

Child Development Issues Related to Thailand's Tablet Computer Policy within the ASEAN Community

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Abstract

Thailand has introduced a new tablet computer policy into the country's primary education sector, and its educational system and economy will soon be interacting in a larger socio-economic community identified as the ASEAN Economic Community (AEC) beginning in 2015.

In a market driven world, the primacy of innovation and adapting to change are two key areas which need understanding. The technological changes that are coming, such as **cloud databases** and mobile digital assistants (tablet computers), will demand new considerations in applications and software development, accessing stored data (digital literacy) and understanding knowledge creation (critical literacy). Another consideration will be to leverage the diversity that defines Thailand's culture as well as understanding the cultural differences of other countries that will also be interacting and exchanging ideas in the AEC.

This paper will show how Thailand's new tablet computer policy will have to consider how the next generation of students are going to be prepared for using digital technology, not only to be effective in the AEC, but also for participating in the global market place. The ability to develop critical literacy skills and formulate a pedagogical framework using digital tools throughout a student's k-12 education is important to consider when implementing a nationwide tablet computer policy. Consequently the paper will show how teachers are beginning to educate primary grade students using tablet computers, their understanding of the relevant issues in a digital learning environment and the preparations Thai students will need for the AEC and global market place. A national tablet computer policy is a major undertaking requiring an approach which integrates educators, parents, software developers and students to understand how knowledge creation, knowledge acquisition and digital learning can be fully developed for a 21st century educational initiative.

Keywords: Tablet Computer, Digital Media, Child Learning, Teacher Education, Cultural Difference

1. Introduction

Education is the key factor for any society to function successfully within its own socio-economic borders as well as being able to communicate with nations around the world. Education in the 21st century is now changing into an interrelated communications environment where access to information and learning techniques have accelerated beyond the traditional teacher-centered classroom to a much more diversified learning environment where students now have the ability to access information more quickly than ever before. The driving mechanism for this accelerated learning environment has been the result of small digital tools which augment access to global information resources. Within the last two years the digital tool that has become the choice of educational institutions to help students learn is the tablet computer; popularly known as the iPad.

The reason this new technology became so popular within such a short period of time was it captured the intuitive nature of people of all ages. The main feature of the tablet computer was that it could be touched to get information rather than using a point and click interface. The tablet computer allowed more freedom in using the hands which appealed to children and this is evident in the sales figures and applications which are geared to primary school children (Rideout, 2011). But behind the inviting touch screen lies an infrastructure which we all know as the internet, an interconnected global computer environment, which now has the repository of almost all knowledge concerning the history and activities of the human race. So, when a child first learns how to change colors or see animated characters fly across the screen with just the touch of a finger something very profound happens that has educators all over the world trying to understand. How can the excitement and adaptation to the tablet computer be channeled into learning?

From the first personal computers used in the mid-80s to the digital tools which exist today, over thirty years have elapsed. People born into this personalized digital world are referred to as digital natives and those who were born more than thirty years ago who had to learn how to use digital tools are called digital immigrants (Prensky, 2005). The digital natives of today who are using tablet computers has spawned a global digital generation, which is pushing the limits of what is possible within an environment predominately populated by digital natives who have no problem when it comes to accessing information.

Thailand is about to introduce to all its 1st graders (and some 4th graders), approximately 8 million students, a tablet computer. The age range for this group of students is between 5 and 12 years old. The noted child psychologist Jean Piaget refers to this age group as the preoperational stage in the path of a child's development (Wood, Smith and Grossniklaus, 2001). Using Piaget's learning theory at the 1st grade level, when children would begin to use the tablet computer, is when, according to Piaget, children develop skills in language, memory and imagination. Once the tablet computers are experienced in the 1st grade it only follows that students in the 2nd grade will also want them, and thus the complete adoption of mobile digital tools begins, which would necessitate the adoption of a learning theory, such as Piaget's, that

would help to build on what the child had learned in previous stages of their development to help them become digitally literate at higher grade levels. By the year 2015 when Thailand enters the AEC this 1st grader will be in the 4th or 5th grade and will be well along in having mastered how to use a tablet computer. It is estimated nearly 10 million tablets will eventually be in use throughout Thailand's schools by 2015 (Intathep, 2011). Also under consideration by the Ministry of Education is to supply all Mathayom 1 (Grade 7) students (approximately 700,000) with higher specification tablet computers to promote a knowledge-based and network connected society (Intathep and Nguansuk, 2012).

