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Mobile Learning in Vocational Education: Tendency Towards Self Regulated Learning

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ABSTRACT
Online learning requires teachers to creatively optimize technology in learning activities. Therefore, this study aims to produce Mobile Learning Application products based on *Flip PDF Pro Maker* to improve learners independence and learning outcomes. Learning media developed there are eight menus and features that facilitate the use in the operation of complete material coverage to help learners in improving the independence and learning outcomes of learners. This research and development uses the Borg and Gall Research and Development model, teknik data analysis used is descriptive percentage and *Mann-Whitney* test. The result of this research and development is a Mobile Learning Application based on *Flip PDF Pro Maker* in the subjects of Automation of Governance of Facilities and Infrastructure named MOLA which has been declared very valid and worthy of use in archival learning by media experts, material experts, and 6 students of small group trials and proven there are significant differences independencies and learning outcomes in large group trials where the test results of the experiment class are higher than the control class. So it can be concluded that MOLA is feasible and effectively used as a learning media to improve learners independence and learning outcomes in the subjects of Automation of Governance of Facilities and Infrastructure.

***Keywords**: Research and Development, Learning Media, Mobile Learning, Flip PDF Pro Maker, Independence, Learning Outcomes.*

1. INTRODUCTION

Education be one of the aspects affected by coronavirus disease pandemic (Covid-19). The spread of the virus has been relatively rapid in Indonesia since the beginning of 2020 [14]. So that in the educational aspect of the implementation of Distance Learning activities (PJJ). Indirectly, students continue to conduct online learning activities with the help of learning media that has been prepared by teachers that is expected to reduce the spread of Covid-19 [19]; [28]. Distance learning is required by utilizing the advancement of technology for educational objectives to be achieved (Li et al., 2020; [21]. Technological advances are inevitable from life, because technological advances are progressing with the advancement of science that will increasingly develop, the latest innovations will always emerge that provide positive impacts and benefits for human life [22]. While learning media is a software in the form of educational information and presented using tools so that messages or information can reach students [21]. Learning media that is now starting to diversely follow the development of science and technology, namely electronic-based learning media that has now been used as an alternative to learning in Indonesia in conducting learning activities from home online, one of which is mobile learning.

The utilization of M-Learning learning is expected to facilitate students in obtaining materials that are easy to understand and packaged using smartphone media so that interaction between teachers and students is not hampered by distance and time and learning outcomes of students remain maximal [16],

[17]; Nur N. S and Sutarni, 2017; [24]; [31]. Mobile Learning developed in this study is a Mobile Learning Application based on Flip PDF Pro Maker. Media-

Some previous studies that also discussed this theme are research [3]; [4]; [5]; [6]; [7]; [23]; [26]; [27]; [30]; [32]; Sriwahyuni et al., 2019; Watin and Kustijono, 2017; [35] based on the research-the research can be concluded that mobile *learning* media based on flip PDF *pro maker* that can be accessed

he shortened learning time makes the delivery time of materials given to students much less. It makes students will be more to learn independently, but the facilities for self-learning is still limited With online learners, these students' learning outcomes last semester of this subject decreased by 40%. From this problem, researchers innovated to create a mobile learning application to maximize the current condition. Researchers innovate to create a Mobile application that can be installed on students' mobile phones and used offline in the Subjects of Automation of Governance of Facilities And Infrastructure. This application contains materials, problem exercises, learning videos. When students do not have an offline learning schedule, they can independently learn and work on problem exercises through the application.

2. METHOD

This study uses the Borg and Gall Research and Development model which has been modified into five steps to shorten the time and state of the field [10]; [12]; [13]; [15];[18]. In addition, researchers also feel that the purpose of research yesit is to produce products, know the feasibility of the product, and know the differences in independence and learning outcomes of learners who use with those who do not use the product developed.

The first step, researchers conducted research and collection of information related to the period ofland that occurred in schools and learning activities of the subjects of automation of governance of facilities and prasarana. The second step, researchers do planning related media to be developed. Step three, researchers develop the initial product format of learning media to be developed. They can be a solution to the problems found in the step of potential and problems and collection information and start making learning media according to the design specified in the previous step. based Flip PDF Pro Maker presented in the form of books that can be in flip and added with images, videos, music, and even quiz questions [7].
offline and can improve the independence and learning outcomes of learners.

