EVALUATION OF BLENDED LEARNING PROCESS OF EXPERT SYSTEM COURSE PROGRAM BY USING CSE-UCLA MODEL BASED ON MOBILE TECHNOLOGY

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ABSTRACT

The aim of this research was to know the implementation of CSE-UCLA evaluation model based on Mobile Technology and to know the evaluation result of blended learning implementation on expert system course program by implementing CSE-UCLA evaluation model based on mobile technology. Research method used in this study was development method with development design that was 4-D development model (Define, Design, Develop, and Disseminate). Research subjects who were involved in the initial trial were 4 people, they were: 2 informatics experts and 2 education experts, while the subject of this research on trial usage was 10 people, they were: 6 lecturers, 2 informatics experts, and 2 Educational experts. Data analysis technique used in this research was quantitative descriptive analysis technique. The results of this study indicated that the implementation of CSE-UCLA evaluation model based on Mobile Technology was realized in the design of model and evaluation application program which had been compiled well. The effectiveness level of the implementation for blended learning on expert system courses program at one private computer university in Bali by using CSE-UCLA evaluation model based on Mobile Technology was 88.15%, thus, it belong to good qualifications.

Keywords: *Evaluation, Blended Learning Process, CSE-UCLA, Mobile Technology.*

1. INTRODUCTION

Implementation of blended learning in the learning process in university was needed because the progress of information technology had influenced students' learning style and habits. Nowadays, most students prefer to learn by finding information and knowledge through the internet because they obtained information quicker and the scope were wider than the conventional learning through face to face in the classroom. This conventional learning gave the source of information and knowledge only from lecturers which would be limited on the knowledge they possessed. Through blended learning, students would get information and knowledge from various sources from lecturers, internet, and group discussion through face-to-face in the classroom or

through other information technology facilities without limited by time and place.

Some subjects taught in universities, especially in the field of information technology education, such as: decision support systems, expert systems, artificial intelligence, basic concepts of databases, programming, discrete mathematics, computer architecture, and others should be packaged in the form of blended learning process.

One subject in department of information technology education which was suitable to apply blended learning in the learning process was expert system program. This was because the expert system subject required a deep understanding of concepts and high logic thinking that was not sufficiently studied in a short time in the classroom with the lecturers' knowledge source. With blended learning, students could gain knowledge of expert

system concept from the internet, from lecturers through direct face-to-face in the classroom, and from group discussions that could be done in the classroom and outside the classroom by following discussion forum/community for expert system area through information technology facility.

The facts indicated that the implementation of blended learning in the Expert System learning course was not always running as expected. This was because there were still obstacles in the implementation, for example: some students were not proficient and did not have the same ability in using information technology, sometimes students were too focused on their own activity in searching the information about the expert system over the internet and not aware to knowledge given by lecturers, students' consciousness to learn about expert systems was still low because they did not know the purpose clearly, and other obstacles.

According to the fact above, it was necessary to evaluate the implementation of blended learning in learning expert system course. There were several models that could be used in evaluating the learning process such as: countenance evaluation model, CIPP evaluation model, formative-summative evaluation model, CSE-UCLA evaluation model, goal oriented evaluation model, etc. From those evaluation models, there was a suitable method to evaluate the implementation of blended learning, especially for the expert system course. It was the CSE-UCLA evaluation model. This was because the CSE-UCLA model had implementation program component to provide an overview about steps to socialize or introduce a particular program/policy/service which was not owned by other models. Although the CSE-UCLA model was already suitable to be used in evaluating the implementation of blended learning on Expert system course learning, it was not complete yet if the evaluation was still conducted conventionally with manual calculations using paper and the evaluation results should wait several days to be processed, thus giving recommendation for the program improvement would be too late. To overcome this problem, the evaluation for the implementation of blended learning on expert system learning process would use CSE-UCLA model based on mobile technology, so that the evaluator would be able to do an evaluation with the calculation and gave a quick recommendation for program improvement.

This study was a development or improvement for the results and obstacles found in previous studies. The previous researches were used as the basis for this research included: research on development of decision support system to selection of the Blended learning platforms for mathematics and ICT learning at SMK TI Udayana which was conducted in 2016 by Ardana, Ariawan, and Divayana [1]. The research result obtained that blended learning platform which was suitable to be used in SMK TI Udayana was Edmodo, while the obstacles found that this research was not able to show the evaluation result on the utilization of blended learning platform used at SMK TI Udayana. Another research was the evaluation of blended learning implementation in SMK TI Udayana using CSE-UCLA model conducted in 2017 by Divayana [2]. The research result showed that each CSE-UCLA evaluation component had different average level of effectiveness obtained. The effectiveness level on the system assessment evaluation component was 86.7% so that it belonged to the high category, the evaluation component of the planning program was 85.6% so that it belonged to the high category, the evaluation component of the implementation program was 87.5% so that it belonged to the high category, program improvement component was 88.5% so that included high category, and for the program certification component was 88.9% so that it belonged to high category. The obstacle found in this research was this model was not able to calculate the effectiveness level on each CSE-UCLA component automatically and quickly by using mobile technology. Based on the obstacles found in these two studies, so in this research was developed an application used to evaluate the implementation of blended learning expert system courses using CSE-UCLA model based on mobile technology.

