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DESIGNING E-LEARNING SYSTEM FOR ASSISTING TEACHERS' PROFESSIONALISM IMPROVEMENT IN INDONESIA RURAL AREAS

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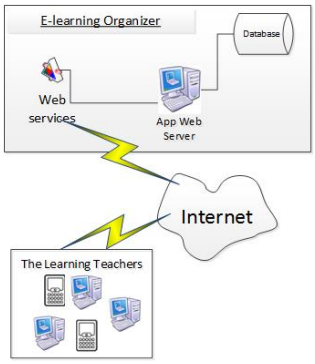

Abstract

Being a teacher is a noble profession that helping the nation to prepare its young generation to be high-skilled, competitive, and tough human resources. However, the number of competent teachers is still low in Indonesia, especially in rural area. Many teachers still do not fit the latest government regulation about the standard of teacher competency. Nonetheless, Indonesian government has encouraged teachers to improve their academic capacity and professionalism by providing money incentives for certified professional teachers. In this research, an e-learning system is developed in order to give solution to the problem and assist the improvement process of teachers' professionalism. The target users of this application development are mainly teachers in rural area who have limited access to information and resources on how to be a competent educator regarding government policies. This e-learning system harvests the benefits of available information technology tools in term of software and hardware. The research methodology consists of information gathering on the topic of e-learning, teacher and the nature of its competency, analyzing the information to design and develop a model of e-learning application for assisting the process of teachers' professionalism improvement, implementing the design into a prototype and testing the application.

Keywords: Online learning application; teachers professionalism development; information system; learning management system

1.0 INTRODUCTION

ASEAN Economic Community (AEC) is started at the end of 2015 and it means that there will be free movement of goods, services, investment, skilled labor, and freer flow of capital among the ASEAN countries [1]. As the effect of this agreement, Indonesia faces challenges to prepare the country's readiness economically, socially, politically, and in many other aspects. According to UNDP survey on Human Development Index in 2014, Indonesia is currently at the position of 108 out of 187 countries [2]. In this survey that puts education quality as one of the assessment components, Indonesia is still far behind the other ASEAN countries, namely Singapore (9), Brunei Darussalam (30), Malaysia (62), and Thailand (89). Reflecting on the survey results, Indonesia education quality improvement has to be one of the main focuses to better educate young generation for becoming formidable and competitive human resources. The notion of education quality improvement is closely linked to the quantity and quality of professional teachers. Teachers play important role in education system to deliver knowledge and values to students.

Indonesia's government has issued Minister of Education Decree Number 16 Year 2007 about Teacher Standard Academic Qualification [3]. According to the decree, a teacher must have four core competencies, namely pedagogy, personality, social and professional competency. Additionally, Government Regulation Number 74 Year 2008 about Teacher has ruled that teachers have the opportunity to improve the academic qualification and

competency and to have training and professionalism development (see clause 46) [4]. The activity of professionalism development is part of teacher certification program that is ruled in Minister of Education Decree Number 87 Year 2013 about Teacher Profession Education Program and makes the certified teacher to be eligible for a sum of money as an incentive paid by the government [5][6]. Yet, many Indonesian teachers still do not satisfy the requirement for being certified [7][8][9]. To improve the eligibility, teachers must have continuous teacher profession development. The examples of teacher profession development are available in Minister for the Empowerment of State Apparatus and Bureaucratic Reform Decree Number 16 Year 2009 on Functional Position of Teachers and the Number of Credit.

