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The Use of Biology-Based Learning Module Android and Their Effect on Learning Outcomes on Coordination System Materials in Class XI IPA in Mas Islamiah Kotapinang

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Abstract

This study aims to determine The Use of Android-Based Biology Learning Modules and Its Effect on Learning Outcomes in the Coordination System Material for Class XI Science at MAS Islamiyah Kota PinangThis research method uses a quantitative approach with a quasi-experimental type of research. The population in this study were students of class XI IPA MAS Islamiyah Kota Pinang. The samples used in this study were students of class XI IPA (experimental class) and class XI IPA B (control class). The sample used in this study was taken as many as 2 classes totaling 60 students. Sampling in this study was conducted using random sampling technique. Sampling in this study was carried out using a random sampling technique, In data analysis, prerequisite tests were carried out in the analysis such as the normality test for the data distribution and the homogeneity of variance test. To be able to test the homogeneity of variance, it was tested using the F test. If F count F table, the two populations have different variances (not homogeneous), If F count < F table then the two populations have homogeneous variance. The results of the research value in the control class that the higher score using the Android-Based Biology Learning Module is the result of the 57.2 experimental class using the Android-Based Biology Learning Module, which has a value of 67.4

Keywords
learning module; based on android; learning outcomes; students

I. Introduction

Education is an institution that can be interpreted as a social process that can move dynamically along with following the development process of the times. in a way of learning does not have to be learned in a room. Teachers can also take advantage of technology based on Android and the internet and various technological applications that support student learning and can help teachers in the learning process(Wahidy, 2019).

Learning is an effort in students, students can provide assistance to students and teachers so that they can learn more easily. In carrying out the lesson there is a goal that can be achieved. in this lesson, namely the merging of a component in the lesson that can have integrity with one another and interact, therefore if one component is not integrated, then in this case the way of implementing the lesson will face many obstacles that will thwart the achievement of goals in learning and learning outcomes. One of the components in the learning process is the teacher.(Robiyanto, 2021).

With the use of information technology in Use of Biology-Based Learning Modules that use Androidfor facilities on instructional media that can cause conditions in the learning process to be good and effective, therefore by taking opportunities in the learning process faster and better for students because it can contain a material that has been taught,

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and can display an assignment. up to discussions among students and also students as well as the guidance of existing teachers can be completed outside school hours with formal teaching. With the large number of uses, an application has begun to be developed as well as the web and Android, even based on mobile phones(Prajana, 2017).

With the developments in applications and adaptations of technology in the classroom lessons that make it an obligation in the face of a process of change in the era of globalization, and with developments in information technology and a communication that has had an impact on the world of teaching and education, especially in the implementation of the process. learning. Along with technological developments, there has been a model in learning that is innovative and creative in the implementation of learning methods(Wahidy, 2019).

With the use of Android in a process of learning and teaching which is believed to be able to bring many uses, including: a student can learn multi-source (with a connection to the internet), the activities of a lesson that can be carried out anywhere and anytime are not only limited. in a single room, having provided an opportunity for teachers to be able to develop a technique in a digital-based learning process so that they can obtain maximum student learning outcomes.(Masruroh & Agustina, 2021).

With the existence of a way of making a learning media with this which sometimes has obstacles in achieving a goal. In learning media, which are usually made in teaching to students, sometimes they cannot understand a meaning in the content that has been delivered. On the other hand, if the content is created together in an application, it will be able to produce a joint product that can be understood by others(Wahyudi, 2019).

Therefore, the learning process is one of the interconnected relationships between teachers and students in the scope of the lesson. The teacher is a guide in a learning process and also as someone who plays an important role in the world of education. Teachers should be more creative and innovative in creating a fun and interesting learning scope, then students can understand the learning that will be given to the teacher.(Kurniati et al., 2021).

On May 29, 2022 until June 2022, the researcher made an observation visit to the school at Mas Islamiyah Kotapinang and conducted a few brief interviews with biology teachers and students of XI IPA, that researchers also received information about students and teachers that many students lack of understanding in the presence of the use of a media in biology lessons with the use of android-based, In this case lessons are not only obtained and produced at school, but can also be implemented anytime and anywhere. In addition, there are several other advantages, including the implementation of this lesson which is very easy to operate, has an attractive design, and the material can be presented in a simple but easy to understand manner.(Theresia Miss Elci1, John Bare, 2021).

Like the case in learning biology, biology is the study of a science of the life of living things and their environment. Biology is very important for us to learn. Because in learning biology we can understand and know the function of organs in the body and their structure. This will make humans to maintain health with healthy living behavior in the body and Biology is also a branch of natural science that studies the ins and outs of activities. Therefore, it is not surprising that biology learning is more rote than counting(Renat et al., 2017).

