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MEASURING THE USE OF TECHNOLOGY IN TEACHING-LEARNING PROCESSES: LECTURERS' PERCEPTION AND IMPLEMENTATION

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Abstract: What does using technology mean? How do we measure the use of technology? The notion of "measuring the use of technology" mostly only means how the technology is used by lecturers to deliver material to students. Some research have been conducted to investigate the role and benefits of technology and the perceptions of lecturers about the use of technology in the teaching-learning processes. However, fact shows that the use of technology by lecturers and how they actually view the use of technology is still difficult to measure clearly. Defining the use of technology as a dimensional unit might simplify the analysis of the use of technology. This means that we have to see how technology is used since preparation process to grading process. Thus, this research is aimed at analyzing how lecturers at University of Abdurachman Saleh Situbondo (UNARS) used technology and how they viewed the use of technology in their classroom teaching- learning. The research data were obtained through questionnaires. The results showed that the lecturers viewed the use of technology positively. The most dominant use of technology was in grading process, while the least use of technology was related to professional use of email.

Keywords: technology, UNARS' lecturers, perception, implementation

INTRODUCTION

Technology is any tool or process created or used by humans to help them solve their problems. This definition implies that technology does not always have to do with any electronic things. Technology is also far beyond any innovation developed by humans. Supriadi (2011) defines technology as the discovery of objects or tools which is a form of implementation of the knowledge and skills possessed by humans. Thus, it can be concluded that technology is any tool created by humans to facilitate their work.

The role of technology is also found in the field of education. Technology significantly develops the quality of education. Any form of systematic and organised process that apply modern technology to advance the quality of education is included as educational technology (Stosic, 2015). Further, he mentions three functional uses of educational technology. Technology functions as a tutor, a tool, and a learning tool. Technology functions as a tutor because it can guide and give instructions to its users, for example, a computer. Then, as a teaching tool, technology can be used in classrooms by educators to help them deliver materials to students. To illustrate, WhatssApp as a platform messaging can be used to ease communication between a teacher or a lecturer with students to discuss any issues related to courses. It eases the mode of communication from the conventional to the modern one. The use of technology can also be felt by students. Students usually use the Internet to search for materials and learning resources. The process of teaching and learning activities will be carried out better with the help of technology. Students living in the present era are known as technology natives. Therefore, it is natural and common if students learn to use forms of technology such as computers, laptops, mobile phones, or tablets. This represents the trend in the era of industrial revolution 4.0 where educators including lecturers have to be technology literate. Characteristics of the industrial revolution era include digitalization, optimization and customization of production, automation and adaptation, interactions between humans and machines, value added services and business, automatic data exchange and communication, and the use of information technology. Therefore, the world of education and industry must be able to develop an industrial transformation strategy by considering the human resources sector that has competence in their field (Rudianto, 2018).

In relation to that, educators, including lecturers, have to be able to adapt themselves with the rapid development of technology. Their skills in utilizing technology outside classrooms will determine how they will use it in classrooms. Nonetheless, do all lecturers know what is actually meant by using technology? Simply, some may say using an LCD projector, a powerpoint slide, a video, and a smartphone in class during the teaching-learning process is a vivid example. Yes, it is true. Yet, if analyzed further, the term "the use of technology" is beyond that. It is not about playing

a video in a drama class nor is it about showing pictures through powerpoint slides in a Science class. Is using technology in preparing materials a use of technology? Does communicating with teaching colleagues represent the use of technology in educational context? Hence, can we really define the use of technology in teaching-learning processes? It is actually still vague how to define it. Even research underlying the topic reveals that the definition only measures how technology is used during the teaching-learning process, when lecturers deliver materials.

