Teachers' Perceptions on the Use of E-Books as Textbooks in the Classroom

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Abstract—At the time where electronic books, or e-Books, offer students a fun way of learning , teachers who are used to the paper text books may find it as a new challenge to use it as a part of learning process. Precisely, there are various types of e-Books available to suit students' knowledge, characteristics, abilities, and interests. The paper discusses teachers' perceptions on the use of e-books as a paper text book in the classroom. A survey was conducted on 72 teachers who use e-books as textbooks. It was discovered that a majority of these teachers had good perceptions on the use of e-books. However, they had little problems using the devices. It can be overcome with some strategies and a suggested framework.

Keywords—Classroom, E-books, perception, teacher.

I. INTRODUCTION

E-BOOKS are nothing new today and will soon be a part of every classroom in most countries. This trend is in lieu with the imperative for schools to comprehend 21st century learning in which teachers assist students to learn and live productively in a global society. This is where accurate and current information is a meaningful part of everyday learning. At the same time, teachers can be the key players in the successful implementation of e-book to foster a sensible, balanced solution in the convincing and ambient classroom environment.

A. What is an E-Book?

Project Gutenberg was started by Michael Hart In 1971 who used computer to store, retrieve, and search information. It was named as e-Books or electronic versions of print books. Since that, this Project Gutenberg creates thousands of free texts and copies of books which can be downloaded or accessed online. The key definition of e-Book varies due to its nature and extent. Armstrong comes up with the definition used by many scholars as "any piece of electronic text regardless of size or composition (a digital object), but excluding journal publications, made available electronically (or optically) for any device (handheld or desk-bound) that includes a screen [1]."

There are three basic components of e-Books: hardware or reader, software and the e-Book files. Hardware-based e-Book readers are portable electronic devices designed mainly for the mean of reading e-Books or any forms of publications. The price range depends on the quality portrayed by the e-Book readers. In terms of capacity, e-Book readers can store certain number of books worth of content, which can be accessed virtually from any location [2]. Good e-Book readers will be able to perform tasks like printing, audio-visual, interactive touch, and even wireless communications. Software-based e-Book readers are programs that display data of an e-Book on the device [3]. Software book readers allow the access on personal computers or any latest computer technologies. Microsoft Reader, Adobe Acrobat Reader, and Adobe Acrobat e-Book Reader are three examples of such software. One advantage of software-based readers is that besides offering the functions of dedicated readers, they offer extra facilities through a keyboard and wider screen sizes [4]. This could offer better access to the information because with the keyboard utilities, users can manipulate the display through changing the settings. A file type is a file which contains an embedded signature. It notifies the operating system how to manage that file. A user can tell what type of file an e-Book s/he has by referring to the file extension located at the end of the file name. The most common file types used for e-Book are exemplified in Table I.

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TABLE I
E-BOOK FILES AND EXAMPLES

E-Book Files	Examples
Plain ASCII text files have the extension .txt	e-Books and their functions.txt
Microsoft Word files have the extension .doc	academic_calendar_and_dates.doc
Adobe acrobat files have the extension .pdf	e-Books at Universiti Teknologi PETRONAS.pdf
Html files have the extension .html or .htm	21st-Century-Classroom_e-Books.aspx.htm
Adobe eBook files have the extension .pdf	malaysia 1.pdf

B. The Momentum Growth of E-Books in the Classroom

The textbook is the single greatest driver of the classroom experience in schools and teachers and students engage with the information contained in textbooks as a key definer of the learning experience. It is important to support for a number of teaching and learning activities and helps to standardize the material teachers present in content areas, ensuring that classroom content is aligned to mandated curricula. Somehow, with the advancement of technology and Internet, classroom instructional materials and activities have become digitally rich and the use of e-books is rapidly gaining ground in education. It is slowly replacing the conventional textbooks. The e-book is an inevitable juggernaut and it enhances the learning process. As technology is expanding fast, the use of e-Books in classroom has become rampant too especially in the last ten years.

