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Competencies of Educational Technology in Training for Teachers at Wahid Hasyim Junior High School, Malang, Indonesia

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ABSTRACT
This research aims to reveal the implementation of digital learning media training for teachers at Wahid Hasyim Junior High School, Malang. This training was held based on the results of needs analysis in the form of interviews with *pamong* teachers accompanied by observation results during mentoring activities with teachers. The training method uses ADDIE consisting of analysis, design, development, implementation, and evaluation. Meanwhile, the research method used in data retrieval is quantitative by measuring and comparison between pre-test and post test results. The result of the research is an increase in the value of teachers after the post test at the end of the training activity. Hopefully, after the training, in general teachers can master the skills in the development of digital learning media. In addition, this article will also explain the competence of educational technology, especially in facilitating learning in schools based on reflection after training.

Keywords: educational technology, education and training, teachers

1. INTRODUCTION

The spread of COVID-19 every day is always increasing. To date (September 8, 2020) the number of cases exposed to COVID-19 as many as 200,035 people with details of 142,958 people declared cured and 8,230 people died [1]. This number will continue to grow for an unpredictable time. Thus, prevention of transmission is key in countering COVID-19 (Figure 1).
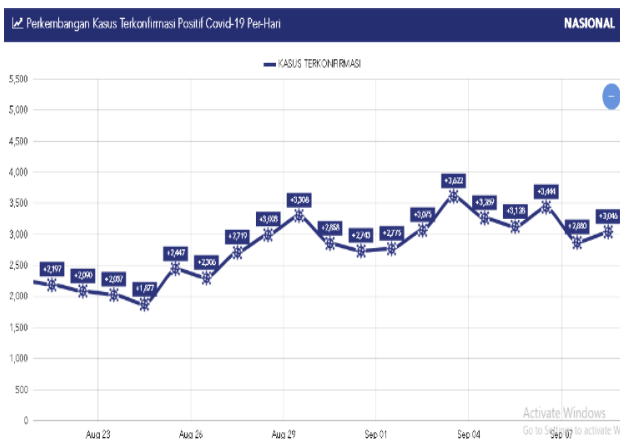

Figure 1 New Positive Case Addition Chart [1]

The impact of the COVID-19 pandemic caused various problems in the life sector. The education sector is one of the sectors that has been severely affected by the massive spread of COVID-19. There has been a change in learning patterns from previously face-to-face to online. This is as the policy of the government, so that areas that are still exposed to yellow to red zones must carry out online learning. As for areas affected by green zones can carry out face-to-face learning with the applicable terms and conditions [2]. The purpose of this policy is to minimize the spread of COVID-19 among educational people, especially in students. Because students are particularly susceptible to contracting this virus [3], [4].

Education is the key to the most important sector in national development. This is because education creates people who are ready for future challenges [5]. These people will contribute to the improvement of the quality of a nation [6].

Teachers have additional needs in the learning process by utilizing ICT because teachers in the "zaman Now" era are encouraged to bring new learning efficiently to the classroom [7]. The COVID-19 pandemic has become a momentum in staring at the flow of change in the process of implementing future learning. This assumption has

reasoned that since the development of the internet in the 90s in Indonesia, the world of learning has been challenged to transform from mechanistic to digitizing. The digitization of education is certainly influential in various changes, such as media, models, methods, strategies to techniques in learning.

The main problem in dealing with the digitization of education lies in human resources, especially teachers in developing and managing digital learning media. One of the schools that has the problem is Wahid Hasyim Junior High School located in Malang. Based on the observations of interviews that have been conducted with the teacher *pamong*, the fundamental needs that are the problem of the school are related to the development and management of media in the form of learning applications (platforms), especially on the WordPress platform for use in the learning process. Therefore, as an educational technologist, researchers have an obligation to solve the problem.

Educational technology is a scientific field in an effort to facilitate learning [8]. Technically, educational technology is defined as a variety of electronic tools and applications that help provide learning materials and support the learning process in the classroom. For example the implementation of CAI, LMS and so on [9]. In modernity, educational technology has challenges in providing learning facilities that are able to adapt according to existing needs [10]. This is because both teachers and students need to prepare to integrate ICT in the implementation of future learning [11].

