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Creating And Testing A Science In English Website For Malaysian Secondary One Students

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Abstract

This paper describes a Science in English website for Secondary One students in Malaysia. The aim of this website is to provide Science in English resources tailored to the needs of the Malaysian Secondary One students. The creation of this website is in line with the new Malaysian Educational policy of teaching Science and Mathematics in English. This policy was implemented in 2003 for Primary One, Secondary One and Lower Six students in all Malaysian schools, and is to progressively encompass all Malaysian students. This website provides an avenue for students to enrich and deepen their knowledge in Science and at the same time to enhance their English language skills and promote autonomous language learning. The website consists of explanation and interactive activities pitched at the intermediate level and designed in accordance to the Form One Science Syllabus. The website has been pilot-tested on 50 Form One students and 10 Science teachers. The results of the pilot study are discussed in this paper.

INTRODUCTION

Science plays an important role in our daily lives. It exists in whatever we do i.e. when we think, eat, walk, communicate, sleep and so on. As for its role to a country, it is a significant contributor to its economical, political and social growth. "Science is all about discovery" (Crow, 2001) that opens to various alternative paths to society. The discoveries often lead to enormous economic and political importance, which are highly profitable. As a consequence of Science being beneficial and profitable, it is considered a crucial subject in all schools. In Malaysia, Science is taught from Primary One right up to Secondary Six – as a core subject up to Secondary Five and as an elective subject in lower and upper Six. The medium of instruction for Science in Malaysia was Bahasa Malaysia until recently. Thus, after being taught in Bahasa Malaysia for 25 years , the medium of instruction of Science was changed to English starting from June 2002. The reactions towards this change were mixed. Staunch supporter of Bahasa Malaysia were understandably upset. However, those who understood the importance of Science understood the logic behind this move. They realised that low proficiency of English among Malaysians have resulted in Malaysians being unable to keep abreast of developments in science and technology (which materials are found mainly in English). This is not helped by the fact that translation of scientific materials from English to Bahasa Malaysia are so slow that in many cases the translated materials become outdated when they are published. The introduction of Science in English is in line with the Immersion Theory and the method used is described as content-based instruction. Immersion theory is defined as "a method of foreign language instruction in which the regular school curriculum is taught through the medium of the language" (Met, 1993) and content-based instruction is described as using the language students are

trying to learn as a tool for developing knowledge and their linguistic ability in the target language (Peachy, 2004). Many studies have proven that applying Immersion theory in the learning process enhances that students' knowledge of the subject and at the same time improves their proficiency in the language (Buchanan & Helman, 1997, Crandall, 1994, Curtain, 1995).

The actual implementation of English as the medium of instruction for Science began in 2003, starting with Primary One, Secondary One and Secondary Lower Six and was to progressively encompass all the other levels. Efforts were undertaken by the Government to prepare Science teachers for the change. Schools were provided with IT equipment such as computers, LCD projector and Science in English software to aid the teaching of Science in English. Television programmes on Science in English were also launched. Training programmes were also offered by a new training unit called EteMS (English teaching for Mathematics and Science). This unit was put together as an "urgent interim measure to ensure that teachers of mathematics and Science will have basic capacity to use English as the medium of instruction" (Choong et. al., 2002). Monetary incentives were also given to teachers who were willing to teach Science in English.

Despite the Government's efforts, it is a well-known fact that many Science teachers are not ready to teach Science in a language which to many of them is a foreign language. Many feel that they need time to adapt to the change. Admittedly, they have been given some computer software in Science to help them in their teaching and that more and more of such computer software is available in the market. However, it is not known to what extent they have utilised this type of software and how useful the software has been in facilitating the teaching and learning of Science in English.

ONLINE LEARNING

Research studies undertaken on the use of the computer delivery system revealed that it has been effective in language learning. Stevens (1999) conducted three different studies on the effectiveness of computers in language learning. The findings showed that students using computer to study were able to learn more effectively and complete more exercises. They also had a more positive attitude towards language learning in general. In addition these students had more successful cognitive learning strategies and their work performance was significantly better than traditional classroom students. These findings were supported by O'Malley and McCraw (1999). Their findings revealed that students, who made use of computers in their learning processes were better at time management and organising schedule, and enrolled for more courses. Thang and Leila Bidmeshki (2004) in their study on the online learning of English by Malaysian Science and Technology undergraduates of Universiti Kebangsaan Malaysia found that the students were enthusiastic with this mode of learning. The results derived from the online forum and the evaluation of an online passage indicated that they felt that the course not only helped to equip them with the necessary reading and computer skills but also provided a fun, entertaining, flexible and non-threatening environment to learn English.