One of the problems with the main thing in biology lessons is the lack of motivation in students in learning. in this case, among others, due to the lack of media in the learning process that can evaluate a lesson that is more interesting and can be easily understood by students without multiple interpretations because they can't really see an object in a lesson.(Aroandini et al., 2021).

Based on the description above and the results of observations and interviews with teachers and students at Mas Islamiyah Kota Pinang, the researcher found a problem above and was interested in being able to carry out an assessment of the use of Android-Based Biology Learning Modules and their Effects on Learning Outcomes in Classroom Coordination System Materials. XI IPA at Mas Islamiyah Kota Pinang And in this study also has a goal, namely to be able to use Android-based Biology Learning Modules and their Effects on Learning Outcomes in Coordination System Materials for Class XI Science in Mas Islamiyah Kota Pinang.

II. Review of Literature

2.1 Research Locations and Research Time

This research was carried out in class XI IPA MAS Islamiyah Pinang City, North Labuhanbatu Regency. This research was carried out on May 29, 2022 until June 2022.

2.2 Population and Research Sample

In this study, there was a population, namely all students of class XI IPA MAS Islamiyah Pinang City, Labuhanbatu Utara Regency in the 2021/2022 academic year with a total of 60 students consisting of the control room and the experimental room. The sampling technique used is total sampling, namely the technique of determining the sample by taking all members of the population as respondents or samples (Sugiyono, 2009). The sample taken by the researcher was the entire number of students consisting of 2 classes, where the two experimental classes of students in room XI IPA A amounted to 30 people. Experimental students of class XI IPA B amounted to 30 people.

2.3 Research Types and Design

This research is included in a quasi-experimental study. The design used in this study is a nonequivalent control group design or non-randomized control pretest posttest design, meaning that neither an experimental group nor a control group is selected randomly. In this design, both the experimental group and the control group are compared, then the existing group is given a pretest, then given treatment, then given a posttest.

Table 1. Research Design Using Android-Based Biology Learning Module

Group	Pretest	Treatment	Posttest
A	L1	X1	L1
B	L2	X2	L2

Information :
A : Control class
B : Experiment Class
XI: Using Android-Based Biology Learning Module in the control class
X2: Using Android-Based Biology Learning Module in the experimental class
L1: pritest and posttest tests in the control class
L2: pritest and posttest tests in the experimental class

2.4 Research variable

In this study, there are two variables, namely the independent variable and the dependent variable. The independent variable is the use of android-based learning modules. The dependent variable is student learning outcomes.

2.5 Data analysis technique

The data analysis is carried out with two main things, namely the requirements test and hypothesis testing, as for the instruments in this study as follows: (1) Converting the student's acquisition score into a scale value of 1-100, (2) Calculating the average variable ,(3) Determining the standard deviation of the variables, (4) Testing the Normality of the Data Testing the normality of the data obtained from the population having a normal distribution or not. The normality test of the data was analyzed by the Lilliefors test, (7) Homogeneity Test. Homogeneity test was to test whether the groups used in the research sample came from the same population, meaning that the distribution within a population was homogeneous, (8) Hypothesis Testing After the requirements were met (normality) and homogeneity) then tested the hypothesis.

On the data from the acquisition of learning outcomes, namely the difference in the data obtained from the posttest results in each activity of a lesson with an instrument on the learning outcomes test. If the results of the analysis have described the existence of a very significant influence between the two rooms with the treatment and treatment, all data analysis was used using a SPSS 21 for windows program.

III. Result and Discussion

3.1 Android-Based Biology Module Class XI Science MAS Islamiya Pinang City

The learning module in the form of an Android application in class XI IPA at MAS Islamiya Kota Pinang is considered able to help and facilitate students in understanding a coordination system material because the learning module is equipped with clear images and the presence of a video display in this learning material in this case. This learning module is made as interesting as possible so that students do not get bored reading it.

In addition, this biology learning module is lighter and easier to carry and can be used anywhere and anytime, because the android-based learning module is a good and independent learning package, this includes a series of learning experiences that are planned and systematically designed to be able to help students achieve a goal in learning.The use of a technology in the learning process with the Android-Based Biology Learning Module can create a learning environment that is better and more interesting, as well as effective, and efficient, in accordance with the existence of an interest in students towards the use of a media.