There are several studies involving the use of e-Books in the classroom as a medium of teaching [5][6]. Most of the studies discuss the effectiveness of e-books in enhancing the learning process. One of the successful stories of e-Books refers to the e-Book project of Clearwater High School in 2010 which replaces print textbooks with e-Books. It is collaboration between the school and Amazon Kindle. In this project, e-Books are fully loaded with the contents of subjects taught and become the main textbooks. Amazon Kindle also equips all 2,100 students and 100 teachers at that school with e-Book readers in electronic formats to access books, newspapers and magazines. The Kindle allows students and teachers of the school to search for word definitions, bookmark pages, highlight text, and type notes. Prior to this project, they needed to scribble on pages of a hard-bound print book to do the same tasks.

This Kindle project is a fine example of how most developed countries are well versed with the use of e-Books in classroom. Somehow, some developing countries like Indonesia, Turkey and Singapore are still grappling to use them. In Malaysia, the Electronic Book Project was initiated by the Ministry of Education in 2001, involving the use of the electronic books or e-Books in 35 schools over a period of five months. The project was meant to gauge how this technology, which stores textbooks, assists teachers to improve the quality of students' performances in classrooms. A similar project was then started by the Terengganu State Government, Malaysia which allocated USD15mil to purchase 50,000 e-Book readers to year Four and Five pupils in 2010. The readers enable the pupils to enjoy a learning environment which was conducive for them not to carry a bag load of books to schools anymore. It was also vital to prepare students to excel academically and face global challenges [7]. The State Government has decided to continue the e-book project for the upcoming years. Such a move actually has prompted other states in Malaysia to introduce e-Books into classrooms.

The paramount of e-Books as textbooks leads more and more countries to formulate special projects in enhancing the use of e-Books in classrooms. Technology specialists are developing software to ease the production of e-Books and convert periodicals into e-Book formats. Their goal is promote

literacy across the nations. A country like Portugal has implemented such projects, while a few other European countries are considering similar programmes. So far, Portugal has distributed 500,000 files of e-Books to students, while Venezuela has deployed a million files of e-Books to certain schools in the country [8].

C. E-Books Promote Good Learning Atmosphere

While print textbooks are designed to support multiple state standards, forcing teachers to dissect and analyze the pages of textbooks create lessons pertinent to their local needs [9], teachers can use digital textbooks and materials to receive customized curriculum to complement and extend their state's standards. Though information is ever-changing and can be quickly outdated in print textbooks, students using digital textbooks can access news about current events and link to information and media that enriches a learning encounter. And, teachers are encouraged to collaborate with one another to select complementary online resources and to update and refine classroom content.

For students, a part from reducing the burden of carrying heavy conventional textbooks, the use of e-Books brings a lot of impacts. E-Books benefit them physically, academically and psychologically. An e-Book reader can compress the contents of a conventional textbook. Since students in Malaysia are typically required to bring a number of textbooks to schools daily, compressed versions of textbooks lighten the burden. Physically, the reduce weight enables the students to grow healthily without any damaging effects such as lower back pain, poor posture, spinal deformity over time and back problems in adulthood [10]. In terms of learning, students who are engaging e-Books may find the process is fun due to e-Book attractive features (i.e. user friendly functions; attractive graphics; enlarged text size; plug-in speakers). These features would encourage students' creativity and learning autonomy.

For education administrators, e-Books ease the management process. E-Books allow them to monitor classroom activities done by each student concurrently. Students' development can be closely and conveniently monitored, documented, categorized and accessed [11]. Through integrating technology into the classroom, curriculum designers and teachers can enhance teaching methods to improve students' learning process in classrooms.

From the perspective of parents or guardians, the use of e-Books in classrooms will be economical. Most e-Book readers are subsidized by the schools, loaned to students, and maintained by technologists. The subsidies will minimize education expenditure for parents with school going children [12]. The loaned e-Books will eliminate the need to buy textbooks which are subject to lower shelf life compared to e-Books. Students often pay little attention in taking care of the traditional books to allow them to hand down the books to the younger students. As such, the battered or damaged traditional books need to be replaced with new copies. Since e-Books require regular maintenance of e-Books, their shelf life of the contents could be optimised.

