# The Potential Influences on Pedagogics by Introducing iPad for Classroom 3.0

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## ABSTRACT
This paper studies using iPads for educational purposes in schools. This research represents the pros and cons of using tablet PCs in schools. The aim of this thesis is to evaluate how suitable it is to use iPads for students in terms of efficiency in academic performances. To answer the questions of this research, this study contains statements from interview of teachers and students and a range of data from existing research that has been done from 2010 to 2012. The findings of this research indicate how many schools are using iPads in the United States and what types of teaching methods are more suitable for teaching and learning with an iPad. Also, this research will provide teachers and students with constructive information about potential difficulties in applying the iPad educational purposes as well as possible solutions to solve the problems they could face in new technology centered classroom environment.

## Categories and Subject Descriptors
[K.3.1] Computer Uses in Education: Collaborative learning, Computer-assisted instruction (CAI), Computer-managed instruction (CMI), Distance learning.

## General Terms
Languages, Theory

## Keywords
iPad, e-learning, smart education, classroom 3.0, technology-centered classroom, Multi media learning, teacher education, e-book, Social network, higher education

## INTRODUCTION
To begin with, I have a lot of interest in technology and education. I studied semiconductor and computer science in college and I have worked for four years in an American electronic company analyzing Samsung Galaxy S. I started studying how to teach English for ESL students and Digital Multimedia Design for Learning in New York University. I hope to use state-of-the-art devices to improve the education environment. This is because technology can be a great solution to solve the problems we are facing in schools like inequality of opportunity in education and low efficiency in studying.

In terms of inequality of education opportunity, students who are living in Africa and small towns in China have a few chances to learn what they want to learn due to the lack of qualified teachers and outdated facilities as well as lack of schools in the areas. However, if they can use the Internet and electric devices, virtual school and online lectures are available anytime anywhere, it may help to reduce many limitations of location and infrastructures in these areas.

Second, since wireless access and mobile devices have no restriction by time and space, people can learn their subjects from more diverse sources and highly qualified teachers from entire world. Today, most people are forced to learn not only their mother language but also second foreign languages, especially English. However, in the setting of EFL (English Foreign Language), such as Korea, learners have to overcome the obstacles that students have only a few chances to talk with people in the target language. However, when it comes to learning languages, the core part of the subject is to develop the ability to communicate with people who came from different countries. If you compare the total amount of time for learning English in Asian countries with the time spent by people in Europe, it can tell us that language learners in Asian countries should be given increased chances to talk with diverse countries' people to have better foreign language skills. In this sense, educational technology can be the key to success in language education. For instance, it can be great approach for students in non-English speaking countries to take some lessons and practice English through the online video chats via Skype. There are some courses which have already started their lessons through the Internet such as, American English Pronunciation Guide by Rachel in New York. She teaches students in Russia, Korea, or China. This shows that with the help of using new technology, students can burst the barriers in education.

Lastly, the governments and students are able to reduce the cost for studying because paper-based books are more expensive than e-books today. Specifically, students have to spend more than $800 on purchasing test books in L-12 level per year, but to purchase E-readers like the iPad is $499 and other devices like the Kindle are $199 now for several years, and it could even be cheaper than the regular price if people buy it as a group purchase. With these advantages, the U.S. government has already started applying the e-books learning system into schools in many states like New York and California. Apple (2012) says that over 600 school districts not only in big cities but also small towns purchased iPads and gave them to all of their students for educational purposes.

However, when it comes to thinking about what education is for, obviously saving money and making learners feel convenient are not the main purposes of education. Therefore, regardless of high cost effectiveness and the possibility of reducing inequality of education, it is still questionable whether the iPad or E-device is a reliable tool for students to boost up academic achievements and learning. Although introducing an iPad initiative will provide a number of the merits for students, some people insist that schools should hold off on the replacing all the paper books with e-books until we are sure that educational technology is actually helpful to enhance academic works in


*Conference'10*, Month 1–2, 2010, City, State, Country.

school. For these reasons, confirming the effectiveness of using tablet PCs for learners is inspired with this research.

# 1. Pre-study

In this chapter, I would like to introduce the hardware specifications of an iPad and multi-media learning principles. This background information will lead people to have better understanding about what functions iPads have, and how and why using multi-media devices can enhance academic performance for students.

## 1.1 Technological specification of iPad4

According to Apple (2012), the iPad3 features a 9.7-inch LED-back lit glossy wide screen Multi-Touch display with IPS technology. The retina display has a 2048x1536 resolution at 264 ppi (pixels per inch). Apple provides two different types of models and three kinds of storage capacity options for the iPad, and each model has different storage capacity such as 16GB, 32GB and 64GB. Wi-Fi only and 4G models are available. An iPad has a built-in 42.5-watt-hour rechargeable lithium-polymer battery, which can last for up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music. Also, several sensors are installed; the iPad has an accelerometer, gyroscope, and ambient light sensor. The main chips are dual-core Apple A6X custom-designed and high performance but low-power system on a chip with quad-core graphics. Two digital cameras on both front and back are built-in.