Result of teacher interviews Subjects Governance Facilities and Infrastructure class XI State Vocational High School (SMKN) 1 Turen Malang District East Java, obtained information that the learning in the school is conducted online. T
The fourth step, the media produced by researchers tested the feasibility by the validators, namely one media expert and one material expert and trials on learners. Step five, in the form of product revision stage or improvement of the final product that can be used and accessed through the manual link *bit.ly/MOLAbyS1PADPUM* and can be downloaded by students to be used as a learning medium.

The data produced in this study include qualitative data and quantitative data, where quantitative data consists of data validation results of material experts, media validation data, data of small group trial results, and data on independence and learning outcomes of learners. Qualitative data was obtained by withdrawing conclusions based on advice, and criticism from material experts, media experts, and 6 test students small group. Data validation results from content experts, media experts, and small group trials were analyzed using descriptive percentage methods to demonstrate the feasibility level of learning media. While the data of independence and learning outcomes of learners were analyzed using the *Mann-Whitney* test to show differences in independence and learning outcomes of experimental class and control class learners.

3. RESULT AND DISCUSSION

The product produced in this research and development is *a Mobile Learning Application* based on Flip PDF *Pro Maker* on the automation of governance of facilities and infrastructure. *Mobile Learning Application* based on Flip PDF Pro *Maker* (MOLA)consists of menus described through Figure 1 below:

Figure 1. Menu in MOLA

Once on the "Menu Page", users can go to the Instruction Page as shown in Figure 2 , which contains the available menu instructions.

Figure 2. Mola app menu instructions

Mola validation results by material experts, media experts, and small group trial students as a whole are presented in Table. 1 below:

Table 1. Expert Validation Data

No.	Validation	percentage	Validity Criteria
1.	Material Experts	98%	Very decent
2.	Media Experts	96%	Very decent
	Average	97%	Very decent

Based on Table 1, it is known that the average percentage of validation in the overall way is 9 7%, so it can be concluded that the learning media developed by researchers namely MOLA,is considered very feasible to be used in the learning automation of governance of facilities and infrastructure at SMKN 1 Turen. This is similar to previous research, where the validation results of material experts, media experts and small group trials are used as the basis for determining whether the learning media developed is feasible or not used in learning [29], [24], [33].

The measurement point in the form of validity refers to the results of measurements made to determine how many aspects in the quantitative realm in the measurement instruments are expressed by score [11]. MOLA presents eight menus and features that facilitate the use in its operation Complete material coverage, as well as a file size of 48 MB can help learners in improving the independence and learning outcomes of learners. The efficiency and effective use of technology depend on hardware ad software availability [1]; [2]; [9].

The results of the *mann-whitney* test on the data of self-reliance learning control class and experimental class di presented in Tabel 3 the following:

a) Analysis Prerequisite Test
Results of Normality Test Data Independence Learning

Table 2. Data of Normality Test Results of Learning Independence

Tests of Normality		
	class	Shapiro-Wilk[a]
		Sig.
Independence Questionnaire Results	Control Class	.055
	Experiment class	.000

In Table 2 shows that the data level of independence of learning control class has a significance value of 0.055 mare significant than the value (α=0.05) the or the normal distributed data, while the level of independence of learning in the class experiment significance is 0.000 small of the value (α= 0.05) the data is said to be not distributed normally, because one of the data is not distributed normally then continued with a nonparametric statistical test using the Mann-Whitney test.

b) ***Mann-Whitney Test***

Table 3. Data of *Mann-Whitney* Self-Reliance Learning Test Results

Test Statistics[a]	
	Independence Questionnaire Results
Mann-Whitney U	62.500
Wilcoxon W	728.500
Z	-6.562
Asymp. Sig. (2-tailed)	.000

Table 3. shows that the results of the Mann-Whitney test obtained by the two samples were 0.000 this value is smaller than the significant value (α=0.05), so the probability of <0.05 (PValue < 0.05), then Ho was rejected which means the independence of learners' learning between the experimental class and the control class was a significant difference. So that *the Mobile Learning Application* developed effectively used to increase the independence of learning pesera didik [20]; Rahmawati and Mukminan, 2018).

