



## Training on the Development of Utilization of Digital Teaching Materials for Teachers to Improve Student Learning Outcomes

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### Abstract

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In the era of the industrial revolution 4.0, modern technology such as fibre technology and integrated network systems in all aspects of life has made humans very dependent on technology. The purpose of this research is to foster a culture of digital literacy in the school environment, increase teacher knowledge and skills in the field of developing and utilizing digital teaching materials, improve student learning performance and increase teacher knowledge and skills in terms of digital learning models and improve student's learning performance. The method used in this research is a qualitative method with this type of research. The method used in this study is the observation method using the pre-experimental design method, one group type pretest-posttest (pretest test-posttest single group). Assistance was provided to 28 junior high school teachers in the South Tangerang area. During the training, participants were given four assignments: Team, Sway, Learning Design and Learning Videos. The study results show that as many as 71% of teachers have mastered the Teams and Sway applications from Microsoft, 60% can make lesson plans, and 53% can make learning videos. The pretest and post-test results showed that the average result was 36.6%, then after participating in the training, the average result was 44.4%. The results of the study show that training in the development and use of digital teaching materials has an effect on the skills and abilities of teachers, which is beneficial for improving student learning performance.

### Keywords:

Information Technology, Digital Teaching Materials, Learning Performance, Teacher Competence

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## INTRODUCTION

In the era of the industrial revolution 4.0, the application of modern technology, such as *fibre technology* and integrated network systems in all aspects of life, has made people very dependent on technology. Technology is a basic need for everyone (Williamson, 2017). From young people to the elderly, from ordinary people to experts, and from rural communities to cities, they also use technology in various aspects of their lives. This also happened in the field of education. In the field of education itself, technology now has its role in the teaching and learning process (Ronny Scherera JoTondeurb Fazilat Siddiq EvrimBarand, 2018). Research results (Sumintono, B., Hidayat, R., Patras, YE, Sriyanto, J., & Izzati, 2019) ) regarding the use of ICT in Teaching: Middle School Science Teachers in Indonesia that 70% of teacher respondents already have laptops/computers. Only 53% of teachers have laptop/computer facilities for



learning activities. There are so many roles that technology has in the teaching and learning process at this time. Technological developments help learning media become easier to use. Various learning media technologies have also become a trend and even help learning resources across regional boundaries, countries to continents (Henry, 2017) One of them is an application that can be accessed easily via the internet using a computer device or cell phone ( *Smartphone* ).

With the sophistication of technology, they are making teaching materials more innovative, making it easier for students to learn independently according to their abilities and learning speed. Competencies that a teacher must possess are developing teaching materials and managing the learning process through innovative learning models (Büyükbaykal, 2015). In the traditional face-to-face learning process, it is enough to use printed teaching materials (Sungkono, 2009). In contrast, in the online learning process, digital teaching materials must be provided that can be accessed offline and online. Indirectly when the learning process turns online, teachers are required to provide and be able to develop and utilize digital teaching materials.

Some of the advantages offered by digital teaching materials, in terms of efficiency, digital teaching materials can be studied and carried everywhere without burdening the user. Digital teaching materials storage does not require physical space but offline data storage space (memory on smartphones, flash drives, hard drives, etc.) or virtual storage space provided online (DropBox, Google Drive, OneDrive, etc.) (Sutarto et al., 2020). The process of duplicating and distributing digital teaching materials is straightforward and does not require a lot of money. Duplicating and distributing it does not require special tools and abilities, such as a technician who must be good at operating a printing machine. Teachers can already duplicate and distribute digital teaching materials to their students through their devices. (Smaragdina et al., 2020)

Substantially, there is not much difference between traditional face-to-face learning in the classroom and online learning. For example, interactions between teachers and students, student interactions with learning materials and interactions between students in both traditional and online learning processes still occur. Technical matters are the fundamental difference between managing traditional learning with online learning (Amrullah, 2022). The learning process used to take place in a physical space while switching to online learning takes place in a virtual space. Habits and understanding in managing online learning are still not developed among teachers (Munir, 2009). Online learning models are felt to be very necessary for teachers to master during this pandemic. Learning models can assist teachers in managing the online learning process according to the time available, the goals to be achieved, the ability of students to absorb, and the availability of existing teaching materials. (Dhawan, 2020)