Based on the background description, researchers are interested in carrying out learning media training activities to find out how basic the teacher is and how successful the implementation of training activities in improving ICT competency for teachers in Wahid Hasyim Junior High School, Malang.

2. METHODS

In this study, researchers acted as facilitators in learning during training. This means the overall training activities ranging from analysis to evaluation of programs designed by researchers [12]. So this research can also be referred to as action research [13]. Program development methods used using ADDIE (Figure 2) consisting of Analysis, Design, Development, Implementation and Evaluation [14]. At the analysis stage, researchers conducted observations in the form of interviews with the school. After learning the analysis of the needs of the school, the researchers designed the training activities to be carried out.

Then, researchers conducted program development activities consisting of developing guidebooks, coordinating with the school, developing Quizizz and WordPress for demonstrations and so on. Furthermore, researchers carried out training activities that began with the spread of pretest to participants (junior high school teacher Wahid Hasyim) and the delivery of training materials accompanied by documentation. In the last stage,

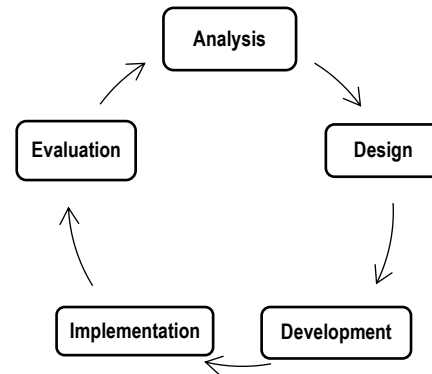researchers conducted evaluation activities in the form of filling out posttest assessments.

Figure 2 ADDIE Model

The research method used to use quantitative. The type of research used is experimental research using a comparison of the accuracy of scores between the pretest and posttests of each sample. As is well known, experimental research is used when researchers want to conduct experiments to find influence in testing the use of learning media one of them [15]. This comparison is a reference to the success of the research conducted. So this type of research looks at whether the training that is done can affect the quality results that have [16].

3. RESULT

In disclosing the results of the data, the researchers used the results of pretest and post tests by the researchers as training evaluation materials carried out.

a. Pretest Assessment Results

Prior to the implementation of the training activities, the researcher first handed out exams related to the training materials to be delivered. The results of the accuracy of the training pretest scores on each individual are as follows (Table 1).

Table 1 Teacher Training Pretest Results

Sample	Value Accuracy
1	87 %
2	87 %
3	80 %
4	73 %
5	73 %
6	73 %
7	67 %
8	67 %
9	67 %
10	53 %
11	47 %
12	40 %
13	33 %

If the accuracy of the value is sought on average, the result is as follows (Table 2).

Table 2 Description Data

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test	13	33.00	87.00	65.1538	17.11162
Valid N (listwise)	13				

The calculation results in a descriptive statistical analysis showed the maximum value obtained 87 percent and the minimum obtained as much as 33 percent. Thus, the average yield obtained was 65.1538 percent accompanied by a standard deviation of 17.11162 percent.

b. Post Test Assessment Results

After the training, researchers evaluated the spread of posttests to all trainees. The results of the posttest assessment are as follows (Table 3).

Table 3 Posttest Training Results from Teachers

Sample	Value Accuracy
1	100 %
2	100 %
3	100 %
4	93 %
5	87 %
6	80 %
7	80 %
8	80 %
9	73 %
10	67 %
11	67 %
12	67 %
13	53 %

If the accuracy of the value is sought on average, the result is as follows (Table 4).

Table 4 Description Data

	N	Minimum	Maximum	Mean	Std. Deviation
Post Test	13	53.00	100.00	80.5385	14.99786
Valid N (listwise)	13				

The calculation results in a descriptive statistical analysis show the maximum value obtained 100 percent and the minimum obtained as much as 53 percent. Thus, the average yield obtained was 80.5385 percent accompanied by a standard deviation of 14.99786 percent.

c. Comparison of Pretest and Post Test Results

After calculating the pretest post test results, there is an improvement in the development and management capabilities of digital learning media for teachers. The results of the calculation are as follows (Table 5).

