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# DIGITALIZING THE MALAYSIAN CLASSROOM: BARRIERS, INSIGHTS AND FEASIBILITY

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## ABSTRACT

Many schools in both developed and developing countries are making the move to e-books, tablets and multimedia enhanced curriculums. Malaysia is also joining the bandwagon by adopting Google Apps and Chrome books for use in the local classroom. In-depth interviews have been conducted with 12 informants comprising teachers from four different government or government-aided schools in Sabah. The interviews revealed some of the main barriers, insights, implications and an idea of how feasible it is for the local classroom to adopt the tablet PC. The study revealed amongst other findings, the tendency for parents, teachers and students to view the tablet PC as a tool for entertainment, not education. The informants also, for variety of reasons preferred that the move be started at a young age, preferably in elementary school, or even in preschool. Feasibility will depend on a stable and fast Internet connectivity, a stable supply of electricity, a customized syllabus-based software that is easy and intuitive to use and the training of teachers to confidently embrace a digital future in their careers.

**Keywords:** *e-books, education technology, syllabus-based software, digital contents*

## INTRODUCTION

Ever since education was made available to the masses, print has always been the favourite, if not the only, medium of learning for scholars and students. For years, teachers have been using the blackboard and textbooks to relay lessons to their students, sometimes switching to projectors and transparencies, or visual guides in the form of large posters, but no other tool is more important and more prevalent to the classroom than the textbook. However, as we enter an age where an Internet connection and mobile gadgets are becoming more of

a necessity than a luxury, it is perhaps time to prepare for a technological boost in digital learning tools, edging the classroom towards a paperless future.

It may be a while before the tablet PC and e-books can make their entrance into the curriculum and classrooms in schools, including schools in Malaysia. Nonetheless, it is important to conduct proper research to find out two things: if the idea of introducing tablet PCs into the Malaysian classroom will be received well by the teachers and to highlight possible implications from introducing technology into a still rather paper-based classroom setting.

This paper endeavours to: (i) Find out the Malaysian teacher's view of teaching with tablet PC and e-books; (ii) analyse the personal innovativeness and attitudes of teachers in using learning technologies in the classroom; and (iii) Identify the possible implications and barriers of using tablet PCs in the Malaysian classroom.

## PROBLEM STATEMENT

The Preliminary Report of the Malaysia Education Blueprint 2013-2025 revealed that despite having spent RM6 billion on Information and Communication Technology (ICT) in initiatives like the Smart Schools, around 80% of teachers were found, in 2010, to spend less than one hour per week using ICT. At this rate, even if the government's plan to provide all 10,000 schools in Malaysia with Internet access and "virtual learning environments" succeeds, history will probably repeat itself and these facilities will be wasted, if the government refuses to address the elephant in the room – where do Malaysian teachers stand in the adoption of ICT and technology in classrooms? Are they tech savvy enough to take the leap from traditional paper to electronic text? Can they adapt to a wireless and paperless classroom? Will they approach the idea with caution, embrace it urgently or maintain an indifferent stance based on their previous experience with early ICT initiatives? How are teachers actually using the ICT facilities provided in their schools?

## ADVENT OF GLOBAL CLASSROOMS

Many schools around the world are starting the revolution of swapping printed textbooks with e-textbooks. If Malaysia was to join this digital revolution, this would be another change at a massive scale. To give an idea of how much is at stake, the Terengganu government has already spent RM100 million to provide 92,224 units of e-books for primary school students since 2007 (*The Star* 20 November 2011). The total number of students in both primary and secondary schools as of 31 Jan 2013 is 5,042,906 (Ministry of Education 2013), 50 times the number of the e-book recipients. A conservative estimate of the same project would push the budget required to RM5 billion.

As more nations start figuring out their plans to incorporate tablets into their classrooms, it may soon be time for Malaysia to do the same. Near the end of the writing of this paper, Google announced on their blog, plans by the Malaysian Education Ministry to adopt Chromebooks and Google Apps as their solution to digital classrooms. The move will probably bank on Google Apps for Education and YouTube Edu which are already used in top universities as well as 500 schools in the US (Yeung 10 April 2013) and a help from Frog Asia, which is part of YTL Communications. Frog Asia provides the learning platform while

YTL communications is providing 4G Internet connections for the 10,000 schools under the 1BestariNet project. The move was a result of a year-long of roundtable discussions, focus groups and interviews involving 50,000 people (Google 2013) although there was no mention of whom were involved in the talks.

Mobile learning or m-learning is touted as the future of learning because of the mobility and immediacy it affords the student (Mahat et al. 2012) as well as its apparent value in distance learning (Al-Fahad 2009). In a wireless learning environment, notes need not be downloaded and can actually be delivered to the students by their lecturers via blog streams or even SMS. Additionally, this learning mode can be easily integrated into the existing teaching-learning modes practiced by the student (Mahat et al. 2012). Research has been made in determining the suitable use of mobile devices in the classroom such as mobile phones (Maniar et al. 2008), smartphones, tablet PCs (Ando & Ueno 2010; Molnar 2012), e-readers (Marmarelli and Ringle 2010) and computers.

