OCW IN IMPLEMENTATION OF CMA WITH PRIVATE CLOUD COMPUTING-BASED TO HELP INFORMATICS STUDENTS TO OBTAIN PROFESSIONAL CERTIFICATION IN INDONESIA

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Abstract*--This paper focuses on the use of technology in education field. It is one of the alternative strategy to increase students' ability in certified informatics field in Indonesia. This paper explains how to create the infrastructure of e-learning (virtual classroom) by using Open Course Ware (OCW) with Cloud Computing-based to help informatics students to take the certification test. Furthermore, according to the regulation of National Professional Certification Institute (NPCI), PCI is prohibited to conduct training, PCI is only allowed to conduct competency test. It makes students difficult to take the competency test, since there is no training. Morever, the training is only conducted in big cities in Indonesia, while informatics study program is spread in all over Indonesia. From the problems above, there should be efforts to resolve it. The OCW is considered as a new platform in the field of educational technologies. It is expected to help informatics students to obtain certificate of competency, and also to fulfill the Minister of Education and Culture Regulation number 81 of 2014 regarding the diploma, certificate of competency, and professional certification of Higher Education. Certification is one of the SKPI documents that must be obtained by candidate degrees

Keywords : Open Course, Competency Test, Educational Technology, Cloud Computing, Facilitating Learning

I. INTRODUCTION

Research in the field of designing e-learning and multimedia learning has been focused on creating e-learning and multimedia applications limited to assist in teaching and learning process within the university severally. In this study, the writer tries to conduct Open Course Ware (OCW) design in the implementation of Content Management Application (CMA) with Private Cloud Computing-based to assist the preparation of certification test at professional certification institution for student of informatics in Indonesia.[1]

The main issue which is discussed is the issuance of Ministry of Research, *Technology*, and Higher Education (Kemenristek) Regulation No. 44 of 2015 on Higher *Education National Standard*, that teaching and learning process refers to the form of Student Learning Centered (SLC), where students must be active in the learning process. Students who are graduated reserve the right to obtain a diploma, professional certificate and certificate of competency. Certificate of competency are published by universities in cooperation with professional organizations, training institutes, accredited professional certification institutes.

Based on the observations that have been conducted, from 2005 to 2016, there are 6 Professional *Certification Institutes* (PCI) under the auspices of the Ministry *of Communication and Information* (Kominfo), namely, PCI of Telematics, PCI of Public Relations Indonesia, PCI of Computer, PCI Telekomunikasi, PCI of Informatics, and PCI of Telecommunications. According to the regulation of National Professional Certification Institute (BNSP), PCI is prohibited to conduct training, PCI is only allowed to conduct competency test.

By the regulation of BNSP, students will have difficulty to take the competency test, because there is no training previously. Meanwhile, taking training program, in official training institute, it will spend money and time. Moreover, the training place is only in big cities, while the study program is located in all provinces in Indonesia. According to BPS on August 2015, currently, the number of Indonesian workers with the qualification of university graduates is 11.01%, high school is 26.69%, and the rest is primary education. According to the data from the Association of Higher Education in Informatics and Computer Science-Indonesia (APTIKOM), there are about 318 universities, 27 institutions, 246 high schools, 138 academies, and 111 Polytechnics which provide informatics study program.

In a long period of time, the concept of sharing that has been implemented and developed with the help of some learning-based applications such as e-Learning, m-Learning, virtual learning, virtual laboratory, media that can be used as a stimulus in order to build the paradigm of sharing learning resources. If universities and the broader community are balanace in terms of knowledge sharing, then the idea of open service learning is a strong strategy and if it is implemented comprehensively, it will have a good influence in terms of teaching and learning in order to share knowledge to the wider community. The concept of sharing knowledge resources is a noble thought that every organization, community, institution, or individual can contribute their learning resources locally, regionally, and globally.[2][3]

By the concept of Open Course Ware (OCW) as a new platform in the field of educational technology has several common characteristics that distinguish the management of other learning systems, such as (1) Offered Free, it means that when an institution, organization, or community declare to use the concept of OCW then the consequences of this policy is, to open all learning materials services to the public, (2) No Register, by disabling the system authentication system intended to enable the community to directly access all

learning resource services directly, (3) Openly Licensed, although the resource is available on the OCW system is open, but the organizing institution must uphold the Creative Common Licensed rules. Where, three aspects such as Attribution (non-commercial), and Shared-Alike (ready and willing to share with others in the same way), (4) Accessible to anyone, The open system of the OCW concept certainly opens and gives the widest access space for the public or the public as long as they have access to the Internet, and (5) Extraordinary Resources, is one of the advantage, and main characteristic of the OCW model is the variant or file format which vary, not only statically (.pdf,.docx, pptx, and so on), but also in the form of other multmedia formats. In addition, OCW also has standards for sharing Learning Object Materials such as Syllabus, References, Reference of Books, Tasks, and so on. [4][5][2]

