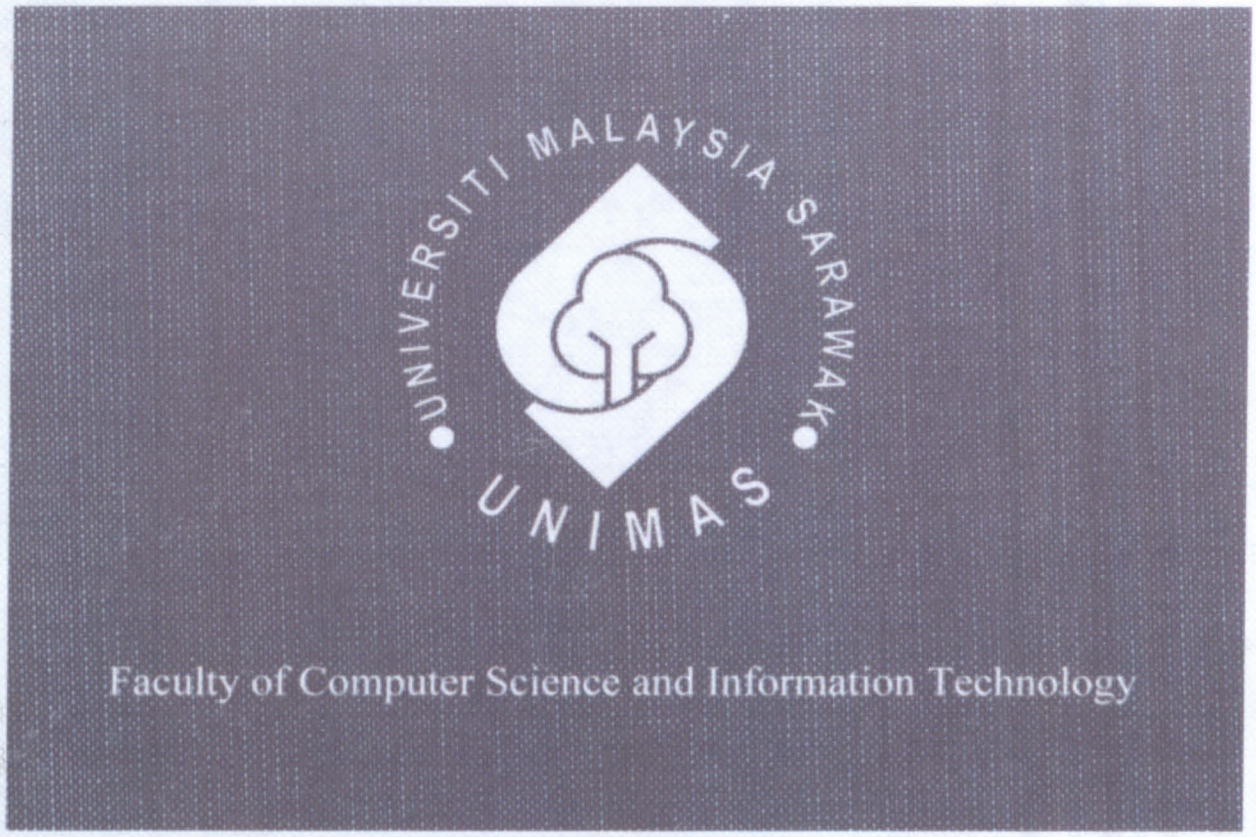

RIMBA ILMU EXTENSION - RIMBA ILMU COLLABORATIVE LEARNING AUTHORING TOOL (RICLAT)

Lim Zi Xuan

Bachelor of Computer Science with Honours
(Software Engineering)
2014

RIMBA ILMU EXTENSIC)LLABORATIVE LEARNING AU CLAT)

LIM ZI XUAN

This project is submitted in partial fulfilment of the requirements for the degree of

Bachelor of Computer Science with Honours (Software Engineering)