The languages supported are English, French, German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Both Brazil and Portugal), Danish, Swedish, Norwegian, Korean, Japanese, Russian, Polish, Turkish, Ukrainian, Hungarian, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Catalan and Vietnamese.


**Figure 1.** iPad tech specification Image Courtesy of Apple Inc

## 1.2 Multi-media learning principles

In this section, I will try to explain the possible reasons why using an iPad is able to boost up students' academic results, and how using multi-media devices can be related to enhancing studying with the following Multi-Media Principle. This can help people deduce the reasons for improved academic performance from understanding the ideas of the principle.

Human factors researcher Najjar (1998) studied existing research on how multimedia affects learning and found that these practices could be beneficial for learning effectiveness:

• Use multimedia specifically to support, relate to, or extend learning, not just as embellishment.

• Present media elements together so that they support each other.

• Use multimedia that effectively employs verbal and visual processing channels to help learners integrate content with prior knowledge (this is called elaborative processing).

• Allow learners to control, manipulate, and explore to positively impacts learning and elaborative processing.

• Use familiar metaphors and analogies, feedback, and personalization to augment motivation.

• Encourage learners to actively process and integrate rather than receive passively.

• Match assessments media to presentation of information media

The principle says that because each medium has its own advantage, students should try to combine media so that the potential learning is greater and more effective than using a single element alone.

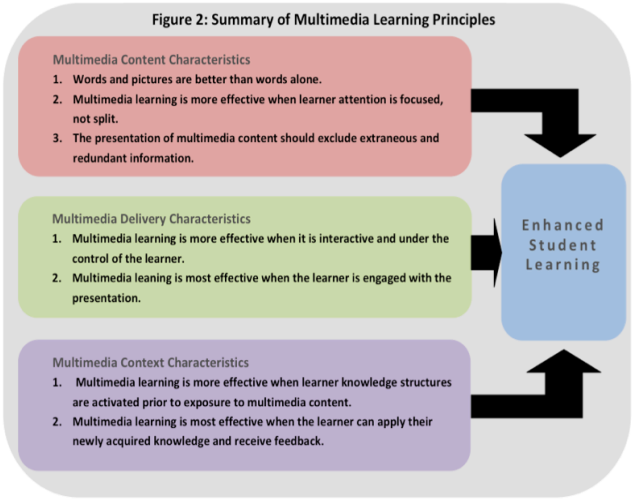


**Figure 2.** Multimedia Learning Principles Image Courtesy of SEG Research [2008] cited from Henrik Valstad (2010) *"Introducing The iPad in A Norwegian High School"*(page 46)

## 1.3 Smart education: Classroom 3.0

This section will provide some of clues about what is going on in the classroom in the digital age. The description of the classroom 3.0 can help to illustrate the new generation of classroom environments.

Wilfred W. Fong (2011) states that before defining Classroom 3.0, one must understand the evolution of classrooms. A traditional classroom is a physical room with tables and chairs in a confined area with blackboard or marker broad, perhaps with an overhead or opaque projector. The second generation of classrooms, Classroom 2.0, is a traditional classroom with technologies incorporated in it. It may have a computer connected to the Internet and instructors can teach using PowerPoint or other presentation software. A smart classroom is an example of Classroom 2.0 where students can have access to the course site or Internet using their own laptops/PCs with Internet connection available at their seats. The next generation of classroom will have neither physical walls nor furniture. Classroom 3.0 will be powered by using mobile devices. Some would call this "M-learning (mobile learning)" but M-learning is only a means. Not only should Classroom 3.0 be defined as a borderless classroom but also in- classroom lectures can be virtually accessed and completely digital.

## 2. Strengths of using an iPad for learning

The benefits of using an iPad to study will be presented and discussed in this chapter. Specific features of the device will be briefly overviewed as well as what factors can be helpful for students to learn several subjects in schools. Also, well-known educational applications will be mentioned and the opinions of students and teachers who have used the applications will be cited.