The increase in independence here is due to students who use Mobile Learning *Application* (MOLA) can be accessed using android smartphones. It is more flexible and easier for students to learn anywhere and anytime. In addition, in the learning process of students in experimental classes or classes that use mobile learning *application* (MOLA) can also manage their learning, students can find solutions when difficulty understanding the material by being able to choose materials in the form of writing or in the form of learning videos. While control classes or classes that do not use Mobile Learning *Application* (MOLA) have not been able to manage their learning strategies, they have not been able to find solutions when understanding the materials provided by teachers through powerpoint media. Like research conducted by [34], mobile learning can help itself in learning such as managing its time.

Results showed that the average learning outcome of the experimental class students was 90 and the achievement of minimum standard is achieved 100% or all students had scores above minimum standard. While the average learning outcome of control class students is 75 and the achievement of minimum standard is achieved 89% or four students have a score below minimum standard. This suggests that the average learning class of the experiment is higher than the control class.

Next, measure the difference in student learning outcomes between the control class and the experiment class consisting of 71 students, namely by using the normality test and mann-whitney test.

a) Analysis Prerequisite Test
   Normality Test Results Data Learning Outcomes Control class learners and experiment classes

Table 4. Data of Normality Test Results

Tests of Normality							
	class	A Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistics	Df	Sig.	Statistics	Df	Sig.
Learning Outcomes	Control Class	.473	36	.000	.378	36	.000
	Experiment Class	.349	35	.000	.739	35	.000

In Table 4 shows that the data of the learning outcome level of control and experiment class has a significance value of 0.000 small of the value (α=0.05) then the data is said to be not distributed normally, because one of the data is not distributed normally then continued with a nonparametric statistical test using the Mann-Whitney test.

b) Mann-Whitney Test

Table 5. Data of *Mann-Whitney* Test Results

Test Statistics[a]	
	Student Learning Outcomes
Mann-Whitney U	62.500
Wilcoxon W	728.500
Z	-6.562
Asymp. Sig. (2-tailed)	.000

Table 5 shows that the results of the Mann-Whitney test obtained by the two samples were 0.000 this value is smaller than the significant value (α=0.05), so the probability of <0.05 (PValue < 0.05), so was rejected H0 which means that the learners' learning results between the experimental class and the control class were significant differences. The results of this study are relevant to the research conducted by several researchers including By [8] which showed the results that students learn using Mobile Learning (M-Learning) learning media with the help of Android Smartphones in class XI TAV 1 is declared classically complete with a percentage of 80.64%. The influence of M-Learning learning media on student learning outcomes is also evidenced by [25] which shows that android-based learning media can significantly improve learners' learning outcomes, have a positive influence in learning, and are shown to have significant differences between the average experimental class learning outcomes and control classes.

4. CONCLUSION

This research and development resulted in *a Mobile Learning Application* based on Flip PDF *Pro Maker* on the subjects of Automation of Governance of Facilities and Infrastructure to improve leaners' Independence and learning outcomes. This learning media is called MOLA which can be downloaded and installed through a manual link http://bit.ly/MOLAbyS1PADPUM and can be accessed *offline.*

The learning media in thisstudywas declared 'Very Valid' and worthy of use in the learning of Automation of Governance of Facilities and Infrastructure through validation by material experts, media experts and small group trials. In addition, MOLA concluded that there are relevant differences and can also improve leaners' independence and learning outcomes in large group trials based on the results of *the Mann-Whitney* test. MOLA also allows learning anytime and anywhere, even independently without having to be tied to face-to-face activities in school,so this application is useful when learning cannot be done face-to-face as it was due to the covid-19 pandemic.

MOLA focuses only on some basic competencies and is limited to the android operating system, so it is expected that researchers will further develop learning media on other operating systems such as IOS.

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