Based on the background of the problem, the previous research and the findings of problem solving ideas offered, it could be explained the research problem, such as: 1) how the implementation of CSE-UCLA evaluation model based on mobile technology was used to evaluate the implementation of blended learning on expert system course?, 2) how was the evaluation of blended learning implementation in expert system course conducted by using CSE-UCLA evaluation model based on mobile technology?

The research objectives were: 1) to know the implementation of CSE-UCLA evaluation model based on mobile technology in the form of CSE-UCLA evaluation model based on mobile technology and evaluation application program of CSE-UCLA model based on mobile technology; 2)

to find out the evaluation result of blended learning implementation on expert system course by using CSE-UCLA evaluation model based on mobile technology shown in percentage of effectiveness level.

There were several studies that had similarities with this research, including: research on the use of CSE-UCLA model in evaluating the quality of expert system application programs conducted by Divayana [3] in 2015 had similarities in the terms of evaluation model used to determine the level of effectiveness/quality of a program/activity. The evaluation model was CSE-UCLA model. The difference lied on the process of obtaining the effectiveness level calculation for in a program/activity implementation, in which the research that conducted by Divayana in 2015 still using manual calculation, while in this study the calculation process using mobile technology, so the calculation process could be faster and accurate.

Research on the evaluation for computer certification program at Universitas Teknologi Indonesia by using CSE-UCLA model conducted by Divayana and Sugiharni [4] in 2016 had similarities in the terms of CSE-UCLA evaluation model used to determine the effectiveness of implementation a program/activity. The difference lied in the process of obtaining calculation for the effectiveness the program/activity implementation, in which the research conducted by Divayana and Sugiharni calculated the effectiveness level conventionally and took longer time to get recommendation, meanwhile in this research the process of effectiveness calculation was conducted quickly and also got a quick recommendation through the mobile technology assistance.

According to several things described above, from the research background, statement of the problems, research objectives, and research related to this research, the researchers were interested to take research about the use of CSE-UCLA model in evaluating the implementation of blended learning on expert system course by using mobile technology assistance.

2. LITERATURE REVIEW

2.1 Evaluation

Evaluation is an activity of collecting, analyzing, and presenting information about a particular object/program/policy and the results are used for recommendations in order to make a decision. The statement is in accordance with the following opinions: evaluation is of collecting, analyzing, and presenting information about a particular object under study and the results can be used for consideration in making a decision [3].

The evaluation is an activity for data collecting, data analysing and data presenting into information about a particular object under study so that the results can be used to take a decision [5]. The evaluation is an activity to collect, interpret and report analyzing results about a particular program /object, thus the results can be used as consideration in taking a decision whether the program will be continued or terminated [6]. Evaluation is an activity that consists of the process of gathering, describing, and explaining various pieces of information about the effectiveness of something that can be used later as the consideration for making a decision and a recommendation [7]. Evaluation is an activity for collecting, analyzing, and presenting, information about a particular object to be used for a consideration in making an appropriate and accurate decision [8]. Evaluation is an activity for collecting, analyzing, and explaining comprehensively information about a particular object/program/ policy being studied and the results of an evaluation can be used for the consideration in making a decision to continue or to stop the object/ program/policy [9]. Evaluation is an activity to collect, analyze, and present information about an object to be evaluated, where the results of these evaluations are used for consideration in making a decision that is precise, accurate, and reliable [10].

Based on the statements and some definitions above about evaluation, it could be concluded that evaluation is an activity conducted by the evaluator to collect, analyze, and present complete and accurate information about a particular object/program/service/policy being studied, thus the results could be used as a recommendation in making a decision.

