

# Chapter 1

## Introduction

### 1.1 Research Background

E-Learning is a system that represents the Open Courseware system to maintain the course materials and videos at Universitas Pendidikan Indonesia which is located in Bandung City. The students from Universitas Pendidikan Indonesia spent a lot of time on the Internet to find the course materials or sometimes teacher sends the materials, but the students who are willing to take a specific course of a semester cannot get a brief concept of the course on before starting the semester. Teachers need to provide lecture materials after a class, but sometimes they forget to send them and sometimes teachers are also busy so they send the files to students later on using e-mail or Whatsapp. But most of the time files are sent by using a flash disk. Teachers usually do not allow students to use a flash disk because of the spread of malware by flash disk. In this modern era, students need to access course materials anytime, anywhere in order to access in the age of lifelong learning. Finding a course material on the Internet nowadays is easy, but access to the materials is quite tough because of not open access to the materials. Most of the time they need registration for downloading files, but after they registrar, they come to know that they have to pay for the materials.

There is now a lot of online education systems on the Internet, but few are Single Page and Responsive. Nowadays students not only use computer or laptop but they also use small device e.g. mobile phone (Straker, Harris, Joosten, & Howie, 2018). When students visit those sites from Mobile Phone, they cannot see the big page on a mobile screen. The traditional web application on e-learning does not give the students a good browsing experience because the traditional system uses basic HTML design (Jadhav, Sawant, & Deshmukh, 2015). The primary aim of this system is to provide students with a better and more efficient way to obtain course materials and information along with other utility features. A single page and responsive web-based courseware system will be developed in this project for the Universitas Pendidikan Indonesia where students will be

allowed to access course materials uploaded by the teachers of the university so that students will find all in one. The primary purpose of this system is to permit students and teachers to easily access the coursework anytime and anywhere and communication with each other while using the system.

## **1.2 Research Objectives**

- a. To gather and analyze the requirements for OpenCourseWare systems and provide a medium for discussion and communication between students and teachers.
- b. To design a web-based OpenCourseWare application for learning resources, design and construct a database that supports the OpenCourseWare system and development of a web-based single page and responsive OpenCourseWare system for learning resources at Universitas Pendidikan Indonesia.
- c. To test the OpenCourseWare system from various testing aspect to produce a quality web application for Universitas Pendidikan Indonesia.

## **1.3 Problem Statement**

- a. What are the user requirements for OpenCourseWare web applications as a source of learning in web-based course materials at Universitas Pendidikan Indonesia?
- b. What are the characteristics of OpenCourseWare web applications as a source as learning course materials?
- c. What are the stages of developing OpenCourseWare web applications as a source of learning in web-based course materials at Universitas Pendidikan Indonesia?
- d. What are the results of the validation and feasibility test of the e-learning system as a source of learning in web-based course materials at Universitas Pendidikan Indonesia?

- e. What are the responses of students and teachers to the OpenCourseWare platform as a source of learning in web-based course materials at Universitas Pendidikan Indonesia?
- f. What are the results of responsive design testing of the e-learning system as a source of learning in web-based course materials at Universitas Pendidikan Indonesia?

#### 1.4 Research Benefits

The expected benefits of this research on the OpenCourseWare for learning resources in Universitas Pendidikan Indonesia are as follow:

- a. To produce an OpenCourseWare system for Universitas Pendidikan Indonesia course materials and other learning resources which can be used by university students in obtaining fast and dynamic information.
- b. To increase students' knowledge about ICT and the understanding level of the students.
- c. To provide information about courses so the student can get a brief idea about the courses before get enrolled.
- d. To help students in rewriting, viewing, and hearing the audio and video learning instruction if the students do not understand the subject for the first time.

#### 1.5 Related Works

Research has been carried out in various research fields on the design and development of the e-learning system in higher education. Some important studies and relevant to this research are given below:

**Design and development of ontology Based e-learning system for sports Domain** which is conducted by (S, 2014). E-learning in this work provides training activity for the sports Domain. This aims to provide the learning activity for various learners of the sports community from different sports domain such as

games and athletics. In this e-learning system, the instructor and the learner are the active Participants. The e-learning system takes either the asynchronous mode of training or the synchronous mode.

**E-learning: Virtual Classroom as an Added Learning Platform in Higher Learning Institutions of Rwanda** conducted by (Ruhinda, 2013). The aims of this research are to study the use of the Virtual classroom platform; this method of facilitating whiteboard updates will require some level of intelligence on the client side to process the received text in order to update the whiteboard appropriately. The virtual classroom framework that is proposed leverages on the security provided by an IP multimedia subsystem network as well as its ability to support simultaneous mode of communications (video, audio, text) through SIP. The delivery platforms are able to offer Quality of Service (QoS), Quality of Experience (QoE) and security.