Azizah et al., (2004) investigated the current practices of teaching and learning English in SMART schools in Malaysia that is special schools designed for students who performed well academically. These schools integrate teaching and learning with IT applications, which include computer based teaching and web-based learning. This programme started with four subjects (English, *Bahasa Melayu*, Science and Mathematics). The findings of this programme showed that both teachers and students were confident and ready to accept learning English through this method and 79.5% of the teachers felt comfortable with their new role as a facilitator.

The studies discussed so far have been conducted on learning of languages online. To what extent are these findings applicable to the teaching and learning of Science in English at Malaysian Secondary schools? As far as I am aware of, no study on the effectiveness of online learning on the teaching and learning of Science in English Malaysian Secondary schools has been undertaken. The purpose of this study is two folds. First, it describes the design of a Science in English website for Secondary One students. Second, it evaluates the teachers' and students' perceptions of the effectiveness of the website in the teaching and learning of Science in English.

THE WEBSITE

This website is designed for intermediate-level Secondary One students. The exercises provided range from various types of tasks obtained from the Hot Potatoes programme to crossword puzzles. Apart from that, the website also provides enrichment or revision activities. Specifically, the website consists of 7 topics which are part of the Science syllabus for Secondary One students. See Table 1 for more information on the topics.

Table 1: The Titles and Contents of the Seven Topics

Topic	Title	Contents
1	Introduction to Science	Definition of Science, importance of Science to human beings, rules of the Science laboratory, laboratory apparatus, hazard symbols, steps in scientific investigation and aspects of physical quantities (mass, length, time, temperature and electric current).
2	Cell as a Unit of Life	Different types of cells, steps in handling a microscope and the human body system.
3	Matter	Definition, types and characteristics of matter and non-matter and formulae to determine density and volume.
4	The Variety of Resources on Earth	Types and functions of earth's resources, different forms of matter and characteristics of metal and non-metal.
5	The Air around Us	Description of the components of air, characteristics of oxygen and carbon dioxide, and examples, sources and effects of air pollutants.
6	Sources of Energy	Definitions and characteristics of different types of energy, and energy changes.
7	Heat	Definition and characteristics of heat and temperature, types of heat flow and the physical changes on matter.

Each topic begins with lessons taken from Malaysian Secondary One textbooks, workbooks or other Science books. There are 5 types of exercises under each topic: True or false statements, Multiple-choice questions, Short-answer questions, Drag and drop exercise, and Task completion exercises. In each of the exercises, learners can check their answers after they have attempted the questions. Hints and clues are provided to help the students. The website also provides enrichment section in the form of a passage on '*Blood Pressure*' and 8 types of exercises. The website also offers try-outs for hands-on activities where learners are given some tips on how to create a magnifying glass, a broken pencil (without breaking the pencil) and a sand-timer.

The website also contains two crossword puzzles. The crossword puzzles can be seen as a learning game or an enrichment exercise. Clues are provided and there is a hint button to help the learners to solve the puzzle. The clues in both crossword puzzles are based on the contents of topics 1 to 7. The website can be viewed at **:**
http://www.ukm.my/webcourse .

METHODOLOGY

The instruments used for assessment of the website were two types of questionnaires. For the teachers, two types of questions were used: multiple-choice questions (MCQs) and short-answer questions (SAQs). For the students only multiple-choice questions were used. This was because the pilot study revealed that students were unwilling to answer the SAQs. A total of 10 teachers and 50 students took part in the assessment of the website. The teachers are Science teachers from various secondary schools in Malaysia. The students are Form One students from a Secondary school in Malacca (a town school in Malacca). It was found that all the teachers and students in this study have never been exposed to online learning of Science in English prior to this.

The assessment of the questionnaires produced both qualitative and quantitative data. The teachers' responses to the MCQs were analysed quantitatively with the use of percentage counts. The SAQs were used mainly to support, corroborate or to provide explanation for the quantitative data. The students' responses were analysed with the use of percentage counts. Finally, similarities and differences between the teachers and students data were identified and discussed.

RESULTS

Teachers' Perception of the Website

All 10 teachers considered the website useful to Secondary One students in Malaysia. They liked the organisation of the website and they felt the instructions were easy enough for the students to understand. All of them believed that the website could help students improve their reading skills. They also felt that the website could improve students' vocabulary (90%), grammar (60%) and writing skills (30%). The low percentage for writing skills was because some of these teachers felt that the website lacked writing activities.