The ASEAN Economic Community will begin in 2015, and within a few short years these 1st and 7th graders will have matured and will soon be entering the AEC to apply their newly obtained digital learning skills; which I might add are far different from those of their predecessors who were only text book educated. How different will students' learning skills be in Thailand as a result of a digital education and what will students be like from other countries that have also been exposed to learning in a digital environment? Answers to these questions are dependent on the various differences in the cultural dimensions which exist in Thailand. The way students achieve successful communication skills in a multi-cultural environment will be looked at using Hofstede's model of "cultural differences" which is included in a study of comparative education in South-East Asia (Brock and Pe Symaco, 2011). The use of tablet computers in education, and the courseware that is installed on them will also be discussed. The over-riding question to be addressed is; will Thailand's students be sufficiently prepared to function effectively when exchanging ideas in the ASEAN Economic Community?

The cultural differences existing in Thailand, as mentioned in Brock and Pe Symaco's study, and how those differences affect the way students learn are important considerations when preparing students to enter the larger digital world where everyone has access to the same information. These cultural differences may affect Thai students' ability to use these global resources effectively when applying their cultural backgrounds to communicating and negotiate with the rest of the world. The learning skills that exist today within Thailand's educational environment, and the challenges they pose for teachers in order to prepare the students for a digitally-driven market place will also be addressed. These are complex issues and ones which would take more space than is allotted in this paper to fully explain, so only an overview will be provided to cover the questions raised.

2. Literature review:

2.1 Child development using digital media:

Recent findings show that children today have more access to all kinds of digital media than ever before (Gutnic, Robb, Takeuchi and Kotler, 2011). The report goes on to show that children enjoy the mobility that new digital tools afford and children who live in countries where the internet is readily accessible are using it for more than 28 minutes daily. Young children have become frequent digital media users which includes hand held video games, cell phones and

more recently iPADs (Rideout, 2011). The controversy in Thailand is about having young children exposed to the new tablet computer for fear it will distract them from other needful learning skills (Heussner, 2010). However, much of the literature available from in-depth research with the use of digital tools within an educational setting found that there are greater gains in intelligence, structural knowledge, problem solving and language skills (Couse and Chen, 2010). The tablet computer combines the advantages of a notebook computer and a paper note pad. It is highly portable and it has the ability to include books, music, videos and drawing tools. One of the most useful aspects of the tablet computer is that a teacher can join in with a student at the same time and show how to perform an activity (van Mantgem, 2008).

The most ambitious studies devoted to preparing children in the digital age come from the Joan Cooney Center at Stanford University in the United States (Barron and Copple 2011). The center has created a Digital Age Teachers Preparation Council to address technology and young children. The Cooney Center has shown how digital media can extend a child's thinking and learning. They also show how well conceived digital media enables children to gain a greater awareness and control of their actions. The Cooney Center is aware of the constant changes which are taking place with digital media products prompting an in-depth analysis of children's interactive media environment (Shuler 2007). The implications of a digital media environment, which a child is immersed in for their informal learning, brings with it the responsibility to find the proper channels where research findings can be translated into more effective ways to teach children with digital technology. Shuler has made a plea to disseminate academic research back to the software developers and trade journals such as *KidScreen* magazine to ensure there is a direct dialogue adapted to students' needs. The most important aspect of the Cooney Center is its ability to inspire the creation of educationally effective products. How best to scaffold a students learning experience when using a digital tool is part of the ongoing research at the Cooney Center.

Common Sense Media's Program for the Study of Children and Media (New York based) provides data on how children use the iPad and the impact it has on their emotional, social and intellectual development (Rideout, 2011). What Common Sense Media has found is that by the time children have reached the age of 5-8 years old over 58% have used an iPad or Smart Phone. The issue that faces Thailand is to develop an on-going relationship between teachers, students, parents and the software development industry to provide a method of feedback concerning the learning behaviors which are unique to Thai students in their early years of education. This is a unique opportunity for Thai educators to be critically aware of what is happening to children when exposed to media-generated material on their digital assistants (tablet computers). The issue for Thailand is how it can transform the learning process of children so they become more effective with innovative uses of the tablet computer.