**Development of Learning Management System (LMS) as an Effort in Increasing Learning Effectiveness and Learning Activities of Students at Sriwijaya University** (Sriyanti, 2014). The aim of this research was to develop LMS as an effort in increasing the learning effectiveness and learning activities of students at Sriwijaya University. The method used in this research was development research approach by applying a model proposed by Hanafin and Peck, with specific phases as analysis of necessities, design, development, and implementation. The subjects of this research were students in Physics Education Study Program at Sriwijaya University, Indonesia. Data collection techniques used in this research was questionnaire technique and observation. Researcher succeeded in developing LMS at Sriwijaya University.

**Development of an interactive e-learning management system ( e-LMS ) for Tanzanian secondary schools** (Kalinga, 2008). This researcher developed an interactive e-learning management system (e-LMS) to be used by Tanzanian secondary schools. Tanzania Secondary Schools e-learning (TanSSe-L) system is the name adopted for an interactive e-LMS developed. The research is aimed at

supporting teaching and learning functions by allowing for the creation and storage of learning materials, making them available, easily accessed and sharable by students from different secondary schools in Tanzania. It is a context-driven research work of knowledge production in a specific context for the application. Initially, the research work focused on two selected pilot schools; Kibaha Secondary School and Wali-ul-Asr Girls' Seminary in Kibaha town, Pwani region. Features of the TanSSe-L system represent the standard form of any secondary school registered by the Ministry

**Design & Development of Modular Learning Management Systems** (Selimi & Veliu, 2010). The aim of this research is to describe the project of LIBRI as a success story and transform its development pattern into a standardized methodology for other future in-house LMS developments. A number of interviews were conducted and later analyzed through the research framework in an attempt to better view the step by step procedures taken by the developers. We present a detailed process view of the analysis, design, development, implementation and evaluation phases by conjoining their similarities with theories that compose the original research framework. Lastly, the researcher was able to distinguish a clear pattern to serve as a guideline for future Modular LMS developments.

Most of the related work mentioned above describe various methods of development of Information system.

### **1.6 UPI E-learning system SPOT**

**SPOT** is an e-learning platform which is running under the Directorate of ICT, Universitas Pendidikan Indonesia where students can get logged in using NIM and password. In this system, the students can only see the courses which are offered and registered by the students for the current semester and students can access the course materials if available on the system. The course materials can be uploaded by the administrators and the teachers of the system.

The UPI e-learning system SPOT is basically designed and developed for big screen device e.g. laptop and desktop. It means the system is not responsive to the device browsing from. So the students who would like to browse the system from a mobile phone device cannot see the materials properly.

The UPI e-learning system SPOT is not a modern web application; it uses traditional web technologies. So it does not give the user comfortable browsing experience. As a result, the system is very slow and not appropriate for a mobile device.

The materials available on the system are not well organized. The students who would like to take a course, they want to see the previous lecture videos, assignments, lecture notes, course materials. But they could not see those on this system.

According to the head of SPOT section in ICT Directorate, Universitas Pendidikan Indonesia SPOT stands for SISTEM PEMBELAJARAN ONLINE TERPADU which has currently supported by many features such as Course Registration, Course Materials Uploading, Download Assignment, Discussion Forum, Learner Activity Record, Online Quiz and Course Grade. He said SPOT is not responsive so that SPOT authority trying buildup a mobile application for android mobile which under construction and they apply it as a pilot project in some faculty. The App will be used to identify students attendance along with some other features course list and discussion forum. Currently, the SPOT system is not connected to the UPI's SIAK (SIAK which stands for System Informasi Administrasi Kependudukan is an Information System used by UPI to maintain Kontrak Kuliah) system. So the data for the SPOT has been collected manually from the academic section of the UPI. But he also said that they are now developing API to connect with SIAK.

SPOT is a customised web application which is developed by customising Moodle software. Currently, SPOT storing the videos on Youtube but the link of the videos are stored on the UPI's own server.

The proposed system is a single page and responsive e-learning platform where students can get logged in using existing NIM and password. It allows small device besides a big screen device. So users can access the system more efficiently and it gives the users better browsing experience by loading the pages asynchronously. So it will look like a desktop application and the proposed e-learning system is more secure and faster because it uses modern technologies. It shares the lecture videos from Youtube, so it will not need a big amount of hosting space.

On the proposed system, the lectures are allowed to create courses, upload course materials and manage the course materials in a better way. Students can see the course materials in a single page and they are able to download the materials.

Finally, the proposed system efficient and comfortable for the user because of its responsive design and modern technologies. The proposed system is professional and very effective. It is very easy to modify and integrate with current UPI e-learning system.

## **1.7 Research Organization**

There are 5 chapters included in this thesis. **Chapter 1** contains an introduction, the background of the study, problem statement, objectives, benefits, and the research organization. **Chapter 2** is a theoretical background which contains an overview of e-learning, Web Technologies, Single Page Application and the component of the Web Application. **Chapter 3** is the research method which contains the flow of research from the applied research approach, the instruments used in the research, the stages of data collection and data analysis. **Chapter 4** discusses the results and the discussion about research findings from

the results of data analysis in accordance with the order of formulation of research problems and discusses the research findings to answer research questions that have been formulated. **Chapter 5** gives a conclusion, implications and recommendations. The results implications and recommendations are aimed at the next researcher who is interested in conducting further research.