2.2 Blended Learning

Blended learning is a learning approach that creates students centered learning experience with independent learning activities through the use of information technology and also remains through face-to-face learning in the classroom facilitated/ guided by the teacher. So that, although the learners had been able to find and gain knowledge by themselves through information technology usage, but did not reduce the learning interaction that occurred in the classroom or outside the classroom

between learners and teachers. The statement conforms to several following definitions about blended learning: blended learning is also defined as learning that can conventionally be defined in the classroom combined with online learning both independently and in a collaboration by using information and communication technology facilities [11]. Blended learning is a student-centered approach to creating a learning experience whereby the learner interacts with other students, with the instructor, and with content through thoughtful integration of online and face-to-face environments [12]. Blended Learning is a student-centered learning using a systematic approach that combines face-to-face learning and online learning aided by ICTs [1]. Most people agree that blended learning combines teaching and learning methods from both face to face, mobile and online learning and that it includes elements of both synchronous and asynchronous online learning options [13].

Based on the statements and the definitions about blended learning above, it could be generated a general conclusion that blended learning is a student-centered learning approach with learning process that combines conventional learning through direct interaction with teachers in the classroom and information technology-assisted learning. It is conducted independently by learners both in the classroom and outside the classroom.

2.3 CSE-UCLA (*Center for the Study of Evaluation-University of California in Los Angeles*) Evaluation Model

CSE-UCLA evaluation model is an evaluation model of education that has five evaluation components, namely: assessment system, planning program, implementation program, improvement program, and certification program. The statement is appropriate with several definitions of CSE-UCLA model, namely: An evaluation CSE-UCLA is a model developed by Alkin used to evaluate a program in five different stages of evaluation which include: *system assessment*, *program planning*, *program implementation*, *program improvement*, and *program certification* [14]. CSE-UCLA is a model of evaluation having five different evaluations (*system assessment, program planning, program implementation, program improvement, program certification*) and is appropriately reliable to evaluate service program and instructional program [15]. CSE-UCLA models are evaluation model has five dimensions evaluation, among others: *assessment system*, which provides information on the state of the system; the *planning program*, assist

with selection of a particular program to meet the needs of the program; *program implementation* is set up information to introduce the program; *program improvement* that provides information about the function/program performance; *program certification*, that gives information about the program benefits [4].

According to statement and several definitions above about CSE-UCLA model, it could be concluded that CSE-UCLA model is an evaluation model of education consisting of five evaluation components: assessment system, planning program, implementation program, improvement program, and certification program which is suitable to evaluate education service or learning model, such as: e-learning, blended learning, mobile-learning, and others.

3. RESEARCH METHODOLOGY

The research method used in this research was development method with 4-D development model design. It had 4 phases, such as: defining, designing, developing, and dissemination. At the defining phase, we described the aspects of CSE-UCLA evaluation model used to measure the effectiveness of blended learning on the expert system course. In planning phase, CSE-UCLA evaluation model based on Mobile technology was designed, and then personnel needs and time requirement were planned in designing the application program of CSE-UCLA evaluation model based on mobile technology to evaluate the implementation of blended learning on expert system course. In the development phase, the application program and trial test of CSE-UCLA model evaluation application program based on mobile technology were conducted. At the stage of dissemination, it was conducted testing for application programs usage to a broader scale in order to obtain the effectiveness level about the implementation of blended learning on expert system courses. The object of this research was blended learning process on expert system course learning program. Research subjects which were involved in the preliminary trial for application program of CSE-UCLA evaluation model based on mobile technology were: 2 informatics experts and 2 education experts. Meanwhile, in the trial usage for the application program of CSE-UCLA evaluation model based on mobile technology to measure the effectiveness level of blended learning implementation on expert system course, it was involved 10 people as research subjects consisted of 6 lecturers, 2 experts of informatics, and 2 experts

of education. The research location was conducted at Universitas Teknologi Indonesia, because this University was one private university in Bali which works in the field of computers and there were expert system courses in its curriculum. The instruments used in collecting data in this study were questionnaires, interview guides, and documentation. Data analysis technique used in this research was quantitative descriptive analysis technique. The results of questionnaires from respondents who had collected, then analyzed using descriptive percentage calculations to obtain the effectiveness level of the blended learning implementation on expert system courses. The effectiveness score was converted to scale of achievement with these following 5 scales:

Table 1: Conversion Achievement Level Scaled by 5

Achievement Level	Qualification	Description
90-100 %	Very Good	No Need to be revised
80-89 %	Good	No Need to be revised
65-79 %	Adequate	Revision
55-64 %	Less	Revision
0-54 %	Poor	Revision

4.   RESULTS AND DISCUSSION

4.1   Results

4.1.1   Measurement aspects of the effectiveness level for implementation on blended learning in expert system course

The aspects used to measure the effectiveness level on the implementation of blended learning on expert system course for each evaluation component were: 1) the assessment system component covers several aspects, such as: vision, mission, objectives, law legality, and the support of academic community; 2) the planning program component, covering: readiness of lecturers' ability, readiness of students' ability, readiness of management team capability, structure of organization management, facility and infrastructure availability, and funding support; 3) the implementation program components, including: the socialization of blended learning features for the users, the introduction to required hardware in blended learning implementation for the management, and the introduction to required software in blended learning implementation for management; 4) the improvement program components, including: the operation of blended learning to seek knowledge about expert system for

users, installation and settings for required hardware in the blended learning implementation, installation and setting for required software in the blended learning implementation, and budgeting management; 5) the certification program components, including: the outlook of blended learning application program, level of reliability and accuracy in searching information about expert system, response speed, ease of giving feedback and the furtiveness guarantee of knowledge base storage.

