

STRATEGIES AND CHALLENGES IN IPAD INITIATIVE: LESSONS LEARNED FROM YEAR TWO

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ABSTRACT

This study examines the impact of iPad integration on teaching and learning activities in a large school district in Midwest United States. The iPad cart initiative was conceived to provide equitable digital learning access among schools in the district and innovate learning activities. 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. CISCO has predicted that every Internet user will have five Internet devices by 2017 and tablets are the fastest growing residential devices globally (Bort 2013). Although educators are debating if iPad will revolutionize education (Walter & Baum

2011) and many school districts are deciding between the adoption of iPads and chromebooks (Murphy 2014), iPads continue to dominate the market for tablets in K-12 schools in the United States (Cavanagh 2014). iPads allow the opportunities for educators to engage students in personalized learning and active collaborative learning in the classroom. iPads enable 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 district to district. Some districts allow complete one-to-one access, in which students utilize the same iPads both at schools and at home. Other districts provide iPad carts for students to access during school. In these cases iPads are used only in specific classrooms. The subjects of this study were students and teachers from a large public school district that provided access during the school day to Social Studies classrooms. The data was collected in the second year of an iPad cart initiative in Midwest USA. This study explores the strategies and challenges in implementing an iPad cart classroom initiative in a large K-12 school district. The purposes of this research are to examine the impact of an iPad cart initiative on teaching practices and student learning and the best practices for iPad implementation.

2. LITERATURE REVIEW

Since its introduction in early 2010, iPad has been touted as the “game changer” in all levels of education (Geist 2011). Studies have shown that iPad can be effective in engaging student learning, communication, collaboration, and critical thinking (Chou, Block & Jesness 2011). An increasing number of studies have also examined the integration of iPad to assist early years literacy (Falloon & Khoo 2014; Falloon 2013; Getting & Swainey 2012), special education learning (Johnson 2013; O’Malley, Lewis & Donehower 2013), and STEM education (Aronin & Floyd 2013). In a meta-analysis of mobile learning studies, Shuler (2009) identified five key opportunities that are anywhere/anytime learning, accessibility for low-income families, improvement of 21st century learning skills, portability in various learning environments, and personalized learning experiences. These are broad impact and benefits of mobile devices in education prior to 2008. With iPad’s wide acceptance in education, recent studies in mobile learning have started focusing on the affordances of iPad in education, such as touch-screen features, ubiquitous wifi connections, and a multitude of education apps (Dhir, Gahwaji & Nyman 2013). Since this study focused on student learning and faculty development, the literature review section will examine recent studies in these two areas.

2.1 Student Learning and Engagement

Although iPad’s innovative features such as plentiful app selections, multimedia, GPS, touch screen, and portability have set it apart from laptop computers, device-neutral technologists or educators’ views are that iPad as a tablet computer could be replaced by other new technologies as all technologies proceeding it (Walter & Baum 2011). The issue might be not to ask how iPad the tool can engage learners but focus on how iPad integration can motivate learners. iPad integration refers to the design, development, and implementation of sound instructional planning to maximize the use of iPad for learning. Without sound pedagogy, iPad

is only as good as an E-Reader, entertainment gadget, or game-device. With thoughtful instructional planning, iPad integration in the classroom can definitely engage student learning and enhance student learning and productivity (Chou, Block & Jesness 2012). One of the largest studies on iPads in Canada found benefits of the use of iPads to include: increased motivation; possibility of working at one's own pace; access to, management of, and sharing of information; and a nurturance of students' creativity (Karsenti & Fievez 2013, p. 6).

Past research on tablets have demonstrated that students were able to be on task and immerse themselves in the process of learning (Beck & Wade 2006; Shaffer 2006). What are the factors that engage learners? In studying games, Malone and Lepper (1987) proposed a theory of motivation that makes games both fun and educational. They stipulated six important components that make an activity both intrinsically and extrinsically motivating for a learner: challenge, curiosity, control, cooperation, competition and recognition. Ciampa (2014) expanded on the theory to investigate how iPad integration can motivate learners using Malone and Lepper's framework as described below:

1. Challenge: Learners enjoyed activities that are *challenging* at various levels to help them meet multiple levels of goals with hidden information and randomness. Many mobile apps have different levels of difficulty to move learners through the activities. Learners could move through a game based on instant feedback to adjust their levels.

2. Curiosity: Two kinds of curiosity motivate learners: sensory curiosity and cognitive curiosity (Malone & Lepper 1987). In tablet's multimedia environment, sensory curiosity can be stimulated through audio, video, music, and other haptic features such as tapping, pinching, and stretching. Learners can receive feedback through multiple means of interaction with tablets. Cognitive curiosity is stimulated when learners desire to attain new knowledge or information through technology. With tablets, learners can easily obtain information to deepen their understanding in a topic.