Some research have been conducted to measure the use of technology in educational context. Gray et al., (2019) conducted a research to investigate the concrete use of technology in complementary medicine education. By a means of survey, they analyzed students' behavior and attitude to learning technologies. Azlim et al., (2015) aimed their research at analysing lecturers' perception about the implementation of educational technology and the aspects influencing the lecturers in utilizing educational technology in their teaching processes. Bower and Sturman (2015) tried to look into how educators from around the globe who are considered good or very good at understanding wearable technologies to determine the key educational affordances and issues at stake. Fourteen affordances and thirteen issues relating to their use were then classified into three categories: 'pedagogical uses', 'educational quality' and 'logistical'. There was also one research conducted by Alper (2012) who examined Turkish pre- service teachers in incorporating educational technology. The goal of the research was to gain the basic educational technology literacy of the pre-service teachers. From these previous study, there is one thing in common, a thin line of the results of the research. Measuring one's perception and the implementation of educational technology cannot be seen from one side. It is a multi-dimensional measurement that needs thorough investigating. There is also a cause- effect relationship between lecturers' perception and how they implement educational technology. Concerning that measuring the use of technology can be multi-dimensional, a research was conducted at University of Abdurachman Saleh Situbondo. The research aimed at measuring thoroughly how the lecturers perceived the use of technology and how they utilized technology in their teaching practices. How they perceived the use of learning technology was measured through how they define the learning technology itself, while the measure of the implementation was seen from how far they used technology as a professional.

LITERATURE REVIEW
Definition of Learning Technology

In general, learning technology can be defined as the use of technological processes as special tools for teaching and learning that facilitate access to all types of information. Based on the function, Yaumi (2016) classifies technology into four; they are:

a. Learning technology as media.

The definition arises because of the use of some forms of audio visual technology in classrooms, such as films and videos. The concept of this definition works because such technology like films can deliver messages to students who watch them. Briefly, technology works to facilitate the process of delivering instructional messages.

b. Learning technology as a field of science.

The definition underlines that technology is seen as a field involved in facilitating the human learning process which includes the process of systematic identification, development, organization, and utilization of various learning resources and through the management of these processes. The use of the word field in the definition is to authenticate efforts to develop both the learning process and the products produced through the results of development activities.

c. Learning technology as a process.

This definition justifies technology as a process that involves people, procedures, ideas, tools, and organization. This procedure is complex and complicated because it involves many aspects that aim to manage solutions in the human learning process. In this definition, it is implied that all aspects involved must be managed well because the main point of this definition lies on the process.

d. Learning technology and area of science.

Learning technology is the theory and practice of design, development, utilization, management and process evaluation.

Types of Educators Based on Use of Technology

Evan-Andris in Mumtaz (2006) classifies teaching styles in computer use into three groups, namely: avoidance, integration, and technical specialization. The first type usually educators who distance and limit themselves, and reduce the time spent in activities related to computers. This type usually also has a low level of interaction with students when they work using a computer. The second type usually combines technology in teaching methods, work, and student learning. In addition, they usually introduce computer applications and develop activities that combine technology with the teaching and learning process. Then, the latter usually embrace computers and see technology as a challenge. Teachers or lecturers with this style will always use computers in schools and integrate the use of computer in every activity. During the teaching and learning process, they will also tend to focus more on teaching students about the technical aspects of the computer.

Approach to Measuring the Use of Learning Technology.

The use of technology by lecturers cannot be measured from one aspect. It should be analyzed thoroughly as a whole. Thus, it is not suggested to see how lecturers use technology merely when they deliver materials in the classroom. We have to see how lecturers use technology as a professional, so it is a multi-dimensional measurement. There are two approaches that can be used to measure the use of technology in a multi-dimensional method, namely: composite measures and multiple measures. Composite measures are obtained from the results of a single composite measurement that represents the frequency of technology use by lecturers. In this research, the measure was done through multiple measures to investigate specific uses by lecturers. The components of use analyzed in this research were adopted from Bebell et al., (2004) and they cover:

1. preparation: use of technology at the preparation stage
2. professional e-mail: use of e-mail for professional business
3. instruction delivery: use of technology when delivering material
4. accomodation: use of technology for accommodation
5. student use: use of technology by students when in class through lecturer direction
6. student's products: use of technology by students with lecturers' direction to produce products
7. grading: the use of technology by lecturers for grading.