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UNIVERSITI MALAYSIA SARAWAK

2014

LANJUTAN RIMBA ILMU- ALAT PEMBELAJARAN KOPERASI PENGARANGAN RIMBA ILMU (RICLAT)

LIM ZI XUAN

Projek ini merupakan salah satu keperluan untuk Ijazah Sarjana Muda Sains Komputer dengan Kepujian (Kejuruteraan Perisiaan)

Fakulti Komputer Sains dan Teknologi Maklumat

UNIVERSITI MALAYSIA SARAWAK

2014

DECLARATION

I hereby declare that the thesis is based on my original work except for quotation and citations which have been duly acknowledge. I also declare that no portion of the work referred to in this report has been submitted in support of an application for another degree at Universiti Malaysia Sarawak (UNIMAS) or qualification of this or any other university or other institution of higher learning.

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Lim Zi Xuan

25/6/2014

.....

(Date Submitted)

UNIVERSITI MALAYSIA SARAWAK

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ABSTRACT

Educator had face a brunch of challenges in educating the students. Student paying less attention during the lecture is one of the main challenge educator faced. Rimba Ilmu is one of the Single Display Groupware (SDG) which enable the collaborative activity with multiple device input. However, some limitations of Rimba Ilmu are there is a lacking of feature to enable teachers to create teaching material and also collaborative activities with self-designed content. An authoring tools is necessary to achieve collaborative activities creation. The objective for this system development is to design and develop an authoring tool that allows teachers to create classroom content and collaborative activities. This system is implemented with several module which are presentation work module, slide module, and media component module. These modules enable the creation of presentation work which includes slides with media component such as audio, image, and text. Besides, the creation of collaborative activity is available in this system together with creation of questions and answers. Total of five mouse inputs are available in the collaborative activity generated by this system and it is performs in presentation mode of this system. The system test for this system shows that this system had met the requirement. Most of the teachers are able to create presentation work with collaborative activities and satisfy with this system. However, this system requires future enhancement for better user experience and greater interaction style templates.

ABSTRAK

Pendidik kini menghadapi cabaran dalam mendidiki pelajar. Salah satu cabaran utama yang dihadapi kini ialah kekurang perihatian pelajar dalam kelas. Rimba Ilmu ialah salah satu perisian yang membolehkan activiti kerjakamaan dengan berbilang peranti. Walau bagaimanapun, guru-guru tidak dapat memciptakan aktiviti-aktiviti kerjasama bersama isi kandungan mengikuti syllabus kini. Sistem yang dapat mencipta aktiviti kerjasamaan adalah diperlukan. Objecktif bagi pembangunan sistem ini adalah untuk membinakan satu sistem yang membolehkan penciptaan aktiviti kerjasamaan. Sistem ini dibangunkan dengan modul kerja pembentangan, modul slaid, dan modul komponen media. Modul-modul tersebut berfungsi untuk mencipta kerja pembentangan dengan slaid yang mengandungi muzik, imej, dan teks. Selain itu, penciptaan aktivit kerjasamaan bersama penciptaan soalan dan jawapan juga didapati dalam sistem ini. Ujian system tersebut menunjukkan bahawa sistem ini menemui keperluan yang dimukai. Kebanyakan guru yang terlibat dalam ujuan sistem dapat menciptakan kerja persembahan dengan aktiviti kerjasamaan dan berpuas hati dengan sistem ini. Walau bagaimanapun, sistem ini memerlui perubahan demi pengalaman pengguna dan gaya interaksi yang lebih baik.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Education is one of the way in order to pass the knowledge gathered from ancestor to the younger generation. However, educator had face a brunch of challenges in educating the students. Student paying less attention during the lecture is one of the main challenge educator faced. As the technology evolve, various possible ways to improve students' learning capability are studied. Computer Aided Learning (CAL) is one of the teaching method which use computer as the lecture medium to teach subjects. It is proven that CAL application is able to improve children's learning ability such as reading, spelling, and written work other (Premji, 2004). Collaborative learning is another learning method which involved groups of students or children. According to Barbara Leigh Smith and Jean T. MacGregory (1992), "Collaborative learning" involves joint intellectual effort by students, or students and teachers together, in other word, a group of students and teachers study a subject and share their knowledge or understanding in group (Authoring tool, 2014). During collaborative learning session, teachers should encourage student to share their views and opinion toward particular subject. Teachers able to monitor the learning process by guiding students or correct the students' understanding which may be wrong for particular subject.