3. Control: According to Malone and Lepper (1987), the idea of being in control could "improve motivation and academic performance" (p. 238). Mobile learning gives learners more control of their learning and the ability to access, create, and share information from home, school, or any locations (van't Hooft 2008).

4. Cooperation: Mobile tools afford learners self-paced learning or opportunities to collaborate with each other. They can share projects, provide comments, and co-create content through mobile apps or devices and achieve greater productivity.

5. Competition: Measuring one against each other is a form of competition that motivates learning. Many games have competition components that make learning exciting. Many educational apps have game-like components that compare one's performance against others to keep learners engaged.

6. Recognition: Recognizing learners for their efforts and accomplishments is another form of motivating learners. With mobile tablets, student performance and activities could be made visible through learning management systems or apps.

In Ciampa's (2014) own research of fifth and sixth grade students, students showed improved learning outcomes and greater motivation in completing tasks through iPad integration for one-to-one learning. Students received instant feedback on quizzes and could repeat practice questions as many times as they would like. Both teachers and students could track academic performance at their own pace. Teachers could also provide individualized feedback and refine teaching methods based on student progress. Ciampa (2014) emphasized that for struggling students, educators could provide "a 360-degree approach to learning, in

which the experiences that underlies in-school learning are aligned with those in afterschool and home settings” (p. 94).

When examining specific on-task behaviors, Hoffman (2013) found mixed results in a 1:1 iPad classroom. Hoffman (2013) studied 55 English class students aged 14 and 15 whether their perceptions of levels of engagement (i.e., on/off task behavior) matched with observational data. Her data suggested a high level of engagement (i.e., on-task behavior) due to the perceived importance of the task, if a task is interesting, and teacher’s style of teaching. Students found that the ability to personalize the device and use it efficiently highly important. However, there were also comments that it was easy to switch to non-learning activities such as checking social networking messages. Negative comments also mentioned difficulties in learning while using a visual display that did not require them to write the words out but just push a few buttons.

Recent studies have shown the great opportunities and potential challenges in iPad integration. In addition to utilizing various instructional strategies to engage learners, professional development of teachers plays a key role in the success of iPad integration. The following section offers an overview of professional development practices.

2.2 Individualized and Responsive Professional Development

While many school districts are adopting one-to-one mobile technologies in hopes that students can be taught in ways previously not conceived before, the barrier that used to be lack of access to technology is now being replaced by unique barriers to technology integration, notably the teacher. Montgomery (2014) maintains that once access is achieved the main barrier in technology integration to overcome is in individualizing professional development for teachers. Citing the work of Tomlinson (2004) in differentiated instruction, Montgomery suggests that teachers need the “what”, “how” and “required demonstration of learning” to be matched with the teacher’s readiness, interest, and his/her preferred modality of learning in order to move toward increased student-centered technology uses and rely less on teacher assistive roles. Montgomery’s three-teacher case study indicated that traditional and differentiated training was most desirable and that such an approach

would assist teachers in several ways: introduce the new technology in a large group format that would allow for conversation and collaboration about the usefulness and possible implementation of the new technology; 2) hold teachers accountable for finding a way to use the technology; 3) provide every teacher with a support system that would help to prevent failure when using the technology because the individual attention could assist the teacher in overcoming their own individual barriers; 4) encourage sustainability of the technology by ensuring proper use and training for all teachers; and 5) build a community of technology users on campus that encourages and assists each other in implementation of various technologies for student-centered technology. (p. 188)

Along with an individualized approach to assisting teachers in overcoming barriers to technology so they could implement technology in increasingly more student-centered ways there is a growing need for “teacher training institutions to improve their technological sub-structures...to train teachers as appropriate to the needs of the era” (Yurdakul, Odabasi, Sahin

& Coklar 2013, p. 243). Using the Technological Pedagogical Content Knowledge (TPACK) (Koehler & Mishra 2008) as an integration model teachers apply instructional strategies enriched with technology according to individual differences in order to strengthen students' learning. The structure of the TPACK model includes a venn diagram of the three components – technology knowledge, pedagogical knowledge, and content knowledge.

In 2010, \$100 million was appropriated by U.S. Department of Education to school districts to fund Enhancement Through Technology (EETT). The main purpose was to provide more access in schools in the hopes of increased technology integration in learning and teaching. TPACK models were highly supported and viewed as responsive to teacher's professional development needs. Newman, Coyle, and McKenna (2013) stipulated that "change in teacher behavior was evidenced by direct observation of teachers' integration of technology into classroom practice, and their use of technology to support lesson plans aligned to state and common core learning standards in the classroom" (p. 270).