The number of teachers in South Tangerang City is 11,699 teachers spread across 7 sub-districts. The National Abdnimas Batch 1 in 2021 has been attended by 81 teachers. There are still around 11,688 teachers who have not had the opportunity to participate in Digital Learning Training by utilizing the advantages of Information and Technology. (Selatan, 2019)

Based on the condition of the education staff in South Tangerang City as

described above, FKIP UT continues the implementation of the National qPkm located in South Tangerang with teacher participants who have not participated in the same activity in 2021. Partner Problems Based on the results of interviews with the MGMP in South Tangerang, it was concluded that teachers still had difficulty using ICT to carry out online learning. These difficulties include the preparation or use of online learning materials, the preparation and implementation of learning evaluations and using ICT for online learning.

The ability to develop digital teaching materials during the implementation of the online learning process also needs attention. Many teachers still do not understand how to easily and quickly develop digital teaching materials as a support during the online learning process (Coman et al., 2020). Although a lot of content or materials are spread on the internet, not all of them are designed for the learning process because good content or materials for the learning process are content or materials that are intentionally designed for learning purposes by taking into account the achievements in the learning objectives. To help increase the competence of teachers in the South Tangerang area, one of the contributions of the Educational Technology Study Program, Faculty of Teacher Training and Education, Open University to the community by assisting educators so that they have adequate competence in the field of information and communication technology. The legal basis for this research is:

1. Letter of Cooperation between the Head of the South Tangerang City Education Office and the Dean of the Open University number: date:
2. Statement of Partner Cooperation in Community Service activities, number: 421.4/1085/Disdikbud, dated 3 March 2021;
3. Letter of Assignment Letter from the South Tangerang City Government Education and Culture Office, number: 800/242/Disdikbud, dated 23 June 2022;
4. National PCM Proposal for Training on the Development and Utilization of Digital Teaching Materials for Teachers to Improve Student Learning Performance towards South Tangerang, a Smart City 2021-2023.

The purpose of this research is to develop a digital literacy culture in the school environment, as well as to increase knowledge and skills teachers in the field of developing and utilizing digital teaching materials to improve student learning performance and improve knowledge and skills taught in terms of digital learning models to improve student learning performance (Azzahra & Felippa, 2021).

The South Tangerang City Education Office partners in this community service activity. South Tangerang City is an autonomous region formed at the end of 2008 based on Law Number 51 of 2008 concerning the Establishment of South Tangerang City in Banten Province. The establishment of the new autonomous region is carried out to improve community welfare, public services and regional competitiveness. South Tangerang City is located in the East of Banten Province with the following boundaries:

1. To the north, it is bordered by Tangerang City;
2. In the east, it is bordered by DKI Jakarta Province;
3. In the south, it is bordered by Depok City and Bogor Regency, West Java Province; and

4. In the west, it is bordered by Tangerang Regency.

To support the success of the PkM implementation, the Coordinating Team first worked together to build communication and ensure a cooperative/partnership relationship with the South Tangerang City Education and Culture Office. Coordination is carried out intensively in terms of the following:

1. Analysis of program needs needed by educators in South Tangerang City.
2. PkM program planning based on the results of the analysis
3. Determine participants, place and schedule for program implementation
4. Monitoring and evaluating the implementation of PkM.

This coordination is carried out so that the program to be implemented can provide optimal benefits for educators and the school in general. In addition, the Coordinating Team also synergized with lecturers from the TPEN study program so that they could present a good program and have the same perception among team members in implementing the community service (Armstrong, 2015). Community service activities will run smoothly if there is good cooperation with all related parties, namely the FKIP-UT TPEN Team, the South Tangerang City Education Office, resource persons from *Microsoft Education* Indonesia, and teachers in the South Tangerang City area. Outdoors target PKM activities are:

1. They are improving teacher competence in developing Digital Teaching Materials and utilizing them in learning. Community service participants who have successfully produced Digital Teaching Materials for several subjects will receive a certificate.
2. Improvements in teacher competence in using Microsoft Office 365 have been given in the first year and practised as training classes in each class in the form of exciting learning. Furthermore, the participants can provide training to their colleagues.

