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Author(s): Gehrett, Matt.

Source: *Pacific Journal*, vol. 10 (2015), pp. 109-124.

Published by: Fresno Pacific University.

Stable URL: <http://hdl.handle.net/11418/553>

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# Mobile Technology and the K-12 Christian School: The Promises and the Perils

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When Steve Jobs, the co-founder of Apple Computers, passed away in the fall of 2011, many reflected upon the early years of the personal computer. These devices, invented in Silicon Valley garages, continue to transform our society in the way we work, connect with each other, relax, and play. However, K-12 schools in the U.S. have not seen such a dramatic, transformational shift. Educators continue to struggle with the integration of technology into classroom instruction. In the early 1980s, Apple Computer donated Apple II computers to schools, and since that time, many educators have embarked on a journey to find the educational treasure at the end of the technology rainbow. Even now, Apple continues to provide the latest technology for schools, with the iPad quickly becoming the Apple II of today. Through trial and error, professional development, support from administration, and scholarly research, the quest continues for educators to discover the promises and perils of using mobile computing technology in classroom instruction.

I have been personally involved in helping teachers integrate technology into classroom instruction for over twenty years. Along with this, my recent dissertation helped me further my understanding of the key factors that lead to a successful technological implementation in the classroom. In addition, I am drawn to the plight of teachers who teach in Christian schools. Their journey is unique as they seek to educate their students. These schools can lack professional development support, teaching resources, and adequate funding. They also have a unique advantage in being able to determine curriculum and academic goals for their students free from government mandates.<sup>1</sup>

From my recent research at two K-12 Christian schools (Immanuel and Fresno Christian) in the Central Valley of California, I discovered a variety of promising practices and problems that entered the classroom as mobile devices began to be used for instruction and student learning. Profiles of each school were developed utilizing online surveys, classroom observations, review of technology-planning documents, personal interviews with the administration, and focus groups of the school staff. This article will highlight a few of the key findings and conclusions from my research.

### **The Use of Mobile Technology in the Classroom**

In January of 2010, the iPad was introduced to the world as the first tablet-computing device. On that day, Apple introduced an innovation that has changed the landscape of technology use throughout the world, and it is beginning to change the classroom as well. Mobile devices, such as a Personal Digital Assistant (PDA) and palm pilot had been used in a limited number of K-12 classrooms.<sup>2</sup> Yet, in 2010, this new device captured the imagination of educators throughout the nation and the world. Other manufacturers have developed their own tablet devices, but the iPad has definitely captured the largest share of the educational market. A whole new category of technology has been introduced to the world of education.

In 2012, Project Tomorrow, in conjunction with Blackboard, Inc., released a report that was based on an annual survey of over 360,000 students in the U.S. The report found that over 50 percent of high school students have a smart phone and 21 percent have a personal tablet. Furthermore, the survey found that mobile technology combined with wireless connectivity and social media allows for more personalized learning for students. The report also identified that the changing of teacher practice is crucial for the effective use of mobile learning in the classroom.<sup>3</sup>

A case study of four K-12 schools in Australia looked at the factors that changed teacher practice in providing literacy instruction using mobile technology (iPads and iPod Touch). The Australian researchers concluded from their study that teachers need time to play and experiment with the technology, and more time to find appropriate software applications (apps) for specific literacy activities. The teachers also wanted to share their discoveries with each other and collaborate. A few teachers provided leadership as they made pedagogical choices that drove the use of the technology. Some teachers were able to differentiate instruction for their students and also reinforce basic skills through the use of the mobile device. It was a struggle for many of the teachers to learn new curriculum and new technology at the same time, which resulted in limited higher order thinking activities developed by the teachers for their students.<sup>4</sup>

A study of a fourth grade teacher using the iPad for literacy instruction and a study regarding the use of the iPod Touch for classroom instruction found that the students were highly engaged, but warns the reader about special considerations needed for the use of iPod Touches or iPads for classroom instruction. These considerations include the sharing and collecting of assignments, technical issues, and app limitations. The researchers in both studies found that there may be times when the technology can get in the way of the content and pedagogy needed for learning.<sup>5</sup> Other school districts, such as the Canby School District in Oregon and the Corcoran School District in California, are beginning to see increases in student engagement and student academic achievement through the use of mobile computer technology. However, peer-reviewed research has yet to be completed to validate the gains reported by these school districts.

### **The Christian School**

Christian schools are places with unique advantages and challenges. Parents throughout our nation enthusiastically choose to “pay extra” for a specific style of education for their children. Christian schools in America endeavor to provide a specific educational experience based on their vision of Christian education.