II. MATERIALS AND METHODS

Several studies have been conducted related to this research, namely, research which discuss about how to design a tool for online mulitimedia learning, ubiquitous learning, utilization of mobile aplication, utilization of educational technology to evaluate a system that has been conducted. [6]–[8]

2.1 Designing

There are several phases that have to be prepared in designing a multimedia information system with educational technology-based for learning purposes, they are: Need assessment is defined as a systematic process to determine objectives, identify differences between real conditions and the conditions that are expected, and determine the priority of actions to be performed.

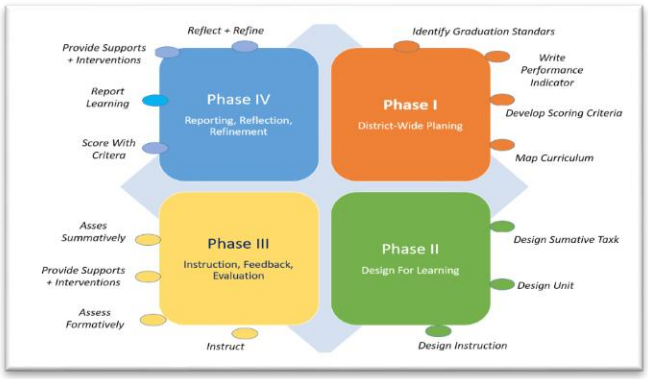

Figure 2.1. Moving from Standards to Practice in a Proficiency-Based System

The Dick and Carey (1990), model is one of the instructional model that is in accordance with the needs and is often used in the design of learning. Need assessment needs to be completed with a questionnaire assesement, setting data collection procedures, analyzing data and producing crucial information that is useful for learning. On conducting the analysis, it requires efforts to collect data by using various techniques such as using questionnaires, interviews, simulations, and observations.

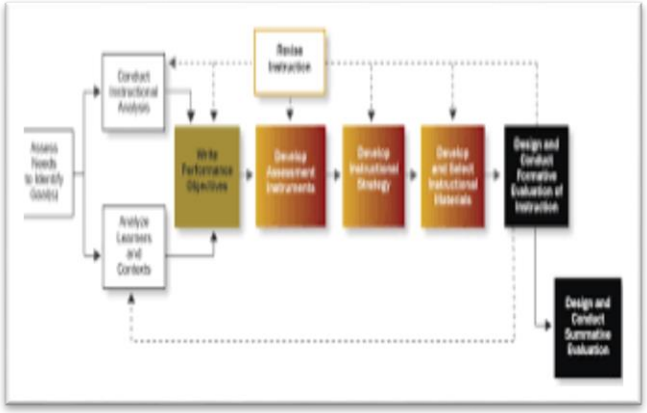

Figure 2.2 The Design Model of Dick and Carey Learning

2.2. Front-End Analysis

In obtaining the result that is suitable with the purpose of this research, the research method used in this study is instrument made by association which refer to Indonesian national qualification framework (KKNI), the research method used in this study are the combination of qualitative and quantitative. The sample of this study are some majors or study programs in various campus in the field of informatics to take the online professional test in informatics field with various materials of Proficiency test from existing professional associations.[9][10][11]

Front-End Analysis is a data collection technique that is used to bridge the gap between reality and expectation, in order to solve the problem. There are ten analysis that can be conducted, they are a) Analysis of participants, b) Analysis of technology, c) Analysis of Situation, d) Analysis of Task, e) Analysis of Issues f) Analysis of important events, g) Analysis of Objective, h) Analysis of Media, i) Analysis of Existing data, and j) Analysis of Cost.