Until now, there is no research has been done to study the presence of e-books in the classroom from the teachers' perspective. Thus, this research is important to determine teachers' perception in using electronic books or e-books instead of paper textbooks in the learning process. It is hoped that the result of this study can help to determine the strategies for the implementation of e-books for the teachers.

II. METHODOLOGY

A survey was conducted in the district of Kemaman, Terengganu in Malaysia involving 14 primary schools. The research population included primary school teachers who teach Year Five and Year Six students. There are 72 participants randomly chosen by school administration. 62 were females and 10 were males. The majority of the participants have more than 10 years teaching experience (72%) while 18% have range of 5 to 10 years teaching experience and the remaining have less than 5 years of teaching experience. They teach various subjects in the school. The questionnaire consists of 25 questions and has been designed specifically for this research. It addressed usage, emotions, lifespan and assistance towards using E-books in the classroom. The rate of response was 100%.

III. RESULTS AND DISCUSSION

The results are presented in the graph below. For every graph, there are five scales at horizontal axis namely 1 for totally disagree, 2 for disagree, 3 for not sure, 4 for agree and 5 for totally agree.
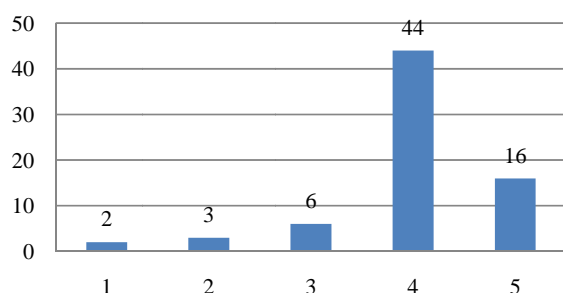

Fig. 1 The significance of e-books

Most of the teachers do agree that e-books are significant to the student. Majority of 83% or 44 teachers agreed that E-Books are significant while 8% or 6 teachers were neutral and another 7 % disagreed with the statement. Only 2% did not give any response.
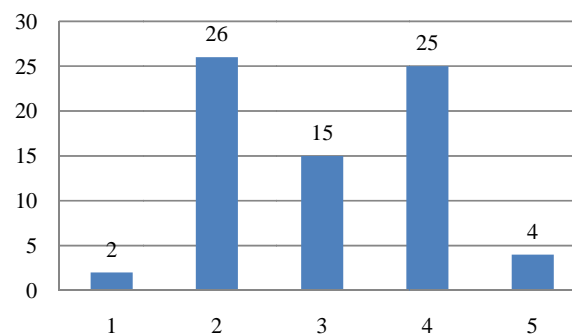

Fig. 2 The utilization of E-Books in the classroom

According to the results in Fig. 2, the usage of the e-book is moderate. Only 40% agreed that e-books were fully utilized in the classroom while 39% did not agree about it. 21% of the teachers were not sure about it. This describes how it helps teachers in the class. This is because e-books have some limitations. There are cases where students use e-books for other purposes, for example playing computer games.
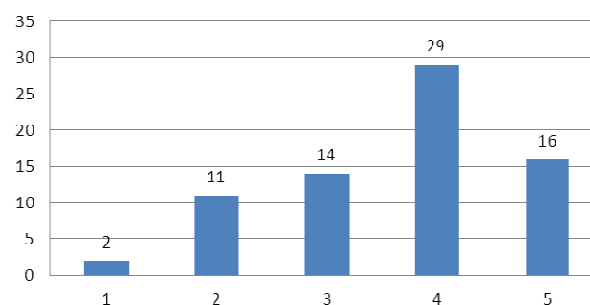