The mission and vision of a Christian school has been found to be a key factor in guiding its educational program. Since almost all mission statements state that the spiritual formation is vital to the development of the individual, spiritual formation can take a front seat over any other considerations in the educational program. This fact has been supported by a variety of studies that have recently measured administrator, teacher, and student perceptions of the educational environment.<sup>6</sup> In fact, school administrators have spoken of spiritual leadership being more important to them than instructional leadership in their day-to-day work. They strive to provide spiritual leadership for their teachers, students, and the general school community, which may also include parents. Administrators tend to celebrate spiritual victories of their students over academic achievement. Academic achievement is important, but it definitely takes a back seat to spiritual formation.<sup>7</sup>

Along with spiritual formation, Christian schools place an emphasis on creating a caring community between adults and students and strong, healthy re-

relationships between individuals on campus. The relatively small size of most Christian schools helps in the development of a close-knit community. Graduates of Christian schools have been found to be very positive about their school experiences, and many of them attribute this to the caring and service-oriented culture found at Christian schools. They feel that they have received value from their educational experience, especially in the relational area.<sup>8</sup>

On the other hand, according to a recent study, academic rigor may not be as high compared to Catholic or public schools. Possible causes for this may be a lack of credentialed, highly-qualified teachers, and ongoing professional teacher development along with the school's primary focus on spiritual development.<sup>9</sup> Many Christian schoolteachers can be very dependent upon formal curriculum and lack the expertise to differentiate curriculum and alter their teaching strategies to meet the needs of specific students.<sup>10</sup> Academic opportunities for students may be limited as well. Christian schools have been found to have fewer honors and Advanced Placement courses at the high school level than Catholic and public schools. This reality may be due to teacher expertise, the relatively small size of Christian schools, and lack of sufficient funding.<sup>11</sup>

Christian schools, like all schools, have their advantages and disadvantages for administrators, teachers, and parents. Yet, after all is said and done, children continue to become educated and responsible citizens of our nation. The author of a recent ACSI report put it best by saying: "Our schools have some work to do to prepare and train students in some areas, such as political work and academic influence, but by and large we are succeeding in molding young disciples of Christ who are capable of entering any sphere of influence and making a difference."<sup>12</sup>

### **Possible Promises of Mobile Technology in the Classroom**

As I spent two years interacting with staff and observing classrooms, I discovered and observed positive effects for teachers and students in the classroom. The teachers and administrators reported on the positive changes in the learning environment, teaching strategies, and classroom productivity.

**Learning environment.** Many of the teachers reported that they noticed having mobile technology in the classroom increased student motivation. I also observed enthusiasm and excitement on student's faces as I visited classrooms. For example, in some of the primary classrooms, the students could not wait

to rotate to the center that used the iPads for instruction. As one elementary teacher said at Immanuel, “They (the students) are attracted to these things. Sometimes, just having that tangible way to touch and connect to the learning, is really helpful.”<sup>13</sup> An elementary teacher at Fresno Christian, when describing the use of the tool Google Earth in a lesson, said: “They (the students) see it on the screen and it looks like the real Earth. They are able to come up and locate things. They really enjoyed that.”<sup>14</sup>

Mobile technology can not only motivate, it can also help the student to become actively engaged with the content in the classroom. The data that supports this statement was discovered in my classroom observations and the teacher comments during the focus group sessions. For instance, I observed the use of Google Earth by two teachers in social studies to engage their students as they studied ancient cultures. A high school foreign language teacher during the focus group session at Fresno Christian said:

I choose technology based on what will promote the most student interaction with the subject matter ... I want to make sure that my students are involved with Chinese and that they can learn how they would not be able to learn without technology. So, there is a cool program that we are using that isn't yet on the iPads but it is on the computer. I partnered that with a different program on the iPads and we are doing that simultaneously for character learning and recognition that it goes way past just doing handwriting.<sup>15</sup>

An elementary teacher also related this story:

There are dozens of quality apps on the iPad that you can use to look at and use to illustrate different things in the body. It is one thing to tell them that when you run your blood starts circulating faster and you breath heavier, but there is an app that I have called the human body where it actually shows the human lungs and the circulatory system and you can press a button and the person starts running. You actually get to see how the blood is flowing and the lungs are taking in more air and releasing the air faster and faster and faster. The kids are able to see it instead of just reading about it or just hearing about it. So, they understand a little bit more. They have much more fun.<sup>16</sup>

Furthermore, I have observed secondary teachers at both school sites use student polling as a tool to engage their students. These teachers created an online poll in advance of the class session. The students were given the opportunity to vote or text in phrases during the class discussion. The teachers used the dynamic results during their whole group discussion with the students, which kept the students engaged in the topic at hand.