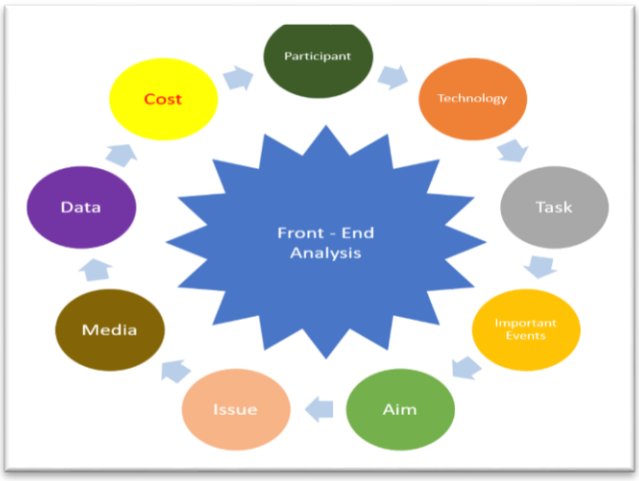

Figure 2.3 *Front End Analysis Cycle*

2.2 Developing

In developing the System made in this Applied Products study, some things are considered on designing of the existing system so that on conducting the system development will run well. The design of this system can apply or use, such as: Searchable Content Objects Reference Model (SCORM), Learning Management System (LMS). [5]

2.3 Evaluation

Evaluation can be defined as a planned activity to know the state of an object by using the instrument, and the results are compared with a benchmark to obtain a conclusion. The main function of evaluation is to examine an object or state to obtain appropriate information as a basis for decision-making. According to, evaluation of learning is a process of collecting, analyzing and interpreting information systematically to determine the extent to which achievement of learning objectives [12]

III. RESULTS AND DISCUSSION

The results obtained in this study is, serving places that can conduct a test or a web-based test. In which, the question instrument is obtained from the association that has applied the KKNI. Participants who take this exam are students and lecturers from all public or private universities. The services of this system can be Open Content and Open Course Ware.[13]

In general, the results obtained in this paper will be displayed in the form of figures with a short explanation, while the results presented in this paper is presented in 3 phases, they are as follows:

1. The Initial Preparation Phase
2. The Implementation Phase or System Implementation
3. The Results of the Delivery of Activities Phase

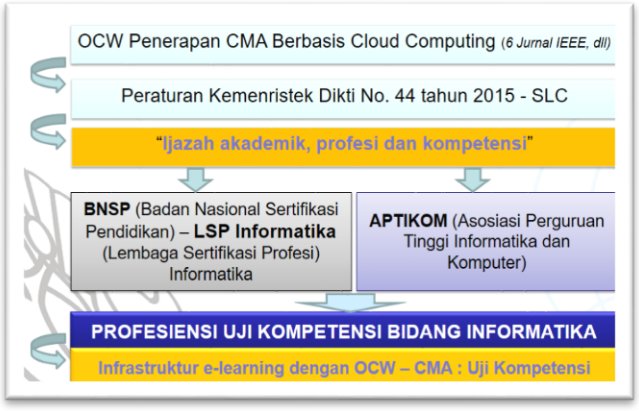

Figure 3.1 The Concept of System that will be Created

Figure 3.2. Relationship Education Competency

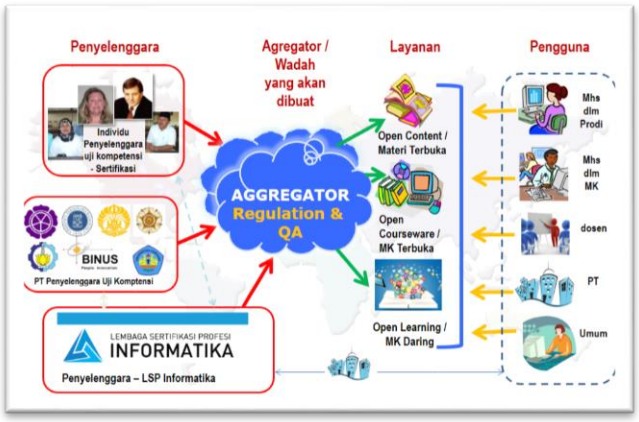

Figure 3.3 The Collaboration Concept of Higher Education and Competency Test

Implementation System

The system that is formed is one of the learning facility that are useful to improve the existing learning outcomes, in this case the ability of students or participants can be acknowledged by taking the test that the web-based applications has been created. it is expected for the next level participants who take the test which is conducted by officially institution or association will pass the test. After the exam, there will be assessing and evaluating the results obtained based on the analysis of qualitative and quantitative methods approach.[14], [15]

In implementation phase, by creating a system that implement the concept of the use of Content Management Application with Private Cloud Computing-based to assist the preparation of certification test at Professional Certification Institute for Students of Informatics in Indonesia, accessed from; E-test.preinexus.com and can be seen in Figure 3.4.