Fig. 3 The usage of e-books compared to the paper text book

Most teachers or 62.5% of them agreed that e-books have replaced the usage of paper text book in the learning process. While only a few or 18% did not agree and 19.5% was not sure with the statement. This is because new gadget is nothing new in this era of technology and most students are exposed to it.
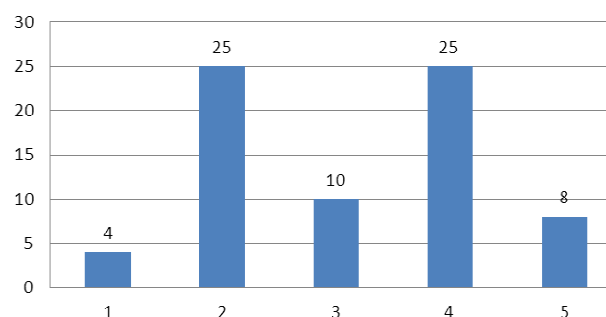

Fig. 4 E-Books make the students give full attention

The result shows that most teachers slightly agreed that E-Books cause students to give attentions during learning and teaching process. 46% agreed about it, 40% did not agree and another 14% was not sure about it. This involves the big number of students in a class, which can reach up to 50 pupils,

and it makes the teachers feel difficult to control the students individually.
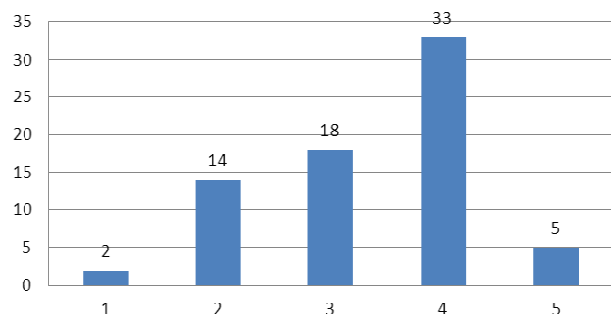

Fig. 5 E-Books and academic performance

Fig. 5 above shows that 38 or 53% of the teachers agreed that e-Books have improved the students' academic performance. Again, it shows the use of e-books by teachers in a way that it helps students to do better. Somehow, 22% of the teachers did not agree that e-books improve the students' performances while 25% of them had no ideas pertaining the issue.
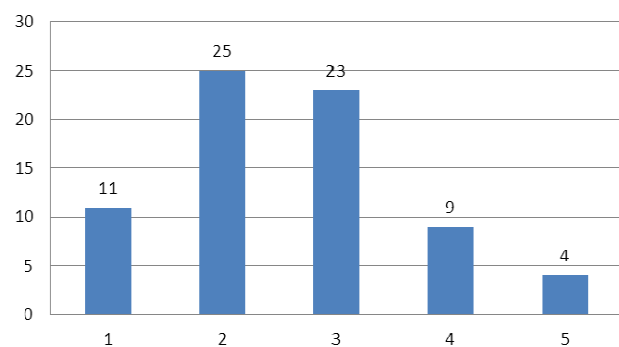

Fig. 6 E-Books is a burden in finishing the syllabus

Only 18% agreed that E-Book is a burden in finishing the entire syllabus while almost half of the teachers disagreed that e-books can be a burden. 32% had no ideas about this.
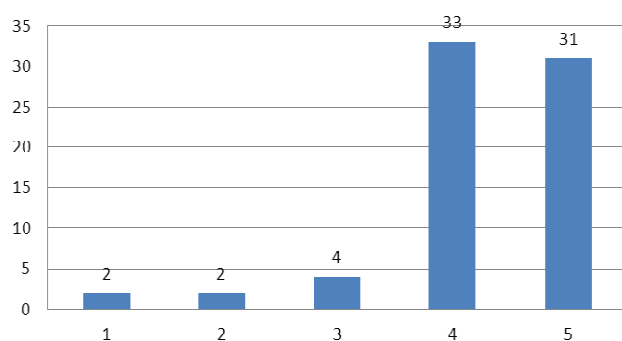