Teachers are not expected to make this transformation alone. There are new partners to support increased technology integration. Farmer (2013) commented "school librarians...can select and incorporate informational and technological resources..." (p. 129). Often times some of the first technology integration that occurs within schools is the K-12 classroom teacher using an app, ebook, or digital database purchased by the librarian in support of the curriculum in the school. American Association of School Librarians has published *Standards for the 21st Century Learner* that outline the need for librarians to be technology integration specialists. Standard 3.1.4 "Use technology and other information tools to organize and display knowledge in ways that others can view, use, and access" (American Association of School Librarians 2014)

While two common threads in technology integration professional development seem to prevail - *increased individualization* and *designing with TPACK* – another key element to professional development for teachers seeking to better integrate technology into learning and teaching are around *communities of practice*. Higher education is increasingly moving to online communities of practice. (Cochrane 2014; Sari & Herrington 2013). Communities of practice exist in the K-12 setting but are very difficult to keep sustained over time. Exceptions to this are when whole districts are moving toward a five-year district technology integration plan. (Minnetonka Public Schools 2011). Minnetonka's plan included face-to-face teacher training, an online course and community of practice for iPad teachers on *Schoolology*TM, and independent professional development videos available on demand. The community of practice established monthly goals.

In the research literature on professional development for technology integration there is inherent in working with these emerging technologies to have an element of exploration of what learning and teaching could be. Creating and supporting such a culture of inquiry and providing individualized training and professional development as needed is requisite for anyone managing these technologies. Perhaps a mantra that should be encouraged in the educational setting is celebration of what was learned and incorporated and integrated, and after a hearty celebration the expected question from all "What's next?"

3. 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. The Digital Divide is an ever-present issue to be addressed in large urban districts. The lack of student resources and digital skills spurred the researchers' idea and offered initiatives to tackle the digital divide in the district. The Digital Divide previously thought of as the gap between access to digital hardware and internet has morphed in to a new divide in which authors make distinctions in the kind of divide. According to Reinhart and Thomas (2011), the second-level digital divide refers to "the difference in how technology is utilized" (p. 21). Their study suggested students who have more home access to computers have higher GPAs and generally 'do better' in school than students without technology access. This differentiated access also plays out in schools, the disparity of access in schools is evident along racial and economic lines. Schools that have higher percentages of students of color accompanied with lower income rates, tend to have a lower student to computer ratio: 5.5 vs. 4.6 in those situations, teachers are less likely to assign creative projects to students that have less access this provide a 'distinct' disadvantage to students with less access (Valadez 2007). This iPad cart project was conceived to address the issue through equitable distribution of iPad carts in the classrooms and personalized professional development of teachers.

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.

3.1 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.

3.2 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.

4. 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).

4.1 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.

4.2 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. The iPad carts were deployed into the classrooms around October 2012. Most teachers did not feel comfortable to be observed right at the beginning. Many teachers were still receiving professional developing training, working out technical glitches with building tech supports, and developing appropriate classroom instructional activities. The research team sent email invitations to all teachers with iPad carts to participate in the research in December. Half of the forty teachers accepted the research teams' request for observation. A total of 40 class visits were made, of which 18 classrooms were observed twice. Two classrooms were not available for second observation. 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.

4.3 Data Analysis

Based on the multiple data sources, the analyses focus on the opportunities and challenges in student learning and teaching practices. The opportunities were examined based on data from SAMR integration, ISTE NETS alignment from classroom observations, student perceived improvement from student focus groups, and faculty perceived enhancement from teacher focus groups. Participants-recommended best practices were also discussed. The challenges were summarized based on focus group data.

4.3.1 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 (from 4 classrooms to 6 classrooms) and redefinition levels (2 classrooms), which indicated that more teachers were integrating activities that engaged students in project-based learning or critical-thinking (Figure 1).