4.1.2   The Design of CSE-UCLA Model Based on Mobile Technology

The display of design of CSE-UCLA model based on mobile technology could be seen in Figure 1 below.
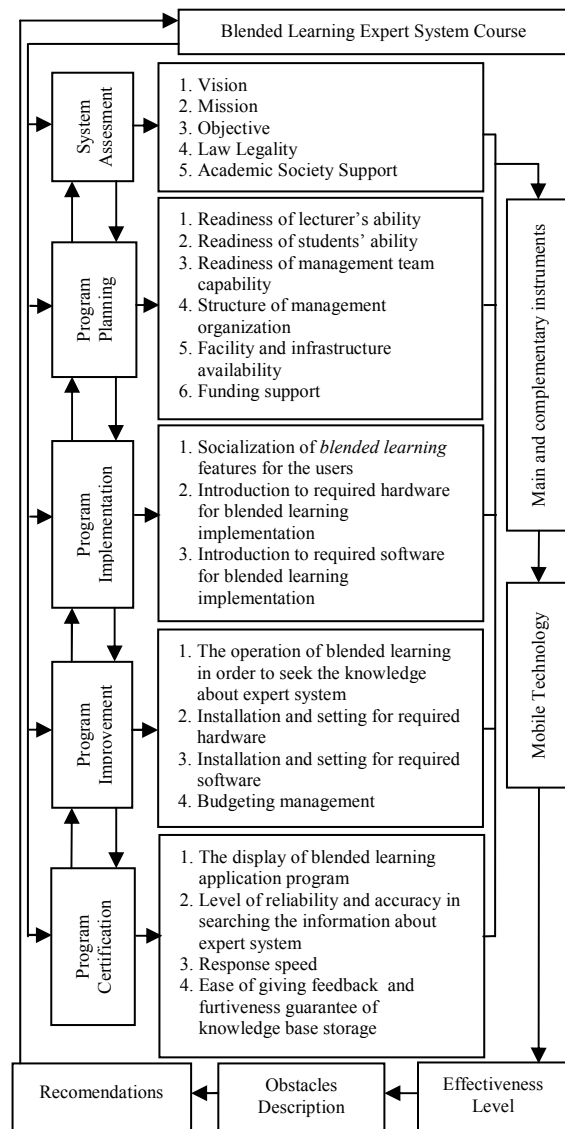

Figure 1: The Display of Design of CSE-UCLA Model based on Mobile Technology

4.1.3 Personnel Requirement Plan

The personnel requirement plan which involved in designing the application of CSE-UCLA evaluation model based on Mobile Technology could be seen in Table 1 below.

Table 1: Personnel Requirement Plan Involved in Designing the Application Program of CSE-UCLA Evaluation Model based on Mobile Technology

No	Activity	Personnel Number
1.	Designing data flow diagram	2
2.	Designing database	2
3.	Designing user interface	2
4.	Program coding	2
5.	Program testing	4
	Total	12

4.1.4 Time Allocation Plan

The time allocation required in designing the application of CSE-UCLA evaluation model on mobile technology could be seen in table 2 below.

Table 2: Time Allocation Plan Required in Designing the Application of CSE-UCLA Evaluation Model on Mobile Technology

No	Activity	Time (Day)
1.	Designing data flow diagram	6
2.	Designing database	5
3.	Designing user interface	5
4.	Program coding	20
5.	Program testing	6
	Total	42