Microsoft Corporation launched the "Enquiring Minds" program in the UK which prepares children in a rapidly changing social, technological and cultural environment (Morgan, Williamson, Lee and Facer, 2007). The Enquiring Minds project encourages students to take more responsibility for the content, process and outcomes of their learning. The question raised by

Enquiring Minds is to find more effective and powerful educational strategies for the 21st century. Since many teachers in Thailand may feel uncomfortable when using a tablet computer, the Enquiring Minds project has developed a “co-constructive” pedagogy or “enquiry pedagogy” to show how an effective interaction between teacher and student can be developed to decrease the anxieties when teaching with new technologies. In this situation the student and the teacher become co-learners, but it is the teacher who still uses their own knowledge to elicit further understanding from the student.

2.2 Preparing teachers and students:

The most important concern for adopting tablet computers focuses around the teacher. How will a teacher use a tablet computer in a classroom with young children? This concern is being addressed by educators everywhere, and in a recent study on literacy and learning in a new media age (Welling and Levine, 2009) revealed that as yet there is little consensus among researchers on how to measure the effects of technology in education. With various levels of educational competency in Thai schools, rural verses city, there have been expressed concerns that the kinds of content installed on tablet computers, such as apps and text books, need to take into account the learning abilities in different regional areas (Tobiasar, 2012). These concerns are about how to offer students a way to achieve the necessary skills when learning their subject matter with digital media. Adjusting educational courses to suit the demands of regional labor and promote the teaching of English and languages of other South-East Asians nations was ordered by Prime Minister Yingluck Shinawatra (Bernama, 2011). Teachers need to be aware of how their students will involve themselves in the activities presented to them with table computers so as to monitor and evaluate their progress. President Kanchit Malaiwong of the Association of Technology Teachers in Thailand has expressed (as cited in Inathep, 2011) concerns that the government should not rush to distribute the tablet computers just for the sake of equality but instead they should only be given to schools prepared to use them properly.

However, in an attempt to incorporate educational technology in schools, the tools have most often been the primary focus rather than the perceptions toward the use of these tools (Albirini, 2006). Albirini’s research reinforces the concerns of Tobiasar when he states that:

A key element that has been left out is the cultural perceptions of the end-users toward these new tools. Such inattention to the teacher’s cultural perceptions may generate unforeseen repercussions and suggests that studies at the early stages of technology implementation should focus of teachers’ cultural perceptions toward technology. (p. 50).

The research of Albirini shows that understanding cultural perceptions has been found to be essential when accounting for the overall attitude toward implementing ICT and being able to anticipate the adoption of more digital tools in the future. This concern of cultural perceptions can effect how successful a teacher will be in the classroom when all the students have digital

technology which the teacher may not be fully acquainted with. Another view from an educator in Thailand states that we ought to give the students the tablet computers and just let them learn by doing, take risks with their usage, and then an authentic learning experience will follow (Foley, 2011). The issue then centers around how to teach a student in an informal, collaborative environment using the principles developed in student-centered learning and at the same time using a tablet computer. Given the possibility that many of the teachers in Thailand's rural areas may never have engaged their students to use a computer as a learning tool, then what guidelines will be made available for them when using a tablet computer? A solution that has been offered as a way to support teachers is a joint effort of the Creative Commons Board and the Joan Ganz Cooney Center at Stanford University (Wojcicki, 2010). The solution was to implement a "Digital Teachers Corps" to work in the lowest-performing elementary schools in order to train teachers to help students learn to read by transforming information with the use of discovery and problem-solving that the tablet computer offers. The Digital Teacher Corps would also engage accomplished teachers and community literacy mentors to advance a multi-generational campaign to address the national crisis in educational awareness using digital technologies (Levine and Gee, 2011). To date the Ministry of Education in Thailand has created the 3 Ns Principles, namely Ned-Net (National Educational Network), NEIS (National Education Information System) and NLC (National Learning Center). These initiatives are to prepare Thailand for the ASEAN Community under the ASEAN Socio-Cultural pillar that will enhance the growth of every community (Yamwagee, 2010). The initiative is praise worthy, but unless the environment in which the learning is taking place using a tablet computer, as well as any negative perceptions teachers may have with adopting new digital tools changes, then the initiative will fall short of its goals. Supporting this view a study from the Asian University in Thailand shows that a digital classroom is not simply using electronic devices to access the same learning materials being delivered through the same pedagogical practice. It comprises a whole different type of learning, teaching and use of materials (de Groot, 2012).