**Teaching strategies.** Along with changes in the learning environment, I observed at both schools teaching strategies that had been enhanced. The iPad had become the tool of choice for teacher presentation and lecture. As I visited classrooms at both school sites, I witnessed teachers giving presentations using the mobile technology for classroom instruction. The teachers connected the iPad wirelessly to an Apple TV, which is then connected to a projector to share notes, internet resources, multimedia, or slide presentations while they instructed the class. The mobility of the device allowed the teachers to move about the room. They no longer had to stand at the front of the room while they instructed their students. Some teachers even allowed students to drive the presentation when they shared their iPad with the students.

At Immanuel, many of the teachers upload their notes and presentations to the cloud-based service, *Schoology*. The students can download the information and follow along with the teacher as they instruct on a particular topic. The principal confirmed this behavior when he said in his interview that “they (the teachers) have taken the idea of not ‘flipping the classroom instruction’ but the idea of everything being centralized on the iPad whether it is going to *Schoology* or going to *Powerschool* or using *Notability* or their digital textbook.”<sup>17</sup> One of the junior high/high school math teachers said:

We do worksheets that are in PDF format. They are listed on *Schoology* so the students can go find them. Also, I have my notes in order so they can find the notes that go with that worksheet ... and then, I put my PowerPoint presentations on there that line up with the worksheets and notes.<sup>18</sup>

In my teacher observations at Immanuel and Fresno Christian, this was the most predominant teaching strategy that I observed. It was also highlighted in

a memo that was sent home to parents regarding the benefits of using the iPad in the classroom.

At Fresno Christian, the principal shared in his interview:

When I go in and observe teachers, what I am seeing is that most of the teachers use the iPad as a presentation tool for their classes ... kind of a glorified whiteboard, overhead projector. You know that everybody is in is different place. Some will use YouTube or other types of movies to enhance the lesson.<sup>19</sup>

A fifth and sixth grade elementary teacher confirmed this observation:

One thing that I do is use an app called *Noteshelf* where I scan in all of my language arts papers and I take it from *Dropbox* and upload it on there so it can be nice and big on the screen. Students can come up and correct paragraphs or fill in answers on my iPad so it shows for the rest of the class.<sup>20</sup>

Some teachers, especially in the elementary grades, used the iPad for small group instruction and center-based instruction since each student does not have their own tablet. Students share an iPad or a small group of iPads. The principal at Immanuel shared in his interview:

We have a group of six iPads that go around. The elementary teachers use them for everything. In Kindergarten, the students recognize shapes and letters in some of their station work. A fifth grade teacher will have ten students bring their personal iPads on Fridays and then she adds the six. Now, she almost has a class set where they can do research or they can make brochures or they can look up zoo information for an upcoming field trip.<sup>21</sup>

A third grade teacher reinforced his comments by saying, “I use the iPad for concepts in literacy, and to make it fun ... I do it in centers and then I use it



more for math when it is hands-on.”<sup>22</sup> At both school sites, I observed limited use of this type of instruction at the primary level.

Centers are not used in secondary classrooms, but formal and informal collaboration on lessons and projects is used as a teaching strategy instead. At Immanuel, a junior high school social studies teacher said, “It is more than just receiving information. I encourage participatory learning in terms of collaborative stuff on the iPad whether that is a presentation, video, or research . . . I make a big effort for them (students) to work collaboratively on their iPads.”<sup>23</sup> I observed this strategy in his classroom as well as other classrooms during my observations. This type of teaching strategy is also highlighted in a memo sent home to parents.

At Fresno Christian, the principal described an economics project that highlighted the use of Google Docs for collaboration:

They do an economics fair and what’s required is for the students to develop a project so that they can sell and then they have to make brochures. They have to plan the advertising for it and in order to do that, it’s not an individual project, you will have two or three or four kids working together to make this thing happen . . . we have so many extracurricular activities going on for most of our seniors . . . if they don’t have a job, so it’s hard for them to get together to meet so by using Google docs they were able to meet on their own, from home, and the teacher was also able to monitor for the first time how much input each person was having.<sup>24</sup>

These types of projects were also highlighted in the project ideas handout used by the tech team for training the other teachers at the school site.

The final teaching strategy that was observed and reported was differentiating instruction for students through the use of mobile technology. Because of easy access to instructional resources, classroom instruction has been tailored at each school site to individual student academic needs. Also, the tutoring of students has been enhanced because of the teacher’s ability to differentiate instruction.