Nowadays, knowledge learning is easier by the availability of the Internet. Many websites provide detailed information on a certain topic and can be accessed free-of-charge or the users may have to pay subscription fee. The contents can be of high quality as the providers are famous education institution, such as Massachusetts Institute of Technology (MIT) with OpenCourseWare [10], Yale serves Open Yale Courses [11], or University of Indonesia with UI Open Courseware [12]. The users can learn the content of the lesson anywhere and anytime without the present of teacher physically or conducting the process in dedicated physical classroom. The process harvests the benefits of information technology products. This concept can be called e-learning. However, ease of access to information has not been felt equally in many areas in Indonesia. This is true for rural areas which still do not have the infrastructure for accessing the Internet and the cost for accessing the Internet is still relatively expensive. As the result, teachers in rural areas do not have similar knowledge with teachers in bigger area, such as cities. This asymmetric access to information can lead to differences in teachers' competency and professionalism.

Furthermore, specific contents for teachers profession development are still not available largely, especially the contents that are delivered in Indonesian language. In addition to that, there are limited assistant for the teachers to learn the material. One example is that teachers have to go to the capital city of the region or province to have access to teacher profession development training. In North Sumatera, there is only a handful number of Institution for Educator Education/Lembaga Pendidikan Tenaga Kependidikan(LPTK) [13]. Hence, this research aims to deliver an e-learning application model that helps to assist the teachers' profession development by using currently available e-learning tools. The e-learning application focuses on delivering contents on teachers' professionalism development training. This system adds the example of how several e-learning tools can be collaborated to solve problem in educations. In addition, the e-learning system also has functionalities can be used in offline situation so that the teachers without internet connection in rural area still can enjoy the benefits of this e-learning system. In conducting the research, these steps are followed to achieve the goal, which are:

1. Collecting and analyzing data and information on teachers' profession development topic. This step is conducted by having intensive internet search regarding the topics, and collecting government regulation documents.
2. Collecting and analyzing information on available e-learning technology. This step will provide enough information to develop e-learning application model for teachers in rural areas.
3. Designing the e-learning application model for teachers in rural area.

2.0 ANALYSIS

2.1 Teachers' Professionalism Development

According to Indonesia Law on Lecturers and Teachers (No.14/2005) and Government Regulation Number 74 Year 2008 about Teacher, teachers must have academic qualifications, competencies, educator certificate, in good health physically and mentally, have the ability to achieve national education goals. A teacher is acknowledged as a professional teacher by following several systematic steps in a so-called certification process. This certification process aims to improve the quality of teacher and eventually improve the formal education quality. At the process of the certification, teachers have to collect credits up to certain level according to their achievement. The credits act as the teacher performance indicators. There four ways to get teacher certification, which are: (1) Direct Grant of Educator Certification/*Pemberian Sertifikat Pendidik Secara Langsung* (PSPL), (2) Portfolio (PF), (3) Teacher Professional Education and Training/*Pendidikan dan Latihan Profesi Guru* (PLPG), or (4) Teacher Profession Education/*Pendidikan Profesi Guru* (PPG). It is compulsory for professional teachers to conduct professional development on an ongoing basis. In Minister for the Empowerment of State Apparatus and Bureaucratic Reform Decree Number 16 Year 2009 on Functional Position of Teachers and the Number of Credit, continuous profession development consists of [14]:

1. Conduct Self-development. The examples are:
   a. Following functional training.
   b. Following collective activities that improve the competency of teachers and/or professionalism of teachers.
2. Produce Scientific Publication. The examples are:
   a. Giving presentation at scientific forum.
   b. Publishing research results, ideas or knowledge in the field of formal education.
   c. Publishing textbooks, and teaching guidelines.
3. Conduct Innovative Work. The examples are:

a. Finding applicative technology.
b. Creating or discovering artwork.
c. Creating/modifying lesson instrument.
d. Following the activity of standards development, guidelines, and problem.

2.2 E-learning

According to Tinio [15], e-learning or online learning can be defined as the formal and non-formal learning that uses the computer network to wholly or partially deliver the course contents, to interact among the users and as the learning facilitation. The learning process in e-learning is characterized by separation of the teachers and the students physically and/or conducted in different place. Education institution can gain benefits from implementing e-learning [16]. In Indonesia, Sa'an has implemented a system for teachers' profession development by implementing distance learning concept [17]. In this system, profession development involves coaches who come from schools and mentor whose location is the education institution centre. About 80% learning process is conducted online by using online site for virtual class, Moodle framework, Skype, Dimdim and Voicethread. The other approach is by developing a digital library that records data and information in the form of articles, e-books, video and instructional media. Users can upload and download the digital library's contents. Based on history, digital library gives opportunities for the users to access diverse information, learn from them and enrich the users' knowledge [18].