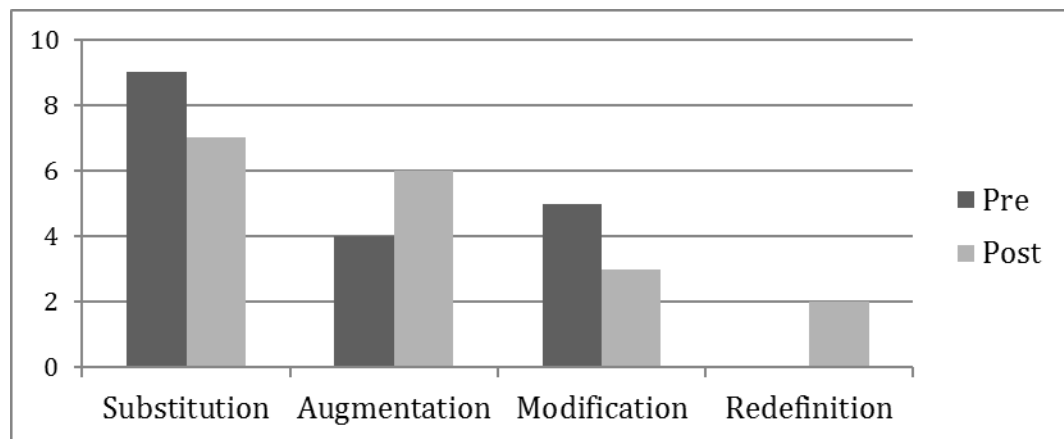


Figure 1. Comparison of SAMR integration level between pre- and post-classroom visits

4.3.2 ISTE NETS Alignment

The International Society on Technology for Education's (ISTE) National Education Technology Standards (NETS) have been adapted by all fifty states 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.

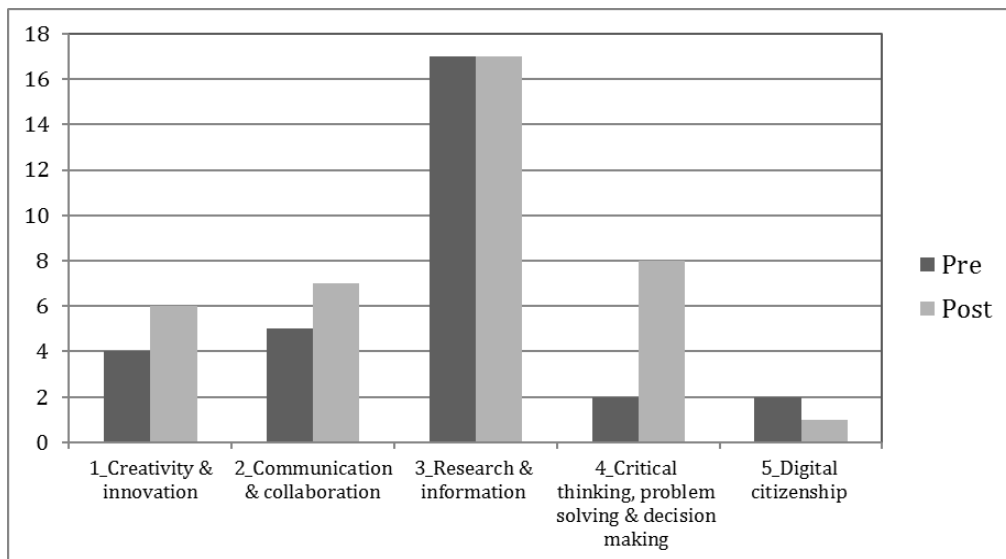


Figure 2. Comparison of ISTE NETS integration: pre- and post-classroom visits

4.3.3 Student Learning

The focus groups discussions were recorded with an audio recording app on an iPad and then transcribed. The researchers started with open coding and then moving to axial coding to group the codes into thematic analysis. The unit of analysis is per student's utterance since they all spoke in short sentences. We gave each student's response a code or multiple codes if the response meets the meaning of multiple codes. The percentages in the figures below might seem low and they do not add up to 100%. Instead, we focus on the patterns that emerged from the focus group discussions. Based on the student focus group data, student responses revealed four major themes on the impact of iPad activities on their learning (Figure 3):

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1. Collaboration and creativity: 11% of the coded 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 coded 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: 14% of 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.”