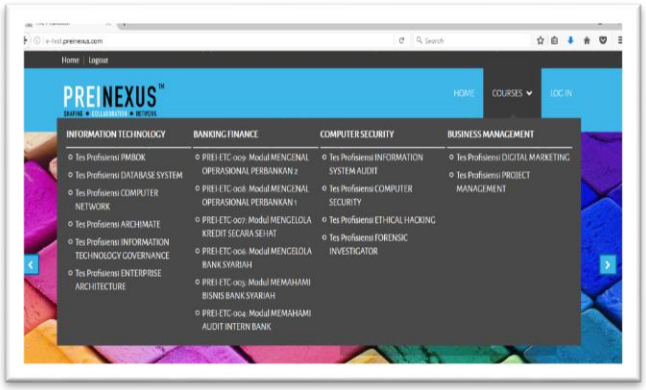

Figure 3.4 the System of Competency Test e- Learning

In Figure 3.4, it can also be seen various materials that can be accessed for some professional certification test materials in the field of informatics. Moreover, in figure 3.5 and 3.6, it can be seen the characteristics of competency test material which are offered for informatics students in Indonesia to take their certification test.

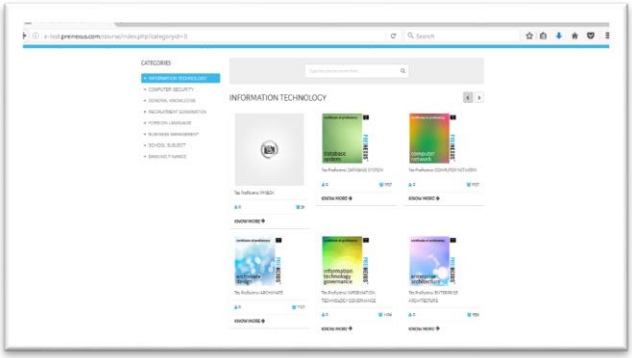

Figure 3.5. the lists of professional certification test material in informatics

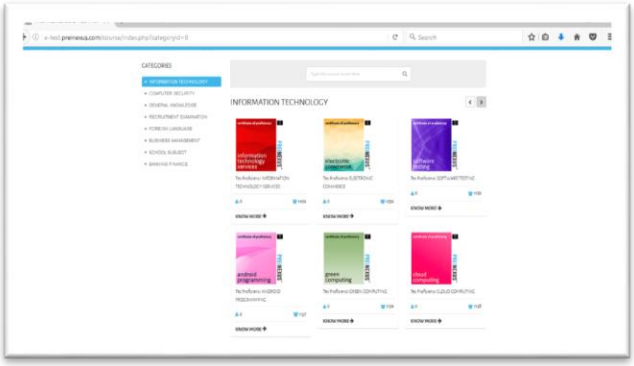

Figure 3.6. The lists of professional certification test material in informatics

The Results of the Delivery of Activities Phase

In the Phase of Delivery of Activities, it has been conducted in 6 major cities in Indonesia, namely Surabaya, Jakarta, Medan, Makassar, Bandung and Jogjakarta with more than 3870 participants. In general, all the data has been collected and calculated statistically based on the number of participation, the location of the certification test, and the figure of each certification test participant.

The results is presented in figure 3.7 until 3.11

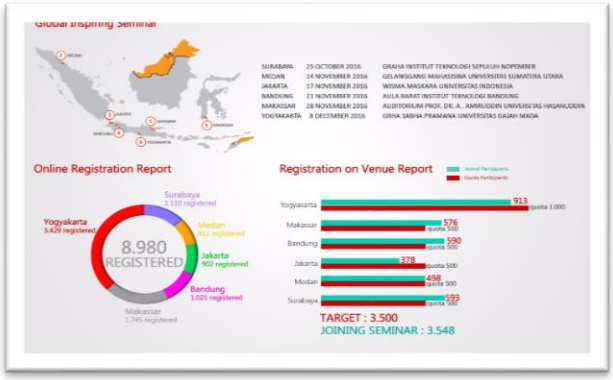

Figure 3.7. The Numbers of Participant that take Certification Test of Informatics Major in 6 Big Cities in Indonesia