A wave of change is sweeping across global classrooms, and tablet PCs are riding that wave. The tablet PC has been the rising frontrunner (Cohen 16 Feb 2011; Madan 17 May 2011) when it comes to bridging the gap between a paper-based classroom and a paperless one. It is preferred over computers, laptops and netbooks because of its portability, ease of use and powerful features, and many nations are already implementing the systems and delivering these tablets into the hands of young schoolgoers.

In Kenya, Africa, Lavington Primary school pupils will become part of a pioneer project that will see pupils learning with tablet PCs and 65-inch electronic boards (Herbling 12 December 2012). The developed platform, dubbed the Samsung Smart School, features multimedia resources, which allows teachers to give quizzes, monitor class attendance and expose young children to a new way of learning, made possible with IT. In India, Pearson Education announced in December 2012 that they were providing tablet-based education solutions for schools there. Students can choose between a 7 or a 10-inch MX Touch-ActiveTouch which contains digitized textbooks and other content, including videos, animation and quizzes (tech2.in.com 3 Dec 2012). Elsewhere in Hong Kong, China, e-textbook applications have been approved for development. The task will be taken up by 5 non-profit organizations, which are to incorporate the benefits of e-learning in 30 textbook submissions. Each textbook set will be given a development budget of USD\$4 million, and delivery is expected by 2014 (HKSAR Government 29 Nov 2012).

In Thailand, a bold project by the Thai Government to put tablets into the hands of school-goers is underway. The "One Tablet Per Child" (OTPC) policy is a close to USD96 million project which seeks to put close 900,000 tablet PCs into the hands of elementary students and teachers in Thailand. The tablet PC chosen cost USD82 per piece, featuring an Android OS and a storage capacity of only 8 GB. Teachers will get tablet PCs of different specifications. Schools that do not have access to the Internet can fall back on teaching with the loaded content, offline (Kunakornpaiboonsiri 15 January 2013). In the second year, the project opened up the choice of tablets in an e-auction, welcoming tenders from manufacturers like Huawei, Scope, Haier and more.

Each tablet is priced at around USD91-98 (Kunakornpaiboonsiri 13 March 2013) and the government will be providing tablets of different sizes for the students as they progress higher up the academic studies. Other nations like Turkey are aggressively pushing for a massive reform that could rival Thailand's efforts. The local government is bent on putting

15 million tablet PC into the hands of school children from 40,000 schools, over the next four years. The project will set the government back USD4.5 billion. The Turkish government has been in talk with Microsoft and even Apple to make this feasible (Faas 7 February 2013). Millions (or maybe billions) are being invested into making the digital classroom happen.

South Korea is home to the world's highest broadband speeds. The nation is reported to have the highest average peak bandwidth of 47.9 Mbps (Duncan 2 May 2012) as of mid-2012, with further plans to push speeds even higher. Even before producing amazing Internet speeds for the whole nation, South Korea has already revealed massive plans to fully digitize their textbooks and convert all their textbooks to tablet PCs by 2015 (Knapp 6 July 2011). The move would set the government back \$2.1 billion. However, the plan was pulled in March 2012 because officials were concerned that they are making the next generation too dependent on tech gadgets and addicted to the Internet (Strauss 26 March 2012). In essence, the project is not entirely pulled, merely delayed, and rather than completely phasing out paper textbooks, the ministry has decided to allow both mediums to co-exist in their classrooms but only from the third grade onwards; the first and second grade will be taught with paper textbooks. It is apparent and imperative that we must first understand the implications of a move like this and there is no better source to find this out than the teachers themselves.

## **METHOD**

The research, which began as a quantitative research using the survey as the instrument, was changed into a qualitative one due to several limitations. Pilot tests of the initial survey revealed that tablet usage is still very low amongst teachers in Tawau, Sabah. The scenario found most common here is that apart from a handful of teachers, most of the teaching staff and students do not use tablets or smartphones in school for learning purposes. They prefer instead to stick to the chalk-and-talk method for their classes.

A first few test respondents viewed tablets as a hindrance to the learning process as in their opinion, tablets are considered as gaming tools for their students. Even smartphones are frowned upon if found in the hands of students in schools. The initial thought of using a survey questionnaire to gather information was basically shattered. The switch to in-depth interviews was fuelled by the need to understand what the teachers think about the usage of technology in the classroom, the feasibility of the idea is and what schools are up against in terms of implementation. Twelve informants from four different government or government-aided schools were involved in this interview. The teachers were approached at random and are interviewed on a voluntary basis.

## **FINDINGS**

The interview data has revealed a few insights about the barriers towards implementing tablet PC and implications from adopting the tablet PC for use in the classroom.

### **Realigning Expectations of the Tablet PC**

A matter of great concern when it comes to identifying barriers was the thought that the idea of a tablet-driven classroom could be greatly impeded by our association of the tablet as a device for pure entertainment. There is a need to realign how we view the tablet.

