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The Effect of Mobile Learning Media Based on Ispring Suite on Students' Learning Outcomes in Mathematics

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ABSTRACT

The low mathematics learning outcomes of class XI students at SMA Negeri 10 Medan, and the not yet utilized mobile learning media based on observation became the background for this research. This research intended to show how mobile learning media based on the Ispring Suite affects students' learning outcomes in mathematics. This research took place at SMA Negeri 10 Medan. The type of research in this study is a quasi-experiment with a nonequivalent control group design. Pre-test and post-test data collection techniques in the form of 10-multiple-choice questions were used. This research's sample was drawn at random and included 30 students from XI MIA 1 (the experiment class) and XI MIA 2 (the control class). Data of this research were analyzed by using normality test, homogeneity test, and t-test. The data gathered with the help of SPSS is normal and homogeneous. The independent t-test findings show that t_{count} is greater than t_{table} (2,594 > 2,002) and the significance value is 0,000 < 0,05, such that H_0 is rejected and H_a is accepted. So, there is a difference between the mean of student post-test learning outcomes with mobile learning media based on Ispring suite and conventional learning model. In other words, using mobile learning media based on the Ispring Suite has an effect on student mathematics learning outcomes. Additionally, with an average score of 88% in the very good category, results from student response surveys to mobile learning media based on the Ispring Suite for learning were positive. It is suggested that mobile learning media based on the Ispring Suite be used to increase students' mathematics outcomes

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INTRODUCTION

Education has a significant effect on the educational quality and development of a country, especially regarding mathematics education. As the main branch of science among all existing branches of science, mathematics is one of the subjects that contributes to the development of an intelligent, civilized, and dignified society by instilling a critical mindset and encouraging students to think logically, rationally, and confidently. Lerner claims that mathematics is a universal language that allows humans to conceive about, record, and communicate the concept of components and amounts as a symbolic language. So, it can be concluded that mathematics is critical as a foundation for thinking and quantitative reasoning, as well as solutions that can be used to other subjects.

Hasratuddin (2014: 30) said that learning mathematics requires a high level of mental activity because it involves deductive reasoning and abstract ideas that are given symbols and organized hierarchically. Therefore, many students still believe that mathematics is a difficult, distressing, or boring subject, and that it is even frightening. This is due to the fact that many students still struggle to solve mathematics issues. In general, students often experience difficulties in learning mathematics, including difficulty calculating quickly, logical abilities, writing or drawing skills, and feeling lazy about learning mathematics. As a result, students' learning outcomes are low. Furthermore, students' low learning outcomes are also because teachers' learning has tended to be conventional.

Indonesian students' poor academic performance is a long-standing issue in the field of education (Faisal & Martin, 2019). The math results of Indonesian students rank low when compared to those of other countries (OECD, 2019). With 379 math skills in the 73rd position, Indonesia ranked 74th in the 2018 PISA survey, sixth from the bottom. Additionally, Indonesia has never scored above the average of the Organization for Economic Cooperation and Development (OECD).

Based on observations made at SMA Negeri 10 Medan, it was discovered that the mathematics learning process was still teacher-centered, with teachers using only conventional methods to provide information, resulting in less-than-effective material being absorbed by students. The teacher merely uses textbooks to communicate the content, and there are no other variations involving media, so student learning activities are low, which results in low student learning outcomes in mathematics.

Students' learning outcomes are frequently used to evaluate whether or not learning was successful. The expected result of learning mathematics in every school is the results that achieve mastery learning. Students are said to be complete in the mathematics learning process if their mathematics learning outcomes have reached the Minimum Completeness Criteria (KKM) set by the school. (Depdiknas, 2006). For an effort to make mathematics more interesting and appealing for students, breakthroughs in developing learning innovations, one of which is through learning media, are still required.

The most effective learning process for students involves the use of learning media that teachers can use to deliver learning information. This is rooted in the concept that the teacher's ability to convey learning materials has some limitations, particularly those linked to material understanding. Because mathematics is an abstract subject, using learning media allows students to think more concretely and reduces verbalism. This is in line with the opinion of Arsyad (2011: 29) namely the use of learning media can help to facilitate and improve learning processes and outcomes by directing children's attention, which can lead to learning motivation and allow students and teachers to interact.

One of the media that is currently very closely related to the daily life of students is a smartphone. Newzoo's 2021 Global Mobile Market Report shows Indonesia ranked fourth with 192,15 million smartphone users. Smartphone penetration (percentage of the population actively using a smartphone) in the country has reached 69,7% of the total population. This is due to the ease with which smartphones can be used anywhere and at any time, as well as the ease of which they'll be obtained. Smartphones have a variety of interesting and unique features that make it easier to find what you need. Many people who use smartphones are children and teenagers who are still in school, indicating that smartphones can be used as a learning tool.

One of the newest teaching methods is mobile learning, which makes the most of the learning potential of smartphones and mobile devices. Mobile learning is, to put it simply, a learning media that enables students to learn at any time and from any location. Furthermore, mobile learning allows students to review topics that they haven't yet mastered. The implementation of this learning media has numerous advantages for both teachers and students. Additionally, Aripin (2018) noted in his research that one benefit of mobile-based teaching resources is that they are more affordable than PCs or laptops. The ability to display multimedia features in the form of video, text, sound, animation, and more gives mobile devices practically the same advantages as PCs. A tool that can be used to create mobile learning media is the Ispring Suite software.

