

**INTERACTIVE STORYBOOK USING CONSTRUCTIVISM THEORY – *ALAM
SAINSKU***

NORAZUA BT ZULKEFLI

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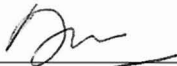
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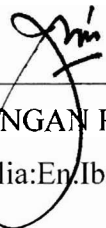
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(TANDATANGAN PENULIS)
Alamat tetap: 929, KM4, Jln Jelevu,
Ampangan, 7400, Seremban,
N.Sembilan

Tarikh: 23/06/08



(TANDATANGAN PENYELIA)
Nama Penyelia: En. Ibrahim Bin Ahmad

Tarikh: 23/06/08

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I hereby declare that this project report entitled
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is written by me and is my own effort and that no part has been plagiarized
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SUPERVISOR:  _____ Date: 23/06/08
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DEDICATION

To my beloved parent En. Zulkefli Bin Sharif and Pn. Hasnah Bt Soib,
my sisters and brother,
my project supervisor, En. Ibrahim Bin Ahmad,
Thank you so much.

ACKNOWLEDGEMENTS

I would like to thank En. Ibrahim Bin Ahmad for being my PSM supervisor. His advice, insightful criticisms and patient encouragement aided my PSM and report writing successfully.

I would also like to thank to my beloved parents and family who have been giving me support and inspiration throughout my project.

Finally to all my friends who help me to complete this project.

ABSTRACT

This project main objective is to develop a courseware for children's reading and learning activity using constructive learning theory. The target users of this application are the children between 6 to 10 years old and the teacher or parent. The current method of reading storybook is still paper-based and some are web-based. The application proposed is interactive science storybooks where user able to read and learn through the CD-ROM and can be accessed free from time and place constraint. The learning content can serve as a storyteller that enables the user to know about basic science. The modules are concluding the reading section, quizzes, games, songs, and parent's information. The main reason to develop this courseware is to get the children attraction in reading and learning process. This project is full with interesting, attractive, interactive module that can help the children to learn the basic concept of science and hoped that this project will bring benefits to the user. For this project, the methodology used is the ADDIE instructional design model. ADDIE is an acronym referring to the major processes which are: Analysis, Design, Development, Implementation, and Evaluation. The research has been conducted at *Tadika Kasih Sayang, Bukit Beruang Melaka*.with 20 respondents involved.

ABSTRAK

Matlamat utama projek ini adalah untuk membangunkan satu perisian untuk kanak-kanak membaca dan belajar menggunakan teori pembelajaran konstruktif. Sasaran pengguna bagi projek ini adalah kanak-kanak dalam lingkungan umur 6 ke 10 tahun serta ibu bapa dan guru. Kaedah yang sedia ada digunakan untuk penyampaian maklumat tentang subjek sains adalah menggunakan buku rujukan atau melalui laman web. Aplikasi yang dicadangkan adalah buku cerita sains interaktif di mana pengguna boleh membaca dan belajar terus dari CD-ROM dan boleh diakses bebas daripada kekangan masa dan tempat. Aplikasi ini berperanan sebagai pencerita yang membolehkan kanak-kanak memahami konsep sains yang asas dengan mudah. Modul-modul yang terdapat dalam aplikasi ini adalah seksyen bacaan, kuiz, permainan, lagu-lagu, dan maklumat ibu bapa. Sebab utama untuk membangunkan perisian ini adalah untuk mendapatkan menarik minat kanak-kanak dalam bacaan dan pembelajaran. Projek ini mengandungi modul yang menarik dan interaktif yang boleh membantu kanak-kanak mempelajari konsep asas sains dan diharap projek ini akan membawa faedah kepada pengguna. Kaedah model rekabentuk ADDIE telah digunakan dalam projek ini. ADDIE adalah akronim kepada proses-proses major yang terdiri daripada: Analisis, Rekabentuk, Pembangunan, Pelaksanaan, dan Penilaian. Seramai 20 orang responden telah terlibat di dalam kajian yang telah dijalankan di Tadika Kasih Sayang, Bukit Beruang Melaka.

