DEVELOPMENT OF WEBSITE INTEGRATED SCIENCE BOOK FOR SCIENCE AT INDONESIA INTERNATIONAL STANDARDIZED SCHOOL

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ABSTRAK

Penelitian Pengembangan Buku Terintegrasi Website Untuk Sains SMP SBI dan RSBI dilakukan dengan tujuan untuk menyediakan buku sains yang dapat dijadikan sebagai salah satu sumber belajar bagi guru dan siswa SMP di RSBI/SBI. Dengan dikembangkannya buku ini, diharapkan pembelajaran sains dapat mengembangkan pemahaman sains siswa secara terintegrasi, mengembangkan kemampuan berbahasa Inggris siswa, serta mengembangkan kemampuan dalam menggunakan teknologi informasi. Penelitian dilakukan melalui metode Reseach and Development (R&D) yang diawali dengan analisis kurikulum sains SMP berdasarkan KTSP dan kurikulum Cambridge. Penyajian buku berupa tema-tema yang mengintegrasikan konsep-konsep dalam fisika, kimia dan biologi dengan menggunakan Bahasa Inggris sebagai bahasa pengantar. Dari hasil uji kelayakan penggunaan buku yang dilakukan terhadap siswa SMP diperoleh bahwa *e-book* yang disusun memenuhi kriteria penggunaan *e-book* dalam aspek penyajian gambar, animasi, penggunaan huruf, penggunaan Bahasa Inggris sebagai bahasa pengantar, latihan serta kegiatan siswa. Secara umum, *e-book* yang dikembangkan dinilai memiliki kreativitas yang baik dan layak digunakan sebagai buku sumber dalam pembelajaran sains di SMP, khususnya di RSBI/SBI.

Kata Kunci: buku sains terintegrasi website, sains terpadu, pembelajaran sains di RSBI/SBI

ABSTRACT

Research on Development of Integrated Website Science Book for International Standardized School aims to provide book that can be used by both teacher and students an International Standardized Schools as learning source. The book hopefully can give an overview to students and teachers in understanding science as an integrated subject, promoting of using English in science teaching and improving skill in using ICT. The research was carried out by Research and Development (R&D) which started from curriculum analysis for both KTSP and Cambridge. The book was constructed in a form of electronic book (e-book) which provides science knowledge in a form of themes that integrate the concepts of biology, physics and chemistry. English is used a formal language of this e-book. Result from trial use of the e-book in bilingual school revealed that this e-book fulfilled the criteria as it contain picture, animation, exercise and sound which interest student to read it. The usage of English in this e-book promote student to learning English. Most student were agree to say that the book is creative and it can be use in teaching learning process at junior high school, specifically in International standardized School .

***Key Words*:** electronic book (e-book), integrated science, international standardized school.

INTRODUCTION

The future Indonesian Education is projected to be able to compete globally. Aiming to fulfill this purpose, the government launches the project of International standardized school. The objective of the program is to improve the quality of Indonesian education so that can produce outcomes who has capability to compete in international world.

There are three issues which are found in international standardized school program in Junior High School in Indonesia. *First*, science teaching that previously given separately among subjects (physics, biology and chemistry) should be given integrated among those subjects. This becomes challenge for teachers as they were not prepared for teaching in integrated way. *Second*, the use of English as formal language in teaching

science becomes constraint for teachers in teaching science. *Third*, is the use ICT in science teaching learning process (Suharno, 2008).

One that may become solution to overcome the problem is developing science book that can meet the need of international standardized school characteristics. The developed book should has science content that integrate the concepts of physic, chemistry and biology facilitated by website to give opportunity for students as well as teachers to access the book. Development of integrated science is aiming to give knowledge to students that science can be studied in integrated way, develop skill to use English and ICT.

The objective of the research is to produce integrated science book which facilitated by website to help teacher to conduct science teaching learning process in international standardized school.

METHOD

Research and Development (R & D) from Borg and Gall (1998) was employed as a method of the reaseach. The research started by KTSP and Cambridge curriculum analysis to identify the topics that should be given in the book. The topics covers concep of biology, physics and chemistry. The reseach will be ended by experimental method to test and validate the efectiveness of the book.

RESULT AND DISCUSSION

The research begins by constructing e-book which completed with audio visual aids. The program used in the e-book is flash program to perform pictures and animation with sound. The construction of the book involved six International Program on Science Education students from Faculty of Mathematics and Science Education, Indonesia University of Education who are in the sixth semester. The research also involved one student of Computer Science program as a flash instructor program.