4.1.5 The Program Application of CSE-UCLA Evaluation Model based on Mobile Technology

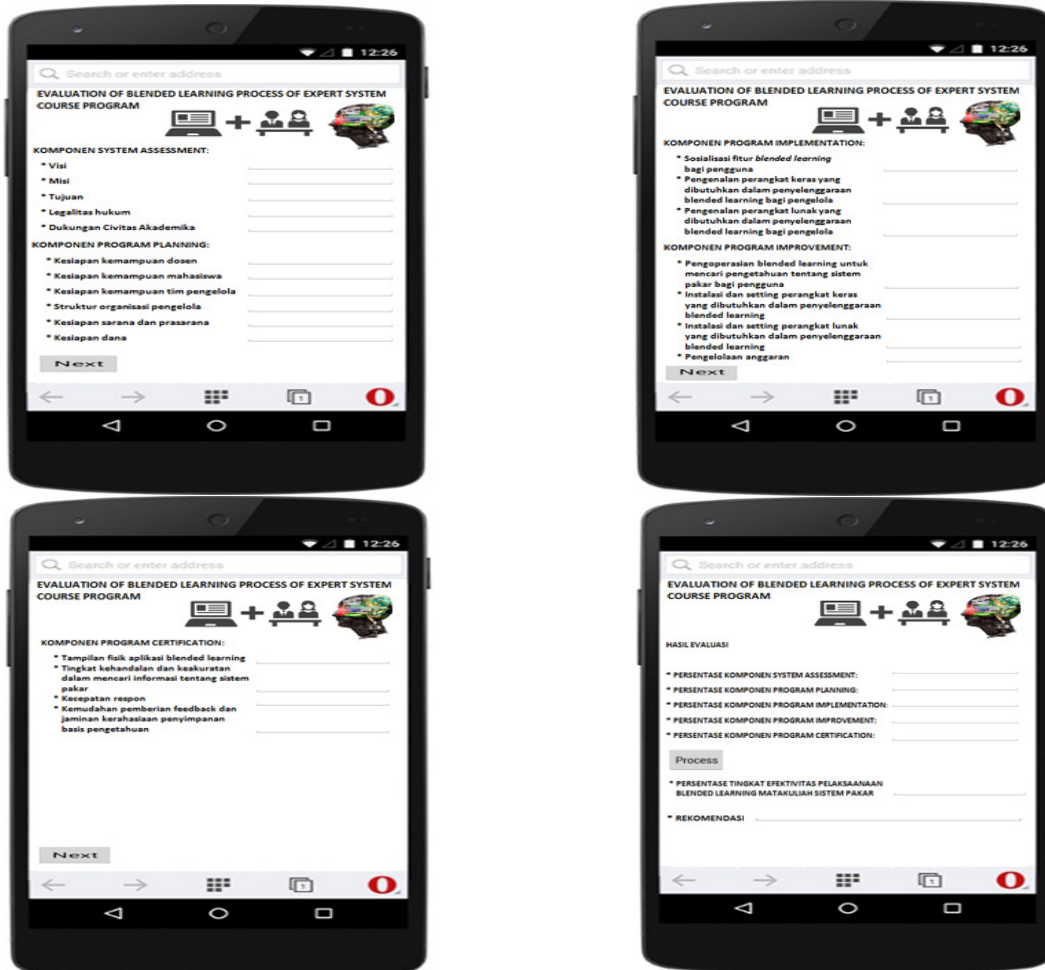Figure 2 below showed the display of Program Application of CSE-UCLA Evaluation Model based on Mobile Technology.

Figure 2: The Display of Application of CSE-UCLA Evaluation Model Based on Mobile Technology

4.1.6 Trial Result on the Application Program of CSE-UCLA Evaluation Model based on Mobile Technology

 The Trial results on application program of CSE-UCLA Evaluation Model based on Mobile Technology could be seen on table 3 below.

Table 3: Trial Result on the Application Program of CSE-UCLA Evaluation Model based on Mobile Technology

No	Respondents	Items										Total	Percentage (%)
		1	2	3	4	5	6	7	8	9	10		
1	R-01	4	4	4	5	4	4	4	4	4	5	42	84.00
2	R-02	5	4	4	4	5	4	5	4	5	4	44	88.00
3	R-03	4	5	5	4	4	5	4	4	4	4	43	86.00
4	R-04	5	5	4	4	4	4	4	4	4	4	42	84.00
											Average		85.50

4.1.7 Test Result on the Implementation of CSE-UCLA Evaluation Model based on Mobile Technology Application Program

 In this trial usage, the suitability test was conducted between the effectiveness standards of blended learning implementation on expert system course with the evaluation result of the implementation of blended learning on expert system course at Universitas Teknologi Indonesia using the program application of CSE-UCLA evaluation model based on mobile technology. The standard effectiveness of the implementation of blended learning on expert system courses could be seen in table 4, while the evaluation result on the implementation of blended learning on expert system course at Universitas Teknologi Indonesia could be seen in table 5 below.