“At this point of time, students are using the iPad as an entertainment gadget. So if they can change their mind(set) [to understand that the iPad can] be used as an educational tool, then it will be different, it will be effective.” (S9)

Rather than look at it as a gaming device or a device solely for social networking or surfing sites that are not education-related, efforts must be made to reinstate its role as an educational tool for the idea of a tablet-driven classroom to work. To tackle this problem requires a widespread ‘conditioning’ in the way we, not just the students, view tablet devices. This lead to the question of how young should a student be exposed to these devices, specifically for school use i.e. at which level of study should we start introducing the tablet into schools? S2 states that the sooner we expose children to these tablets, the better, as it is important to teach them young. It is also easier to start afresh than to change an ingrained habit.

“If we limit their usage to learning applications, that’s the only thing they will play with. When they are older, they [will already be] used to using the tablet for learning apps... Students who are in form 5, they will view the tablet more as a toy, rather than a learning tool.” (S2)

### Finding the Right Starting Age

At this point, it is important to note that three other teachers believe that we should start teaching with the tablet with younger children. S11 believes that “the younger, the better”. Even S6 who prefers the non-digital way of teaching believe that starting them young, “in kindergarten or Year 1” can be a great deciding factor. S12 further illustrates this by saying, “Australian kids do not download mp3 or illegal software. Upbringing should start early.” S9 states that at this point in time, the tablet is probably better suited for use at the university level where the students are deemed more mature and can better handle their devices for learning. Lastly S2 also adds that if students are used to the tablet before the proper lesson begins (say, at Primary 1) then it will not eat into the lesson time in class.

“If the child uses it for the first time, he wants to try everything, explore what is in the tablet. So they will learn less of the syllabus, they would focus on doing other things.” (S2).

Based on this, it is easy to surmise that the longer we delay this transition of learning from text to tablet, the more conditioning we will have to commit to, particularly when it comes to uprooting the mindset of several entire generations. But do they think that it is time for the shift?

“... for our time, books are ok, but for kids nowadays, it’s a new period. Something new [like the tablet], there is motivation [for them] to learn.” (S7)

“Digital devices is the new trend of learning in school, maybe some of us cannot see the opportunity of learning online by using the iPad. Sooner or later the younger citizens will pick up. We (educators) have to be open-minded about this.” (S11)

“The kids who are now in primary 1, 2, they are used to tablets because they are born in this generation. They have gotten their fill of the tablets.” (S2)

## The Role of Parents

Inevitably, the role of parents came to light. Teachers would only get access to students in kindergarten or Primary 1. Meanwhile, children are being exposed to tablets at younger ages as more educational apps are continued to be developed for children as young as 2 (Rothman 6 May 2010).

S11 states that “if you teach [the children] the good values young, they will be able to control themselves” and since it is the parent who spends more collective time with their children, the onus, as many of the respondents insist, falls back on the parents.

“In school each teacher gets 1 hour tops with the students, then they go to other classes. At home the parents can monitor them for longer.” (S2)

“I think it is important for parents to know how to use the device because students only come to school for 5 hours. I teach you one subject, which takes about 40-50 minutes only; the rest of the day, I may not even see you again. Then how will I know [what you download or use the laptop for]... for the older students, we can still talk ‘reason’ with them, they may be able to think for themselves – whether or not they want to follow your advice is another matter.” (S5)

“...after my class, I’m not sure how they will use it... Parents also can control usage, hopefully. If the students listen to their parents.” (S6)

Not only do parents spend more time with their kids than the teachers do, they are also the rule-makers at home. S2 raised the idea that parents can instill certain behavioural rules around the usage of these devices at home. He actively practices this with his children, allowing them to only use the tablet during weekends and after they have done their homework, and washed their shoes. S11 made behavioural rules for her children too but with the personal computer, the device of the day when her children were growing up. However, it is probably S9’s account of how important the role of parents is that marks a crucial key to unlocking the tablet’s potential in school.

“Actually the iPad, there is nothing wrong with it... [it’s the] Parents [who] use the thing to babysit their children, 4-year olds, 5-year olds.”

She describes how parents and grandparents take small kids out and let them play with the iPad while they wait for their meal to be served. While she has no clue as to what is so interesting about the tablet, she sees that the users do not care what happens in their surroundings and are too absorbed with the gadget. “*If it is an educational thing, of course it is good*” but most of the time, it is to play with games. While parents may dote on their children by getting them a tablet (which functions as a babysitting tool to alleviate their parental responsibilities as well), she states that parents don’t have the time to sit down and teach [their children] how to properly use the gadget, which “is different thing.” More and more parents are using technology to help them keep their children busy while they work or rest from a hard day’s work.

In S9’s view, today’s parents are fueling the attachment of students to the tablet as a tool to pass the time with. The result:

“at home, they lock their door in their room... either they are socializing with their friends, chatting (online)... watching videos... they use it for entertainment, or [to] play game, DOTA, Farmville. They spend maybe 5 hours a day in this, not the beneficial type of activities... They create a few accounts, they send [game requests] to themselves. They might be using ICT for 5-6 hours, but whatever info they get is very minimum.” (S9)

Further research is required to see how widespread this activity is in Malaysia and in the Asian region.