Ispring Suite is a PowerPoint-based authoring toolkit that allows users to combines text, images, videos, animations, dialogue simulations, sound, quizzes and other interactive learning materials to create slide-based courses, screencasts, or video lectures become one with the way wherein learning process takes place. The output courses are published in HTML5. The Ispring Suite software can be integrated with Microsoft Power point, making its use simple, and the time necessary to generate interactive media with this software is relatively short. Maryana, et.al., (2019) shows that making mathematics learning media using PowerPoint and Ispring Quizmaker can increase the willingness of students to learn. Therefore, the combination of Microsoft Power Point and Ispring Suite will produce in an engaging learning media that is intended to improve students' mathematical learning outcomes.

Based on that background, the researchers are interested in carrying out research on the effect of mobile learning media based on the Ispring Suite on students' learning outcomes in mathematics. The researcher hopes that, with its diverse potentials and benefits, mobile learning media will be aids or objects used in learning that can increase learning motivation, efficiency, and effectiveness of the learning process, as well as student learning outcomes in Indonesia.

LITERATURE REVIEW

Learning Outcomes

Definition of Learning Outcomes

Learning outcomes can be explained by understanding the two words that make them up, namely "learning" and "outcomes". The definition of "learning" is an activity or a process of interaction between teachers, students, and resources, including direct and indirect interactions that have been systematically organized based on educational principles as a teacher's effort to assist and facilitate the creation of conditions so that students can acquire skills and be able to master the knowledge conveyed, whereas outcomes (product) refers to an acquirement as a result of an activity or process that causes a functional change in input.

Learning outcomes are described by Hamalik (2004: 49) as the level of mastery achieved by students in adhering to the teaching and learning process in line with the established educational goals. Winkel (1996: 226) claims that learning outcomes are proof of a person's success or achievement. Learning outcomes are measurements of the evaluation of learning processes or activities that are expressed in symbols, letters, and sentences that describe the outcomes each learner has accomplished over time. According to Susanto (2013: 5), learning causes cognitive, affective, and psychomotor changes in students. He emphasizes the concept of learning outcomes, stating that learning outcomes can be viewed as the level of student achievement in studying subject matter at school, as indicated in test results for certain subject areas. These results are influenced by many factors. The most important factor in achieving learning goals and successful learning outcomes is how teachers instruct and provide learning materials to the students.

Factors Causing Low Learning Outcomes

Some students who achieve high grades but struggle to apply their knowledge demonstrate the low quality of education. Low student learning outcomes in mathematics can be caused by a multitude of factors, such as problems with mathematics comprehension, the lack of student engagement in the teaching and learning process, as well as a lack of teacher expertise in creating teaching materials. The teacher's inaccuracy in designing and implementing learning is one of the factors causing students' low mathematics learning achievement.

According to Abdurrahman (2012), one of the causes of students' low or lack of understanding of mathematical concepts is the teaching style employed by teachers, such as learning focused to conventional methods that place students in the teaching and learning process as listeners. Learning is a mental or psychic activity which is influenced by several factors. According to

Baharuddin and Esa Nur Wahyuni (2009: 19–28), the following variables affect learning outcomes:

1. Internal factors
   a. Physiological factors, those which affect a person's physical state.
   b. Psychological factors, including student intelligence, motivation, interests, attitudes, and abilities, that can have an influence on learning.
2. External Factors
   a. Social environments, such as school social environments, community social environments, and family social environment s.
   b. Non-social environments, such as the natural environment, instrumental factors (learning tools), and subject matter factors.

In the national education system, the formulation of educational goals, both curricular and instructional objectives, uses the classification of learning outcomes by Benjamin Bloom, which broadly divides them into three domains, namely the cognitive, affective, and psychomotor domains (Sudjana, 2009). Based on cognitive, emotional, and psychomotor evaluations, learning outcomes display student achievement. However, the focus of this study's researcher was on the students' cognitive learning outcomes.

Learning Outcomes Criteria

Evaluation, which is a review of how well students have performed in relation to set targets, is used to measure learning outcomes. After being evaluated, the measurement findings are expressed in the form of a value that meets a particular level of the commonly used criteria, namely as follows:

1. Individual Completeness
   Individual learning completeness is calculated using the formula (Purwanto, 2000: 112):
   $$Total = \frac{Score\ obtained}{Maximum\ score} \times 100$$
   Students are declared to have completed their learning if they are able to achieve the Minimum Mastery Criteria (KKM). And if students get scores below the KKM, they do not finish studying (Muslih, 2008: 36). KKM for learning mathematics at SMA Negeri 10 Medan is 75.
2. Classical Completeness
   Classical learning completeness is calculated using the formula:
   $$Percentage = \frac{Number\ of\ students\ complete\ study}{Total\ number\ of\ students} \times 100\%$$
   The success indicator of classical learning completeness is determined if the class mean obtained is above the KKM score and at least 85% of the number of students who score 75.

Mobile Learning Media

Warsita (2018: 62) defines mobile learning (m-learning) as a type of instruction that makes advantage of the advancement of cellular technology and portable electronic devices (such as smartphones) as learning tools. Since the content must fit on a small screen, mobile learning is created using a multimedia format that emphasizes text, pictures, and audio and minimizing video and animation. As a result, it makes for an engaging and simple learning tool.