The use of android in the coordination system material in class XI IPA at Mas Islamiyah Kota Pinang can be developed and can find out all information and learn well. With the use of Android-based modules on the coordination system material, it can facilitate and improve learning outcomes

3.2 Description of Student Learning Outcomes

The results of the acquisition of learning outcomes for students in lessons can be a solution to a problem that has been encountered in a process of learning and teaching in the room as well as lessons used in a learning media in the form of an Android-based

application that can activate student participation. those who are in the room can even access it at home and even anywhere.

The pretest data in class XI Science MAS Islamiya Kota Pinang shows that the student learning outcomes in the control class using the Android-Based Biology Learning Module from 30 students have obtained an average value and standard deviation of 57.2 while the pretest data on student learning outcomes in the experimental class using the Android-Based Biology Learning Module from 30 students, the average value and standard deviation of 67.4

Table 2. Average Value of Learning Module Use Results

Android Based Biology				
No	Class	Lowest Value	The highest score	Average
1	Control	36	74	57.2
2	Experiment	40	87	67.4

3.3 Normality test

The distribution of the results of the pretest and posttest data on critical thinking of students taught by using an Android-based learning module can be seen in Table 3 below.

Table 3. Test the normality of the pretest and posttest data on student learning outcomes

Class	Average	significance	Highest value	conclusion
Control	57.2	0.05	74	Normal distribution
Experiment	67.4	0.05	87	Normal distribution

From the results of the table above, that the results in normality testing on the control class data that normality sig> 0.05 significant 0.057> 0.05 Normal distribution means that the learning outcomes of students in the use of Android-Based Biology Learning Modules in the control class, and normality testing in the control class. experimental class data that normality sig> 0.05 significant 0.067> 0.05 Normal distribution brings the learning outcomes of students in the use of Android-Based Biology Learning Module in the experimental class. Homogeneity Test

The results of a homogeneity test on the control data of student learning outcomes that do not use the learning module are also stated to be homogeneous (P = 42.8> 0.05) and the control data of student learning outcomes are also declared homogeneous (P = 57.2> 0, 05) which uses the Learning Module, and the experimental class data on the learning outcomes of students who do not use the learning module is also declared homogeneous (P= 32.6> 0.05) and experimental data on student learning outcomes is also declared homogeneous (P= 67, 4> 0.05) which uses the Learning Module.

3.4 Data analysis

In testing a hypothesis, a technique is used in Covariate Analysis (Anacova) for student learning outcomes based on pretest and posttest data in the use of Android-based Biology Learning Modules.

Figure 5. Table of Pretest and Posttest Results in Control and Experiment Classes

Class	Not Using Learning Modules	Using the Learning Module
Control	42.8	57.2
Experiment	32.6	67.4

It can be seen in the diagram above that the results of the average value of the Control class in the control class are higher scores using the learning model with an average acquisition result of 57.2 than those who do not use the learning model with an average result of 42.8, then the results in the experimental class using the Android-Based Biology Learning Module, which has an average score of 67.4 while students who do not use the Android-Based Biology Learning Module have an average score of 32.6. using Android-Based Biology Learning Module in learning.

Researchers also conducted an assessment using the test method. which tests have been given such as pre-test and post-test as many as 30 questions "The pretest that has been given before carrying out a management in room XI IPA (practice about the coordination system in humans that has been carried out before using the use of the Android-Based Biology Learning Module) while in the Posttest experimental room which has been given when a space management has been implemented (practice on the coordination system after carrying out an activity). the use of the Android-Based Biology Learning Module in learning.

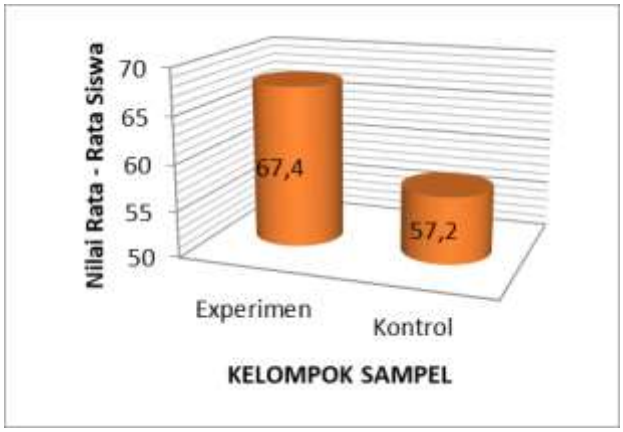

Figure 4. *Diagram of Students' Average Scores in Experimental and Control Classes*

It can be seen from the diagram above in the experimental and control diagrams that students get the highest score in the experimental room, students get a score of 85 while in the control room students get a score of 78, then From the results of the acquisition of control scores, the average result is 57.2 students who use it while students who do not use the lesson model with an average result of 42.8, then the results in the experimental class with the use of the Android-Based Biology Learning Module which has an average value

of 67.4 while students who did not use the Android-based Biology Learning Module had an average score of 32.6 that in the use of the learning model the students who got the highest score in the experimental class were 85 while the control class students got a score of 78. Android-Based Biology is very influential on students.