Single display groupware (SDG) is one of the technology for collaborative learning which allows multiple device input to interact within single screen and it is a cost effective solution especially for constrained area. Rimba Ilmu was developed in Faculty of Computer Science and Information Technology, UNIMAS as part of the research project to explore the shared single display technology in constrained environment. Rimba Ilmu is designed and developed for Malaysia's primary year students and was developed to improve student's

learning capability in Bahasa Melayu. Rimba Ilmu involves simple class management which allows teachers to perform basic class operation such as add new student and modify class name, games involve various type of interaction style allows students to have collaborative activities, and also student learning progress tracking. Observational data has shown that Rimba Ilmu is able to stimulate collaboration between different genders; an engaging technology among students; a tool for group and individual assessment; a tool to facilitate leadership skills; fun to play with; allows ease of lab management and control; enabling novices to learn computers; promoting membership in collaboration learning and finally provide environment for task accomplishment with minimum teacher intervention.

However, some limitations of Rimba Ilmu are there is a lacking of feature to enable teachers to create teaching material and also collaborative activities with self-designed content. These features are important as it is a common practice for teacher to design and control of the instructional design. As a result, an authoring tools is needed in order to achieve this requirements.

1.2 Problem Statement

An authoring tool for Rimba Ilmu is needed to enable the creation of teaching material with collaborative activity. The creation of collaborative activity should include the preparation of question bank and answer bank. Without these features, teachers are unable to create the classroom content via Rimba Ilmu as the program does not support content authoring. Educators needs a flexible authoring tool which allow them to import necessary teaching material including photo and question. Thus, these content element able to embedded to the collaborative activities.

1.3 Objective

- To design and develop an authoring tool that allows teachers to create classroom content and collaborative activities.
- To design and develop various collaborative interaction style.

1.4 Scope

The authoring tool, RICLAT is able to import audio and image file. However, it support only audio with file type .mp3, image with file type of .png and .jpg. Besides, RICLAT allow text insertion but the font selection are not available. RICLAT is working well in Windows 7 Home Premium and above and not supporting Window XP or below.

1.5 Methodology

The OO (Object-Oriented) model will apply to this project. OO model included total of five phases, that is, requirement analysis, design, development, testing, and deployment. Each phase's activity will be further explain under this section.

Phase 1: Requirement analysis

Problem understanding is a must in this phase. Interview with clients will be perform in order to gather the problem statement. After that, the gathered statement will be analyse to obtain the goals and requirements. The collaborative games, Rimba Ilmu, which developed by ISITI has been tested by current and future educators in Institut Pendidikan Guru Batu Lintang, Kota Samarahan (IPG). Thus, the game is presented to public during Research and Development (R&D) Exhibition and Learning Science Exhibition. Most of the testers give a positive feedback toward interaction style and its' potential to provide an active learning environment. However, the content was not suitable and simple User Interface (UI) with clear

instruction shall be provided. Exploration of various similar system will be perform and comparison between the similar systems will be made to acquire the strengths of every reference system. Currently the existing collaborative learning authoring tools in market are Microsoft Mouse Mischief and Cloze. Both of the authoring tools sharing some similarity, that is, simple interface, slideshow preview, task-oriented, and media insertion function available. However, both of them provide only interaction style of Click and Drag. Therefore, some interaction styles will be designed and insert into Rimba Ilmu Collaborative Learning Authoring Tool (RICLAT) as the interaction template to enhance the participation of students.