Table 5 Pre-test and Post Test Results

	N	Range	Sum
Pre and Post Test	2	15.38	145.69
Valid N (listwise)	2		

The result of the comparison between pretest and posttest was a 15.38 percent increase in teacher ability with an overall total mean score of 145.69 percent. This demonstrates the training of being able to develop the ability of teachers in developing and managing learning media. With these results, the development of educational technology is able to improve the quality of human resources in the community.

4. DISSCUSION

a. Transformation of Constructivism Learning during Pandemic

The COVID-19 pandemic has forced entire sectors of life to change. From changes from the political sector, administration, economy to expanding into the world of education. In this field transformed from initially face-to-face into online, so that both teachers and students inevitably also participate in the flow of transformation.

The current era of transformation leads to many rules both written in the curriculum and unwritten with the aim of attracting students in learning [17]. This is certainly the difference from motivation, content to learning methods in its implementation [18]. This transformation is part of the shift towards a constructivist paradigm.

The conception of constructivist learning has historical roots through the works of Dewey (1929), Bruner (1961), Vygotsky (1962), and Piaget (1980). Bednar, Cunningham, Duffy, and Perry (1992) and von Glasersfeld (1995) [19] has proposed several constructive theory implications for instructional developers that emphasize that learning outcomes should focus on the process of knowledge construction and that learning goals should be determined from authentic tasks to specific objectives. The constructivist paradigm basically has an emphasis on freedom in the learning process of teaching, both time and place.

Constructivism is an approach to teaching and learning based on the premise that cognitive (learning) is the result of "mental construction." In other words, students learn by providing new information along with what they already know. Constructivist believes that learning is influenced by the context in which an idea is taught from the beliefs and attitudes of students [20]. In other words, constructivist in the process is student-oriented itself [21].

There have been many studies that reveal the benefits of a constructivist approach to learning. There is research that reveals that a constructivist approach is able to influence the attitude and motivation of learning [22]. In addition, this approach can also improve academic achievement [23]. So that with a constructivist approach, able to meet the learning aspects needed, especially during this pandemic.

b. ICT Competency for Teachers in Pandemic Period

The consequences of teachers as professional educators require several things, namely academic qualifications and competencies [24]. Teachers must have academic qualifications, competencies, educator certificates, physical and spiritual health, and have the ability to realize national educational goals. Academic qualifications are obtained through higher education undergraduate programs or four diploma programs. Teacher competencies include pedagogical competencies, personality competencies, social competencies, and professional competencies obtained through professional education [25].

In carrying out the study during the COVID-19 pandemic, it is necessary to learn with a constructivist approach. This is done with the aim of breaking the chain of the spread of the virus, especially among educational people. Therefore, the effort that can be made during this emergency period is to carry out online learning. In meeting these expectations, teachers need to make many adjustments, especially related to the development of ICT competencies in the virtual learning process. This is in accordance with the current free learning policy often held by the Ministry of Education and Culture [26]. It is hoped that this adjustment can overcome learning problems during the ongoing pandemic period.

Although this policy is seen as solution in solving educational problems, in reality many teachers have difficulty in carrying out learning online. Based on the research that has been done, there are three types of barriers that most respondents experience during online lectures, namely a limited quota of 21.5%, unstable networks of 23.4% and tasks that accumulate as much as 30.6%. Of course, these three factors should be anticipated by all parties including by the respondent himself and the institution. So when the online learning system is implemented, understanding the material with the instructions that have been explained is still a challenge [27].

In addition, capability issues are also a major issue. One of the schools that experienced these obstacles was Wahid Hasyim Junior High School. This is like the observation of interviews and mentoring activities that researchers do during activities (Figure 3). Data shows that teachers have difficulty developing and managing digital learning media due to various factors, such as easily forgotten training materials that have been taught before, not accustomed to age factors. Therefore, as an educational technologist in achieving the level of complementary facilitation or providing ease in learning, researchers took the initiative to conduct digital learning media training for teachers to improve the quality of human resources owned by the school.