Table 5. Recapitulation of the calculation results of the t-test of Student Learning Outcomes Using the Android-Based Biology Learning Module Usage Model

Class	N	T Count	Conclusion
XI A	30	1.99	Ho Rejected
XI B	30	1.9	H1 Accepted

In the way of implementing lessons using Android, it also requires a teacher and students to be able to use a learning module based on Android in their way of learning. has deficiencies in presenting a material as an e-module that is used during the learning process, and the use of a broadcast material as well as a strategy that is still boring and makes students lazy or bored, then this can affect the independence of students in learning. Moreover, in a material that has been used to be able to help students in the learning process in order to achieve an independence in learning is not so adequate.

3.5 Discussion

Based on the results obtained by the reviewer regarding an effect in the use of a Use of Android-Based Biology Learning Moduleon the learning outcomes of students in the material coordination system of space XI IPA at Mas Islamiyah Kota Pinang, the experiment on students in the experimental room and in the control class, each of which there were 30 students, can be seen in the diagram table where the learning model that has been carried out helps improve student learning outcomes. One of the results of student learning scores is by using a model using the Android-Based Biology Learning Module, students will be able to improve their learning outcomes. Below is a class diagram of Student Experiments in Control Class and Experimental Class Using Android-Based Biology Learning Module, The results of learning acquisition by students can be known in the implementation of an initial test (pre-test) and posttest.

The use of the Android-Based Biology Learning Module is significantly more successful than a learning model that is used simply for the coordination system material in humans. on the average obtained 66.4 and on the post-test with a value of 87.

Then in the control room the average value of the pre-test result stage is 56.2 and in the post-test it is 74. In the results of obtaining the average value, it can be seen that using a Problem Based Instruction learning model can increase the results in learning biology. with the results of the t-test of 1.99 and t-table of 1.9. Thus tcount t table or 1.99> 1.9, then Ha is accepted and Ho is rejected

In the use of a technology in the learning process with the Android-Based Biology Learning Module, it can create a learning environment that is better and more interesting, as well as effective, and efficient, in accordance with the existence of an interest in students towards the use of interactive media, namely Android or smartphones or laptops. . With the use of technology in the Android-Based Biology Learning Module, on biology material that is so easy that it can be more easily understood and a problem related to the way biology lessons can be expected to be resolved(Idris, 2018).

In this case toomake the acquisition of lesson values by studentsThis has been caused by the use of the learning module, namely the Android-Based Biology Learning Module, which students can do more responsibly on learning outcomes because students have motivation with responsibility in solving problems faced by students. The material in biology learning that is difficult for students in high school to digest is the coordination system material. The difficulties that have been experienced by students are caused by a difficult material and too much material as well as a teaching material that is difficult to understand.

So that students need supplementary teaching materials that can support students' understanding of the difficult material of the coordination system. Booklet teaching materials are teaching materials that are in accordance with the problems of students' difficulties and the criteria for teaching materials that are preferred by students(Syamsurizal & Ardianti, 2021).

In using an Android-based learning media, it is a learning system on the use of mobile electronics which has been known in mobile learning. where Mobile learning is a new process in a process of learning and teaching. With the use of mobile learning, which is a system or concept in an education that is used in a technology system in the implementation of a teaching and teaching process(Fauzan Jamza, Titi Sri Wahyuni, 2015).

The use of e-learning in biology subjects in class XI science nervous system materials can increase student interest and learning outcomes. This can be seen from the increase in interest in learning before the implementation of classroom action research has a percentage of 75.55%; Cycle I was 87.5%, and Cycle II was 93%. In addition, there was also an increase in student learning outcomes whose scores reached the minimum completeness criteria (KKM), namely before class action research it was 15.25%, in Cycle I it was 90% and in Cycle II it was 95%.(Eva Zahora, 2021).

The interest of students in the learning process needs an increase by using an existing facility. Therefore we need a media in lessons in order to be able to optimize the achievement of interest and expertise in students in technology lessons to learn biology subjects. Android can provide information in learning(Diamond, 2020).