They are improving teacher competence by using several online learning models as outlined in a Learning Implementation Plan. Participants who have attended a series of lessons and completed tasks in training will receive a certificate.

## **METHODS**

In general, the use of technology in learning can be seen from the aspect of the delivery system (face-to-face vs online), from the aspect of teaching materials (print vs digital), as well as from the aspect of evaluating learning outcomes (face-to-face vs online). Community Service Program The Educational Technology Study Program, this time, refers to the goal of providing educators with the ability to use information technology through the introduction of the Microsoft Office 365 platform, which will later be used as an online learning platform and the development of digital teaching material (Mpungose, 2020).

Considering *online learning* as one thing learning mode, students need to understand the characteristics or potential of online *learning* so that they can make optimal use of it for the benefit of learning. The advantage of online learning is providing fun learning media to generate student interest in learning.

This community service activity is a digital development and utilization activity for teachers to improve teaching performance in the Tangerang area, specifically in South Tangerang. According to (Sugiyono, 2016), the sample is part of the number and characteristics possessed by the population. This sample was taken because it was not possible to study all members of the consumer population in this study. This sample search was determined by the sampling technique used in this study using purposive sampling technique. The samples taken in this study were elementary and junior high school teachers in the city of South Tangerang, totaling 11,669. By using a purposive sample technique, the number of teachers who were used as research subjects was 28 respondents. The implementation of this research was carried out in June-July 2022. The targets in this activity were junior high school teachers in the South Tangerang area, totalling 28 respondents. The implementation of this research was carried out in June-July 2022.

The research method used in this program uses observation and the pre-experimental design method, type one group pretest - post-test (pretest test-posttest single group). (Rukminingsih et al., 2020) The pretest and post-test design for specific groups is a research activity involving giving an initial test (pretest) before treatment and then giving a final test after treatment (post-test).

After seeing the above understanding, it can be concluded that the results of the pretest and post-test are to determine whether there are changes in the development and use of digital teaching materials for teachers to improve student learning performance (Taufik et al., 2019)

The stages of Community Service in the Educational Technology Study Program consist of the following activities.

1. Online/Network Learning Model Development Training (PMPD)

Participants learn to create virtual classes with various learning models in the network using applications from Office 365.

2. Interactive Digital Teaching Material Development Training (BADI)

Participants learn how to create digital teaching materials using applications from Office 365.

The description of each training activity above is further elaborated below. Online learning model training (PMPD) Digital Learning is a digital learning model using digital devices, either done live or recorded. In digital learning, students can access material and teacher explanations anytime and anywhere. Digital learning is often also called *online learning* or e-learning (Suparwito et al., 2021). Material to be discussed:

- a. Online learning features in Office 365
- b. Develop virtual classes with Office 365

Participant The Online Learning Model Training (PMPD) participants are junior high school teachers in the city of South Tangerang consisting of 28 state schools. Resource Person and Facilitator 11 participants came from open university lecturers.

Digital Interactive Tea Interactive Teaching Materials Training (BADI) Theory. The teaching materials to be developed are digital materials that educators and students will later use on virtual class pages developed in online

learning model training. Training materials Development of Interactive Digital Teaching Materials:

- a. Overview of Interactive Digital Teaching Materials
- b. Procedure for Developing Interactive Digital Teaching Materials
- c. Design of Interactive Digital Teaching Materials
- d. Developing BADI with the O365 application

Participants were junior high school teachers in the city of South Tangerang. Badi participant the schools that participated in this study consisted of 13 schools and 28 teachers at public junior high schools in South Tangerang City. The resource persons consisted of 10 people, 8 agents came from open university lecturers, and 2 people were open university students.