Phase 2: Design

The architecture design of the system shall be done during this phase. During the design process, the gathered requirements must be included in the architecture design. Thus, the necessary functionality, in other word, non-functional requirements should be consider and included into the system architecture design. The user interface design is one of the activities within design phase and it should meet both the functional requirements and non-functional requirement. The design of system flow should be done in order to provide the clear vision of how the system works and the expected output of system. Activity diagram which involve various possible activity in authoring tool will be created as the output of system flow design.

Phase 3: Development

This project will be developed using the Microsoft XNA Game Studio 4.0 under .NET Framework 4.0. C# programming language is selected as the middleware to develop the authoring tool. The application programming interface (API) within the open sources includes the mouse devices information and mouse devices events which enable the implementation of various interactions. For graphical user interface (GUI), Microsoft XNA Game Studio 4.0 do

provide simple API which allow the programmer to draw an image easily into a window. Some element from Window Presentation Form (WPF) will be used in Microsoft XNA window as well to have a simple user interface.

Phase 4: Testing

Testing phase shall start after the development of authoring tool is done. There are two main part to test for this project: interaction and usability. Interaction part include the testing for interaction template and the communication between educators and students. Interaction template should be tested by educators and student to obtain the feedback from them. The feedback include the opinion toward interaction style, improvement available and other interaction style suggestion. The communication between educators and students is also important to check whether the collaborative activity created by authoring tool improves the activeness of learning environment. Usability part includes the frequency of educator to use it as the teaching tool and the comfort level of users toward UI.

Phase 5: Deployment

Before the installation of the project, several number of mouse device shall prepared. Thus, the computer should have more than five Universal Serial Bus (USB) ports. As the installation is done, XNA and other necessary API will be installed into users' computer and an executable file will be created. Necessary documents such as installation guideline and user manual shall include in folder for user guideline and handover to users.

1.6 Significant of Project

This project allows educators to have their own unique teaching style by implement self-design collaborative activity. Various interaction template will helps the educators with low computer proficiency to improve their slides. Within single display, the educators able to involve more than two students into the activity by assigning each student a mouse.

1.7 Outline of Project Report

Chapter 1: Introduction

Chapter 1 introduce the project including introduction of Authoring Tools, collaborative learning, and single display groupware. Thus, the problem statement referring to proposed system, scope and limitation of implementing project, methodology used, and significant of project will be written in this chapter.

Chapter 2: Literature Review

This chapter will record the revision of three existing authoring tools. These tools will be analyse and compare among each other in terms of user interface, interaction style available, feature and functionality. The strength and weakness of each tool will be listed down and form a table.

Chapter 3: Analysis and Design

In this chapter, the analysis and design of system is included. User requirement data are stated in analysis part and designed based on it. The design included the system flow design, class design, and architecture design.

Chapter 4: Implementation and Evaluation

Chapter 4 describe the implementation of system thus the testing and evaluation processes. The testing result and evaluation will be discuss in this chapter.

Chapter 5: Conclusion and Further Work

The summary and discussion are included in the final chapter. Future enhancement will be discuss in detail and list down while conclusion of this project will make in this chapter.

1.8 Expected Outcome

A system similar with Microsoft Office PowerPoint will be release. Educators are able to create teaching material as well as collaborative activity through the system. Users able to add in graphics, text, media, and activity within the slide and many slides can be create within one presentation. Slideshow functionality will be implemented and users are able to view the overall slideshow preview at the left side of interface. Within a collaborative activity slide, users are able to select the interaction style such as turn taking and regional quiz competition for students' participation improvement. Thus, users are able to add questions and answers into collaborative activity slide.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents an introduction of Rimba Ilmu, a research grant project in Faculty of CS and IT and the review of several existing authoring tool which are Microsoft Mouse Mischief, Cloze, and REDEEM's authoring tool. Section 2.2 presents the review of existing authoring tools which mentioned above in detail. This is followed by the discussion on overall literature review of all three mentioned system. After review of existing authoring tool, conclusion and comparison of existing authoring tools is made.