METHOD

The design of this study is a survey method with descriptive analysis techniques. This research was conducted at the University of Abdurachman Saleh Situbondo (UNARS). The respondents were one lecturer from each faculty at the university. There were six faculties so the total number of respondents were six people. The responds given by the lecturers were the main data of the research. This research employed questionnaires to obtain the data. There were two kinds of questionnaires used, they are: close-ended and open-ended questionnaires. The format of the former questionnaire was adapted from Bebell et al., (2004) while the format of the latter was adapted from Davidson et al., (2012). The first questionnaire has been used by several researchers in their research there was no need to do pre-testing or validation before distributing. The questionnaires had twenty question items on seven components (preparation, professional e-mail, instruction, accommodation, student use, student's products, and grading) of use of learning technology by lecturers. The open-ended questionnaire required the respondents to give their explanation about the use of learning technology and their views on its use of the learning process. For the close-ended questionnaire, the data were analyzed quantitatively (in percentages) and then were described qualitatively. Every aspect of the seven components measured was calculated using a Likert Scale with a range of 1-5. Point 1 states "never", point 2 states "one or two times a year", point 3 states "several times a year", point 4 states "several times a month", and point 5 states "several times a week". Then, the results were analyzed further and grouped into three kinds of categories. Those who answered 1 and 2 belonged to negative group. Those who chose 3 belonged to neutral/fair group, and those who chose 4 or 5 belonged to positive group. The results of the second questionnaire were analysed qualitatively by considering the theories on learning technology, particularly on how they viewed technology in learning (Yaumi, 2016) and how they implemented it as a professional (Evan-Andris in Mumtaz, 2006 and Bebell et al., 2004).

FINDINGS AND DISCUSSIONS

The results of the questionnaire were classified into three groups: negative, neutral, and positive. Negative implies the least frequency of technology. Those who chose scale 1 and scale 2 belonged to this group. Neutral means fair frequency of technology, and this is for those who chose scale 3. Positive consists of people who chose scale 4 and scale 5. They are the ones who have the highest frequency of the use of technology in their teaching practice

Table 1. Classification of Questionnaire Results

Component to	Negative	Neutral	Positive
preparation	17	61	22
professional e-mail	83	11	6
instructional delivery	0	18	100
accomodation	33.5	16.6	50
student use	0	8	92
student's products	43	30	27
grading	0	33	67

From the table, it can be seen that the most frequent use of technology by lecturers at UNARS is at instructional delivery stage, while the least frequent is at the use of professional e- mail. The second highest frequency of the use of technology is related to student use, meaning that many lecturers have already facilitated their students well to integrate technology in their learning processes. However, a deeper focus and attention should be given to the use of professional e-mail. Even though all lecturers have an e-mail account, it does not mean that they always use it for professional use. Another concern should be also given on three components: preparation, accommodation, and student's products. The low frequent use of technology on these three components are caused by several reasons. Some of the lecturers only consider designing lesson plan and syllabus at the beginning of the semester. Well actually preparation here is everything a lecturer should do before coming to the class on the following day such as preparing teaching media, materials, modules, or handouts. The low frequency of technology at accommodation stage is caused by the lack of ideas in designing activities involving technology. Most of the lecturers think that involving technology in teaching only deals with electronical things, such as computer, LCD projector, or tape player. They do not realize that learning technology can also be in the form of strategy in teaching. Hence, they reason that technology cannot be integrated with any activity. Lecturers also find it difficult and tricky to design an activity that can create student's products. Usually they only ask their students to make powerpoint slides for a presentation session. Besides, they also argue that they do not teach in an art department, so they never ask their students to make artworks like pictures or films. Yet, drawing is not only related to art department. Even though they teach at Economic Faculty, they can still ask their students to create a picture using technology. To illustrate, Economics students can be assigned to draw a chart on economic development in a year, and Literature students can record a short drama using technology.

It is acknowledgeable that almost all of the lecturers use technology in their teaching practices despite on at what stage they use it the most. However, if categorized, most of the lecturers belong to the *integration type*. They combine technology in their teaching activities, but not to the extent that they have to focus to teach students aspects of technology. Five out of six lecturers belong to this type. The other belongs to type avoidance because he finds it difficult to cope with the rapid development of technology. Therefore, he sticks to his comfortable zone by not getting along with new technology. From this we can conclude that *many of the lecturers still define learning media as media*. Few view learning technology as a process, as an area of science, and as a field of science. Meanwhile, it is also significant to see learning technology as a process because the process of teaching-learning involves many aspects and people. This is also the one that determines the success of teaching-learning processes.

CONCLUSIONS AND SUGGESTIONS

It may be difficult to measure the use of technology in educational setting because the term is ambiguous by its nature. How we can measure the use of learning technology can be done by analysing how we define the learning technology. We can also measure the use of learning technology by categorizing to what type of educators we are if seen from how we use it. Finally, the measurement is also possible to be carried out by investigating the specific use of

technology as a professional. The results of these three measurements is seen as a multi-dimensional characteristic that represents how we view learning technology and its implementation. Such characteristic can be use used as a reference for a better quality of teaching practices.

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