



The Effectiveness of Project-Based Android Media to Improve Accounting Learning Achievement

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Abstract

This study aims to determine: the effectiveness of using android media with a project-based learning model to improve student achievement. This research is a quasi-experimental study with a randomized control group pretest-posttest design. The population in this study was 335 students of SMK Negeri 1 Surakarta. The sample of this research was 60 students of the class XI accounting expertise program. The data collected in this study is student achievement data. The prerequisite test showed that both groups were homogeneous and normally distributed. The t-test using the t-test Independent Sample Test shows $t_{count} > t_{table}$ that is $2,259 > 2,00172$ and significant $0,028 < 0,05$ which indicates that H_0 is rejected and H_1 is accepted. From the results of data analysis, it can be concluded that the effectiveness of android media with a project-based learning model of 56% is included in the quite effective category.

Keywords: *Effectiveness; Media Android; Project-Based Learning; Accounting Learning Achievement*

Introduction

Accounting learning is a series of activities that facilitate students to develop competencies based on the scientific foundation of accounting. Student competence in accounting that can be further developed in higher education and the world of work. Accounting learning has one goal, namely learning achievement. This student learning achievement involves changes that can be seen from the cognitive, affective, and psychomotor aspects (Mallillin et al., 2021). However, in reality, student achievement is still in the low category. This can be seen from the average score of the Computer-Based National Examination (CBNE) on accounting competencies which still need attention. Table 1 Average Value of CBNE Accounting Competence at SMK Negeri 1 Surakarta.

| No. | School year | Average Score CBNE |
|-----|-------------|--------------------|
| 1. | 2017 | 56,57 |
| 2. | 2018 | 65,00 |
| 3. | 2019 | 54,90 |

Source: <https://hasilun.puspendik.kemdikbud.go.id/>

Data from table 1 shows that student achievement in accounting competence at SMK Negeri 1 Surakarta has not been maximized. The factors that cause the students' learning achievement to be not maximal can occur because of the compatibility between the material, media, and learning models in the process of learning activities. The results of initial observations show that the learning that is currently being carried out is still using textbooks and modules as teaching materials, as well as learning media in the form of laptops to convey the material through PowerPoint slides.

The development of technology-based learning media creates the concept of electronic learning (e-learning) which develops into mobile learning (m-learning). E-learning or m-learning refers to the use of mobile devices and applications that support their use in an educational environment (Nachiketa et al., 2013). Mobile learning or m-learning is often also grouped as one e-learning that is taught through a mobile device (Listyorini & Widodo, 2013). Mobile learning is a novel, cutting-edge method that facilitates accessing learning content through mobile devices (Naciri et al., 2020). Mobile learning now comes with smartphones that operate using the Android system. The Android system currently dominates smartphone users. Based on data from Statcounter.com, android and iOS users in July 2022 in Indonesia were 89,94% and 9.95%, respectively, while 0.09% used operating systems other than Android and iOS.

The use of smartphones with Android systems in the student environment is currently a lot, but to support teaching and learning activities it has not been used optimally. The existence of this smartphone can be used to develop a learning media for students in the form of an application. Learning media using technology can allow students to learn with high motivation because it uses technology that can display text, images, video, sound, or animation (Wahid et al., 2020). The use of these learning media can attract students' interest and improve students' understanding (Gan et al., 2015).

Android-based learning media can adapt to learning in the 4.0 education era whose overall learning has been technology-based. Android-based learning media advantages that can be considered are flexible and can be accessed anywhere and anytime (Nealbert et al., 2014). Thus, the main providers of education, namely educational institutions, especially schools, must be responsive and improve their management to changing times that require the use of technology ranging from administration, and learning processes, to evaluation because without technology education will not run effectively (Malik, 2018).

Learning media can be combined with the right learning model. In general, vocational schools still use a learning model with the 2013 curriculum, one of which is project-based learning. Project-based learning models are considered relevant for the implementation of the learning process in vocational education (Li, 2015). Project-based learning is a learning model that allows students to gain new knowledge through asking questions, researching, solving problems, making decisions, and doing designs based on cognitive or psychomotor skills Project-based learning produces a project that is done individually or in class that will provide opportunities for students to show their achievements (Kızıkan & Bektaş, 2017).