2.3 Pedagogy and cultural differences in learning.

The most alarming news concerning the Thai education system came in a pronouncement on Jan 8, 2012 claiming, "Poor English Skills could Leave Thais out in the Cold" (Marukat, 2012). On Feb 13, 2012 another indication of Thailand's performance came with the comment that the Ministry of Education is ignoring the quality of education provided to children (Maksrivorawan, 2012). Addressing these concerns has recently been published in the Oxford Studies in Comparative Education (Brock and Pe Symaco 2011). The study focuses on education in South-East Asia and brings to attention the wide disparities in education which exist among the members of the AEC. It is pointed out that the South-East Asian region is distinctive in ways that have fundamental influences on all forms of education. The urban and rural disparities of economy and wealth make for fundamental differences in educational chances despite generally positive efforts by all governments to support schooling for all. Included in the study (Trakulphadetkrai, 2011) shows that the educational quality in Thailand is alarmingly low and that it is imperative for teachers and pupils to be made aware of how certain deep-rooted Thai socio-

cultural values may be counter-productive to affect teaching and learning. One example of working with cultural differences between teachers and pupils was reported in a recent unpublished study (Sprogoe, 2012) using iPADS in schools from amphur Khu Khan in Si Saket, Thailand. A way was found to overcome some of the cultural obstacles especially those that help teachers overcome their fright of losing face when using new computers. The solution was to make the applications easy to use so the teachers would become engaged as much as the pupils. The study concludes that teachers need to feel more comfortable with using the tablet computers before starting on courses built around them. From observations made in the schools it was found that the tablets were not used systematically by the teacher for curriculum oriented learning. However, the students had no problem with learning how to access the information asked of them. Overall the effects of understanding the use of apps, thinking in new directions and the effects of learning through play needed to be evaluated. Teachers, it was found, needed to have more time using the apps on the tablets because they have too little time to try them out. A solution to this problem was establishing a teacher training team (TTT) which would be responsible to go to the schools and take teachers through the whole cycle of using an app and applying it to course work.

A method by which we can account for these cultural differences, so as to be made aware of their impact on teaching, is found in the theory of “Cultural Dimension” (Hofstede, 1994). Both Hofstede and Trakulphadetkrai argue that unless these deep-rooted Thai socio-cultural values are relaxed the chances of implementing any meaningful education reform is going to be minimal. In his unpublished masters thesis Trakulphadetkrai (2007) confirmed that the five social and epistemological dimensions outlined by Hofstede appear to manifest differently among Thai pupils of different levels of exposure to Western socio-cultural values and cautions not to belittle the significance of the Thai teachers and students own cultural values.

Hofstede’s theory on Cultural Dimension points out that the educational process in Thailand is teacher centered, which he calls a “power distance” relationship between the teacher and the student whereby students don’t like to ask teachers questions. Hofstede has even developed an app, *CultureGPS*, which shows a 5D model explaining intercultural differences. The 5 dimensions represent common issues in the cultural systems of all countries and are centered on five fundamental areas of human behavior. Of course not everyone agrees with this model. The questions that have been asked are: Do nations have cultures and what is the basis of claims that national cultures exist? Is a sense of Thainess a relevant descriptor of Thailand? The Hofstede model, which conceptualizes a national culture, is based upon the premise that a culture is territorially unique, implicit, as it has a core, and is systematically causal. This model has been extensively challenged on the plausibility of any systematically causal national culture existing (McSweeney, 2002). For a more precise look at how the Thai culture has been formed it is necessary to look to Thongchai Winichakul; a contemporary Thai historian (Winichakul, 1994). According to Winichakul (1994), “The geo-body has become powerful technologies of nationhood. The most powerful effect is their operation in the identification of Thainess, or We-self, as opposed to otherness” (p. 164).