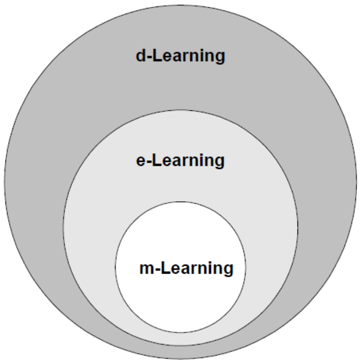


Figure 1. The Place of M-Learning As Part of E-Learning and D-Learning (Source: Georgiev, Georgieva, and Smrikarov, 2004)

Utilization of mobile learning media can improve students' autonomous and learning outcomes as stated by Forment & Guerrero (2008) that mobile-based media are flexible, can be used repeatedly according to the readiness and willingness of students. The use or repeated learning with high frequency can improve students' learning outcomes. Additional benefits of mobile learning (M-Learning) over other forms of education, include:

a. It can be used at any time and in any place.
b. Most mobile devices are less expensive than desktop PCs.
c. Designed to be smaller and lighter than a desktop computer.
d. Mobile learning can engage more students since it integrates technology into daily life. (Pujiono, 2016).

Ispring Suite

Ispring Suite is software for creating learning media by incorporating various aspects of media such as audio, video, and audiovisual content, which can be integrated (add ins) with Microsoft PowerPoint software and does not require special skills to use. Ispring Suite is the best software when compared to educational device usage, according to Juraev (2019). Because it has capabilities for creating questions of different types and can automatically process grades, this program is suitable for use as a multimedia mobile learning platform. In order to produce interactive content with decent, useful, and effective quality that can be used in the learning process, this media is also equipped with the ability to record and sync video presenters, add flash and YouTube videos, import or record audio, and create unique navigation and designs.

Additionally, the Ispring Suite supports the display of learning evaluations in a variety of formats, including multiple choice, multiple response, true or false, short answer, numeric (numbers), sequence (sorting), matching, fill in the blanks, essay, and others (Rovita, 2020: 153). As a result, learning materials created with the Ispring Suite software can make it simpler for teachers to provide lessons so that students can be more focused, conducive, and simple to grasp.

The researcher can deduce that Ispring Suite 10 is a top-notch program that can be employed as an interactive learning tool based on the knowledge shared here. Because this application is compatible with Microsoft PowerPoint, where the menus and programming language are very straightforward and recognizable to new users, it can insert different types of media, making this learning material more interesting and understandable for students. It also makes it easier for teachers to master quickly. The output of developing learning media can be turned into formats like flash, power point, HTML5, and MP4 video, where it can be utilized directly by users. It is best employed in the form of e-learning or mobile learning, which can be accessed later both online and offline on computers and Android devices.

METHODOLOGY

Location and Time of Research

This research was conducted at SMA Negeri 10 Medan, which is located at Jl. Tilak No.108, Sei Rengas I, Kec. Medan Kota, Medan City, North Sumatera. This research was carried out in 03 October – 10 October 2022, the odd semester of the 2022/2023 academic year.

Type of Research

The type of research used is quasi-experimental research. A quasi-experimental is one of the research types that is applied by giving experiments to the experiment group with conditions that can still be controlled (Bungin, 2004: 38).

Population and Sample of Research

The population is all individuals who are the source of sampling, so the population in this study is all class XI at SMA Negeri 10 Medan in the academic year 2022/2023, which consists of 6 classes.

This research sampled 30 students each from classes XI MIA 1 as the experiment class and XI MIA 2 as the control class.

Variable of Research

The independent variable (X) is the variable that is used as the type of treatment, namely mobile learning media based on the Ispring Suite.

The dependent variable (Y) is the variable that is affected by the influence of the independent variable, namely students' mathematics learning outcomes.

Design of Research

The Pretest-Posttest Control Group Design was applied in this research, which is a design that delivers a pretest before treatment and a post-test after treatment in each group. According to Sugiyono, the research design of Pretest-Posttest Control Group Design is as follows (Sugiyono, 2013: 113):

Table 1. Pretest-Posttest Control Group Design

Class	Pre-test	Treatment	Post-test
Experiment (R)	O_1	X	O_2
Control (R)	O_3	-	O_4

Description:
R : Experiment Class and Control Class
O_1 : Initial Test Results (Pretest) Experiment Class Before Treatment
O_2 : Final Test Results (Posttest) Experiment Class After Treatment.
O_3 : Initial Test Results (Pretest) Control Class Before Treatment.
O_4 : Final Test Results (Posttest) Control Class After Treatment.
X : Treatment, implementation of teaching and learning activities in mathematics subjects using mobile learning media based on the Ispring Suite.

Data Collection Technique

Tests and non-tests are used as the data collection technique in this research. Student learning results were assessed using pre- and post-tests before and after treatment. The non-test utilized is a questionnaire made to know more about how students react to mobile learning media based on the Ispring Suite after learning.

Research Instruments

Instruments used in this research includes pre-test, mobile learning media based on Ispring Suite, RPP, post-test, and questionnaire.