At Immanuel, an elementary teacher described this teaching strategy in her classroom:

I can differentiate games based off of specific objectives that I need particular students to have. So, if one student gets this but they don't get this, I can have three students work on this on their iPad. I can have these two students work on something else. So, I don't have to have all of the students working on the same thing, which is really nice.<sup>25</sup>

A junior high math teacher said: "It is also helpful in differentiating because of the amount of resources that they [students] have at their fingertips. The information is accessible. If they need extra time, they may take it."<sup>26</sup> Another secondary teacher who tutors students stated: "Lots of the teachers have recorded their lectures and their notes that go along with it. For the ones who struggle, it has helped a lot."<sup>27</sup>

At Fresno Christian, they have used online resources such as Khan Academy to differentiate for math instruction and math tutorials. When all secondary students started bringing their devices in the fall of 2014, the tech team helped teachers put their lectures, notes, and other resources online using *Schoology* in conjunction with *Google Apps for Education*.

**Classroom productivity.** Based on teacher comments and my observations, the first change in teacher/student productivity has been the unlimited access to resources online. The Internet is now instantly available to each student. The principal at Immanuel confirmed this reality:

It has changed from the teacher being the sole resource. Now, the resources can come from anywhere that we can access through technology. It has also changed the way the teacher is viewed. It is not just what I [the teacher] know. It is what we can find out as a class ... it has definitely changed the dynamics of how teachers use that information.<sup>28</sup>

Later, he continued this line of thought by saying, "The teachers have centered everything around the iPad. Specifically, the notes are just right there. There digital textbooks are right there so everyone has access to the textbook

as well as it can be put up on the screen.”<sup>29</sup> In my classroom observations, I observed this use of outside information and resources to enrich the class as well. For example, some of the teachers would ask the students to “Google it” when they were stuck with a definition of a word or were confused by a topic covered in class.

One of the Immanuel math and science teachers that is promoting and using teacher-adapted, digital textbooks in his classroom said: “The amount of resources that are available to them (the students) . . . is massive. It really helps us meet student needs whether they are high achieving students or at the other end of the spectrum. We are able to plug them (the students) into resources much more efficiently.”<sup>30</sup> Another high school math and science teacher shared that “the online version of the math book has links to Khan Academy and other videos that they can go to if they so choose. They are useful.”<sup>31</sup> Other subject area teachers use this ability to get to extra resources as well. A junior high English teacher said:

Informally, if you were in class, reading a novel, and you come across a word you don’t know, you can immediately look it up and they [the students] all scramble to do that. If you want to see a location, you can go to Google Maps and show them or a kid can do it and put it up on the screen. That instant access to information is great. In the past, we would have to write the question down, find the answer, and bring it back the next day. We may have never got back to some of those things.<sup>32</sup>

At Fresno Christian, a fifth and sixth grade teacher also found the access to resources helpful, as she shared during the focus group session:

I think about half of my students have devices. I think it really lends itself to spontaneity in the classroom. If we are reading something and we don’t understand a word, half the class says, ‘let’s look it up’ and they all give their definitions. Or, when we are studying ancient civilizations with an archeological dig, we can get on and see some images of what that looks like. And then, they will volunteer those things. It just brings an extra level of enthusiasm to the class.

Based on my observations at Immanuel, the teachers and students have begun to move towards a paperless environment. Students are becoming more organized because everything is posted online and available through the use of the mobile technology and cloud-based services. According to the teachers, students who are absent no longer have an excuse for not knowing the information that was covered on a particular day. Also, the speed and efficiency of the day-to-day classroom routine is being improved.

The following specific comments from the focus group illustrate this reality at Immanuel. A high school Bible teacher said, “*Notability* is a good app for taking notes, scanning information and getting it to the students, paperlessly ... it helps them keep track of everything that you have given them. There are not papers floating around in some binder.”<sup>34</sup> A high school English teacher concurred:

I love that I am not in the copy room making copies all period. I just spent five minutes of my prep period getting an entire unit scanned and getting it into their classes through *Schoology* in a folder. It took me five minutes. I am not copying and stapling, copying and stapling, to create packets. No more excuses from students. I don't have my packet. I lost it. I left it at home. It is all right here. Every single thing is here. It is here forever.<sup>35</sup>

She continued later in the interview:

The transitions in class are so fast. I don't know if you guys have noticed but it is like, we used to say get out a piece of paper and it would take five minutes to get out paper and pencil and now it is just like this [swiping her hand in the air.] They are there and it is quiet. In transitional time, I bet I save 15 minutes in a day. Maybe ... a half hour?<sup>36</sup>

### **Possible Perils of Mobile Technology in the Classroom**

The teachers and administrators also shared about the possible perils regarding the use of mobile technology for classroom instruction during their interviews and focus groups. In addition, I heard some of these concerns from the teachers as I observed their classrooms. The following evidence was reported.