Research conducted by Elfeky & Masadeh, (2016) shows that learning with smartphones is quite positive and fun for teachers and students who have learning difficulties because students can access their lessons and teachers deliver assignments through their mobile devices anytime and anywhere. In addition, (Branch, 2015) writes that the application of information technology in project-based learning can be effective in improving student achievement. Android-based learning media with this project-based learning model can be a solution to overcome the problems that occur in students at SMK Negeri 1 Surakarta, namely the understanding of students who are still relatively low due to the lack of attractiveness of the learning media used.

Research Methods

The purpose of this study was to determine how effective the use of android media with a project-based learning model is in improving student achievement in accounting practicum subjects. This research is quasi-experimental. The population and research sample used were students of SMK Negeri 1 Surakarta and class XI students of the Accounting expertise program. The study was conducted in two classes, namely XI Accounting 2 and XI Accounting 3. In conducting the research, 30 students of class XI Accounting 2 used Android media with a project-based learning model, so this class was experimental. While 30 students of class XI Accounting 3 are in the learning process with a project-based learning model and do not use android media, then this class is the control class.

Data collection is carried out using tests, the aim is to measure knowledge about the material contained in the application. The form of the test uses 10 multiple choice questions and 10 essay questions. The analysis prerequisite test is carried out in two stages, namely: the first stage of the normality test to determine whether the data used in the study were normally distributed or not, was carried out using the Kolmogorov-Smirnov test with $\alpha = 0,05$. The second stage, the homogeneity test to find out whether the data obtained has a homogeneous variance or not, is carried out through Levene's Test with $\alpha = 0,05$. The t-test was conducted to determine the significant difference in meaning between the two classes with a significance level of $\alpha = 0,05$ and was assisted by the SPSS 21 program. The N Gain test was conducted to find out how effective the use of project-based android media was in improving student achievement.

Results and Discussion

Results

It is known that the significance value of the pretest and posttest data normality test in the experimental and control classes is more than ($0,092 > 0,05$). This shows that the cognitive values between the experimental class and the control class are normally distributed, both at the pretest and posttest.

Table 2 Scores Pretest and Posttest

| Data | Class | N | Mean | Std. Deviation | Std. Error Mean |
|----------|------------|----|-------|----------------|-----------------|
| Pretest | Eksperimen | 30 | 58,33 | 13,412 | 2,449 |
| | Control | 30 | 55,33 | 13,830 | 2,525 |
| Posttest | Eksperimen | 30 | 79,67 | 14,735 | 2,690 |
| | Control | 30 | 71,67 | 12,617 | 2,304 |

Based on Table 2, it can be seen that the control class shows that the experimental class scores higher than the control class. On the other hand, it is necessary to prove whether there is a significant difference in learning achievement between the experimental class and the control class by carrying out the Independent Sample Test (Table 3).

Table 3 T-test Pretest and Posttest

| Data | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
|----------|---|-------|------------------------------|----|----------------|-----------------|-----------------------|
| | F | Sig | T | df | Sig (2-tailed) | Mean Difference | Std. Error Difference |
| Pretest | 0,111 | 0,741 | 0,853 | 58 | 0,397 | 3,000 | 3,517 |
| Posttest | 0,691 | 0,409 | 2,259 | 58 | 0,028 | 8,000 | 3,542 |

Based on Table 3, it is known that the significance value of Levene's Test from the pretest data is 0,741. This value is more than 0,05 so the cognitive value in the pretest between the experimental class and the control class has a homogeneous variance. The significance value of the post-test data is 0,409 so it can be concluded that the cognitive value in the post-test between the experimental class and the control class has a homogeneous variance.

Table 3 shows that there is no significant difference in the average student achievement scores between the experimental class and the control class before using project-based android media. After confirming that the experimental class and control class have the same level of knowledge, the research can be continued by giving different treatments to the experimental class and control class. The experimental class was treated with project-based android media, while the control class was still using textbooks and PowerPoint. The learning process in the experimental and control classes lasted for two meetings. After the second meeting, students were given a test to see their learning achievements.

Based on Table 2 shows that the post-test results of the experimental class are better than the control class. The results of this posttest showed an increase between the experimental class and the control class from before. Then tested using the Independent Sample Test to prove whether there is a significant difference in learning achievement in the experimental class and the control class. The results showed that the experimental class students had better learning achievements than the control class students.