Research Procedure

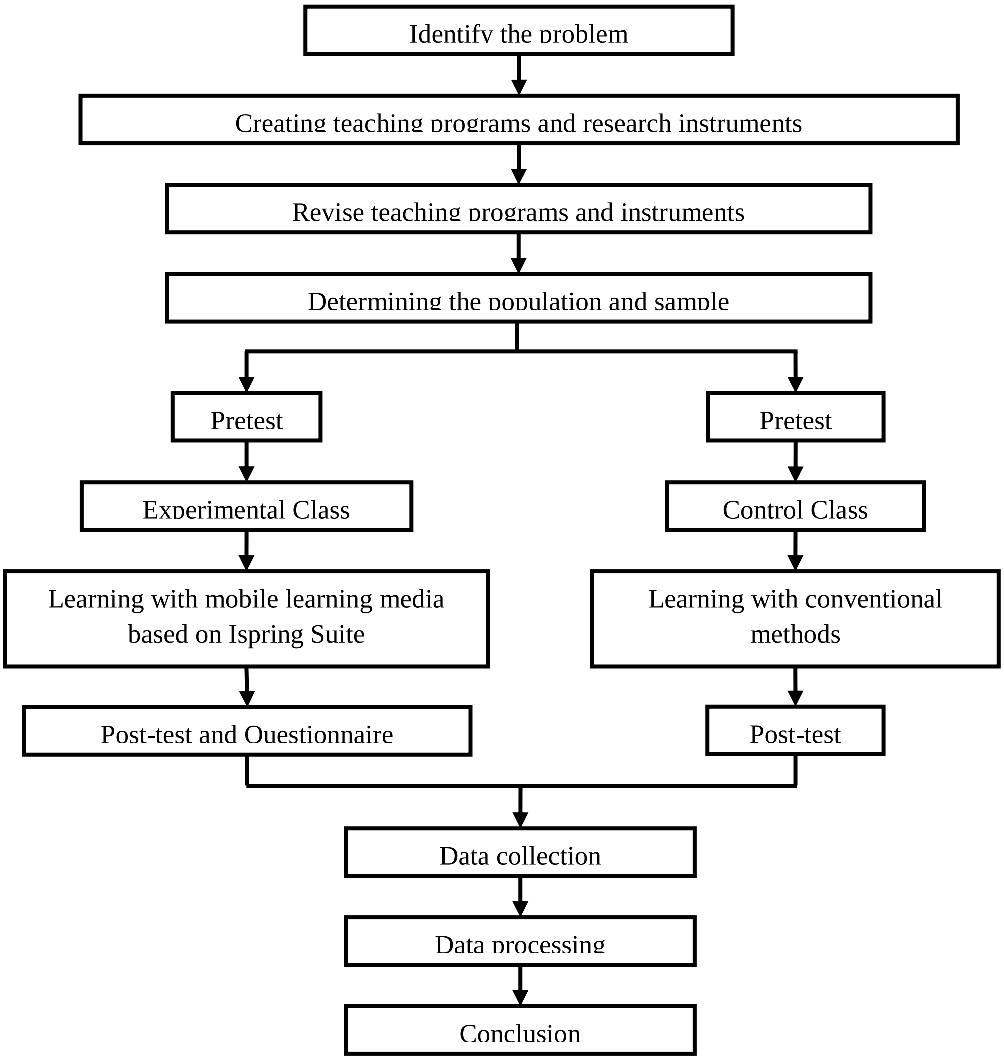


Figure 2. Schematic of the Research Procedure

Data Analysis

The t test will be used to evaluate and analyze obtained student test data. The normality test and the homogeneity test are prerequisites that must be satisfied before the hypothesis may be tested. Non-test data analysis was used to determine how much student response to the use of mobile learning media based on the Ispring Suite in learning mathematics. Data analysis was carried out with the help of SPSS Version 24 and Excel.

RESEARCH RESULT

Description of Research Implementation

Classes XI MIA 1 and XI MIA 2 are the two classes that are used in this research. Class XI MIA 1 served as the control class using the conventional learning model, and Class XI MIA 2 served as the experimental class using mobile learning media based on Ispring Suite while implementing the contextual learning model (CTL).

The data used in this research are from the pre-test and post-test of students' mathematics learning outcomes in classes XI MIA 1 and XI MIA 2. Students who answered all questions correctly received a total score of 100. The data processing for this research uses the SPSS application. The learning material taught in this learning process is the equation of a circle. The data collection process began on October 3, 2022, with a number of meetings, both in the experiment class and the control class. In more detail, it can be seen in the following table:

Table 2. Research Implementation Schedule

No.	Days/Date	Time (Minutes)	Activity	Class
1	Monday/ 03-10-2022	45	Pre-test	Experiment
2	Monday/ 03-10-2022	45	Pre-test	Control
3	Wednesday/ 05-10-2022	90	Meeting I	Experiment
4	Wednesday/05-10-2022	90	Meeting I	Control
5	Friday/07-10-2022	70	Meeting II	Experiment
6	Friday/07-10-2022	70	Meeting II	Control
7	Monday/10-10-2022	45	Post-test	Experiment
8	Monday/10-10-2022	45	Post-test	Control

Researchers obtained initial data on student learning outcomes for the circle equation through a pre-test given to students. The purpose of pre-test data processing is to establish whether or not the data from the research sample originates from a normal and homogeneous population distribution. The experimental class received treatment using mobile learning resources based on the Ispring Suite after the pre-test was completed in both classrooms, while the control class used a conventional learning model. After the two classes received different treatment, a post-test was provided to assess the students' final learning outcomes in mathematics. The multiple-choice questions from the pre-test and post-test consist of the same 10 questions.

Description of Pre-test Data on Mathematics Learning Outcomes for Experiment Class and Control Class

A descriptive analysis was conducted to provide an overview of the learning outcomes of the experiment class and control class students' pre-test mathematics. Here are the results of the descriptive analysis:

Table 3. Experiment and Control Class Pre-test Descriptive Statistics

Class	Descriptive Statistics							
	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance	Ideal Score
Pre-test Experiment	30	20	70	1410	47.00	13.933	194.138	100
Pre-test Control	30	30	80	1580	52.67	12.847	165.057	100

Based on table 4.2, the pre-test data in the experiment and control classes, it is known that the lowest value in the experiment class is 20, while the lowest value in the control class is 30. The highest value in the experiment class is 70, while the highest value in the control class is 80. The mean, or average value, of the experiment class is 47,00 while the mean of the control class is 52,67.