Determining the unique cultural social patterns in Thailand and how they can be communicated and understood by students who will become part of the AEC is an area of concern which ultimately will determine whether Thailand remains a unique nation state or becomes homogenized into a globalized secular world. Factoring this issue into digital communication will also require sensitivity as to how any predetermined cultural identity is used when communicating with other AEC members.

So what does this have to do with using tablet computers in the Thai classroom? The answer comes by recognizing that cultural differences impacting on-line learners who have been brought up with different cultural communication patterns can lead to an increase of miscommunication among participants from other cultures (Liu, Liu, Lee and Magjuka, 2010). Hofstede's study indicates that these socio-cultural differences will impact the way students perceive the rest of the world as well as how the teacher perceives using technology in the classroom. It's at this juncture of the tablet computer and teacher/student relationship we need to look at more closely in order to develop a Thai initiative which will capitalize on the unique cultural diversity Thailand has to offer. In a landmark research study the Center for Education and Labor Studies (CELS), based at Chiang Mai University, produced a comprehensive and critical account of current debates over the state of the Thai education system (Mounier, 2010). It is Mounier who clearly describes how complex it is to acquire knowledge which is dependent on both the content of knowledge and the learner's personal and cultural characteristics. It is, therefore, a complicated task when designing curricula which aid in the material to be studied, but also the links between the sequence of disciplines and the progression of studies from one grade level to the next. What program the young learner is going to encounter on the tablet computer has to take into consideration this progressive aspect of scaffolding the student up to the next level of tablet computer interaction or even the next digital assistant which will surely arrive sooner than later. How this scaffolding will be done will require a devoted committee to oversee the developments in software and apply them to the learners grade levels throughout their early years of education. This leads to the next consideration of the appropriate software and apps which a student will use in the classroom.

2.4 Software development and the use of apps:

Thailand began testing the use of the tablet computer in one of five pilot schools in different regions of the country with a project titled Integrating Technology to Enhance Learning (Saengpassa and Khaopa, 2012). Not unexpectedly a few problems did arise within the classroom using the tablet computers one of which were insufficient teaching aids to go along with the contents of the software. Consequently a support group, Mom's with Apps, has developed a forum to provide a more thoughtful and supportive approach to design and development issues related to children's apps (Donahoo, 2012). Software developers and app designers are aware that children want to see apps that are uniquely beautiful. Apps such as *The World of Goo* and *Contre Jour* are good examples of beautifully executed apps. Good examples of apps that provide excitement and originality are *Angry Birds*, *Fruit Ninja*, *Cut the Rope* and *Tilt to Live*. The *Angry Birds* app has been downloaded by over 50 million people and it's estimated that the

total number of hours played is 200 million minutes a day or 1.2 billion hours a year (Maura, 2011). That statistic has prompted some serious questions as to why this game is so popular. Although the game may appear simple it prompted an in-depth analysis by software developers of the user interface so they could understand the cognitive attraction of the overall schema formation that takes place in children's minds when they play the game. What made the interface engaging in *Angry Birds* was adding more detail to the user's mental model at just the right time, which is referred to as "intuitive based gesture interaction". Consequently, the children develop a mental model of the interaction methodology, and the fundamental strategy of scoring techniques is learned very quickly. These little birds are actually packed with clever little behaviors expanding the user's mental model and thus increase the game-level complexity. The findings, after analyzing *Angry Birds*, showed that the faster the response time when children play the game the better was their performance thus making "response time management" a crucial design feature used in designing software. Mauro's research has uncovered many more findings which has made his MauroNewMedia software firm highly sought after for its advice on designing children's apps. Likewise, Pressmart from Hyderabad, India has developed a complete teacher-student testing and evaluation app *Pearl* for the tablet computer integrating classroom management and evaluation with student coursework (Pressmart, 2012).

Developers not only need to consider response time management but also how to cater to other themes such as children's spontaneity and develop tools that allow them to create their own worlds and games rather than only having one set of activities to create with. Extensive research shows that with iPad usage children's skills develop from novice to mastery if the activities are sequentially progressive and the child's subjective experience is one of independence and autonomy (Cohen, 2011). Apps that fall into this category are *PuppetPals*, *StoryRobe*, *ShowMe* and *Story Wheel*. The recently launched *KinderTown* app is exploring a space to evaluate the educational benefit of digital play. *KinderTown* is an attempt to educate parents on the value of a digital space and foster an understanding of what apps are and what design elements should be considered for children.