Table 4 T-Test Independent Sample Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Mean | | | | | | |
|----------|-----------------------------|---|-------|-----------------------------|--------|-----------------|-----------------|-----------------------|---|--------|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | ower | pper |
| Posttest | Equal variances assumed | 0,691 | 0,409 | 2,259 | 58 | 0,028 | 8,000 | 3,542 | 0,910 | 15,090 |
| | Equal variances not assumed | | | 2,259 | 56,657 | 0,028 | 8,000 | 3,542 | 0,907 | 15,093 |

The test results in Table 4 show a t_{count} of 2,259 with a significance in the column Sig.(2-tailed) of 0,00. Based on the analysis data, it is known that the t_{table} obtained is 2,00172 with a significant level used that is 5% (0,05), while the df based on the t-test results is 58.

Based on table 4 the results of the Independent Sample T-Test analysis, then the research hypothesis was tested. Hypothesis testing is a step to determine whether the hypothesis is accepted or rejected. The testing steps carried out are compiling research hypotheses, namely:

H_0 : there is no difference in the average student achievement before using project-based android media and after using project-based android media

H_1 : there is a difference in the average student achievement before using project-based android media and after using project-based android media

The results of the calculation of this hypothesis test using the t-test Independent Sample Test. Based on the table shows the t coefficient score of 1,67155 with a significant value of 0,000 which means it is smaller than 0,05 ($0,00 < 0,05$). From the t-test, it shows that $t_{count} > t_{table}$ is $2,259 > 2,00172$ and significant $0,028 < 0,05$ which indicates that H_0 is rejected and H_1 is accepted. This shows that there is a significant difference in the effect of using android media with a project-based learning model on student achievement.

Furthermore, the results of the post-test mean difference test showed that the value of the learning achievement ability in the experimental class was higher than in the control class, meaning that the treatment given to the experimental class was effective. The effectiveness in the experimental class can be strengthened by using the N gain test.

The recapitulation of the results of calculating the effectiveness of using project-based android media on student achievement is presented in table 5.

Table 5 Test Results Summary of N Gain

| | Class | G | Category |
|--|------------|-----|-----------------|
| The effectiveness of using project-based android media on student achievement | Experiment | 56% | Quite effective |
| | Control | 35% | Ineffective |

. Based on Table 5, it is known that the results of the N Gain test show that the average value in the experimental class is 56% which is included in the category of quite effective. The results of the N Gain test in the control class were 35% included in the ineffective category.

Discussion

The t-test was used to determine whether there was a difference in the use of project-based android media by giving different treatments to the experimental class and control class, while students in the experimental class learning were given treatment using project-based android media. While the control class students during learning were given treatment using textbooks and PowerPoint without using android media.

It is known that there are significant differences in student achievement between the experimental class and the control class. The results of the t-test in the post-test showed that the average student achievement in the experimental class was higher than in the control class, so the results of this test showed that there were differences in the two classes. The results of the N Gain test show that the effectiveness of using project-based android media on student achievement is included in the quite effective category.

This is in line with the opinion of Sugiyanto et al., (2020) that the integration model of Android-based mobile learning and project-based learning can significantly improve student competence in the cognitive domain as indicated by an N-gain value of 73%. Judging from its effectiveness in learning, Android-based smartphone technology has the benefit of providing new learning and experiences because students are often directly involved in learning activities (Kim et al., 2013).

So, these results indicate that the use of project-based android media is quite effective in improving student achievement. This is due to the existence of learning media that help students understand the material taught by the teacher and when the learning process in the classroom is not

always teacher-centered so that the learning materials used are not limited to accounting practicum subjects and can help students learn independently not too dependent on learning from the module alone.

Conclusion

This study concludes that there is a significant difference in effectiveness in the application of project-based android media on the learning achievement abilities of students in class XI Accounting. The results of the prerequisite test, namely the normality and homogeneity tests, show a normal and homogeneous significance of probability. The results of the calculation of the hypothesis test using the Independent Sample Test t-test showed a t-coefficient score of 1,67155 with a significant value of 0.000 which means it is smaller than 0,05 ($0,00 < 0,05$). From the t-test, it shows that $t_{count} > t_{table}$ is $2,259 > 2,00172$ and significant $0,028 < 0,05$ which indicates that H_0 is rejected and H_1 is accepted. This shows that there is a significant difference in the effect of using android media with a project-based learning model on student achievement. The results of the N Gain test show that the effectiveness of using android media with a project-based learning model is 56%, the category is quite effective for improving student achievement. The application that was developed in this study only contained one subject on the subject of trading company accounting practicum for vocational and high school students. Thus, it is necessary to conduct another study related to application development that is not only on one subject and can be combined with creative and innovative learning models that can improve student competence.

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