### Fear of Technology

The urgency to adopt the tablet into the classroom for today’s young ones may be more evident in other countries such as Thailand, Turkey, Australia and the U.S. but in Malaysia, as the following few paragraphs will show, adopting tablets and e-books face a few challenges that are harder to overcome than other forms of technical barriers. First, there exists the fear factor:

“[When it comes to trying] something new, the fear factor is always there, it is human nature. We resist until we cannot, then we try it, then we learn. When we learn then we realize, oh it is actually very easy. [The fear factor] is always there.” (S11)

“Computer tech is too fast [for us to catch up]. We haven’t gotten used to the old version, and we have a new version out... Those who have been teaching all this while, suddenly they need to swap to ICT. They cannot cope. Some of them, I teach them to buy airline tickets online and even after I’ve taught them, they are still fearful of buying online.” (S2)

S4 and S6 are actual proof that this phenomenon is present in our teachers. A recurring answer from S4 shows that the main problem inhibiting proper usage of ICT in her part is ‘technical problems’. She stated that she would prefer an e-board that is already setup in the class so there is no need to set equipment up or configure settings etc. She did not specify what sort of technical problems she faced but admitted that she uses ICT rarely, at most, one or two times. Ease of use is a crucial factor for these types of teachers when using the tablet in the classroom.

S6, in this researcher’s opinion, is a dedicated teacher who will take it upon herself to force her students to improve but does not use ICT to make her life easier. In fact she gives off a most sceptical vibe.

“Maybe they will improve in terms of the skills to use a mobile device, but not in the subject.” (S6)

When faced with the thought of using tablets in school, she worries instead about students bringing uncharged tablets to school and how much the school will have to pay for to power these devices on a daily basis.

“The two biggest problems with using the tablet in class is one, funding. Understandably, it’s a big sum. Secondly, our electrical supply problem. I’m going to need a lot of electrical plugs to power these tablets.”

**Interviewer:** The tablets can last a full 8 hours without recharging.

**Informant:** But what if the student forgets to charge?

**Interviewer:** I doubt that so many students, say 20 out of 40 will forget to charge.

**Informant:** [ignores] Yeah, then I cannot use it. Where am I going to find 20 electrical plugs to help them charge this?"

This negative view towards using tablet PC was also reported in the Ifenthaler and Schweinbenz (2013) study and was said to be caused by the respondent's beliefs and hopes rather than actual knowledge and experience about the technology. Both S4 and S6 only go online for about an hour a day, for the purpose of social networking and to keep up with current issues. Both also own a laptop (their preferred device to go online with), a personal computer and a mobile phone each<sup>3</sup>/<sub>4</sub> neither owns a tablet or a smartphone. They seem content to continue with their current method of teaching without much use of ICT. Ifenthaler and Schweinbenz (2013) reported the need to have a comprehensive support system for teachers with less affinity to technology to aid adoption. Without proper training to help digitalize their teaching styles, the outcome will probably remain in a traditional form (Garavaglia and Ferrari 2012). Not only will this idea face resistance from teachers who prefer to use their own way of teaching, without the use of ICT, we also face resistance in terms of our local culture.

"If you say nations abroad can do this, why can't we do this, don't forget, foreign countries, the way they educate their youngsters is that they give them independence from a very young age. Here it is different. Here we (teachers) have to work together with parents. If you are a parent and you want to give your children the freedom (to use these devices as they like) I believe there will be problems." (S5)

She does not specify what the problems are or will be, but the next section may reveal clues. One of the questions posed to the teachers involved the description of the Samsung Smart School, "One of the major highlights of the system is that the teacher can send all the information written on the e-board to their students' tablets in real time. They can also use the e-board to monitor the activities of the students on their respective tablets."

S6 was very agreeable to this feature.

"I think it is good that you can correct things immediately, like a math question, get a student to do [the problem] in front of [the] class. If I correct his work, immediately you can see what this student did wrong, and what is the right way." (S6)

### Effect on Teacher-Student Relationship

Enriquez (2010) in studying the Interactive Learning Network found that immediate assessment was a favourable feature in increasing learning efficiency. This Smart School concept allows teachers to do that. However, while it may look good on paper, several respondents were quick to point out how the system may in fact backfire. S1 thinks that we can develop the students only academically if the class is fully digitalised in this format.

There is no wholesome development on the other three aspects: physical stamina, spiritual and emotional development. The relationship between the teacher and the student may also be affected due to the loss of communication between student and teacher.

“When we teach students by sharing information between teacher and student, student and student, there is a lot of development in the group spirit, the sense of belonging.”

She does however state that there are students who don't like to listen when a teacher speaks; the concept can be helpful in this sort of situation. S9 notes that this concept lacks the human factor, which is important for weaker students. Also, when students face the machine instead of the teachers, they may lose more than the teacher-student bond.

“[Kids today] have lost their communication skills. They only know how to handle machines... They are too involved [with the tablet].” (S9)

This situation, which was referred to as “total absorption” syndrome (in the interview) has been happening with books, the TV, video games, and the computer but S9 has only associated this extensively with the tablet PC. When asked why this is, S9 reiterated that it's probably because the tablet and the smartphones are so portable. “It is so small. And everyone has their own device,” so much so that when gathered at the same table for a meal, everyone whips out their own smartphone or tablet to play with rather than engage in conversation with the person they are dining with.