**Classroom distraction.** Mobile technology can add distraction to the classroom environment. With so many apps at their fingertips, it can be tempting for a student to drift off task and spend their time playing, surfing, or watching something that is not related to the classroom or task at hand. The superintendent at Immanuel addressed the need for teachers to develop effective classroom management skills when he said: “Being in class ... I talk about when they [the students] can use it, when they can’t, being respectful, flipping it [the iPad] over, not using it, when they can listen to music, when they can’t ... Well, at the end of the day, it is not a technology problem, it is a classroom management problem.”<sup>37</sup> A junior high social studies teacher at Fresno Christian said: “And then I think to about the distraction. You have some students that are not mature enough to handle technology in their hands and that is obviously a classroom dynamic that can be an issue as well.”<sup>38</sup>

At Immanuel, the teachers were concerned about classroom distraction, but they had other concerns as well. The administrators and teachers were working through policies regarding the regulation of student devices. If the students own them, what can teachers and administrators do to regulate the apps that are available to the students? “This has definitely brought in a few complications here and there,”<sup>39</sup> said the principal at Immanuel. The teachers also echoed this sentiment during the focus group session.

**Technology addiction and lack of socialization.** The teachers and administrators at Immanuel were also concerned about students becoming addicted to the devices and the lack of socialization by their students. The principal said in his interview:

For instance, our junior high kids were so addicted to it the first couple of months. It was in their face constantly instead of socializing. They were not doing their normal school routine. During breaks and lunch, they were hovering around their iPads. So, we had to have some discussions about that with our students.<sup>40</sup>

A junior high language arts teacher confirmed this reality:

A negative thing with the iPads, especially for junior high, is having the technology in their hands also gives them access to games...This is a

fight that constantly happens. I really think at the junior high that they have an addiction to it.<sup>41</sup>

The use of mobile technology can be addictive to teenagers, especially games. They can be so engrossed and/or distracted by the use of the technology that they miss out on the reality around them. Their ability to learn effectively could be diminished, instead of enhanced, by years and years of use. In fact, in the case of Christian schools, student spiritual formation could be affected by constant video game use. A research study published in the *International Journal for the Psychology of Religion* of 56 undergraduate students in Canada found “that playing video games reduces a sense of the numinous, i.e., the feeling that there is a force out there beyond ourselves and the physical world.”<sup>42</sup> In fact, I have observed this trait in my own teenage son who uses mobile technology in the classroom and thoroughly enjoys playing games on his iPad and the computer. From my perspective, ongoing study and discussion needs to be done in this area if we are to responsibly guide the teenagers in our classrooms and homes.

Along with addiction, a lack of traditional socialization by teenagers can be a concern as well. As you can see from the comments from teachers in this study, addiction and lack of socialization are real concerns in the 21st century classroom. Well-meaning adults have encouraged the use of mobile technology to further education, but, without further study, educators cannot determine if the negative socialization effect on our children would outweigh the educational benefits to our students. On the other hand, might the use of mobile technology, social media, etc., lead to a completely different type of positive connection between humans in the future? No one knows at this point.

Because the spiritual development of students is important to Christian schools, lack of socialization might be especially concerning to Christian school administrators, teachers, and parents. In my opinion, balance is the key, but keeping this balance may be difficult without encouraging specific practices and strategies in the classroom and at home. In fact, one secondary teacher at Immanuel is reintroducing non-technology social activities (playing board games) to the students at lunchtime and at breaks. He is finding resurgence in socialization through this activity. As a high school English teacher at Im-

manuel has asked, “How do you get them (the students) to disconnect for 45 minutes a day when you have been asking them to connect for eight hours?”<sup>43</sup>

## Conclusion

When Steve Jobs announced the coming release of the Apple iPad on March 12, 2010, individuals across the world paid attention. Mobile technology had existed for many years, but Jobs predicted that this would be the first mobile technology massively accepted and used across cultures and industries. Almost overnight, his prediction came true. Apple invented a whole new market that did not previously exist just a few years ago.

At almost the same time, I started my academic journey towards my dissertation. I had the privilege to document the promises and perils of mobile technology at two Christian schools in the Central Valley of California. This article is a result of my dissertation research. I am grateful to the students and staff of these schools for allowing me to enter their world to observe and document their journey. That being said, this is just the beginning. There is much more study to be done as we continue to grapple with the promises and perils of using mobile technology in K-12 schools.

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