The major problem at this level of concern is there are no studies which can assist a teacher or parent to conduct active research on the elements that go into software and/or app design. The design goals of apps for young children, as well as middle school and high school kids, is to understand what the interactive elements such as buttons, hot-spots, roll-overs or sliders have on learning. This is further complicated when these design elements are integrated into a learning object such as picking the right vocabulary to build a sentence, display a geometrical shape or provide easily accessible categorization of information (data bundles) so immediate feedback is given to the learner (Churchill, 2006). Apps which offer constructive feedback are *KickBox*, *Bubble Ball*, *Gravity HD* and *Word Zombies*.

For ESL learners the tablet computer provides a platform whereby a whole new approach is developed when designing a way to generate simple sentences or hear how words are pronounced. The British Council has developed the app *Sounds Right* so you can hear the

phonetics of all the vowels, diphthongs and consonants using a touch sensitive “Phonemic Chart”.

The app *Johnny ESL* allows a student to hear how a sentence sounds when read aloud. *Dragon Go* and *Dictation* allow a student to speak and see the words appear on the screen providing feedback on correct pronunciation. By taking into consideration the cognitive structures of ESL/EFL students a whole new spatial morphology has been incorporated into app design (Meurant, 2010). Meurant has advanced a new approach to enable appropriate cognitive structures to be formed in the language learner’s mind by designing activity on the screen display. This area of app design related to cognitive activity in children is addressed in a Norwegian study on the pedagogical use of e-Learning. (Valstad, 2010). The Norwegian study shows that to produce effective online learning and teaching using a tablet computer requires an understanding on how students learn and interact with technology. For an in-depth look at how software development is considered for the digital generation we can look to Brown University Department of Computer Science (van Dam, 2005). The developers at Brown University claim that the new content derived from software development when incorporated into existing curricula show no improvement in learning outcomes. Their solution is to re-define curricula to support learner-centered, on-demand, exploration and problem solving. To make these design issues available to the general public Carnegie Mellon University in Pittsburgh, Pennsylvania is offering a free on-line course in tablet computer programming offered on Apple’s iTunes U. (Kittur, 2012).

3. Conclusion

If we put all four of these areas mentioned above together: a. child development using digital media; b. student teacher preparation; c. pedagogy and cultural differences; and d. software development and the use of apps; into a wider social context, we begin to appreciate and understand the complexities that are changing our concept of literacy. The first thing to consider in the larger world comprised of a competitive global economic environment is to understand how to access information and then communicate it to others. There is the whole concept of cultural differences to be taken into consideration and how software developers can harness the cultural diversity of the users in each country to make the information more relevant to each culture as well as understanding how other countries perceive that same information. This effort will lead to a larger understanding of cultural literacy which will maintain the integrity of each nation’s human resources. The teacher’s role is pivotal in developing new learners within a digital educational setting (Van De Bogart, 2011, 2012). It is the teacher who will be given updates on existing digital tools and that must come from a well organized body of educational technology experts who are a combination of educators, parents and software planners.

Literacy is defined as a way to be able to read and write and communicate ideas, (Bashutski, Peckham and Hrynewich, 2011), but that definition has been elevated to understand a newer “post-typographic” world (Leu, Kinzer, Corio and Cammack, 2000). In Leu’s “post-

typographic world” where different types of literacy skills, (digital and critical), assessment of curriculum perceptions of teachers toward digital technology, and how the students are responding to new software applications, require a real time active research approach to this new knowledge generation of digital natives. The discerning skills students must develop in relevance and reliability of information in a digitally driven world can not be overlooked or underestimated in its affect on how students learn. For Thailand, as a developing country, to initiate a nationwide tablet computer policy is as bold and courageous as any education policy can be. But without knowing what terrain lays ahead it would be wise to be prepared for an abrupt adjustment into the efficacy of a national tablet computer policy considering the dynamic and ever changing landscape of the digital world.

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