All the teachers were of the opinion that the website helped the students in improving their knowledge in Science. Some commented that "adequate notes" and "precise explanation" were provided and more importantly, the contents of the website were "packed with a lot of information on Science". Other positive remarks include: The lessons were suitable as materials for their students, the graphics were attractive, the layout and colours were suitable, and the lessons were in-line with the syllabus. 90% of the teachers supported the use of the online lessons in the teaching of Science in schools. Only 10% opposed. The reasons given by them are realistic and need to be taken

into consideration. They pointed out that some schools in Sabah do not provide computer facilities for the students and most students do not have Internet access at home. However, all of them were very enthusiastic over online learning in general and claimed that it would motivate the students.

The teachers identified some problems that they believed students might face. In the case of weak students, a few teachers were worried that they would not be able to cope on their own as they needed guidance and explanation from their teachers. Some felt that overdependence on the online lessons might not be good as students needed more practise in handling Science experiments since 60% of the total marks in the Science examination is for this component. . Several teachers were also afraid that the students might not have the computer skills to access the website and undertake the activities given.

A few teachers offered some suggestions on how to improve the website. These include a different colour scheme, more graphics, more animations, more crossword puzzles, more interactive texts and fonts and more challenging exercises and "try-outs". They would like new features to be added such as online forum, video shows on experiments, jokes related to Science, extracts from TV shows, cartoon characters, links to other relevant websites, extra tips on Scientific facts and devices for monitoring students used of the website.

Students' Perception of the Website

Similar to the teachers, the Secondary One students responded in a positive manner towards the website. 90% of the students indicated that they enjoyed doing the online lessons. The main reasons they gave were that they enjoyed learning online and the lessons were fun. Most of them were also satisfied with the length of the lessons (80%) and the difficulty level of the instruction (88%). Their perceptions of the contents were also favourable. They generally felt the lessons helped them in improving their skills in English (80%), were pitched at an appropriate level (70%), and that the lessons had helped them to improve their vocabulary (92%) and knowledge of Science (90%). Most also found the lesson useful for revision (94%) and more interesting than text books (80%). Interestingly, 78% felt that they online lessons could even replace the classroom lessons! The students also expressed liking for the graphics (92%). However, only 62% liked the choice of colours. Regarding the lessons they enjoyed most, it was found that the highest score went to Topic One (66%), followed by Topic Two (62%) and Topic Seven (29%) and Crossword Puzzles (54%). The lowest scoring lesson was the Enrichment exercise (16%), followed by Topic 4 (30%).

The students also responded to questions regarding problems they faced. Their most serious problems were the lack of Internet access at home (46%) and not knowing which lesson to begin with (40%). However, it was good to know that 96% of them knew how to use the computer and that all of them had access to the Internet in school. The students' suggestions for improvements were more explanation about Science (76%), more exercises (66%), availability of an online dictionary (66%) and more animated pictures (56%).

DISCUSSIONS

The findings revealed that generally the teachers and the students responded positively to the website. The teachers felt that the website was beneficial to the students as it would help them to improve their knowledge of Science and enhance their skills in English. However, they felt that lower proficiency students might need more support. Generally, they liked the layout of the website though some were not entirely happy with some of the features and contents. They felt the website

could be improved by adding in more attractive and sophisticated features. Several pointed out some problems that might arise that is the lack of computer skills among students, and inadequate computer facilities and Internet access for the students.

The students found the website helpful in many ways. In addition they found online learning fun and many even recommended that online learning of Science replaced the conventional classmate mode. It was also encouraging to know that all of them knew how to use a computer and could access the Internet in school. However, quite a large percentage of them still could not access the Internet at home. Bearing in mind that the respondents are studying in a town school, we can safely deduce that the percentage of students from rural areas who are not able to access the Internet at home will be much higher.

The students' inability to decide which lesson to start suggests they still need their teachers' guidance in making decisions. Their suggestions that the lessons should have more explanation, exercises and an online dictionary inform us that the website still to be improved substantially. This is supported by the teachers' requests for more attractive and sophisticated features. Students lacked of enthusiasm towards certain lessons suggest that they need to be revised. I think some useful guidelines to follow are that the lessons must be informative, fun, attractive and interactive.

CONCLUSION

The teachers and students' keen support for the online Science for English website suggests that online software or online network system should be utilised by secondary schools in Malaysia in the teaching and learning of Science in English. Since teachers can design online websites like the one used in this study relatively easily and that online software is easily available in schools and in the market, finding the resource materials for this mode of learning should not be a big problem. However, we do foresee some problems that cannot be resolved easily that is the lack of Internet access for a large proportion of Malaysian students at home and limited access to computer in schools if more and more teachers decide to embark on this mode of learning. Azizah et al.(2004) and Thang & Leila Bidmeshki (2004) also found the lack of infrastructure a problem in their research studies. This problem cannot be resolved in the short run but this should not stop enterprising teachers from using this mode of learning in their respective schools considering it has been shown to be beneficial, fun and entertaining and also promote self- exploration and autonomy among students.

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