Rimba Ilmu, a SDG, shared single technology that is developed to support multiple input of mouse and keyboard simultaneously. Currently Rimba Ilmu supports up to maximum of four players within a collaborative activities and there are total of nine types of activity available within the SDG. The activities are: *Role playing, Quiz, Swap, Taking Out, Hurry, Merge, Turn Taking, Regional,* and *Self-Learning.* All of these activities is implemented with unique interaction. As Rimba Ilmu executed, a class selection screen is display. Teachers can perform basic operation of class management such as add new class, edit class name, and delete class or select a class to perform collaborative learning. This thesis presents an authoring tool which is an extension of Rimba Ilmu which support collaborative learning activity creation.

Authoring tool is a program which is pre-programmed for a non-developer to develop an interactive multimedia software. According to *webopedia.com*, authoring tools or *authorware* is a program which enable the users to write hypertext or multimedia application. Harris states that authoring tool goes beyond from specialized form of word-processing software which enable trainer to integrate an array of media to create professional, engaging, interactive training content (Harris, 2002).

According to Khuloud M. A, authoring tool can be classified based on its purpose, complexity, and fee. Some authoring tools is designed to concentrate to creating courses while some other having other functionalities and this called the categorization of authoring tools' purpose. Complexity indicate the level of computer skills that are required for a user to use the authoring tool. A simple authoring tool supports functionalities like drag and drop and wizard. While the advance authoring tool requires programming capabilities to build a course material along with technical competency (Al-shawkani, 2010).

Figure 2. 1 : Rimba Ilmu Main Page.

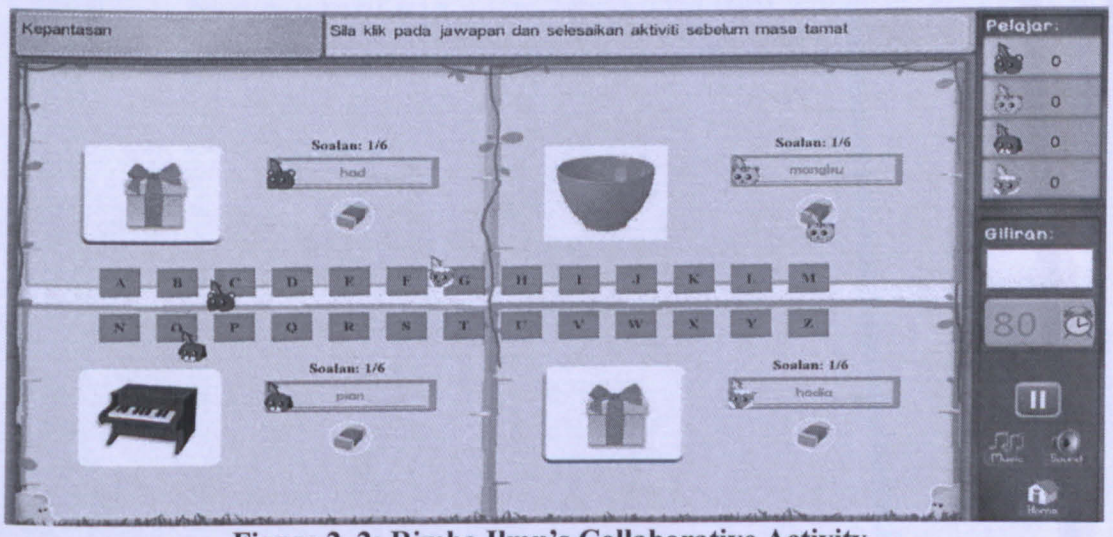

Figure 2. 2: Rimba Ilmu's Collaborative Activity.