Before designing the model of e-learning for assisting teacher's professionalism development, it is important to note that a learning framework can be used as the guidelines for choosing the more appropriate e-learning or other information technology tools. In this research, learning framework by Oliver [19] is used. The framework lists three main components, which are: (1) learning activities, (2) learning resources, and (3) learning supports. The learning framework can be depicted by Figure 1.

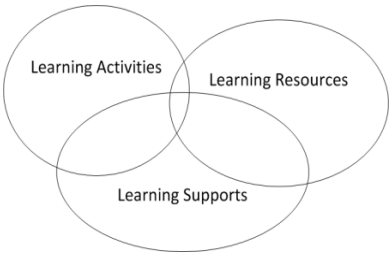

Figure 1 Oliver's Learning Framework [19].

By using this framework, the developed e-learning system will have several tools that can perform the functionalities based on the three learning framework components depicted in the picture. Tools that can be categorized and used for learning activities to deliver teachers' profession development contents is listed and chosen. After that, the tools for learning resources and learning supports are also listed and chosen. The combination of these tools is the building block for e-learning system for assisting the teachers' profession development. The list of tools that can be used for each component can be seen in Table 1. The categorized tools are chosen from the 2014 Top 100 Tools for Learning list developed by Hart [20]. During categorization process, the functionalities of each tool are identified and the matched to the definition and principles of each e-learning components.

Regarding the content, e-learning system proposed in this research aims to deliver the knowledge related to the profession development mentioned in chapter 3.1. The contents are systematically developed into academic curriculum that has several courses. The content has the following structure:

1. The course layout, which is based on module structure. Each course topic is designed to contain several interrelated parts that will be delivered in certain period of time.
2. Online learning activities for students, that consists of the following process: (a) downloading the course contents, (b) engaging in collaborative forums, (c) working on the assignments and upload to the website, (d) discussing intensively with the mentors in private communication channel.
3. Online teaching activities for teachers, that consists of the following activities: (1) creating and uploading the course materials, (b) engaging in the course forum, (c) providing assignments, and (d) discuss one-on-one with the troubled student.

In this research, the example of the developed contents is of *Penelitian Tindak Kelas* (PTK) topic [21][22]. This topic is one of teachers' profession development activities.

Table 1 List of available tools for each component.

Learning Activities	Learning Resources	Learning Supports
Moodle, Blackboard Collaborate, Google Search, Wordpress, Evernote, Pinterest, Blogger, Articulate, Scoopit, Snagit, Adobe Connect, Kindle, iSpring, Hootsuite, iPad, Padlets, Pocket, Udutu, WebEx, Mahara, iTunes, IFTTT, OneNote, Google Apps for Work, Govt & Edu, Socrative, Wordle, Notability, Glogster EDU, Canvas, Tumblr, Kahoot, OpenOffice, Instagram, Pearltrees, EDpuzzle, Blackboard Learn, TodaysMeet, ProProfs Quizmaker, Schoology, Blendspace, Softchalk	Moodle, Google Docs, Drive, Twitter, Youtube, PowerPoint, Wordpress, Dropbox, Facebook, Prezi, Slideshares, Word, Wikipedia, Feedly, Diigo, Audacity, Camtasia, TED, Google Chrome, Google Scholar, Adobe Captivate, Flipboard, Coursera. Khan Academy, Edmodo, Adobe Photoshop, Excel, Zite, PowToon, Storify, Google Translate, SharePoint, HaikuDeck, Google Sites, Delicious, Vimeo, Wikispaces, Easygenerator, Lectora, Firefox, Paper.li, Moovly	Skype, Twitter, Facebook, Google+ Communities & Hangouts, Yammer, Gmail, Outlook, Edmodo, Google Maps, SurveyMonkey, Poll Everywhere, Whatsapp, Voki, LINE,

