaningful iPad integration.

One-to-one learning with iPad has great potentials to enable students to develop passions through personalized and media-enhanced learning environment that keep students connected and engaged. The iPad initiative has demonstrated that with effective instructional activities, educators can improve student performance and prepare them for future academic challenges.

REFERENCES

Fang, B. (2007). A performance-based development model for online faculty. *Performance Improvement, 46*(5), 17-24.

Puentedura, R. (2009). Transformation, technology, and education, Retrieved May 1, 2012, from http://hippasus.com/resources/tte/

Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks: Sage.