Figure 3 Study Interviews with School Authorities

c. Educational technology in Wahid Hasyim Junior High School

Improving the quality of education is the main effort in the process of producing quality human resources. The quality of education is determined by many factors, such as the quality of educators and educational personnel, the quality of curriculum and educational programs, the quality of education and learning services, the quality of access and information and communication services, the availability of learning facilities and infrastructure, and the completeness of adequate learning resources [28], [29].

Educational technology has an important role in improving educational human resources. This is because the essence of educational technology as a learning facilitator [8]. In the field, when referring to the agreement from AECT in 2008 [8], then the scheme of employment of an educational technologist is as follows (Figure 4).
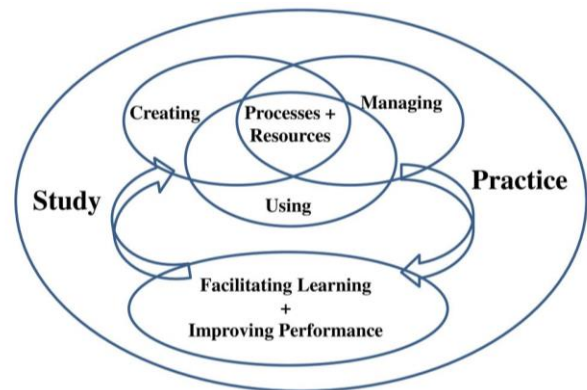
Figure 4 Educational Technology Scheme by AECT 2004

In addition to that in an article [30] also explained, one of the competencies of Education Technology is designing training. In this role, education technologists will: (1) organize the implementation (class coordinator), analyze employee needs, create syllabus, schedule and training materials, coordinate with training teachers, and evaluate training implementation; (2) conceptualize, design, develop media such as web, X-banner videos, interactive media eBooks and others; (3) organize, supervise employee

activities and performance; and (4) conduct Training Need Assessment, design training, conduct training, conduct training, evaluate training , create training materials based on curriculum, develop questions for training materials.

There are still many descriptions of the field of educational technology science. Most professionals in the field of educational technology have served as agents of change. This is because, education technology basically seeks to introduce various reforms through concepts, procedures and products [31]. So that educational technology has an important role in solving educational problems in particular.

Therefore, in order to achieve these competencies, researchers held digital learning media training activities in the form of Quizizz and WordPress. Both platforms were chosen because of the easier use [32], [33] and dependents required in the implementation of learning at Wahid Hasyim Junior High School. This is part of a project based learning conducted by researchers to improve the competencies owned by the participants themselves [34].

Figure 5 Training Documentation

Figure 6 The Instructor is Teaching Training Materials

Training activities take place smoothly without being accompanied by significant obstacles (Figure 5). Methods for delivering training materials use lectures, demonstrations and practices. So participants (teachers) will be given lectures on training materials, then held demonstrations and asked to practice. This aims to allow participants to construct their learning experience during the training independently.

Participants in digital learning media development and management training seem enthusiastic to participate in this activity (Figure 6). This is because participants gain new insights into the management of digital learning platforms. In addition, participants can improve their abilities independently through training that researchers.

5. CONCLUSION

The COVID-19 pandemic may be making the rest of the world lethargic. However, the virus has become momentum for educational technologists to demonstrate their capacity in education. The conclusions that can be obtained from the training activities carried out are as follows:

a. Educational technology has competence in improving the quality of human resources in schools (teachers).
b. There was an improvement in the competence of teachers in developing and managing learning media after training with an average of 15.38 percent.
c. The assessment results are reviewed from the average score between pretest and posttest.
d. From these results, showing the success of educational technologists in improving the quality of teachers.

Regardless of the success that has been achieved, of course researchers desperately need the support of educational actors on a broader scale. This aims to make education technology have a direct impact on people's lives, so that this scientific group can be widely known.

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