Table 4: The Effectiveness Standard of Blended Learning Implementation on Expert System Course

No.	Evaluation Component	Aspect Code	Evaluation Aspect	Standard Effectiveness (%)
1.	*System Assesment*	A1	Vision	86-100
		A2	Mission	86-100
		A3	Objectives	86-100
		A4	Legal Regulation	90-100
		A5	Academic society support	86-100
2.	*Program Planning*	A6	Readiness of lecturers' ability	85-100
		A7	Readiness of students' ability	85-100
		A8	Readiness of management team capability	87-100
		A9	Structure of management organization	87-100
		A10	Facility and infrastructure availability	85-100
		A11	Funding/budgeting support	86-100
3.	*Program Implementation*	A12	Socialization on Blended Learning features for the users	85-100
		A13	Introduction to required hardware in implementing blended learning for the management	86-100
		A14	Introduction to required software in implementing blended learning for the management	86-100
4.	*Program Improvement*	A15	The operation of blended learning in order to seek the knowledge about Expert system for the users	87-100
		A16	Installation and setting for required hardware in implementing blended learning	88-100
		A17	Installation and setting for required software in implementing blended learning	88-100
		A18	Funding and budgeting management	90-100
5.	*Program Certification*	A19	The display of blended learning application program	88-100
		A20	Level of reliability and accuracy in searching the information about expert system	88-100
		A21	Response speed	88-100
		A22	Ease of giving feedback and furtiveness guarantee of knowledge base storage	87-100

Table 5: Evaluation Result on Blended Learning Implementation on Expert System Course at Universitas Teknologi Indonesia using Application Program of CSE-UCLA Evaluation Model Based on Mobile Technology

No	Evaluation Component	Aspect Code	Score of Respondents										X	%
			R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	R_9	R_{10}		
1.	*System Assesment*	A1	5	4	5	4	5	4	5	4	4	4	44	88.00
		A2	4	4	4	4	4	4	5	4	5	5	43	86.00
		A3	5	4	4	4	4	5	4	4	5	5	44	88.00
		A4	5	4	5	4	5	4	5	5	4	5	46	92.00
		A5	4	5	4	5	4	5	4	5	4	4	44	88.00
	Percentage of Effectiveness Level on System Assessment Component													88.40
2.	*Program Planning*	A6	4	5	4	5	4	4	4	4	4	5	43	86.00
		A7	5	4	4	4	5	4	4	5	4	4	43	86.00
		A8	4	5	4	5	4	5	5	4	4	4	44	88.00
		A9	4	4	4	5	5	4	4	5	5	4	44	88.00
		A10	4	4	4	4	4	4	5	4	4	5	42	84.00
		A11	4	4	4	4	5	4	5	4	4	4	42	84.00
	Percentage of Effectiveness Level on Program Planning Component													87.00
3.	Program Implementation	A12	5	4	4	4	5	4	4	5	5	4	44	88.00
		A13	4	5	4	5	4	5	4	4	5	4	44	88.00
		A14	4	4	4	4	5	4	5	5	4	4	43	86.00
	Percentage of Effectiveness Level on Program Implementation Component													87.33
4.	Program Improvement	A15	4	5	5	4	4	4	5	4	4	5	44	88.00
		A16	5	5	4	4	4	4	5	5	5	4	45	90.00
		A17	4	5	4	5	4	5	4	4	4	5	44	88.00
		A18	5	4	5	5	4	5	4	5	4	5	46	92.00
	Percentage of Effectiveness Level on Program Improvement Component													89.50
5.	Program Certification	A19	5	5	4	4	4	5	5	4	4	4	44	88.00
		A20	4	4	5	5	5	4	4	5	4	5	45	90.00
		A21	4	5	4	5	4	4	5	4	5	4	44	88.00
		A22	4	4	5	5	5	4	5	4	4	4	44	88.00
	Percentage of Effectiveness Level on Program Certification Component													88.50
	Percentage of Effectiveness Level on Implementation of Blended Learning on Expert System Course at Universitas Teknologi Indonesia													88.15

4.2 Discussion

The design of CSE-UCLA evaluation model based on mobile technology which was used to evaluate the implementation of blended learning on expert system course had been well designed (as shown in Figure 1). In that draft, it was explained that the implementation of blended learning on expert system course at Universitas Teknologi Indonesia was evaluated based on the five components of CSE-UCLA evaluation model, such as: system assessment, program planning, program implementation, program improvement, and program certification. In the system assessment component there were 5 aspects that used to measure the effectiveness level in blended learning the implementation on expert system course, there were 6 aspects of program planning component, there were 3 aspects the implementation program component, the improvement program component had 4 aspects, and the certification program component, it had 4 aspects. To be able to use these aspects in evaluating the implementation of blended learning on expert system course at Universitas Teknologi Indonesia, it was required the main instrument in the form of questionnaires and complementary instruments that could be interview

guide, observation and documentation. To obtain accurate, fast and valid calculation results, the results of data collection through questionnaire could be processed using mobile technology assistance. The results of these calculations could provide an overview of the effectiveness level about the implementation of blended learning on expert system courses. Based on the observations, interviews and documentation, it was obtained information related to the obstacles found in the implementation of blended learning on expert system courses. From these obstacles, the recommendations were given to solve the problems in order to develop/ improve the implementation of blended learning on expert system course at Universitas Teknologi Indonesia.