### 2.1 Multi-media features

Apple CEO Tim Cook (2012) says, "Thanks to the retina display, everything looks and feels lifelike. The iPad HD will have a 9.7-inch 2048×1536 (264 pixels per inch) display. To put this into perspective, the nearest competitors, size-wise, are 15-inch 1920×1080 laptop displays, which have a PPI of just 146. You can find desktop monitors in the 20-inch range that sport resolutions of 2560×1600, but that's still 'only' 150 PPI. In short, the iPad HD will be visually stunning, and for supply reasons." In the past, most students who read e-books with a digital device were not satisfied with their display, which is not vivid since the low resolution of the e-readers led their eyes to be fatigued in a short time. Therefore, they cannot read as much as they want, which has made their reading efficiency decreased. However, the students can avoid having their eyes fatigued with the high resolution of display in the iPad3. Plus, students have better reading fluency with new devices than with printed books. Apple reports the case of Central Elementary School in Escondido, California (2010) that in a six-week period, students' reading fluency increased at six times the rate considered normal for that period of time. Students gained almost two years of reading comprehension after only six months. Moreover, due to the better legibility and portability of iPad3, students can expect much increased reading fluency than the previous device. Moreover, improved reading skills means that it will affect other abilities in study. According to Rosenblatt (2005), reading comprehension is a core component to being an effective literate reader. Reading is an act of making meaning.

### 2.2 E-learning content

Overwhelmed online learning contents can be a great merit for learners and educators using an iPad. iTunes, iTunes U, iBook, and Podcasts are the exclusive contents of Apple iTunes store. According to Apple's website (2010), iTunes U has 350,000 lectures from the top universities around the world such as MIT, Beijing, and Oxford. Also, podcasts and iTunes provide videos and radio contents, for instance CNN news, and they are completely free to download to an iPad. This year, 2012, Apple released a new application, iBook author, to assist teachers to publish e-books. New iTunes U 2.0 and iBook 2.0 was released in January 2012. Teachers can use the applications to publish their own books online as a complement for textbooks when the books do not offer them up-to-date information properly.

Due to the digital cameras, educational applications, and always-on functionality of an iPad, students can easily use a number of online contents and look up the definition of some words via online dictionaries. Some people may worry that a drawback of having easy access to resources may encourage laziness in the students. However, Cutrim (2008) pointed out that the use of multimedia resources helps students comprehend complicated concept, meanings and ideas and teachers can provide more complete explanations. Also, the National Center On Universal Design For Learning (2010) explains that non-educators often make the mistake of equating access to information with access to learning. In reality, these are two separate goals.

Occasionally, even teachers cannot make sure if their answer is correct or not in some cases. In this case, teachers and students simply confirm the answer online with the iPad immediately. By visiting Wikipedia, students would fill their curiosity anytime. With these functions in an iPad, learners can study in an individualized education environment. Also, using educational applications and multi-media tools allows students to do self-study and distance learning to follow up on the certain subjects that they fall behind on like mathematics. For example, Khan academy (http://www.khanacademy.org/) is one of the most famous educational applications among k-12 level students and about 40% of the students are access to the websites and download the application from different countries. The application provides students with more than 3000 lectures about mathematics, history, and economics without charge.

Additionally, learners with an iPad can have feedbacks and social interactions because they are always connected with teachers and other colleagues by deploying the SNS (Social Networking Service) such as Facebook and Twitter. Moyle and Owen write that young people's lives are fundamentally collaborative in nature. The students can increase the amount of time for social interaction by using instant messages and social networking sites to communicate with each other. Contrary to most people's expectation that SNS will lead their students to waste a lot of time, the activities encourage students to socialized with other people and improve their attitude toward school and learning in positive way.

## 3. Potential problems for introducing iPad for pedagogical purposes

This chapter will explain what factors would prevent teachers and schools from using an iPad for pedagogical purposes. I will bring up the two issues: teachers' abilities and environmental limitations.

### 3.1 Teachers' lack of knowledge in using technology

Prensky (2001) states "The single biggest problem facing education today is that our digital immigrant instructors, who

speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language." Even though most people have their own electronic devices and use them all the times, only schools are exceptional in this digital age. This is mainly because teachers still think of electronic devices as a type of toy that can interrupt students from studying in the classroom. The more important thing is that teachers are not familiar with using the new type of devices for teaching their students. Teaching methods they are using in school are the same they learned from their teachers in the past. This means teachers are using teaching methods that the teachers' teacher used when the teacher was a student. In order to relieve the issues, teachers have to be trained, but it is not as simple as we thought. According to Trinity School in Melbourne (2011), not only because of the substantial resistance from staff to using iPads, but also because of the careful and timely training that will be required for them, schools will face a lot of difficulty to overcome.

Another reason for this is that teachers still strongly doubt that using electronic devices will improve students' academic performance. Sapp (2012) writes that sometimes skepticism prevents people from the adoption of using revolutionized approaches. Using an iPad for Internet or e-learning system are relatively new types of teaching methods. With the arrival of this new class environment, teachers are not considered to be the main actor on the stage in class. The new classroom setting will change from a traditional classroom to a learner-centered education environment. Students will find the answers to the questions by searching the online websites or using their electronic devices, rather than from their teachers in mobile learning systems. Marc Prensky (2001) writes that today's students have spent their entire lives surrounded by and using computers, videogames, digital music players, cell phones, and all the other tools of the digital age. Teachers should rethink their role. The role would be changed for digital natives. Teacher should coach their students, not try to teach students in the new digital environment. Teachers will guide students to determine what sources will be proper for their study and what is the biased or wrong information online.