Fig. 7 E-Books can be misused by students

A strong opinion from 64 or 89% of the teachers admitted that e-Books can be wrongly used by the students while only a few numbers (6) denied it. Another 5.5% was not sure about it.
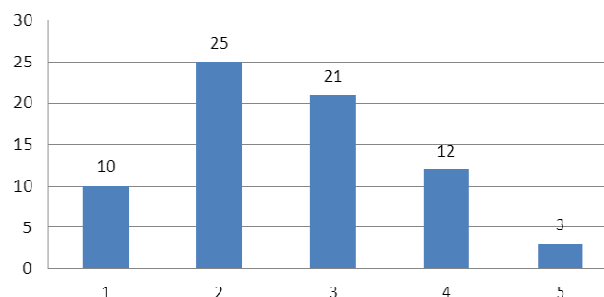

Fig. 8 E-Books are a waste of money

49% of the teachers refused that E-Book is a waste and it should not be used for other purposes. Only 21% of them agreed about this and another 29% was not sure.
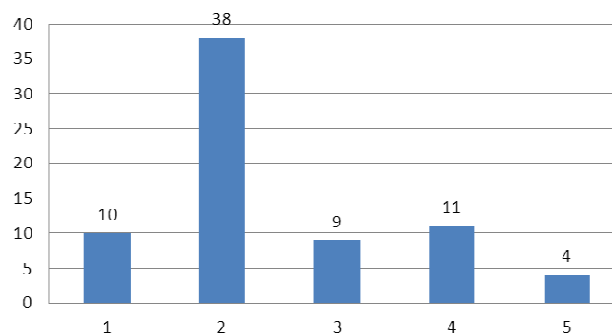

Fig. 9 E-Books are not practical for young learners

A strong of 67% of the teachers disagree that E-Book is not practical for the young standard 5 students. This is because young kids nowadays are exposed to technological devices. They learn very fast and even the younger one can access e-books at home. 21% of them agreed about e-books were not for the youngsters while 12% of them had not any idea about it.

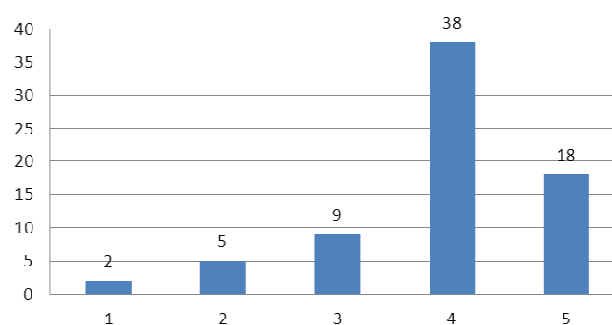Fig. 10 The use of e-books should be continued in future

A majority or 78% of the teachers agreed that E-Book should be continuously used for the next few years. However, 10% did not agree about this and 12% was not sure whether it should be continued or not. The price of the e-books was expected to be reduced and more e-books might be produced in a mass scale. It may contribute to the use of e-books in future.
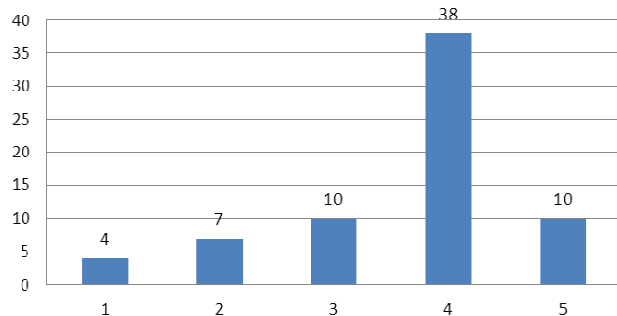
Fig. 11 I am happy with e-books

Overall, 67% or 48 teachers met agreed that they were happy with the e-books while 15% or 11 of them were not happy and another 10 teachers or 14% was not sure whether they were happy or not with the presence of e-books in the classroom. It indicates that as a whole, teachers met in the survey had a positive attitude towards the use of e-books in the classroom compared to a paper text book.