The following is a summary of the pre-test of the experimental class and control class, which is shown in the bar chart by figure 4.1.

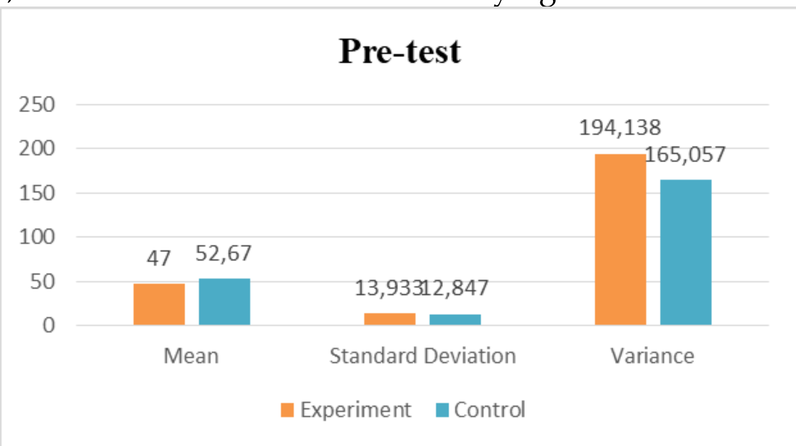


Figure 3. Bar Chart of Pre-test Experiment and Control Class

Description of Post-test Data on Mathematics Learning Outcomes for Experiment Class and Control Class

The following is a description of the post-test data on the mathematics learning outcomes of the experiment class and control class students:

Table 4. Experiment and Control Class Post-test Descriptive Statistics

Class	Descriptive Statistics							
	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance	Ideal Score
Post-test Experiment	30	50	100	2410	80.33	12.726	161.954	100
Post-test Control	30	50	100	2150	71.67	13.153	172.989	100

Based on table 4.3, the pre-test data in the experimental and control classes, it is known that the lowest value in the experiment class and control class is 50. The highest value in the experiment class and control class is 100. The mean or average value of the experiment class is 80,33 while the mean of the control class is 71,67.

The following is a summary of the post-test of the experimental class and control class, which is shown in the bar chart by figure 4.2.

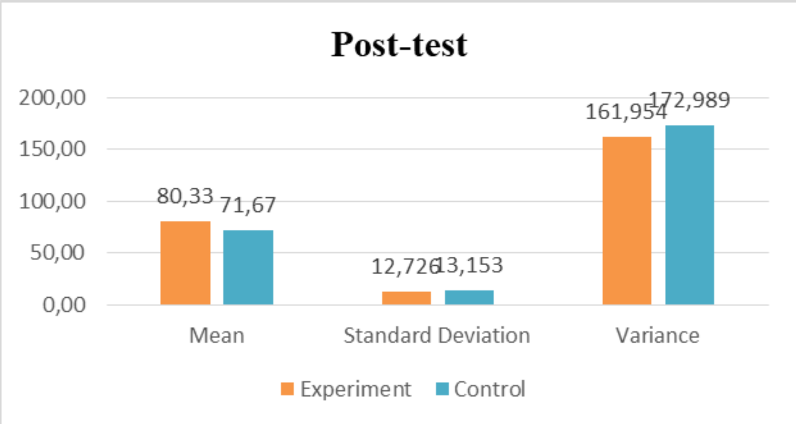


Figure 4. Bar Chart of Post-test Experiment and Control Class

Description of the Comparison of Mathematics Learning Outcomes of Experimental Class and Control Class Students

The comparison of students' mathematics learning outcomes between the experimental class and the control class can be seen in the following table:

Table 5. Comparison of the Mathematics Learning Outcomes of Experiment Class and Control Class Students

Class		Minimum	Maximum	Mean	Percentage Increase
Experiment	Pre-test	20	70	47,00	33,33%
	Post-test	50	100	80,33	
Control	Pre-test	30	80	52,67	19,00%
	Post-test	50	100	71,67	

Based on Table 4.4, it can be seen that the mean value of the control class pretest is 52,67, which is higher than the experimental class, which is 47,00. Meanwhile, the mean value for the experimental class posttest was 80,33, which was higher than the control class, which was 71,67. These results indicate that the value of the control class and the experimental class has increased after being given different treatments. The control class that was given conventional learning treatment experienced an increase in learning outcomes with a difference in the pretest and posttest scores of 19,00%, while the difference in the mean pretest and posttest scores of the experimental class that was given treatment in the form of learning using mobile learning media based on the Ispring Suite was 33,33%. This data indicates that the experimental class that was given learning treatment using mobile learning media based on the Ispring Suite had a higher increase in learning outcomes compared to the control class that was given conventional learning treatment.

Description of Student Mathematics Learning Outcomes Completeness Individually and Classically

The final score results meet good criteria if the students' final grades achieve classical completeness or at least 85% of the number of students in the class achieve KKM. The minimum completeness criterion (KKM) for circle equation material in SMA Negeri 10 Medan is 75. A class is said to have completed its study (classical mastery) if in that class there are ≥ 85% of students who have completed their studies (Royani, 2017: 299).