“They become very funny, when they see their friends, they don't talk. They use nonverbal communication. Using words but no sound, no communication.” (S9)

It is thus very important to make an effort to add the element of face-to-face or human interaction into the digital classroom. A digital classroom may need classroom content that is not just interactive in the tap and swipe sense, but also one that focuses on enhancing verbal and presentation skills, communication, exchange of opinions, debates and the likes.

### **Absenteeism and Loss of Attention**

Another problem that may occur is the absenteeism:

“Given the culture and mentality of the locals, I can foresee a lot of absenteeism. Because I (the student) have the tablet, the teacher is going to send [the lessons] to the tablet. I don't even have to attend classes. Even [with] the classroom kind of teaching, the absenteeism is [already] so high. With this, they will totally disappear.” (S11)

Even more importantly, although the notes-syncing system may be good for PnP, one thing it cannot make sure of is if the student is focusing on the lesson. S7 mentions that in this kind of class setting, students would go to school just to listen.

“But they may listen in, one ear, out, the other.”

In this matter, S5 said that if everything is given to the student, they will only look at it without taking the effort to process the information given,

“That's it, you just look at it.”

S2 feels that the student's ability to take notes is not there. He probably meant data retrieval rather than copying blindly, and illustrated the point with the example of drawing a microscope:

"...when a student draws a microscope, [they take note of] where the light comes from, the path the light takes. If you give them the microscope straight [in a single picture], they won't learn... which parts make up the microscope."

The act of note-copying is also viewed as a sign that the student is following the lesson. The way S6 put it:

"How do you know if the student is actually paying attention in class?... the personal attention? If you ask them to copy something, you know for sure ... how far they are. Yes, they may not be surfing on other sites because you monitoring, but are they really involved in what you are teaching? He has that page or site [you want] open, but is he reading it or is his mind somewhere else?" (S6)

S11 shared the same concern saying that the monitoring system is not absolute and a teacher cannot be 100% sure the students are doing the activities asked. In this sense, this can be developed from the publisher's or programming side. Teachers may have remote access to the students' device to check and correct individual work without having to move around the classroom (Garavaglia and Ferrari, 2012). This will not disrupt the class or inhibit a child's motivation to try and err as many times as required to learn the concept. What is harder to develop is getting everyone on the same page yet still ensure that the content is catered to the student's respective proficiency levels.

"If they are not in sync, they are not learning together (with everybody at the same time). And you have to resort to remedial activities, to get students that do not grasp the concept, to grasp the concept." (S11)

To make the lessons effective, teachers may need to repeat the lesson a few times to get the students to understand the lesson (Kunakornpaiboonsiri 15 January 2013) or they will need several versions of the content (beginners, intermediate, advanced) to suit the students' academic levels. Alternatively, the school can sort the students to their proficiency levels, good students in one class, weaker students in another, then cater different lessons to each class. Content publishers may need to create multiple levels of content: introduction, enhancement, remedial etc. for the same topic, allowing students to work on the content as many times as they want without the fear or rejection or being criticized (Kunakornpaiboonsiri 15 January 2013).

### Alternatives to Using Tablet PC

There lies a risk of over-complicating and pushing too hard to stick to ICT. S3 in his interview, emphasized from the get-go, a rather good alternative. S3 states that there is no need to give a tablet to each student. It helps to lighten the bag load but it is more cost-efficient to improve on the LCD screens.

“If you can see it clearly on your iPad, you can see clearly on the LCD screen as well. Same difference.” (S3)

He suggests improving the student seating, replacing the cement walls with plant walls that will help absorb the echo, make sure the LCD screen is clear, the audio works – basically optimizing the classroom for a full “Lessons on LCD” experience. It also does not consume so much electricity, a prevalent problem in the state of Sabah. This electricity problem is also mentioned by S6, and in fact the interviews conducted for S10, S11 and S12 were done in the midst of a power outage in school. S3 also wonders about who the students can turn to in the even of an out-of-order tablet as well as how classes can continue in the even of a blackout. He is also aware that the real-time syncing feature will require a fast and stable Internet connection, preferably of the fibre optic sort. The technology is far from established in the state of Sabah as of March 2013.

### **Security and Implementation**

Another problem is that school security will have to be heightened in this type of classroom setting. LCD projectors are more cumbersome to move about, however laptops and mobile phones, being the handy, portable mobile devices they are, are common victims of theft in schools. S5, S6, S9, S11, S12 explained that thefts are rampant in school and there were cases where students brought devices to school and the device was stolen.

S9 reported a case where an outsider had wandered into the school compound and made off with a teacher’s laptop. S13 has the same problem in her school and suggests to students to bring their laptops to the teacher’s staff room for safekeeping until it is needed for class. Still, this is not a foolproof solution for all schools. In S5’s school, students are required to report the devices they bring to school and spot-checks will be conducted in the event of a lost device. However, not all stolen items were found. In all the theft cases, there is added responsibility for the teachers to deal with.