Interactive Digital Teaching Material Development Training (BADI) will be held from 17 June to 7 July 2022. The implementation will be carried out online and face to face. activities carried out include: Introduction of the UT Team and Participants, Overview of BADI Development Training, getting to know the features of Office 365 As a tool for creating BADI, Development Procedures and Structure of BADI, BADI plan, Practice making BADI designs, independent tasks Create a BADI Plan, BADI Design Presentation by participants, Develop BADI (Interactive PPT and Video), Mandiri assignments develop BADI and videos, BADI presentation by participants ABDIMAS Program Evaluation and Closure.

## **RESULTS & DISCUSSION**

### **PMPD Training Result**

#### 1) Work on Assignments and Exercises

During the training, participants were given four assignments, namely: Team, Sway, Learning Design and Learning Videos, the results obtained shows 28 respondents who participated in online learning model training and worked on assignments in the form of teams, sways, learning designs and learning videos. The results were that 71% of respondents understood the use of teams and Sway, 60 respondents could design lessons, and 53% of respondents had mastered making learning videos well. The percentages above show that this research directly impacts the development and utilization of digital teaching materials.

#### 2) Participant Attendance Analysis

The implementation of the Online Learning Model Training is carried out in four meetings, with the implementation of the Online Learning Model Training is carried out in four meetings. with training sessions held on June 17 and 24, and July 1 and 7 2022. The participation of students who attended each meeting was more than 80% attendance.

#### 3) Participant Pass Analysis

The implementation of the Online Learning Model Training is carried out in four meeting based it can be concluded that the implementation of developing and understanding digital teaching materials affects teacher understanding and skills. These results can be seen from the changes in the scores obtained by respondents during the pretest and post-test. Of the 28 respondents who had not

previously attended development and utilization training, an average yield of 36.6% was obtained, and then after attending the training, an average yield of 44.4% was obtained. The increase in these numbers shows that the implementation of the development and utilization of digital teaching materials for teachers improves student learning performance.

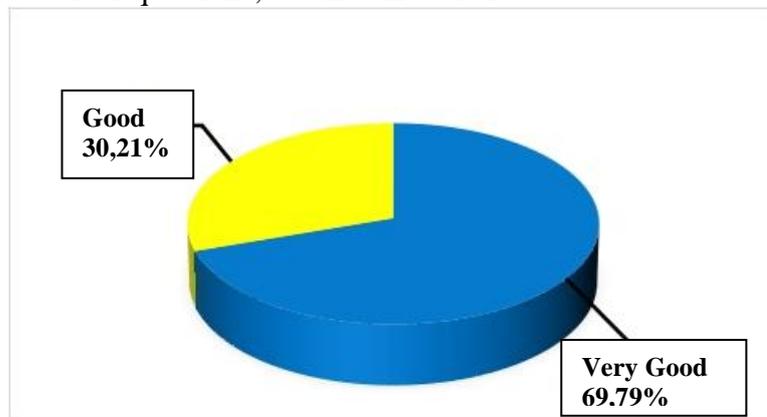
Evaluation of training activities is carried out through a survey to determine the level of satisfaction of community service activity participants with the services provided by the Open University community service team, Educational Technology Study Program. The survey was given to obtain data related to the input, process and output components of the community service activities that have been carried out. The survey was conducted with respondents via Google Forms. The survey uses Likert scale questions using four criteria. Spread survey results Participants who filled out the survey are listed in table 1.

**Table 1.** Distribution of Respondents

NO.	INSTITUTION	NUMBER OF RESPONDENTS
1	SMPN 6 Tangerang Selatan	2
2	SMPN 7 Tangerang Selatan	1
3	SMPN 9 Tangerang Selatan	1
4	SMPN 11 Tangerang Selatan	1
5	SMPN 12 Tangerang Selatan	2
6	SMPN 16 Tangerang Selatan	2
7	SMPN 18 Tangerang Selatan	1
8	SMPN 19 Tangerang Selatan	1
9	SMPN 20 Tangerang Selatan	1
10	SMPN 21 Tangerang Selatan	4
<b>TOTAL</b>		<b>16</b>

**Input Component**

The input component includes the responses of the training participants to the performance of resource persons and committee during the activity. The survey results showed that the participants gave perfect responses (69.79%), and the rest of the respondents gave good ratings (30.21%). The input component survey includes four questions, detailed in table 2.