IV. Strategies of Using E-Books

A. Limitations of Using E-Books in the Classroom

Together with the change of times and the evolution of technology, there has been a rampant outbreak of e-Book readers in the market. However, what has truly awed the market is the invention of the e-Book readers which enable readers to read books on small mobile devices. Anyhow, these awesome devices still have flaws and limitations [13][14]. Based on the survey conducted among the teachers who use e-books in the classroom, there exist some of the limitations which are specified below:

- There is a limited storage capacity on the hardware itself.
- There are limited power outlets in a classroom to ensure uninterrupted use of e-Books in the classroom. Those who do not bring the e-books or fail to charge he power supply earlier may disturb the class. Teachers also have difficulty to m monitor student regarding the using of E-book during the process of teaching and learning.
- Teachers and educators may not be adequately trained to conduct lessons with an e-Book.
- Insufficient supply of e-Books at schools could not be overcome through sharing as conveniently practiced with textbooks. The size of e-books is too small and it is not comfortable to be shared.
- Some teachers may find e-Books do not offer the same pleasure of reading compared to reading a traditional book. The screen of e-books is too small for display.
- Some e-Book readers discourage text annotation. Students cannot write in texts, underline, circle, or even comment in the margins to help them understand and analyse the text.
- Stringent DRM (Digital Rights Management) often prevents e-Books from being shifted from one device to another.

B. Strategies of Using E-Books in the Classroom

Drawing from the limitations given by teachers when using

e-Books as textbooks, the following guidelines may give a rudiment concept for them or school administrators upon implementing the use of this portable electronic device:

- The use of e-Books in the classroom involved few parties: teachers, school administrators, and technology specialists. Is there any collaboration among them to jive the content presentations of the syllabi with the e-Book readers?
- The prerequisite of introducing e-Books in class is the technology. Schools must equip the technology of e-Books (i.e. software and hardware) if they would like to use them as learning materials. So, are these technologies readily available? Do teachers have knowledge and skills about e-Books?
- How do schools provide instructions and manuals to students who are not IT savvy, are ESL students, or are with special needs? How can e-Books support teachers in helping these groups of students?
- Parents must adapt themselves to e-Book technology when e-Books replace the traditional textbooks. How can teachers help parents to monitor their children using e-Books both at school and at home?
- E-Books may not have a long shelf life if not regularly and properly maintained. Is the maintenance of e-Books properly planned and implemented? If there is, who is responsible for it? Will the service be readily available? Teachers must aware of these and act necessary.

V. A Framework of Using E-Book as Textbook

E-books have the potential to provide teachers with a teaching tool that can help them to effectively deliver their lessons to their students. Nevertheless, this paper acknowledges that e-Books can never replace teachers. The task of teaching elementary-age students is very complex as it needs the teacher to possess deep knowledge of the children's mental capacities as well as their emotional requirements. Furthermore, how effective the child's education also depends on the types of feedback, direction and encouragement that can only be provided by human teachers who have the knowledge as well as the passion. Yet, the use of e-Books as text books is definitely best suited in today's learning environment. The education system has entered a new paradigm to keep pace with the emerging green environment trend. This paper outlines a framework on how e-Book can support teachers in the learning process. The framework is based on the findings from the questionnaires and also adopted from a framework of Using Technology within K-6 Programme [15]. It is then used in this paper to suit the context of e-Books as Textbooks. The proposed framework consists of five general capabilities as the following:-

- Offering various presentations of information and activities
- Automating some feedbacks for students
- Facilitating the evaluations of students' work
- Providing scaffolds for learning process
- Ensuring sustainable resources of knowledge

A. Offering Various Presentations of Information and Activities

E-Books can present any type of auditory or visual materials – including speech, text, music, animations, photographs, or videos – alone or in different combinations. E-Books can link different types of representations such as pictures with sounds, oral readings with written text, videos with subtitles, or any other combinations that could reinforce teaching and teach (Casey, 1994).They can also provide enormous flexibility, allowing students to set the rate of speech, decide whether written text should also be read aloud, choose the language presented in text and speech, or decide whether to repeat the presentation.