Another point to consider is a nationwide implementation of this system and if it would actually be feasible in rural areas where there are schools that still suffer from the lack of basic necessities. Besides, these students may find no need for it.

“Some of them don’t think that learning is important, for instance, in Semporna. Or in Mabu Island, they are so carefree. They just go out and catch fish. The teacher asked the mother why is it that your son didn’t go to school. [She said] if my son [goes] to school, who is going to bring me back my dinner?... You see the sea gypsies, they splash in the water all day; they catch fish. To them this is enough. You say this is poverty but they won’t come out of this.”

The type of funding required to make this feasible in all 10,000 schools in Malaysia is undoubtedly a huge sum and the question of whether to send tablets into rural areas or not, is one for the policy makers.

### **Health Issues and Other Effects**

When asked what are the implications of studying long term on the tablet, six respondents were concerned about the vision of the students. S2 thinks that students will get dizzy due to overuse, and S5 fears that our future generations will inevitably be bespectacled. S3 says

although kids can be real smart from the use of these digital tools but what happens if they aspired to be a soldier or police officer? Without a 20/20 vision, their chances to enter the forces would be affected. Not only are the respondents sure that the students will need spectacles eventually, they think that the teachers will also have it tough handling the screen time required to mark their student's papers and their progress in class.

In a study by Sommerich et al. (2007), students using the tablet PC were found to experience discomfort in not only the eyes, but also the shoulder due to lugging the tablet PC around, neck, upper and lower back due to the sitting posture, as well as the wrist and head (headaches). Also of concern are data retention problem, an over-reliance on technology and the possibility of losing the text-reading initiative. S12 who has been supportive of the idea throughout her interview was asked if she suffered any side effects from working on her lessons on her laptop for long hours. She answered:

"I find that I lose concentration easily... I'm more forgetful. I can get what I want so precisely... but I cannot remember the information [or recollect from memory]. And [I] lose attention easily... I think this problem exists with students as well." (S12)

S12 terms it as a data retention problem. Since we can find information so easily, we do not have to remember any bit of it. Whenever there is a need, we go to Google to look it up. Another thing she brought up was the over-reliance of tools. She gave the example of the humble calculator to illustrate her point:

"10 x 1000, the students even need calculators for this." (S12)

When it comes to text, S13 mentioned that the use of visuals (pictorial, videos, multimedia) may create a natural aversion for text.

"I think it will slow down the reading initiative. They will start to prefer images, because it is so easy to put pictures into your e-text now. But text is important to explain the concept. If they don't read, [the teacher] will have to explain more." (S13)

The data found for these implications are limited as only S12 and S13 use these devices more often than the other respondents. There will probably be better and more conclusive findings in a larger population sample preferably one that is actively using the tablet in their daily online dealings.

### **Print Has to Stay**

After all this back and forth, came the issue of the style of classrooms the respondents want. It was no surprise that 11 out of the 12 teachers wanted print to stay (S3 finds no relevance to print for his Physical Ed classes). However, there are interesting revelations to share. S2 was the only respondent who not only owned both a tablet and a smartphone but also could identify the OS of his devices: iOS 6. However, he is rather against the idea of using the tablet to study, saying that one would miss out on the feel of the book:

“One bad thing is you don’t have the feel of reading the book, the flipping of the pages. The smell of the paper. It’s cold electronics... you cannot draw on the iPad like you do with printed textbook.” (S2)

S2 also added:

“If they are in primary 1, then they got to learn to write on paper as well; we can’t let them [learn] A, by press[ing] A.”

Whether apps on the tablets can do a better job to help students learn the basics of reading and writing remains to be seen. One of the biggest problems to overcome in this sense is the limitation of suitable input methods. Typesetters face great difficulty in inserting mathematical symbols and operators into the layout of a book and students may face a similar difficulty with their homework on the tablet. Studies are being conducted on how handwriting recognition technology can help allow students to write, than type, on the tablet for mathematical subjects (Anthony, Yang, and Koedinger 2012) but thus far, it is a developing situation. For now, it is safe to say that print may be the best platform to enhance a student’s writing skills and basic understanding of concepts.

Despite her awareness that digital learning is coming to the classroom, S12 says,

“It cannot be a paperless society. It is impossible. When education is concerned, I cannot imagine paperless. We need hard copies of proof of work, of results.”

Print is tangible proof of work done: homework, projects, essays etc. When a student ‘hands in’ his or her work, teachers know that the student has gone through the content and possibly learned a thing or two about what was taught in class. For S9, proof of writing is “proof that you are studying.” It is also hard to abruptly make the switch from print to digital. “*We are used to working on paper. And teachers need to see the student’s paperwork.* (S4)”

Additionally, due to the workload teachers face e.g. when an essay assignment is assigned, the teacher will have to mark dozens of copies. Doing the marking on the tablet is harder to manage—“*If I mark certain parts inside the soft copy, they don’t know where I marked* (S10)” —and marking on the tablet is perceived to cause more eyestrain, especially due to the sheer amount. Marking on paper not only shows clearly where the mistake has been made, paper is easier to manage, carry around and store away.