**Figure 1.** Input Component Survey Results

**Table 2.** Input Component Survey Results

NO	QUESTION	VERY GOOD	GOOD	PRETTY GOOD	NOT GOOD
1	Mastery of the material of the speakers	73.75%	26.25%	0%	0%
2	The ability of resource persons to guide participants	67.5%	32.5%	0%	0%
3	Organization of training	62.5%	37.5%	0%	0%
4	consumption quality	68.75%	31.25%	0%	0%

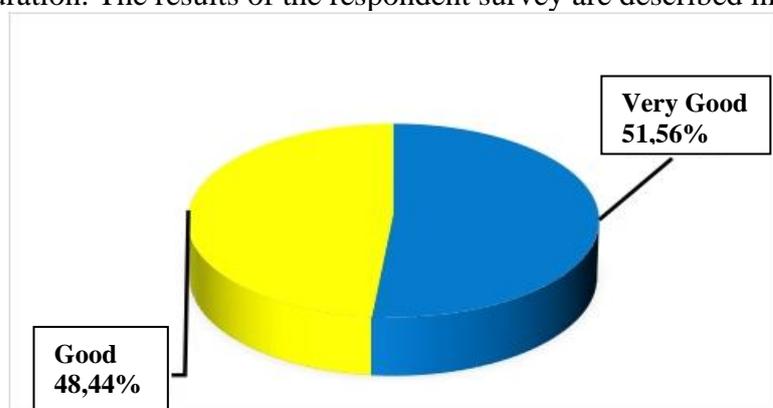
**Table 3.** Results of the Survey of Sources

NO	SOURCE PERSON	MATERIAL MASTERY		ABILITY TO GUIDE PARTICIPANTS	
		VERY GOOD	GOOD	VERY GOOD	GOOD
1	dr. Dewi Artati Padmo Putri, MA, PhD.	75%	25%	62.5%	37.5%
2	dr. Marisa, M.Pd.	75%	25%	75%	25%
3	Siti Nafsiah	68.75%	31.25%	62.5%	37.5%
4	Sutaryanto	75%	25%	62.5%	37.5%
5	Bachriah Fatwa Early	75%	25%	75%	25%

From the survey results, it is known that all Abdimas participants gave Good and Very Good ratings. Evaluating the resource persons' mastery of the material gave the best results. Namely, 73.75% of respondents gave a Very Good rating. Regarding individual abilities, all resource persons were also considered very good at mastering the material and in their ability to guide the training participants.

**Process Components**

Respondents gave a very appropriate rating of 51.56% and an appropriate 48.44% on the survey results on the process component. In the process component, four questions cover the relationship between training material and training objectives, face-to-face training methods, online training methods, and training duration. The results of the respondent survey are described in table 4.



**Figure 2.** Process Component Survey Results

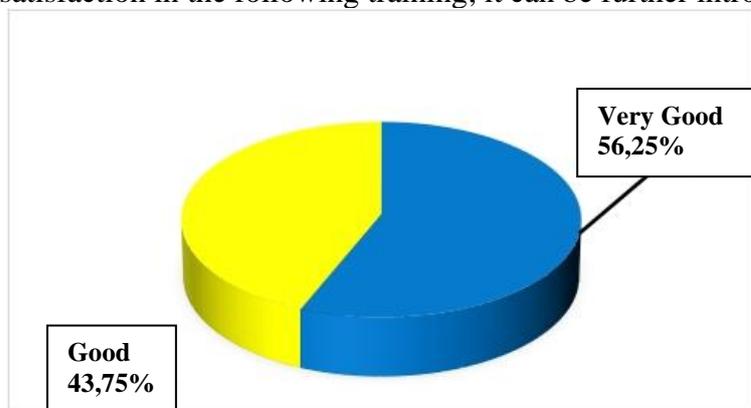
The survey results found that respondents gave an excellent rating of 50% for online training methods. This condition is already good, but it needs to be considered for the community service team to review online training methods so that the respondent's assessment will improve. Likewise, with the duration of the training, 81.5% of respondents gave a Good (Enough) rating. This can be considered in subsequent community service activities so that more attention is paid to the duration of the training.