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LIST OF ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
MB	Megabytes
GB	Gigabytes
MHz	Megahertz
KPM	Kementerian Pelajaran Malaysia
MSC	Multimedia Super Corridor
CD	Compact Disk
ADDIE	Analysis, Design, Development, Implementation, Evaluation

CHAPTER 1

INTRODUCTION

1.1.1 Project background

The growing and improvement of technology was affected in every part of life. The expanded of information technology and computer usage has brought big impact to human's life including educational field. Its can help teachers and students in teaching and learning process with more interesting and interactive. Technology aspect has been combined in curriculum as an initiative to gain positive attitude to rapid growing of technology. A significant changes need to be done by the teachers in handling classroom's teaching and learning (Ismail, 1996). Learning culture should to be change from something memory-based to knowledgeable, thinkable, creative, and caring using latest technology (KPM, 1997). Computer based learning can make the learning more meaningful and improve student's achievement according to Smith and Furst (1993) to the positive attitude to the computer usage in student. Computer technology can be use as an alternative to teaching technique and it needs the creative and innovative approaches. Based on Yusuf Hashim and Razmah Man (1999) one of approach's changes is teaching based on technology.

In educational field, information technology can be use to collecting, saving, processing, and conveying information quickly and correctly like Internet, or multimedia or hypermedia in teaching and learning process. The use of computer technology in teaching and learning process is not to replace the function of teacher but to create an interesting, effective, and meaningful teaching and learning atmosphere to student. Teaching and learning style in 21st century still based on

student but the teacher play the most important role to let student actively involve in learning activities.

Teaching and learning based on computer had grown since forty years ago and the latest innovation is multimedia field (Halimah, 1999). Multimedia technology has expended the usage of computer from information processing tools to teaching tools. According to Halimah (1999) multimedia technology has ability in delivering text, video, sound, animation and high resolution graphic. An information delivery effect created by combination of images, texts, and sounds has shown the significance everlasting compared to listened or read (Wilkinson, 1980). Combination of these elements will create an interesting presentation and make the information conveying more meaningful. Based on Smellie *et al.* (1997) teaching media that using multimedia technology are able to get the student's attention, get the idea, and gain the complex information and help to prevent lack of time, size and space. Computer-based teaching media that has interactive or linear movement can able the user to access the information from one segment to another without following the flow.

This project will be using the constructive learning techniques. Constructivist learning theory predicts that knowledge encoded from data by learners themselves will be more flexible, transferable, and useful than knowledge encoded for them by experts and transmitted to them by an instructor or other delivery agent. If this prediction is correct, then learners should be modeled as scientists and use the reasoning and technologies of scientists to construct their own knowledge. However, it cannot be taken for granted that the prediction is correct or correct in every knowledge domain. By representing information spatially and with images, students are able to focus on meaning, reorganize and group similar ideas easily, and make better use of their visual memory. It will use plenty attractive color and moving objects in all the interfaces and pages. Actively involve from student will make the learning process easier and impressive. The usage of computer-based teaching will improve with the presence of *Sekolah Bestari* which is one of seven Multimedia Super Corridor (MSC) applications.

The purpose of this research is to build learning content for children user. The application proposed is interactive science storybooks. The learning content can serve as a storyteller that enables the user to know about basic science. The modules are concluding the reading section, quizzes, games, songs, and parent's information. The main reason to develop this courseware is to get the children attraction in reading and learning process. This project is full with interesting, attractive, interactive module that can help the children to learn the basic concept of science. Interactive storytelling never been developed in computer-based-learning before by any other person and hoped that this project will bring benefits to the user.

1.2 Problem statement

Computer is a very potentially tool to make ease of daily works. In educational field, computer doest not only able in helping office management work but it can be a media that help in teaching and learning. As a teaching media, computer can be use in dialog, checking student's answer, repeat teaching source and can be extend to higher level.

First, the current sciences books that our country are using now are printed and some are digital but being restricted to internet connection. Sometimes the sciences concept is very hard to understand or read because some children find it very difficult for them to understand it. Computer based teaching media can produced an effective learning. Audio and graphic effects are the most important aspect in computer-based learning process. According to Reindhart (1995), combination of viewing and listening sense in a multimedia teaching media able to improve 50 percents of memory. Less of audio and graphic effect in learning will take student's time to understand.

Printed storybooks also have limitation that's make it unable to provide and deliver the sufficient information to the children. Another problem is the children always misplace their books. The e-storybooks will be more interesting but it is hard for children to use the internet and to explore the website. The main reason to make the science book to a interactive storytelling is because the children will be attract

with the animation and they can interact with this program such as answering the question and playing the games.

