Mobile learning infusion through enhancing teachers' perception: Case study in eastern of Indonesia

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***Abstract*—Information technology penetration in Indonesia is relatively high. People have used this technology widely in many activities, but its use is still relatively low in education; including the use of mobile learning. One reason is that the teacher's perception is still low regarding the benefits of this technology. This study aims to improve the teacher's perception of mobile learning in science learning. The infusion process is carried out through training with a learning by doing approach. Teachers are involved as students in the learning process that uses mobile learning. After the exercise, the teacher's perception regarding the implementation of mobile learning was measured using the COLLES Questionnaire. From the results indicate that the teacher becomes more confident about the benefits of mobile learning to manage better education. This model can be a lesson learned to expand the use of mobile learning in Indonesia.**

Keywords: technology, enhanced learning, mobile learning, physics education, mobile technology, ubiquitous technology, learning management system, teacher perception

I. INTRODUCTION

The issue of using digital technology in today's learning is critical and widely discussed to enhance a better learning environment. Competency demands as learning outcomes following the needs of the community or the real-life world are sometimes different from how the teacher creates the learning atmosphere. This difference engages the importance of research related to the integration of digital mobile technology in learning. A significant aspect to finding out is what perceptions or beliefs of teachers in using this technology in their teaching and learning activities [1,2,3]. Besides the teacher belief, the availability of supporting facilities for the implementation of digital mobile technology-based learning is critical [4,5,6].

In Indonesia, information technology as the basis for the use of digital technology has a high penetration rate with relatively even distribution throughout the region. This technology also has a significant influence on changes in the social behavior of people [7,8]. The increasing social media activity is one of the indicators which bring new cultures in social interaction. In other sectors, this technology also brings change. However, in the education sector, this technology is less appropriately adopted because of the various existing problems [9]. Concerning education policy, the ministry of education has encouraged the development of a curriculum that utilizes this technology in learning. However, this policy has not implemented effectively at the school level.

With an extensive population distribution in Indonesia, the problem of technological integration in learning becomes more complex, especially in rural areas; one of them is in the eastern part of Indonesia. Research that explores what teachers' perceptions in integrating this technology on learning and also what strategies to increase teacher awareness in utilizing this technology are indeed very useful for improving the quality of education in the region.

There is small research related to teacher perceptions in integrating this technology into learning especially in rural areas in Indonesia. The benefits of the results of this study are significant. Based on this rationale, this research aims to improve teacher awareness. At the beginning of the study, teachers were involved in training using mobile technology. After the preparation, the teachers' perception of the integration of digital technology is measured. If the result is positive perceptions, then this study can be used as the reason for educational policy making related using mobile technology in learning.

II. METHODOLOGY

This research is descriptive quantitative research. The number of respondents was 23 junior high school science teachers in Sikka district, East Nusa Tenggara. All

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respondents are 30-40 years old and have an undergraduate degree. The teachers involved in training on the use of mobile learning before respondents delivered their perceptions. The learning strategy in this training is learning by doing. A set of learning programs has been prepared by the instructor to deliver the training process. The learning management system used during training is Edmodo. In this LMS, trainees (teachers) have a role as students and instructor as the teacher. Some features of Edmodo used during exercise are Chat, Forum, and Reading. During training, the teacher and instructor are in the same room. This training is carried out for 21 hours (7 hours per day). At the end of the practice, the teachers were asked to fill out a Questionnaire.

This study used the Constructivist On-Line Learning Environment Survey (COLLES) questionnaire. COLLES is a survey which is packed with Moodle courseware and is designed to assist the assessment of critical questions on the quality of the online learning environment. The format of the questionnaire requires the Likert scale of 5 points (1-almost never, 2-seldom, 3-sometimes, 4-often, 5-almost always). This questionnaire includes six learning aspects which are relevance level, reflective level, interaction level, tutor support level, peer support level and communication level of student and tutor (interpretation) [10,11]. We analyzed data obtained from this questionnaire using descriptive statistical analysis.

III. RESULT AND DISCUSSION

Table 1 shows the frequency of students 'answers to the COLLES instrument. This table provides an overview of students' perceptions of LMS lecturers related to their online learning experience with the project activities they undertook. In each aspect (relevance, reflective thinking, interactivity, tutor support, peer support, and interpretation) there are four questions so that there are total of 24 items.