**Table 4.** Process Component Survey Results

NO	QUESTION	VERY GOOD	GOOD	PRETTY GOOD	NOT GOOD
1	Linkage of training materials with training objectives	75%	25%	0%	0%
2	Face-to-face training method	68.75%	31.25%	0%	0%
3	Online training method	50%	50%	0%	0%
4	Training duration	12.5%	81.5%	0%	0%

**Output Components**

The results of the assessment of the output component survey given by the respondents were Very Satisfied at 56.25%, and the remaining 43.75% gave a Satisfied rating. The output component is the general satisfaction of the community service participants with the community service training they received. This condition can already be said to be good, but to further increase participant satisfaction in the following training; it can be further introspected.



**Figure 3.** Output Component Survey Results

**Follow-up**

From the survey results, several inputs were obtained from the participants in the community service activities, which could be used as reference material for the following community service activities. The input obtained is listed in table 5.

**Table 5.** The input of Community Service Participants

No	Enter Respondents
1.	When introducing the application, guide it slowly so that it is easy to understand from logging in to the contents of the application and its use.
2.	The implementation of the training coincided with the end-beginning of the learning year. Many teachers are preoccupied with learning administration. It's

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suitable for future activities when it can be coordinated again, so there are no clashes

3. The next training is related to the Independent Curriculum
  4. Study time is too short
  5. Conducting Live streaming training with fun learning media for making independent curriculum training or curriculum that is being applied in schools
  6. The next training is how to make videos for more exciting learning
  7. It is better to deliver more face-to-face material so that there are more opportunities to ask questions and don't seem rushed.
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### **Training Certificate**

The participants, resource persons, and facilitators of the Education Technology Abdimas activities of FKIP UT were jointly given a certificate between the Teaching Faculty of Education at the Open University and the South Tangerang City Education and Culture Office. The electronic certificate downloaded at the link.

### **Funding**

The cost of organizing the National Community Service Education Technology Study Program in 2022 will be borne by the Open University budget and the Ministry of Education and Culture.

## **CONCLUSION**

Based on the research conducted, it can be concluded that the purpose of this research is to provide an overview of training for developing the use of digital teaching materials for teachers to improve learning outcomes, especially for teachers in the city of Tangerang. The method used in this study was carried out with a research flow where participants were given four assignments: Team, Sway, Learning Design, and Learning Video. The study results show that 71% of teachers have mastered the Teams and Sway applications from Microsoft, 60% can make lesson plans, and 53% can make learning videos. The results of the pretest and posttest showed an average result of 36.6%, then after participating in the training the average result was 44.4%. The results of the study show that training in the development and use of digital teaching materials influences the skills and abilities of teachers which are useful for increasing student achievement. This report is a form of accountability in community service activities in the 2020 FKIP-UT Educational Technology Study Program 2. This report also provides a complete picture of the implementation of the community service program, including the evaluation results. The results of this evaluation will become the basis for developing the Community Service program in the second and third years.

The successful implementation of the Community Service for Educational Technology Study Program FKIP-UT in 2022 was carried out well with close cooperation between the City Government of South Tangerang, Microsoft Education Indonesia, FKIP-UT, various study programs at FKIP-UT, lecturers and staff FKIP-UT education and students who have shown excellent performance in implementing this Community Service program. The implication of this research is to provide an overview of development training on the Utilization of Digital Teaching Materials for Teachers to Improve Student Learning Outcomes.

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