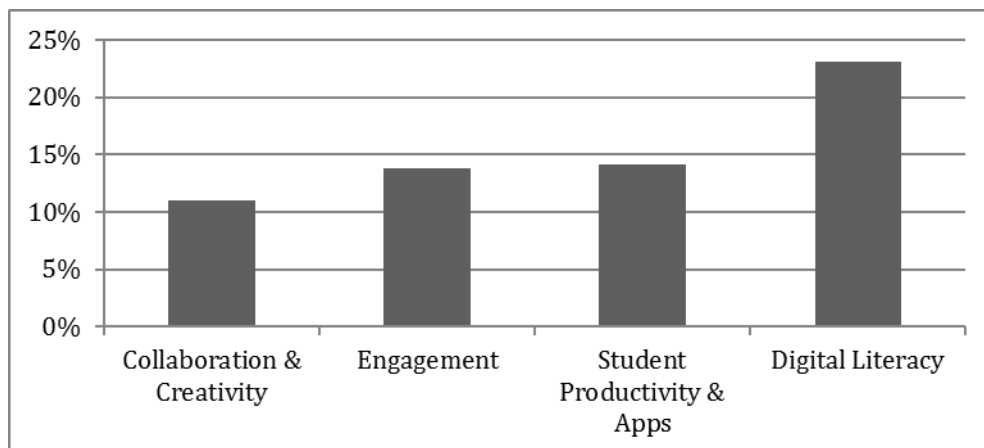


Figure 3. Areas of improved student performance

4.3.4 Teaching Practices

The teacher focus group data showed that through iPad integration teachers have enhanced their teaching in the following ways (Figure 4). The number in parenthesis after each theme indicate percentage of total coded responses.

1. Creativity and Productivity (12%): With iPad integration, teachers felt 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 (6.5%): Through district-sponsored PD and learning circles, teachers were able to receive continued support in improving their skills and knowledge in iPad integration (6.5%).
3. Shifting Pedagogy (7%): Teachers recognized a need to integrate more student-centered activities and personalized learning for students through iPad.
4. Modeling(9.5%): Teachers found it most efficient to have other teachers modeled lessons, project, or classroom management ideas.
5. Teacher Collaboration (11%): 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.

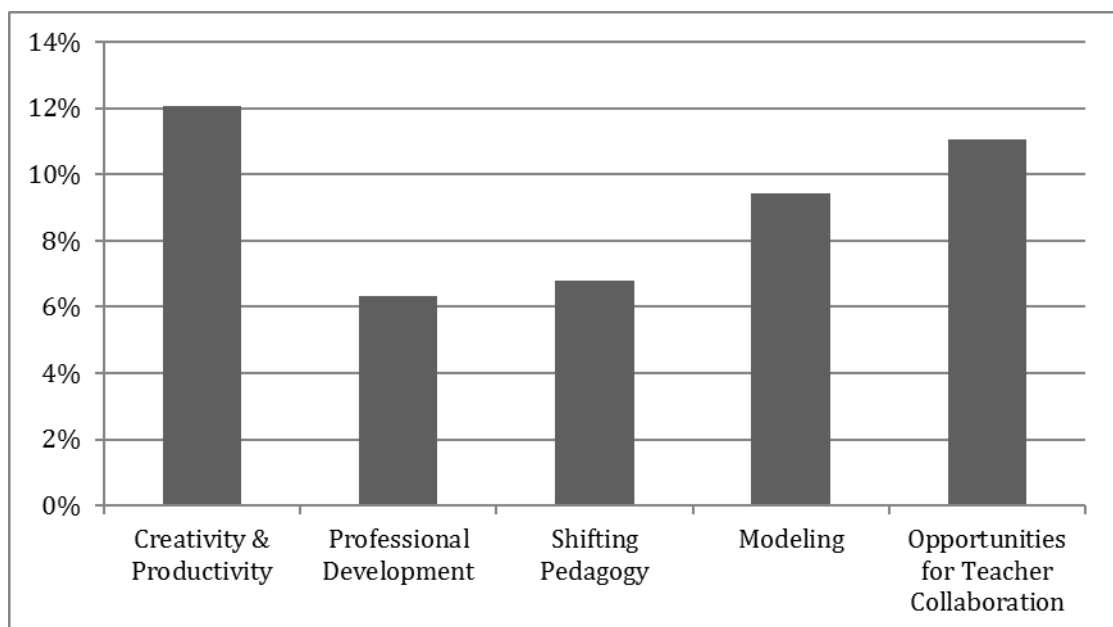


Figure 4. Opportunities for teaching practices

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."

4.3.5 Challenges

Technology integration requires multi-layer support in a large educational institution. The challenges faced by the teachers and students are summarized below based on focus groups and researchers' observations:

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 technical 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 was to locate more pedagogical sound examples for adaptation into their own teaching. It took time for teachers to integrate best practices into the daily classroom activities.
4. Distraction: Students have indicated that it was easy to get off task with so many different apps and easy access to websites on iPad. It was also difficult for teachers to manage the iPad when students went off tangent onto other tasks that were not central to their assignments.

4.3.6 Best Practices

After eight months of iPad integration, teachers have made the following recommendations during the focus group discussions 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."

5. 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 second year iPad rollout, there were many lessons 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:

- 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 district's 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.
- 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.
- 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 environments 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.

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