Based on preliminary trials on application program of CSE-UCLA evaluation model based on mobile technology (shown in Table 3), the average percentage of application program effectiveness rate was 85.50%. This result, if it was converted to achievement level scale on a scale of 5 was categorized into good qualification, so there was no revision required and then the program would be ready to be used.

Based on the evaluation result on the implementation of blended learning on expert system course at Universitas Teknologi Indonesia using application program of CSE-UCLA evaluation model based on mobile technology which was conducted on trial usage (as shown in table 5), it was obtained the percentage of effectiveness level in the system assessment component around 88.40%. If it was converted to achievement level scale on a scale of 5, it was categorized into adequate qualification. The percentage of effectiveness level in program planning component was 87.00%, categorized into good qualification. The percentage of effectiveness level on program implementation component was 87.33%, categorized into good qualification. The percentage of effectiveness level on the program improvement component was 89.50%, it was categorized into good qualification. The percentage of effectiveness level on program certification component of was 88.50%, it was categorized into good qualification. Referring to the percentage of effectiveness level on each evaluation component, it was found that the general level of effectiveness of the implementation of blended learning on expert system course at the Universitas Teknologi Indonesia was 88.15%, so it was categorized into good qualification.

If it was adjusted to the effectiveness standard about the implementation of blended learning on expert system course (shown in table 4), then the evaluation result of the blended learning of expert system at Universitas Teknologi Indonesia in the aspect of vision which showed 88.00% effectiveness level, had fulfilled the effectiveness standard vision aspect in the range between 86% -100%. In the mission aspect showed that the percentage of effectiveness level was 86.00%, it meant that it met the effectiveness standard for mission aspect in the range between 86% -100%. For the objective aspect showed that the percentage of effectiveness level was 88.00%, it meant that it met the effectiveness standard of objective aspect in the range between 86% -100%. For the aspect of law legality showed the percentage of effectiveness rate was 92.00%, it meant that it met the effectiveness standard of law legality in the range between 90% -100%. Then, for the academic community support aspect showed the percentage of effectiveness level was 88.00%, it meant that it met the effectiveness standard of academic support in the range of 86% -100%.

In the aspect of lecturers 'ability readiness, it showed the percentage of effectiveness level was 86.00%, it meant that it met the effectiveness standard of lecturers' ability in the range between 85% -100%. In the aspect of students' ability readiness, it showed the percentage of effectiveness level was 86.00%, it meant that it met the effectiveness standard of students' ability readiness in the range between 85% -100%. Then, for the aspect of the management team's capability readiness, it showed the percentage of effectiveness level was 88.00%, it meant that it had fulfilled the effectiveness of the management team's capability readiness in the range between 87% -100%. In the aspect of management organization structure, it showed the percentage of effectiveness level was 88.00%, it meant that it met the effectiveness standard of this aspect in the range between 87% -100%. In the aspect of facilities and infrastructure availability, it showed that the percentage of effectiveness level was 84.00%, it meant that it did not fulfill the effectiveness standard yet for the facility and infrastructure availability aspect in the range between 85% -100%. In the aspect of funding support, it showed the percentage of effectiveness level was 84.00%, it meant that it did not fulfill the effectiveness standard yet for funding support aspect in the range between 86% -100%.

For the aspect of socialization of blended learning features for users showed the percentage of effectiveness level was 88.00%, it means that it had fulfilled the effectiveness standard of socialization of blended learning features for users in the range between 85% -100%. In the aspect of the introduction to management about required hardware in the implementation of blended learning showed the percentage of effectiveness level was 88.00%, it meant that it met the effectiveness standard of the introduction to management about required hardware in the implementation of blended learning, in the range between 86% -100%. In the aspect of the introduction to management about required software in the implementation of blended learning showed the percentage of effectiveness level was 86.00%, it meant that it met the effectiveness standard of the introduction to management about required software in the implementation of blended learning, in the range between 86% -100%.