In addition to the test, information can also be obtained through observation in the process of implementing the lesson, on the acquisition of scores on the answers to the posttest and pritest questions, and so on. Data such as documents can be used in order to dig up information that happened in the past. As well as the reviewer must also be able to carry out an analysis on the data, it can perform a test on an analysis, namely the normality and homogeneity test, then carry out a test on the T test. This study shows that there is an effect on the use of the Android-based Biology Learning Module and its Effect on Learning Outcomes in the Coordination System Material for Class XI Science at Mas Islamiyah Kota Pinang. There needs to be an action from the teacher, namely repeating the nervous system material through interactive learning, so that it can increase interest and the results of students' learning scores on the material. This interactive lesson uses e-learning learning media(Eva Zahora, 2021).

As according to(Indrastyawati, 2016) can be seen that at Sig. in that space of 0.000 as well as Sig. The result obtained is smaller than 0.05 (<0.05), which means that the results of the pretest and posttest results are significantly different. Based on these results, it can be concluded that a media lesson given to students has an influence on learning outcomes for students and is effective in improving learning outcomes for students.

In obtaining results that are effective in digital modules with constructs to get an achievement in an independence in learning outcomes for students who are developed in a very effective category, it can be seen from the questionnaire data on the independence of

all learning outcomes that have been distributed. on the average score that has been obtained from the data, the questionnaire obtained 89.55% results and has proven that a digital module using construct 2 can help a process result in a learning process in the school room and also show students who are trained to learn effectively. good and independent with this digital module(Ramadhani & Fitria, 2021).

In the use of a coordination system learning media based on Android for biology teachers as a whole, it can be seen from a criterion, an assessment in this aspect has shown that 57% are categorized as well and 43% are categorized as very good. In general, a media in this learning process has got a good assessment mode result, the media in the lesson in terms of the feasibility of the content is said to have a good quality, it is known on the results of the aspect of a feasibility on a content from a display or from a language, and material, as well as a programming that already has a medium in the lesson(Indrastyawati, 2016).

That in a medium of learning by using a mobile learning on a coordination system based on an Android that has been developed, based on the results of an assessment by experts on a media it gets a value of 89.71% and with a very good category and the assessment of experts on a material get a score of 95.83% with a category Very Good. in a test, it is tried on students in high school who get quality results on a media in lessons with a percentage result of 85.13% in the Good category. in the second trial carried out on a student at a high school school which obtained quality results on a medium in the lesson with a percentage on the outcome of 86, 91% with an Excellent category. Based on the results of the acquisition value on the data, it has been shown that in the use of a media in mobile learning lessons based on Android, the material for human coordination systems is suitable for use as a learning resource for high school students.(Hardinata et al., 2018).

In learning that uses a media module in an application based on Android, the results of the acquisition of learning outcomes for students in lessons can be a solution to a problem that has been encountered in a process of learning and teaching in the room and lessons used in a learning media. which is an application based on Android that can activate a participation in students who are in the room and can even access it at home and even anywhere. With this, there is a need for readiness for teachers and students in accepting an era of developments in technology in this century.(Ardiansyah, 2020).

In obtaining the results on the average in the validation an expert has produced a very valid criterion. on the results of testing a feasibility on a medium for teachers and students on the results of limited field tests on teachers (79) and students (60.5). in Wider field testing by a teacher (79.5) and students (66.92). and on the feasibility test by teachers (86) and students (70.50). on Overall on the results of the average scores of teachers and students who obtained a criterion on eligibility very well. in this study, it has provided a positive benefit for the world in education, especially during the covid-19 pandemic, it can make it easier for students to get material results and teaching materials, to be able to improve an expertise in independent learning for students,(Theresia Miss Elci1, John Bare, 2021).

Modules with the use of android on the coordination system material can be developed and can find out all information and learn well. with the use of android-based modules in the coordination system material can facilitate and improve student learning outcomes by using android-based modules.(Ade Suryanda, Ernawati, 2016).

The use of android is something that is one of the supporting factors for student learning outcomes, the use of android has various kinds of features and the like in everyday life more and more ranging from the sophisticated to the simple ones that can be used in everyday life or in learning to use(Dian, 2016).

IV. Conclusion

Lesson Using Android Based Biology Learning Modulehas a good influence on the acquisition of learning outcomes for students. This is because in working on a material or problem faced by students it will make it easier for students and use of Android-Based learning modulesin carrying out learning. Based on the results obtained and the discussion of the study in the previous explanation, it can be concluded that the control class obtained an average score of 57.2 while the experimental class obtained an average score of 67.4. Android-Based Biology Learning Module on learning.

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