B. Facilitating the Evaluations of Students' Work

The capability of presenting information and activities in various formats also means that e-Books can accept a variety of inputs from students, ranging from mouse clicks to written text to spoken words. It can be programmed to check a student's work. A good e-Book is highly capable of recording and organizing information, as well as reporting that information in multiple formats. The e-Book can, for example, record the responses of all students in a class and then immediately report to the teacher the errors made by each individual student as well as the common errors made by the entire class. In more complex tasks, e-Books can serve as convenient recording and reporting devices for teachers, helping them track students' progress far more conveniently than other means of data collection [16]. This capability can be used to inform teachers' instructional decisions and to make documenting students' progress much more efficient.

C. Automating Some Feedbacks for Students

While e-Books ease evaluation, they should also be interactive to ensure effective instruction. For example, when students respond to questions or read aloud, they need: feedback to know whether they are correct, instruction to help them learn more, and opportunities to engage in additional work at appropriate levels to further their learning. When tasks require simple inputs, such as selecting from presented options or typing a word, the e-Book can be programmed to immediately evaluate each response and provide appropriate feedback. This feedback can be in the form of positive messages when the child is correct, and hints, additional chances, or corrected answers when the child is incorrect. Most importantly, the e-Book can be programmed to adjust the tasks presented based on feedbacks from previous performances.

D. Providing Scaffolds for Learning Process

Besides interactive instructions, e-Books should also provide flexible supports for students' learning process. Most e-Book programs provide the ability to highlight text sections, and take notes. Some even add the ability to create drawings within the book. All of these features can increase a student's comprehension of and attention to a given work. Some e-Book programs have interactive dictionaries, providing just-in-time learning, that allow users to select any word within the e-Book and get a definition instantly, have the definition read aloud, or request an instant translation to another language.

Furthermore, the display offered through e-Book programs and devices can provide reading scaffolds for many students through their ability to change the displayed text size. Students who struggle with reading, regardless of the reason, can benefit from changing to larger font sizes. The reason for using large print is not necessarily because these children have visual difficulties. Larger font sizes and spacing actually cause the eyes to move more slowly while reading, allowing students to track their reading more easily [17] and giving them more processing time. All students, especially those susceptible to visual stress, were found to make more errors when using smaller text sizes than with larger text[18]. For most e-Book programs, creating a large text format is just a matter of sliding a text size bar to a larger setting.

E. Ensuring Sustainable Resources of Knowledge

Providing scaffolds for the learning process should also be supported by fostering sustained development of knowledge and learnt society. E-Books can contribute to this continuos effort through maximizing the availability of knowledge while reducing the numbers of trees cut down to produce printed books. In 2007, Green Press Initiative reports that every year about 200,000 tons of paper are produced from 4 million trees for the publication of textbooks [19]. This accounts for approximately 20 per cent of the total paper used in the book publishing sector. According to the latest figures from the Ministry of Education, Malaysia, the current number of enrolment in Malaysian public schools is approximately 5.2 million [20]. This number accounts for 2.9 million primary school students and 2.3 million secondary school students. Each primary school student generally has about 10 textbooks per year and each textbook has about 50 to 80 pages. The shift to using e-Books as textbooks would not only reduce the usage of approximately 1 billion sheets of paper which translates into 120000 trees being saved every year but also ensure sustainable resources of knowledge [21].

VI. CONCLUSION

The emergence of e-Books as textbooks among the school children requires teachers to think how to adapt themselves in using e-Book. While e-Book will not replace print books in the near future, it will definitely be used to complement print books. It appears that teachers give a positive perception on the use of e-books as a text book. In classrooms, teachers and students will start to value the convenience and accessibility of e-Books. It is one of the latest developments in education technology. Indeed, the introduction of e-book in education could be a jump-start in promoting highly literate society. The suggested framework above may also need to suit a country's policy. With a proper study and plan, the integration of e-books as part of technology application in mainstream schooling in Malaysia will become a reality.

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