Teaching science to small kids is very difficult because they hard to understand the science terms and cannot imagine what is actually happen. By representing information spatially and with images, students are able to focus on meaning, reorganize and group similar ideas easily, and make better use of their visual memory. It will use plenty attractive color and moving objects in all the interfaces and pages. The fact will be transform to story line with animation so that they can understand and remember the science fact based on the story.

Majority science book used high level of *Bahasa Melayu* that hard to children to understand. They have to find dictionary to translate or to understand the terms. This courseware will be use simple language so that the children can understand the concept easier.

1.3 Objectives

Objectives of this project are:

1. To investigate the education method suitable to be used in a courseware.
2. To develop a specific courseware for children's reading and learning activity using constructive learning theory.
3. To apply multimedia and interactive elements such as audio, sound, and graphics to the project.

1.4 Scope

The application is aim to serve as a storyteller that enable the user to know about basic science. The main target users of this project are the autism children ages between 6 to 10 years old and the content expert which is the teacher or parent. The

language option for the application will be in *Bahasa Melayu* to let the children understand the science concept.

The scope of this project is to develop a reading and learning application using computer. Computer is the most common device technology in the world now. It has become the most important gadget to human and we can say every single house and school should have computer. This project will be publish in CD platform and can be operate in computer.

The contents of the project are based on the series of storybooks that based on basic and simple nature science. It contains of collection of three basic science series for kids. The application also has a few modules which are quizzes, simple games and science information. The kids can choose either to read by their own or the program will reads the story for them. The quizzes are based on each story in the project. Parents or teachers also will be given with some information about science element in each story.

1.5 Project significance

The target users for this application, which is the children, will benefit the most from this application. This application will make them more understand the topics about science because they will answer the quizzes based on their knowledge of each story. For example, the children can replay the story back if they not able to answer the question. This can help them more understand because the story will be contains some animation.

By having the interactive storybook in CD based, can also reduces the risk of losing their storybooks. When the children found out the interesting of science, it will attract them to learn more about it and this can produce more intelligent and genius people in Malaysia.

1.6 Expected output

The expected output of this project is a collection of storybooks which can be operated using computer. The application should provide the series of storybooks with simple animation. User should be able to answer the question given based on the stories and also can play games that related to the stories. This project also provides information for the use of parents or teachers.

1.7 Conclusion

The application is doing a research on and build is for children user. The application is interactive science storybooks. The current storybooks that are using now are printed and some are digital but being restricted to internet connection. The target users of this application are the children between 6 to 10 years old. The main objective of this project are to develop a specific courseware for children's reading and learning activity, to see the achievement from impressive of the courseware and to get attraction of the children who have problem in reading and learning via computer. The next activities to be developed are to prepare a Gantt chart so that the progress of the project can proceed smoothly and according to schedule. A research will be conducted to existing activities and storybooks so that it can be determine whether this new application is better or not.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Literature review is a comprehensive survey of publications in a specific field of study or relates with research done to get more understanding about the project. In this section all fact findings related with any keyword of this project will be stated and explained clearly. Besides review on existing e-learning, this application helps in understanding the flow and process involved. Literature review includes study and research of published materials like journals, thesis, case studies, technical documents and online library. Generally, the purpose of review is to analyze critically a segment of a published body of knowledge through summary, classification and comparison of prior Research studies, reviews of literature, and theoretical articles. Project Methodology describes a set of practices that will be carried out iteratively to produce the application. The ADDIE Instructional Design Model – a systematic approach will be a valuable, tool in planning for the effective delivery of this project.

2.2 Domains

The domain of this research is the use of computer as an educational medium. Relationship between Constructivism Learning Theory and to this application will be study. The potential of computer to provide information and help in teaching and learning process also will be explored.

2.2.1 Introduction

Computer based teaching that involved multimedia technology are getting popular in this country. This technology becomes interesting because it give different impact in presentation process rather than other style. In the future multimedia technology will change the teaching and learning style. Computer based teaching and learning process will become more effective with existing of multimedia technology because the teachers can various their teaching technique. Multimedia technology now has been accept as teaching aided tools that suitable for helping teachers in new era of education.

In early of computer based teaching's development, users were not able to control the learning process. The presentation process was in linear and the flow of teaching module was customized. Teaching module has been stated since the early growth of learning process.