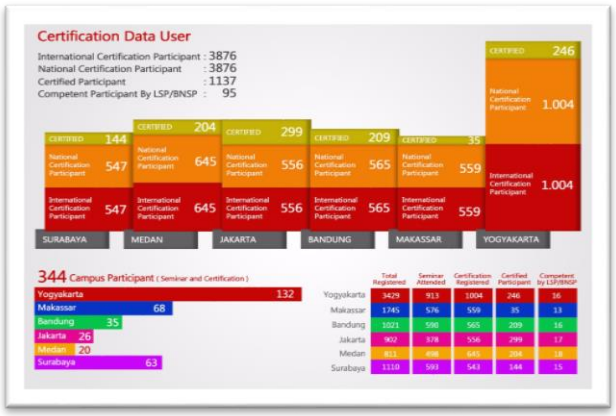

Figure 3.8. The data of Certification Test Participant Based on the City

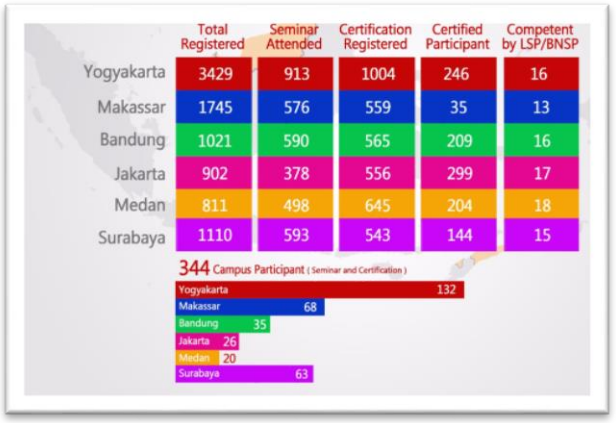

Figure 3.9 The Numbers of Participant Data that Take and Pass the Certification Test in 6 Cities

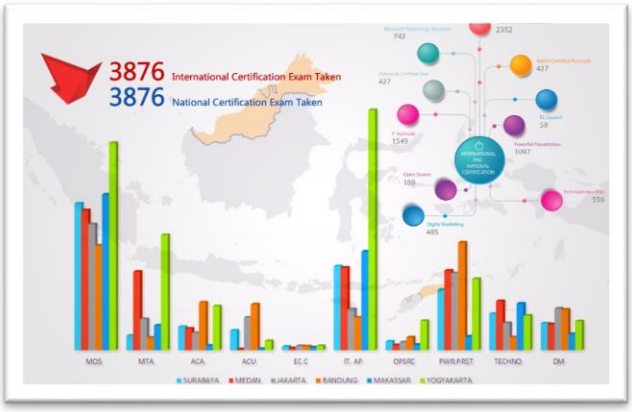

Figure 3.10. Final Tabulation of Participant and the Passing of Certification Test in 6 Cities

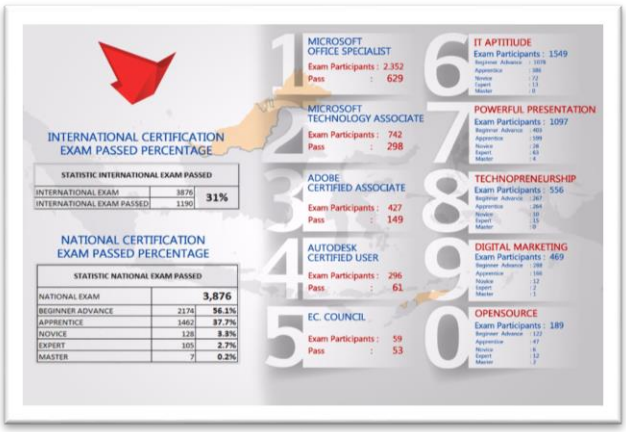

Figure 3.11. The Final Result of Certification Test and Passing Grade from All Participants

IV. CONCLUSIONS AND SUGESTIONS

Conclusion

The conclusion obtained in this paper are:

A. It can generate an Open Course Ware Model in implementation of Content Management Application (CMA) with Private Cloud Computing-based to help the preparation of competency test.

B. It is generated a model development by sharing the resources of science owned by universities or experts from the closed system / internal course of study through e-Learning into open learning system (OCW),

C. Produce a form of interactive learning materials by using Learning Management System with Multimedia-based in Open Course Ware model to help students who will take the competency test in the field of informatics in all provinces in Indonesia

D. As an Alternative Learning Strategy in the Preparation of Student Certification Test with web-based in Indonesia

Suggestions

The point to be put forward in this suggestion is the need of mindset for the stakeholders to be able to do the diffusion of innovation in the learning organization, so that it will create a tendency in the use of technology in education, so that some issues in application of education technology gradually can become even better. Especially in the utilization of EMU-based technology Learning (Electronic Mobile Ubiquitous). Particularly in the article discussing the use of Content Management Application with Private Cloud Computing-based to assist the preparation of certification test at Professional Certification Institute for Student of Informatics in Indonesia, the concept that is needed is the concept of Facilitating Learning and Improving Performance in this Application, it is expected not only IT that put forward, but also how the existing learning in this system. However, in terms of technology, how infrastructure tools and other supports such as bandwidth, server and technology applications should be able to adapt with technological developments which are rapidly and sustainably growing.

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