Furthermore, data from the experimental class and control class, which are categorized based on the completeness criteria, can be seen in Table 4.5 as follows:

Table 6. Description of Experiment and Control Class Pretest Completeness

Score Intervals	Category	Frequency	Percentage (%)
$0 \leq x \leq 75$	Not Completed	30	100
$75 \leq x \leq 100$	Completed	0	0
Total		30	100

Based on table 4.5 above, it can be seen that the number of students who did not meet the individual completeness criteria in both classes was 30 people, or 100% of the total number of students. From the description above, it can be concluded that the results of the pre-test of experimental and control class students before being given treatment did not meet the classical student learning achievement indicators, namely 85% and were classified as very low.

The control class posttest data categorized based on the completeness criteria can be seen in Table 4.6 as follows:

Table 7. Description of Control Class Post-Test Completeness

Score Intervals	Category	Frequency	Percentage (%)
$0 \leq x \leq 75$	Not Completed	18	60
$75 \leq x \leq 100$	Completed	12	40
Total		30	100

Based on table 4.6 above, it can be seen that the number of students who did not meet the individual completeness criteria was 18 people (60%), while students who met the individual completeness criteria were 12 people (40%) of the total number of students. From the description above, it can be concluded that the post-test results of the control class students after being given treatment did not meet the classical student learning achievement indicators, namely 85%.

Experimental class post-test data categorized based on completeness criteria can be seen in Table 4.7 as follows:

Table 8. Description of Experiment Class Post-Test Completeness

Score Intervals	Category	Frequency	Percentage (%)
$0 \leq x \leq 75$	Not Completed	10	33
$75 \leq x \leq 100$	Completed	20	67
Total		30	100

Based on table 4.14 above, it can be seen that the number of students who did not meet the individual completeness criteria was 10 people (33%), while students who met the individual completeness criteria were 20 people (67%) of the total number of students. From the description above, it can be concluded that the post-test results of experimental class students after being given treatment also did not meet the classical student learning achievement indicators, namely 85%.

Analysis of Research Data

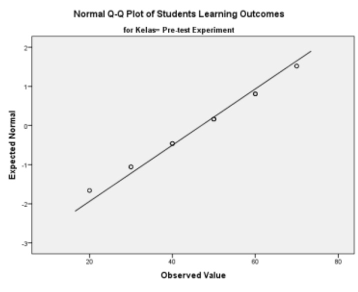
Normality Test

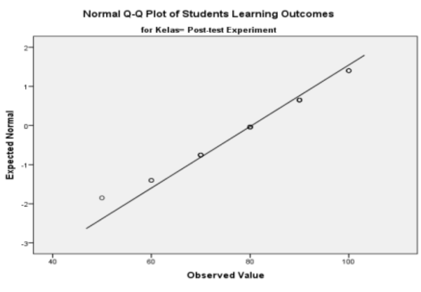
The purpose of the normality test is to assess whether or not the sample of research data represents a population with a normally distributed population. The Shapiro-Wilk test can be used to perform a normality test to determine if the data is normally distributed or not.

Table 9. Tests of Normality

	Class	Shapiro-Wilk		
		Statistic	df	Sig.
Students Learning Outcomes	Pre-test Experiment	.943	30	.109
	Post-test Experiment	.935	30	.067
	Pre-test Control	.943	30	.107
	Post-test Control	.941	30	.096

Based on the output table above, it is shown that the significance of the experiment class pre-test is 0,109 > 0,05, the experiment class post-test significance is 0,067 > 0,05, the control class pre-test significance is 0,107 > 0,05, and the post-test significance of the control class test is 0,096 > 0,05. It can be concluded that the research sample is normally distributed. In addition, we can utilize the result of a normal Q-Q plot to determine normality graphically. The data points will be close to the diagonal line if the data is normally distributed. The data are not normally distributed if the data points deviate from the line in an obvious non-linear pattern. The data is normally distributed, as seen by the normal Q-Q plot below.





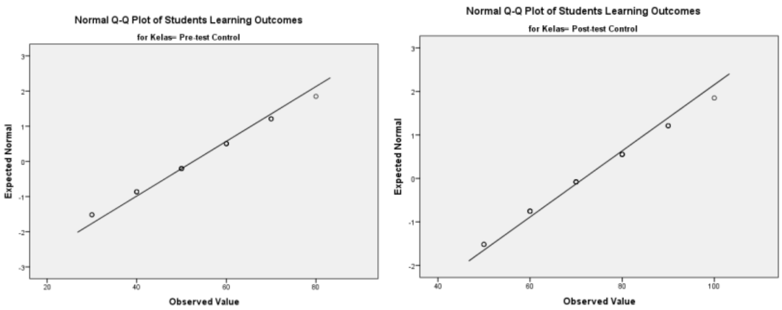


Figure 5. Q-Q Plot Normality of Class Experiment and Control

Based on the figure 4.3 above, we can see the data points approach the diagonal line and spread around the line, which means there is no data that is far from the diagonal line. So, it can be concluded the data distribution is normal.

Homogeneity Test

The homogeneity test is used to identify whether or not the research sample is drawn from a homogeneous population. The following are the results of the homogeneity test calculation from the experimental class and control class pre-test:

Table 10. Test of Homogeneity of Pre-test

Test of Homogeneity of Variances			
Students Pre-test Learning Outcomes			
Levene Statistic	df1	df2	Sig.
.288	1	58	.594

Based on the output table "Test of Homogeneity of Variances" above, it is known that the significance value (Sig.) of the experiment class and control class students' mathematics pre-test results is 0,594 Because the value of Sig. 0,594 > 0,05, so it can be concluded that the variance of the data on the results of the mathematics pre-test learning outcomes for students in the experimental class and the control class is the same or homogeneous.