According to S6, when one actively writes something, one will feel more “engage, involved and alert” compared to when you are just staring at the screen. Apart from that, S11 also insisted on the need for tests to be done on hard copy instead of digitally. She shared an incident where teachers who had to take online exams suffered bad grades due to what she described as either a coding bug in the system or unclear instructions. Instead of submitting answers to 5 questions, the test-takers clicked the ‘Submit’ button too soon and were graded only for the one answer they had actually completed. The repercussion from this was that the teachers had to take a weekly course to rectify their ‘poor performance’.

The idea of receiving a bad grade due to poor programming of online tests or a fault in the system is not only unfair to test-takers (be they students or graduate teachers) but also a blow to user confidence, undermining the efficiency of a digital education. Any test

implemented digitally has to be flawless for this to never happen. Otherwise, print is still the best option to take important examinations on. Another respondent vying for print to take precedence over digital is S5 who over the course of the interview asked me how I go this far academically to explain her point:

“...how do you normally revise for your exams? You look at the information, absorb it then think about it, and if possible, write it out. It takes you through the process... if it is already there, you are not invested in it... When you write out the information, the amount you can write out (from memory) is what you have absorbed so far.” (S5)

No matter how much the respondents insist that print must stay, the jury is still out on whether the main bulk of the teaching and learning process should be digital or print.

## CONCLUSION

The need to equip our younger generations with the skills to survive in a digitally driven world is pressing and is already here. The idea to introduce the tablet PC into schools is a means of ensuring that the young children of this country will be able to gain access to a digital education regardless of financial background, upbringing, race or religion. It is obvious from the findings of this research that there is a lot of further research required to iron out the creases and ensure a painless, seamless transition phase for students, and teachers alike. Identifying the problems that do and may exist is part and parcel of a successful implementation process. While not all answers have been asked or all questions have been found, this research paper provides a starting point that will hopefully branch out into solution-finding efforts from all quarters to realize this move.

This research has unveiled more than what was expected probably because the teachers spoke freely under the promise of confidentiality and unbridled by any question structure. Nothing can be proven conclusive because of the small amount of teachers interviewed – the sample is too small to represent any group of teachers in the whole of Malaysia.

However the data collected has been more than sufficient to show to us the barriers and suggestions that could make or break a learning by tablet PC initiative, if one ever comes to be. The findings from this paper can also be the grounds for a larger-scaled, more widespread survey involving more teachers from more levels and more places.

## REFERENCES

- Al-Fahad, Fahad N. 2009. Students' attitudes and perceptions towards the effectiveness of mobile learning in King Saud University, Saudi Arabia. *The Turkish Online Journal of Educational Technology* no. 8 (2):111 - 119.
- Ando, M., & M. Ueno. 2010. Analysis of the advantages of using tablet PC in e-learning. Paper read at Advanced Learning Technologies (ICALT), 2010 IEEE 10<sup>th</sup> International Conference. 5-7 July.
- Anthony, L., Jie Yang, & Kenneth R. Koedinger. 2012. A paradigm for handwriting-based intelligent tutors. *International Journal of Human-Computer Studies* no. 70 (11): 866–887. doi: 10.1016/j.ijhcs.2012.04.003.