Learning process can be interactively using multimedia technique. Student can interact with teaching media without existing of their teacher. Combination of multimedia element with certain specific software will produce a better courseware than the one that has been developed using traditional authoring system.

Referring to Brown et al. (1994) multimedia based learning' application able to give many real examples to the student using combination of text, music, image, video and animation. According to Merrill (1992) the development of multimedia

courseware for authoring and learning has become easier to modify and apply for individual used., This makes the courseware very suitable to be use as a self learning tool.

2.2.2 Constructivism Learning Theory

Constructivism is a theory of learning based on the idea that knowledge is constructed by the knower based on mental activity. Learners are considered to be active organisms seeking meaning. Constructions of meaning may initially bear little relationship to reality as in the naive theories of children, but will become increasing more complex, differentiated and realistic as time goes on.

It is impossible to discuss constructivism without contrasting it with its opposite, objectivism. Bednar, Cunningham, Duffy and Perry (1991) state the philosophy of objectivism as follows:

Objectivism is a view of the nature of knowledge and what it means to know something. In this view, the mind is an instantiation of a computer, manipulating symbols in the same way....These symbols acquire meaning when an external and independent reality is "mapped" onto them in our interactions in the world. Knowledge, therefore is some entity existing independent of the mind of individuals, and is transferred "inside". Cognition is the rule-based manipulation of these symbols...this school of thought believes that the external world is mind independent (i.e., the same for everyone) and we can say things about it that are objectively, absolutely and unconditionally true or false....Consistent with this view of knowledge, the goal of instruction, from both the behavioral and cognitive information processing perspectives, is to communicate or transfer knowledge to learners in the most efficient, effective manner possible. Knowledge can be completely characterized using the techniques of semantic analysis (or its second cousin, task analysis). One key to efficiency and effectiveness is simplification and regularization: thought is atomistic in that it can be completely broken down into simple building blocks, which form the basis of instruction.

Referring to Jonassen (1991) constructivism, founded on Kantian beliefs, claims that reality is constructed by the knower based upon mental activity. Humans are perceivers and interpreters who construct their own reality through engaging in those mental activities...thinking is grounded in perception of physical and social experiences, which can only be comprehended by the mind. What the mind produces are mental models that explain to the knower what he or she has perceived.... We all conceive of the external reality somewhat differently, based on our unique set of experiences with the world and our beliefs about them.

Bednar, *et al* (1991) elaborate further:

...the learner is building an internal representation of knowledge, a personal interpretation of experience. This representation is constantly open to change, its structure and linkages forming the foundation to which other knowledge structures are appended. Learning is an active process in which meaning is developed on the basis of experience....Conceptual growth comes from the sharing of multiple perspectives and simultaneous changing of our internal representations in response to those perspectives as well as through cumulative experience.

Consistent with this view of knowledge, learning must be situated in a rich context, reflective of real world contexts, for this constructive process to occur and transfer to environments beyond the school.

2.2.3 E-learning

According to Matt Comerchero, e-learning is a means of education that incorporates self-motivation, communication, efficiency, and technology. Because there is limited social interaction, students must keep themselves motivated. The isolation intrinsic to e-learning requires students to communicate with each other and the instructor frequently to accomplish their assigned tasks. E-learning is efficient as it eliminates distances and subsequent commutes. Distance is eliminated because the

e-learning content is designed with media that can be accessed from properly equipped computer terminals, and other means of Internet accessible technology. E-learning is a flexible term used to describing a means of teaching through technology.

The different types of e-learning are based on:

- Means of communication
- Schedule
- E-learning class structure
- Technologies used

a) Means of Communication

There are several different means for individuals to communicate with each other and their instructor. E-learning can be conducted solely through on-line applications. In other cases, if distance is not a factor, some face-to-face communication can be included to create *blended e-learning*. Blended e-learning includes elements of web interaction and in-person interaction. Technology broadens the definition of *face-to-face* as there can be the use of two way video, and two way audio. Introducing these elements of participation create a blended e-learning experience.

b) Schedule

E-learning can either be Synchronous or Asynchronous. Synchronous means that real-time communication is implemented, such as video conferencing, teleconferencing, and on-line chat programs. Asynchronous indicates that other means of communication are utilized that do not require real time responses. Examples of asynchronous e-learning include; e-mail, list serves, threaded discussions, blogs, and on-line forums.