The following are the results of the homogeneity test calculation from the post-test experiment class and control class:

Table 11. Test of Homogeneity of Post-test

Test of Homogeneity of Variances			
Students Post-test Learning Outcomes			
Levene Statistic	df1	df2	Sig.
.210	1	58	.649

Based on the output table "Test of Homogeneity of Variances" above, it is known that the significance value (Sig.) of the experiment class and control class students' mathematics post-test results is 0,649. Because the value of Sig. 0,649 > 0,05, so it can be concluded that the variance of the data on the results of the mathematics post-test learning outcomes for students in the experimental class and the control class is the same or homogeneous.

Hypothesis Test Results

Based on the statistical prerequisite test, it was found that the data was normally distributed and the two samples were homogeneous. Therefore, hypothesis testing was carried out using a t-test using the SPSS 24 software.

1.Independent-Samples T test (Experiment Class pre-test with Control Class Pre-test)

The research hypothesis for independent-samples t-test as follows:

H_0: There is no difference between the mean of student pre-test in experiment class and control class.

H_a: There is a difference between the mean of student pre-test in experiment class and control class.

with mathematics form:

$H_0 : \mu_1 = \mu_2$

$H_a : \mu_1 \neq \mu_2$

where μ_1 and μ_2 are the population means for experiment class and control class, respectively.

The basis for decision-making in the independent sample t test is that if the value of Sig. (2-tailed) > 0,05 or the value of $t_{count} < t_{table}$, then H_0 is accepted and H_a is rejected. On the other hand, if the value of Sig. (2-tailed) < 0,05 or $t_{count} > t_{table}$, then H_0 is rejected and H_a is accepted. The following are the results of the independent sample t-test results for the experiment and control class:

Table 12. Independent Samples Test of Pre-test

		F	Sig.	t	df	Sig. (2-tailed)
Students Learning Outcomes	Equal variances assumed	.288	.594	-1.638	58	.107

To find the value of t-table, we refer to the formula (α); (df) is equal to (0,05); (58). We look for this value in the distribution of t-value statistics table. Then it is found the value of t-table is 2,002. Based on the results above, it was found that the Sig. (2-tailed) > 0,05 (0,107 > 0,05) then H_0 is accepted and H_a is rejected. As well as $t_{count} < t_{table}$ (1,638 < 2,002). So, it can be concluded that there is no difference between the mean of student pre-test in experiment class and control class because no treatment has been given.

2.Independent-Samples T test (Experiment Class post-test with Control Class Post-test)

The research hypothesis for independent-samples t-test as follows:

H_0: There is no difference between the mean of student post-test learning outcomes with mobile learning media based on Ispring Suite and conventional learning model.

H_a: There is a difference between the mean of student post-test learning outcomes with mobile learning media based on Ispring Suite and conventional learning model.

with mathematics form:

$H_0 : \mu_1 = \mu_2$
$H_a : \mu_1 \neq \mu_2$

The basis for decision-making in the independent sample t test is that if the value of Sig. (2-tailed) > 0,05 or the value of $t_{count} < t_{table}$, then H_0 is accepted and H_a is rejected. On the other hand, if the value of Sig. (2-tailed) < 0,05 or $t_{count} > t_{table}$, then H_0 is rejected and H_a is accepted. The following are the results of the independent sample t-test results for the experiment and control class:

Table 13. Independent Samples Test of Post-test

Students Learning Outcomes		F	Sig.	t	df	Sig. (2-tailed)
	Equal variances assumed	.210	.649	2.594	58	.012

To find the value of t-table, we refer to the formula (α/2); (df) is equal to (0,05/2); (58) is equal to 0,025; 58. We look for this value in the distribution of t-value statistics table. Then it is found the value of t-table is 2,002. Based on the results above, it was found that the Sig. (2-tailed) < 0,05 (0,012 < 0,05) then H_0 is rejected and H_a is accepted. As well as $t_{count} > t_{table}$ (2,594 > 2,002). So, there is a difference between the mean of student post-test learning outcomes with mobile learning media based on Ispring suite and conventional learning model. Or else, in other words, using mobile learning media based on the Ispring Suite has an effect on student mathematics learning outcomes.

3.Paired-Samples T Test (Pre-test with Post-test Experiment class)

The research hypothesis for Paired-Sample T Test:

H_0: There is no mean difference between pre-test and post-test learning outcomes, which means there is no effect of using mobile learning media based on Ispring Suite on students' mathematics learning outcomes in the circle equations material class XI SMA Negeri 10 Medan.

H_a: There is mean difference between pre-test and post-test learning outcomes, which means there is an effect of using mobile learning media based on Ispring Suite on students' mathematics learning outcomes in the circle equations material class XI SMA Negeri 10 Medan.

with mathematics form:

$H_0 : \mu_1 = \mu_2$
$H_a : \mu_1 \neq \mu_2$

where μ_1 is the sample mean of variable pre-test, and μ_2 is the sample mean of variable post-test.

The decision-making guide in the paired sample t-test based on the significance value (Sig.) of the SPSS output results is that if the value of Sig. (2-tailed) < 0,05, then H_0 is rejected and H_a is accepted. On the other hand, if the value of Sig. (2-tailed) > 0,05, then H_0 is accepted and H_a is rejected.

Table 14. Paired Samples Test Experiment Class

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-test Experiment - Post-test Experiment	-33.333	4.795	.875	-35.124	-31.543	-38.079	29	.000

Based on the "Paired Samples Test" output table above, it is known that the value of Sig. (2-tailed) is 0,000 < 0,05, then H_0 is rejected and H_a is accepted. So, it can be concluded that there is mean difference between pre-test and post-test learning outcomes, which means there is an effect of using mobile learning media based on Ispring Suite on students' mathematics learning outcomes in the circle equations material class XI SMA Negeri 10 Medan.