## 3.2 Environmental limitations

What would be the next difficulties for using an iPad if schools were able to go beyond the barrier of teachers not being willing to use the device for teaching fields? Even if all of the students and instructors could receive their own iPad and deploy it, the initial infrastructure has to be ready to use the number of devices at the same time, allowing Internet access. Hatlevik et al. (2009) states that the IT department itself does not wish to further increase network congestion and only a limited amount of network traffic is available with heavy restrictions. If the IT department claims there the network infrastructure cannot handle increased traffic, these are the issues that need to be dealt with before introducing new digital tools in schools that only increase network traffic. Even after installing all the facilities required, the facilities and devices have to keep being up-to-date, which is costly to do.

In order to use the contents online with an iPad properly, legal help is necessary because students under 14 years old cannot be allowed to have an account on Facebook and YouTube. Young students should be allowed to access certain contents for educational purpose.

# 4. Discussion and Conclusion

It is hard to say that one single factor, using an iPad, is the only reason that gives the positive results of study to learners in many cases. This is because other factors, such as educators' teaching methods and well-designed curriculum settings have to be considered as other elements influencing on academic results. Warschauer (2012) said there is no evidence yet that the devices improve learning by saying, "I'm a big enthusiast of technology in education, but I'm very wary of notion of silver bullet or magic bullet or game changer."

Based on the multi-media learning principle, however, the iPad can be the best e-learning tool so far. This is because the iPad can fully meet the requirements the principle proposed. Even better hardware functions and educational software can be provided today than the principle requires. Therefore, if teachers are able to integrate using an iPad into well-organized curriculums, they can expect a synergetic effect on developing the learning and teaching process.

Nevertheless, whether or not using an iPad is suitable to improve students' academic works is still very debatable. On one hand, Shepperd, Grace, & Koch (2008) write that there is no significant difference in average grades in schools between the students using e-books and ones using printed books. On the other hand, representative of school in Watchung Borough (2012) comments "the eighth grade students in the school have the result more than 50 percent improved in math and language of the national standardized tests after using iPad, and thus the eight grade students ranked the school second highest in Somerset Country." Also, Alberto Marsal, coordinator of the technology Department in John E. Dwyer Technology Academy, believes that the iPad will help capture the attention and commitment of students by saying, "This will undoubtedly lead to higher attendance, increased student achievement and a positive attitude for all our students."

Even though there are controversial opinions in different places, students and schools prefer using the iPad to paper-based books due to the other strengths in using iPads, such as cost effectiveness, portability, and multi-media functions, as we can learn from chapter 3, With these strong points, many countries have been immigrating classroom setting from printed-books to e-books by offering individual tablet PCs to all the students. Based on the article written by Technology Review (2012), the South Korean government made the decision that all paper-based books in the schools will be replaced with e-books by 2015 and they will invest $2.4 billion dollars in providing tablet PCs (Galaxy Tap by SAMSUNG), which got a lot of attention in the U.S. in 2011. In this circumstance, a number of schools in the United States also are transferring their classroom settings to 3.0 from 2.0. In March 2012, President Barack Obama's administration set goal of getting digital textbooks is that all the nation's students will gain their own tablet PC by 2017. These phenomena tell us that applying e-learning system to our classroom is inevitable.

In addition, as we can see in chapter 4.2, there are still many obstacles to overcome for fully supporting mobile-learning systems with online contents. Since to access the practical digital materials on Facebook and YouTube young learners have to be permitted for educational purposes, it prevents the websites from using them properly in class. In this sense, it is necessary for the government and the online service provider to amend their policies and laws to fully support students to study.

Lastly, in order to relieve the issue for training teachers, technology related subjects have to be required courses for graduation for prospective teachers in schools. This will help the students in education departments to prepare teaching in their future classroom environment. In order to support the teachers

who have already graduated from the school, technical experts should be present at all times in school. The department office for technological support will be looked like the Genius Bar in the Apple store today.

The history of using an iPad for educational purpose has been three years. When we think of the history of using iPads in schools, even if there is no big difference in academic performance between the two groups who are using iPads or printed books so far, schools should not stop changing their class environment to classroom 3.0. This is because electronic devices still have a lot of potential development in the long term. On the contrary, traditional materials like printed books, which have been in use for more than one hundred years, cannot be expected to have a lot of possibility to be improved. Therefore, using tablet PCs in classrooms will be more and more dominant and this will lead our school system to the new renaissance in education.

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