- Cohen, Deborah L. 2011. Tablet startups bet on digital classroom. Reuters.com 16 Feb. <http://www.reuters.com/article/2011/02/16/us-column-cohen-tablets-idUSTRE71F4J220110216>.
- Duncan, Geoff. 2013. Who has the fastest Internet? Report sheds light on most- and least-connected countries. 2 May 2012 [cited 2 Feb 2013]. Available from <http://www.digitaltrends.com/computing/who-has-the-fastest-internet-report-sheds-light-on-most-and-least-connected-countries/>.
- Enriquez, Amelito G. 2010. Enhancing student performance using tablet computers. *College Teaching*, 58 (3):77-84. doi: 10.1080/87567550903263859.
- Faas, R. 2013. A supermassive iPad deployment in Turkish schools could be a model for business. Cite World. 7 February. Available from <http://www.citeworld.com/tablets/21404/15-million-ipads-turkish-schools>.
- Garavaglia, A. & S. Ferrari. 2012. A Model for Defining Digital Classroom Settings. *Procedia - Social and Behavioral Sciences*, No. 46:1983-1987. doi: 10.1016/j.sbspro.2012.05.415.
- Google. 2013. Classrooms, chromebooks, and the web: lessons from Miami to Malaysia. Google 2013 [cited 2013 13 April]. [http://static.googleusercontent.com/external\\_content/untrusted\\_dlcp/www.google.com/en/intl/en/chrome/assets/education/pdf/global-edu-white-paper.pdf](http://static.googleusercontent.com/external_content/untrusted_dlcp/www.google.com/en/intl/en/chrome/assets/education/pdf/global-edu-white-paper.pdf).
- Herbling, D. 2012. Samsung enriches learning with Smart School technology. *Business Daily Africa*. 12 December. <http://www.businessdailyafrica.com/Samsung-enriches-learning-with-Smart-School-technology/-/1248928/1642548/-/eunyp0z/-/index.html>.
- HKSAR Government. 2012. *E-Textbook Market Development Scheme*. HKSAR Government 29 Nov. [http://7thspace.com/headlines/427039/e\\_textbook\\_market\\_development\\_scheme.html](http://7thspace.com/headlines/427039/e_textbook_market_development_scheme.html).
- Ifenthaler, D. & V. Schweinbenz. 2013. The acceptance of Tablet-PCs in classroom instruction: The teachers' perspectives. *Computers in Human Behavior*, 29 (3):525-534. doi: <http://dx.doi.org/10.1016/j.chb.2012.11.004>.
- Knapp, Alex. 2013. South Korean schools to have digital textbooks by 2015. *Forbes.com* 6 July 2011 [cited 2 Feb 2013]. <http://www.forbes.com/sites/alexknapp/2011/07/06/south-korean-schools-to-have-digital-textbooks-by-2015/>.
- Kunakornpaiboonsiri, Thanya. 2013. Thailand updates OTPC Tablet Project in 2013. FutureGov. 13 March. <http://www.futuregov.asia/articles/2013/mar/13/thailand-updates-otpc-tablet-project-2013/>.
- Kunakornpaiboonsiri, Thanya. One tablet per child policy: stepping up education reform. FutureGov. 15 January. <http://www.futuregov.asia/articles/2013/jan/15/one-tablet-child-policy-stepping-education-reform/>.
- Madan, Vinnet. 2011. 6 reasons tablets are ready for the classroom. Mashable.com 17 May. <http://mashable.com/2011/05/16/tablets-education/>.
- Mahat, Jazihan, Ahmad Fauzi Mohd Ayub, & Wong Su Luan. 2012. An assessment of students' mobile self-efficacy, readiness and personal innovativeness towards mobile learning in higher education in Malaysia. *Procedia - Social and Behavioral Sciences* 64: 284-290. doi: 10.1016/j.sbspro.2012.11.033.
- Maniar, N., E. Bennett, S. Hand, & G. Allan. 2008. The effect of mobile phone screen size on video based learning. *Journal of Software*. 3 (4): 51-61. doi: <http://dx.doi.org/10.4304/jsw.3.4.51-61>.

- Marmarelli, T. & M. Ringle. 2010. The Reed College Kindle Study. [http://www.reed.edu/cis/about/kindle\\_pilot/Reed\\_Kindle\\_report.pdf](http://www.reed.edu/cis/about/kindle_pilot/Reed_Kindle_report.pdf).
- Marmarelli, T. & M. Ringle. 2011. The Reed College iPad Study. [http://www.reed.edu/cis/about/ipad\\_pilot/Reed\\_ipad\\_report.pdf](http://www.reed.edu/cis/about/ipad_pilot/Reed_ipad_report.pdf)
- Ministry of Education. 2013. Statistik bilangan murid (Enrolmen). Ministry of Education, 31 Jan 2013 2013 [cited 31 March 2013]. Available from <http://www.moe.gov.my/>.
- Molnar, Gyorgy. 2012. New learning spaces? M-learning's, in particular the iPad's potentials in education. Paper read at Interactive Collaborative Learning (ICL), 2012 15th International Conference on, 26-28 Sept.
- Mus Chairil Samani, Jamilah Maliki, & Norazimah Abd Rashid. 2011. Literasi media: ke arah melahirkan pengguna media berpengetahuan. *Malaysian Journal of Media Studies*, 13 (2) 2011: 29–40.
- Rothman, W. 2010. The best ipad apps for babies, toddlers and sanity-loving parents. Gizmodo. 6 May. <http://gizmodo.com/5532261/the-best-ipad-apps-for-babies-toddlers-and-sanity+loving-parents>.
- Sommerich, C. M., R. Ward, K. Sikdar, J. Payne, & L. Herman. 2007. A survey of high school students with ubiquitous access to tablet PCs. *Ergonomics*, 50 (5): 706-27. doi: 10.1080/00140130701194793.
- Strauss, Valerie. 2013. South Korea's surprising stand-down on digital textbooks. *Washington Post* 26 March 2012 [cited 3 Feb 2013]. [http://www.washingtonpost.com/blogs/answer-sheet/post/south-koreas-surprising-stand-down-on-digital-textbooks/2012/03/25/gIQA6djvbS\\_blog.html](http://www.washingtonpost.com/blogs/answer-sheet/post/south-koreas-surprising-stand-down-on-digital-textbooks/2012/03/25/gIQA6djvbS_blog.html).
- tech2.in.com. 2012. Pearson Education showcases MX Touch-ActiveTouch tablet. Tech2. 3 Dec. <http://tech2.in.com/news/tablets/pearson-education-showcases-mx-touchactivetouch-tablet/615762>.
- The Star*. 2011. Pupils abusing free e-Books. *The Star Online*. 20 November. <http://thestar.com.my/news/story.asp?file=/2011/11/20/nation/9942833&sec=nation>.
- Yeung, Ken. 2013. Malaysia goes big on Google Apps and Chromebooks as it reforms its national education system. *Thenextweb.com*. 10 April. <http://thenextweb.com/google/2013/04/10/malaysia-goes-big-on-google-apps-and-chromebooks-as-it-reforms-its-national-education-system/>.