Results of Questionnaire Data Analysis

To determine student responses to mobile learning media based on the Ispring Suite, an instrument in the form of response lift consists of 10 statements with assessment categories, namely, Strongly Agree (SS), Agree (S), Fairly (C), Disagree (TS), Strongly Disagree (STS). The following is the result of calculating the questionnaire response scores of experiment class students using mobile learning media based on the Ispring Suite.

Table 15. Percentage of Student Questionnaire Response Scores

Indicator	Questionnaire Indicator	Experiment Class	
		Percentage	Conclusion
1	Presentation of image display designs, animations, and quizzes in Ispring Suite-based mobile learning media	88%	Very Well
2	Presentation of material concepts and evaluation	89%	Very Well
3	The use of Ispring Suite-based learning media in the teaching and learning process	88%	Very Well
Mean		88%	Very Well

Table 4.14 shows the results of the percentage of responses to the use of Ispring Suite-based mobile learning in learning mathematics on the concept of circular equations. The average percentage of 88% indicates the overall category is very well. Calculation of the results of the questionnaire can be seen in the appendices.

DISCUSSION

The results of the analysis of the acquisition of pretest data in both classes, namely the pre-test score of class XI MIA 2 is higher than that of class XI MIA 1. It is proven by the mean value of the pretest result of class XI MIA 2, which is 52,67, which is greater than class XI MIA 1, with the mean pre-test of 47,00. The data can be used to determine that the control class is class XI MIA 2, while the experimental class is class XI MIA 1. The experimental class received learning treatment using mobile learning media based on the Ispring Suite.

The post-test data drawn from the research revealed that the experimental class received a higher mean value than the control class. The mean value of the experimental class is 80,33, while the mean value of the control class is 71,67. After getting the post-test value, the post-test data hypothesis test was carried out using SPSS 24. The value of significance obtained is 0,012. So that the value of sig (2-tailed) < the value of the significance level (0,012 < 0,05) as well as $t_{count} > t_{table}$ (2,594 > 2,002), then H_0 is rejected and H_a is accepted.

The following is a manual t-test calculation to show in more detail and prove that the calculation with the SPSS application is proven correct:

$$t_{count} = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \cdot \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$t_{count} = \frac{80{,}33 - 71{,}67}{\sqrt{\frac{(30 - 1)(12{,}726)^2 + (30 - 1)(13{,}153)^2}{30 - 30 - 2} \cdot \left(\frac{1}{30} + \frac{1}{30}\right)}}$$

$$t_{count} = \frac{8{,}66}{\sqrt{\frac{(29)(161{,}95) + (29)(173)}{58} \cdot \left(\frac{2}{30}\right)}}$$

$$t_{count} = \frac{8{,}66}{\sqrt{\frac{4.696{,}55 + 5.017}{58} \cdot \frac{1}{15}}}$$

$$t_{count} = \frac{8{,}66}{\sqrt{\frac{9.713{,}55}{870}}}$$

$$t_{count} = \frac{8{,}66}{\sqrt{11.165}}$$

$$t_{count} = \frac{8{,}66}{3{,}34}$$

$$t_{count} = 2{,}594.$$

So, it can be concluded that there is an influence of mobile learning media based on Ispring Suite on students' mathematics learning outcomes on the concept of circular equations. These results prove that the mobile learning media based on the Ispring Suite that are given to the experiment class are effective in the learning process so that it has an effect on students' mathematics learning outcomes, especially on the circle equation material.

Learning media can play a significant part in the teaching and learning process as a tool to make learning enjoyable so that students can comprehend the information offered by the teacher. This media is quite practical in terms of students who can operate it independently. Through the use of this media, teachers can encourage students to actively participate in learning and make learning content easier to absorb. It is intended that through using mobile learning media based on the Ispring Suite, students' abilities would develop and the learning process will operate more smoothly, resulting in higher student learning outcomes.

CONCLUSIONS

Based on the results of research data analysis and discussions that have been carried out, students' mathematics outcomes using mobile learning media based on the Ispring Suite outperform students' conventional learning outcomes. This is demonstrated by the acquisition of the t test findings, namely $t_{count} = 2{,}594$ and $t_{table} = 2{,}002$. Because $t_{count} > t_{table}$ $(2{,}594 > 2{,}002)$, then according to the decision-making criteria, H_0 is rejected and H_a is accepted, which means there is a difference in the mean student learning outcomes between the experimental class and the control class. Also, based on the results of the questionnaire, student responses to mobile learning media based on the Ispring Suite in learning obtained positive results, with an average value of 88% in the very good category. This proves that mobile learning media based on the Ispring Suite has an effect on students' mathematics learning outcomes in the circle equations material class XI SMA Negeri 10 Medan.

RECOMMENDATIONS

Based on the results and conclusions of the study, the suggestions to be given by the author are as follows:

1. Learning that includes students being actively involved is very important. In addition, teachers are also expected to be able to take advantage of technological developments that are a source of student interest.
2. One solution that is quite effective for teachers in delivering learning materials is to combine learning media and learning models to obtain more effective and interesting results for students. For example,

according to research data obtained and proven to have an effect on student learning outcomes, mobile learning media based on the Ispring Suite.

ADVANCED RESEARCH

This research still has limitations so that further research is still needed on this topic The Effect of Mobile Learning Media Based on Ispring Suite on Students' Learning Outcomes in Mathematics.

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