3.0 PROPOSED E-LEARNING SYSTEM

The proposed architecture of e-learning system can be in the following Figure 2. In this system, an entity called e-learning organizer maintains the system. The staffs of e-learning organizer have the responsibility to provide learning resources, conduct learning activities and provide supports to the users. In the organizer centre, there will be a server that can run the tools for each learning components. Data used in the system will be recorded in a database and the system provides web services so that data can be accessed in vary tools. The organizer can choose one or more tools from Table 1 to be implemented in the e-learning system.

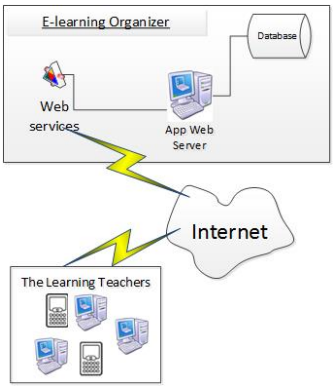

Figure 2 Proposed e-learning system architecture

Nonetheless, it is already mentioned in the introduction that the internet infrastructure are not largely available in rural area. Hence, other than the e-learning system that is proposed in Figure 2, the author also propose an offline application that can also be used to distribute the knowledge regarding the teachers' profession development content. This offline application is built by using different platform and the business process to distribute the course contents can be seen in the following Figure 3.

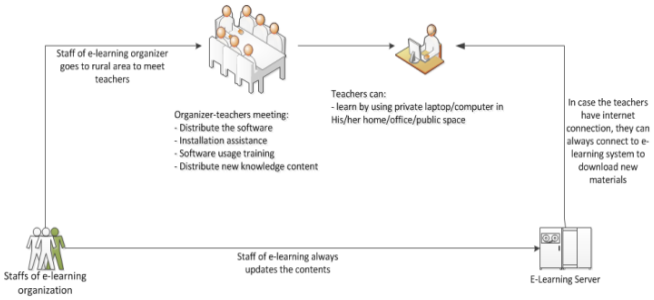

Figure 3 Proposed offline mode of e-learning system architecture

For maintaining the information about teachers that use the e-learning system, the author designs and develops an information system. This information is not only for recording the information about the participants of teachers' profession support, but also provides functionalities to maintain the information of the teacher's number of credit for new functional position proposal. This information system will be part of the complete e-learning system developed in this research. The information system decomposition can be seen in the following Figure 4.

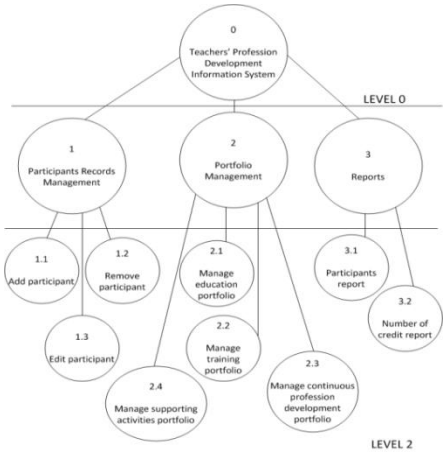

Figure 4 Application functions decomposition.

4.0 CONCLUSION

The research aims to produce an e-learning system which gains the benefits of available tools of this purpose. The content that will be delivered through this e-learning system is for the teachers' profession development purpose. For further research, it is proposed to further test the usability of this system by having a deployed implemented system in hosting servers, designing and implementing organizational structure for an e-learning organizer to continuously harvest the benefits from the system and keeping the sustainability of the system. Eventually, the system will help Indonesia to have better position in term of human development index through education.

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