Table 1. The result of COLLES survey

Items	Frequency				
	Almost never	Seldom	Some-times	Often	Almost always
Relevance: the course's **relevance** to student's interests and professional goals					
1. my learning focuses on issues that interest me.	1	0	0	15	7
2. what I learn is important for my professional practice.	0	0	0	1	22
3. I learn how to improve my professional practice.	0	0	0	11	12
4. what I learn connects well with my professional practice.	0	1	0	9	13
Reflective Thinking: the level of **critical or reflective thinking** that the student applies to the material in the course					
5. I think critically about how I learn.	0	0	0	13	10
6. I think critically about my own ideas.	0	0	1	18	4
7. I think critically about other students' ideas.	1	0	0	17	5
8. I think critically about ideas in the readings.	0	1	2	16	4
Interactivity: the level of **interactivity** the student engages in during the course					
9. I explain my ideas to other students.	2	1	1	17	2
10. I ask other students to explain their ideas.	1	3	1	13	5
11. other students ask me to explain my ideas.	2	2	0	17	2
12. other students respond to my ideas.	1	4	1	15	2
Tutor Support: the level of **tutor support**					
13. the tutor stimulates my thinking.	0	0	0	12	11
14. the tutor encourages me to participate.	0	0	0	14	9
15. the tutor model good discourse.	0	1	0	16	6
16. the tutor model critical self-reflection.	1	0	0	16	6
Peer Support: the student is receiving **peer support** in the course					
17. other students encourage my participation.	1	2	0	14	6
18. other students praise my contribution.	0	4	1	18	0
19. other students value my contribution.	1	0	1	21	0
20. other students empathize with my struggle to learn.	1	1	3	14	4
Interpretation: the success of both students and tutor in making good sense of each other's **communication**					
21. I make good sense of other students' messages.	0	1	0	19	3
22. other students make good sense of my messages.	1	1	0	19	2
23. I make good sense of the tutor's messages.	0	0	0	16	7
24. the tutor makes good sense of my messages.	1	0	0	16	6

Items 1 to 4 in Table 1 shows the relevance aspect. From the table, there is a strong tendency of teachers' responses to answers often and almost always for all items. For the second item (what I learn is important for my professional practice) shows nearly all teachers answer "almost always." The interpretation is that teachers feel the mobile learning will support the learning practices they will carry out. Perceptions of the learning experience in the relevant aspects that obtain the highest score become a hope that online learning is suitable to the learning practices they will face as teachers that are in line with current needs. The tendencies that teachers who are young and digital natively make them feel comfortable with the learning done.

Reflective thinking aspects measure the level of critical thinking that the participants apply in the course. Items number 5 to 8 in Table 1 show the reflective thinking aspects. From the results of the responses of the teachers it can be seen that with mobile learning, they can still develop the ability to reflect reflectively on what they learn, individual ideas, ideas from other participants, and ideas

from readings available. The development of critical thinking skills can occur when someone is dealing with an ill-defined problem. This situation in this training often arises when there are discussions between participants.

The interactivity aspect measures the level of interactivity of the student engages in during the course. From Table 1 in items number 9 to 12, there appears response for answers 1, 2, and 3. Although overall it is relatively good, there is still a low response. The habit of participants who will not present ideas unless stimulated externally makes posting on forums and chatting not high enough. From the posting activity pattern, participants will respond to the discussion if asked by the instructor to give a response. This fact indicates that there is a less optimal interaction between participants. This situation is also seen in the low eagerness the other students to convey ideas. There is a tendency for students to only respond to instructors' requests, but less respond to requests from fellow students.

The tutor support aspect is related to how the instructor plays a role in supporting the learning success of participants. The instructor's role in learning is more functioning to ensure all participants can be actively involved in the learning or training process. To obtain information and understand learning activities in depth, the instructor only directs to search from online learning resources and does not directly provide learning material or information needed. This method seems successful in this training process. The maturity of the teachers as students makes the response to aspects of tutors support very good.
Peer support for online learning occurs when other participants provide support, respect, and empathy. Also, learning participants are expected to use positive words when discussing through forums or while chatting. By practicing to use positive language, overall participants feel that peer support is also good. Items 17 to 20 in Table 1 show this result.

The interpretation aspect measures the success of both students and tutors in making good sense of each other's communication. The instructor role that directs learning activities so that all participants are actively involved has an impact on the level of psychological stress. The constructivist approach to learning makes good communication responsive. This excellent response is possible because participants and instructors do not have a gap both concerning age and maturity as good learners.

Considering the teaching and learning experience implemented by the teacher, they need to change how to manage learning. They also will face many obstacles that require support from decision makers in schools such as infrastructure, training, and other support [12]. Teachers in eastern Indonesia also face this [9]. However, the results of this study indicate that in fact, teachers have also realized the importance of using technology in learning today. Changes in the teachers' belief will bring a new learning atmosphere in their classrooms [13,14,15]. Changes in the beliefs of teachers on the use of information and communication technology in learning become essential capital in classroom learning. The next support for teachers is how teachers can be able to improve the process of social interaction in car learning. Maintaining social interaction in online activities is a critical problem [6, 16].

IV. Conclusion

From the analysis of each aspect, in general, mobile learning provides opportunities for optimum learning interactions for teachers. There are no factors that have been responded poorly by the teachers. It means that teachers believe the mobile learning will support their better learning management. These results become a sign that there is a big chance to use mobile learning for better learning interaction.

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