In the aspect of the operation for blended learning in order to seek knowledge about expert system for users, it showed that the percentage of effectiveness level was 88.00%, it meant that it had fulfilled the effectiveness standard of the operation for blended learning in order to seek knowledge about expert system for users, in the range between

87% -100%. In the aspect of installation and setting for required hardware in the implementation of blended learning showed that the percentage of the effectiveness level was 90.00%, it meant that it met the effectiveness standard of the installation and setting for required hardware in the range between 88% -100%. In the aspect of installation and setting for required software in the implementation of blended learning showed the percentage of effectiveness level was 88.00%, it meant that it met the effectiveness standard of installation and setting for required software in the implementation of blended learning in the range between 88% -100%. In the aspect of budgeting management showed the percentage of effectiveness level was 92.00%, it meant that it met the effectiveness standard of budgeting management aspect in the range between 90% -100%.

In the terms of display of blended learning application program showed the percentage of effectiveness level was 88.00%, it meant that it had met the effectiveness standard of the display of blended learning application program in the range between 88% -100%. In the aspect of reliability and accuracy level in searching information about the expert system showed the percentage of effectiveness level was 90.00%, it meant that it had met the effectiveness level standard of reliability and accuracy level in searching information about the expert system in the range between 88% -100%. In the aspect of response speed showed the percentage of effectiveness level was 88.00%, it meant that it had met the effectiveness standard of response speed in the range between 88% -100%. In the aspect of the ease of giving feedback and the furtiveness guarantee of the knowledge base storage showed the percentage of effectiveness level was 88.00%, it mean that it met the effectiveness standard of the ease of giving feedback and the furtiveness guarantee of the knowledge base storage in the range between 87% -100%.

According to the obstacles on research conducted by Ardana, Ariawan, and Divayana about the development of decision support system to selection of the blended learning platforms for mathematics and ICT learning at SMK TI Udayana in 2016, which was no evaluation results on the utilization of blended Learning platform that was implemented in SMK TI Udayana, thus from this study results could be showed the contribution of improvements to that research in the terms of recommendation for the implementation of CSE-UCLA model with evaluation component such as:

system assessment, program planning, program implementation, program improvement, and program certification, which could be used to evaluate the implementation/utilization of blended learning. Another obstacle in research conducted by Divayana in 2017 about the evaluation on blended learning implementation in SMK IT Udayana using CSE-UCLA model was not able to calculate the effectiveness level on each CSE-UCLA evaluation component automatically and quickly. This obstacle could already be answered through the results of this research. It was by using the application program CSE-UCLA model based on mobile technology that could provide automatic, fast, and accurate calculation results.

In general, the results of this study were able to contribute for the improvements to the previous studies, however specifically in this study also found the obstacles include: 1) in the implementation of blended learning on experts system course at the Universitas Teknologi Indonesia was on the aspect for the availability on facilities and infrastructure. It was shown from the percentage of effectiveness score which was less than the standard percentage score of the effectiveness aspects of the availability on facilities and infrastructure. This was because the facilities and infrastructure which supported the implementation of blended learning was still incomplete, including many computers that were broken/could not be used, not all students have smart phones, and the internet access was still unstable; 2) other obstacles were the aspect of funding support. It was shown from the percentage of effectiveness score which was less than the effectiveness standard percentage score of the funding support aspect. It was because there was no full support funding from the foundation or from other sponsors from outside the institution, so that the funding was only limited to sourced from students' tuition fee.

5. CONCLUSIONS

There were several things that could be concluded based on the results and discussion in this research, they were: 1) the implementation of CSE-UCLA evaluation model based on mobile technology was realized in the design of CSE-UCLA evaluation model based on mobile technology and a mobile application program CSE-UCLA model based mobile Technology that had been well designed, so it could be used to evaluate the implementation of blended learning on expert system course at the Universitas Teknologi

Indonesia; 2) The evaluation result of blended learning implementation on expert system course at Universitas Teknologi Indonesia using evaluation model of CSE-UCLA based on mobile technology, showed the effectiveness level was 88.15%, so that the implementation of blended learning on expert system course at Universitas Teknologi Indonesia was categorized into good qualification.

Recommendations given to overcome the obstacles found in the implementation of blended learning on expert system course at the Universitas Teknologi Indonesia, such as: 1) providing supporting facilities and infrastructure for the implementation of blended learning optimally through routine checks on computers used in the implementation of blended learning in the classroom, providing the smart phones to support the implementation of blended learning in the classroom so that students did not feel compelled to buy a smart phone, and increasing the internet bandwidth; 2) seeking donors from outside the institution to fund the implementation of blended learning on expert system courses; 3) finding breakthroughs of new findings or further research that could facilitate the expert system courses learning process with the concept of blended learning which was easier, more efficient and if possible could minimize the implementation expenses.

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