The first step of the research was the analysis of Standard competency and basic competency from Government Regulation Number 22 Year 2006 to identify competency standard in physics, biology and chemistry which are be able to be integrated topics. Literature study to physic, biology and chemistry books was carried out to have an overview of the concepts. The deepness of the concept in book refers to basic competency stated in the Government Regulation Number 22 Year 2006.

The second step of the research was select students who will be get involved in developing the book. Students are given opportunity to freely choose the title for the topic that will be used in each chapter of the book. The themes of the topics are: Wave and Sound; Environment maintenance; Acid, Base and salt. After student determine the title or theme for their topic, they develop the content for their topic and got involved in the flash program training given by student from computer science.

The final step of book construction was to test the usability of the book. The test was carried out in one bilingual school. Based on test, it is resulted that 80 % students respond positively to the book. They said that the book constructed is interesting and meet the criteria to be used as a source of science learning. The language used in book is easy to be understood, by using English the book foster them to be more eager to learn English. The picture and animation make students more understand to the concepts and the font letter use is appropriate.

More than 80% students agreed to say that the book is creative and increase their motivation to learn more about science. The deepness content of the concept was also appropriate for junior high school students. As many as 70% students said that the theme provided in book help them to be more understand of science as an integrated knowledge that interconnected each other. The content was also valued as contextual and related to the real life. In general students agreed that the book help them to understand science.

Based on the type, the e-book developed in this research is hypermedia data based e-book which was constructed by programmer.

The e-book formatted in flash program in a form of CD so that it easily carried out and used outside of the class. The e-book has some interesting features as it can interact with students. The types of interactions are: dragging mouse to open the pages, open the video and animation, and type summary or comment by using keyboard that can be saved in the pages.

Other that those features, the e-book developed is also completed with database system that can record student activity while they use the e-book. *Camtasia Studio 6*. *E-book* was employ in recording students activity aiming at facilitating students learning based on their speed learning. This become important for the e-book to have such kind of facility as the e-book contain of interactive media so that every student has different speed of their learning. Munadi (2008) argues that interactive media can be used in teaching process to improve student learning result.

Information in the e-book will be gained if student interact with the e-book. The component of the e-book such as concept in a form of text, video, animation, test, game and pictures are performed to help student to be able to understand abstract concept and to simplify complex concept. Therefore it is easier for student to understand the concept.

Some research carried out related with using e-book resulted that using e-book as a learning source has some advantage such as creating good environment for learning which in line with constructivism philosophy (Nugraha, 2010; Permana 2010). Research carried by Francisca (2009) resulted that using E-book in instruction process improving students' result of their study. The reason behind these results is because pictures, animation, video, sound, game and interaction test give student feedback for their own learning. Based on this argument it can be concluded that e-book can be used as optimum as possible with the teachers' supervision in the teaching process.

Widodo (2004) argue that there are five characteristics of constructivism learning environment, they are: (1) facility that supports learning process for students. Good facility should encourage students to be more actively get involved in constructing their knowledge so they have broad view of their own knowledge, (2) relevancy and meaningful learning experience. Student can develop their learning through discussion, experiment and testing their ideas, (3) social interaction. Students are given opportunity to negotiate with their friends and teacher actively when they communicate to each other or to the teacher, (4) motivation and encourage spirit. Students are encourage to be self learner who responsible for their own learning.

Referred to Widodo (2004) argument, it can be said that e-book facilitate learning in line with constructivism philosophy. E-book that facilitated with multimedia support students to be more engage by their own learning as the student can be actively seek more information as it provides web link that suitable with the concept they learnt. Student also can practices their own experiment and test their idea with the games and experiments provided in the e-book. The e-book also provides opportunity for students to share with other student with teachers' help. Teacher can give instruction for students to share the knowledge that they get from the e-book. Finally, the e-book with has multimedia aspect can help student to be self learners, as it provides media to simplify the concept that can make student easier to understand the concept they learnt.

CONCLUSION

Based on the result of trial use of the e-book, it can be conclude that the e-book developed can be used science learning source at International Standardized Schools. Students respond positively to the e-book of as it contain interesting pictures, animation, interactive games and test. The integrated science provided in the developed e-book make student to be more understand science as an integrated concept among physic, biology and chemistry. The use of English in the e-book encourages them to be eager to learn English.

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