

Interactive Multimedia Development using Ispring Suite 9 Application in Natural Sciences Learning of IX Grade in Junior High School

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Abstract – Learning support facilities at State Junior High School 5 Panyabungan, North Sumatra Province are adequate for the learning process, but the innovation of learning implementation has not been optimized by using technology. Industry Development 4.0 has greatly assisted teachers develop the latest technology-based teaching media to save space and time. This study tried to equalize technology-based learning facilities in rural areas to be equivalent to the urban ones. This study aimed to find out the development and feasibility of interactive multimedia using the Ispring Suite 9 application for learning outcomes in Natural Sciences subject. Form of learning utilizes computer devices, that are operationalized offline and individually. This type of research was Research and Development (R&D) using the ADDIE development model. Assessments of media experts, material experts, linguistic experts, students, and teachers were used as research data and analyzed with descriptive percentages. Analysis technique of gain-test data was performed to find out the increase in student understanding.

This research generates interactive learning multimedia. A student rating of 90% indicates that students are motivated in learning. Teacher ratings of 95% indicates that multimedia is very helpful for teachers teaching. The results of the study show that interactive multimedia using the Ispring Suite 9 application on Natural Sciences subject is can improve student understanding.

Keywords – *Interactive Multimedia, Ispring Suite 9, Natural Sciences Learning.*

I. INTRODUCTION

Education is a sector that highly determines the quality of a nation. It provides guidance to students to learn various things about life to be able to become excellent individuals in facing the future, and every Indonesian citizen should obtain adequate education. Point C of (“UU Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional - Referensi HAM,” n.d.) states that the National Education System must be able to guarantee equal opportunity for education, quality improvement as well as the relevance and efficiency of education management to face challenges following the changing demands of local, national, and global life so that it is necessary to have education renewal that is planned, directed, and sustainable.

In facing global challenges, the world of education demands innovation and creativity that can support the

improvement of the quality of education. Technological developments are in line with improving the quality of education as stipulated in the Government Regulation No. 19 of 2005 in Chapter 4 about National Education Standards regarding the standard process that the learning process in an educational unit is carried out interactively, in inspirational way, fun, challenging, motivates students to participate actively, and provides sufficient space for students to establish creativity, and independence following their talents, interests, and physical and psychological development.

The government plans for education to be carried out equally across all parts of Indonesia, both in urban and rural areas. The education is adequate education, by providing interactive, inspiring, fun, challenging learning, and motivating students to actively participate to establish creativity and independence. The education system at school teaches many subjects. One of the subjects taught at school is

Natural Sciences (IPA). The Natural Sciences subject is related to the way to find out about nature systematically, so that the Natural Science is not only a collection of knowledge in the form of facts, concepts, or principles, but also a process of discovery. Based on the ("Permendiknas Nomor 22 Tahun 2006," n.d.), science learning should be carried out in scientific inquiry to foster the ability to think, work, and be scientific and communicate it as an important aspect of life skills. Thus, Natural Sciences learning in Junior High School/Islamic Junior High School emphasizes the provision of direct learning experiences through the use and development of scientific process skills and attitudes.

Based on the ("Permendiknas Nomor 22 Tahun 2006," n.d.) above, Natural Sciences learning should be carried out by directing students closer to direct learning experiences to improve scientific skills and attitudes. Although direct learning experience is very good for students, it is not possible to be implemented to students in some situations and conditions. For example, in teaching materials of Natural Sciences for IX grade, the reproductive system in humans as well as the development system of plants and animals are very difficult to be delivered by direct learning. The use of limited visual aids results in ineffective learning. Only students who are closest to the teaching aids can see them clearly and understand the teacher's explanation. A large number of students in a class will need a lot of time to carry out the learning process more effectively if it is required to provide direct learning experiences to students.

Based on the results of interviews conducted on IX grade students of State Junior High School 5 Panyabungan, the obstacle in learning Natural Sciences is that it is difficult to understand the images presented in textbooks because they are presented in the form of parts of the form described. The students expect the learning process to be carried out with media to make it interesting and enjoyable, so that the students are motivated in the learning process.

Based on the results of interviews with Natural Sciences teachers, they said that the learning process has been carried out in line with the learning objectives, which is in accordance with the curriculum, syllabus and lesson plan development, but the use of learning media in the classroom has not been implemented optimally. This is because the learning media in the form of teaching aids are limited, and sometimes in their use, they are placed at the front desk of the class so that the teaching aids can be seen by all students. The students' activities only observe and listen to the teacher's explanation. They tend to be passive to observe more closely due to limited time. The teacher has not used the LCD Projector in presenting

the material because the school LCD Projector is damaged. The limitations of teaching aids in delivering the material make the teacher cannot explain the material optimally, which is only using textbooks. This condition results in students who tend to be sleepy, talking to other students, playing, and always doing their own activities when the teacher explains the learning material using the lecture method, so that classroom conditions are not conducive which results in a lack of student understanding of the learning material that has been delivered by the teacher which apparently affect student learning outcomes.

Therefore, learning media need to be optimized in Natural Sciences learning because the materials are difficult for students to understand if presented in the form of printed books and lecture methods only. The media are also required to be optimized with the use of technology to make it more varied and enjoyable, especially in schools that have been provided with computers and LCD projectors in the computer room. The media should provide direct experience to students so that it has a positive impact on student learning outcomes, especially in these days which have reached the development of the 21st century. Smaldino et al., (2014) stated that the basis for 21st century knowledge and skills is the preparation of students for meaningful and deliberate learning to utilize technology and media for creativity, innovation, communication, research, and problem solving. Technology-based media are important to be empowered in school learning activities, both in urban and rural areas.

Therefore, learning media need to be optimized in Natural Sciences learning because the materials are difficult for students to understand if presented in the form of printed books and lecture methods only. The media are also required to be optimized with the use of technology to make it more varied and enjoyable, especially in schools that have been provided with computers and LCD projectors in the computer room. The media should provide direct experience to students so that it has a positive impact on student learning outcomes, especially in these days which have reached the development of the 21st century. Smaldino et al., (2014) stated that the basis for 21st century knowledge and skills is the preparation of students for meaningful and deliberate learning to utilize technology and media for creativity, innovation, communication, research, and problem solving. Technology-based media are important to be empowered in school learning activities, both in urban and rural areas.

Teachers also have a crucial role in creating quality learning activities, both in urban and rural areas. Every individual who is involved in the Department of Educational

Technology should also contribute in solving educational problems in Indonesia. (Miarso, 2011) argued that Educational Technology is defined as an ethical study and practices in facilitating learning and improving performance, through the creation, use and management of appropriate technological processes and resources.

Operationally, educational technology is considered as a systematic process in helping to solve learning problems in humans. To solve problems in Natural Sciences subject of IX grade in State Junior High School 5 Panyabungan, it can be carried out through the development of learning media in the form of interactive multimedia. Multimedia is a combination of text, images, video, sound and animation. Interactive multimedia that will be developed are in the form of a combination of Power Point, Ispring suite 9, Adobe Photoshop, Camtasia, Powtoon, and Google Doc Form software. The software supports the development of interactive multimedia that contains text, images, video, sound and animation. The use of interactive multimedia aims to provide motivation to students, stimulate students to remember what they have learned. Besides providing stimuli for learning, interactive multimedia also fosters the habit of repeating lessons, and it is expected to have a positive influence on student learning outcomes.

Ispring suite 9 is a software which can be used in integrated learning with Microsoft Power Point software. This software is a tool that converts presentation files to flash. The use of Ispring suite 9 will create interactive multimedia containing media of images, text, audio, video, and animation that are able to foster student motivation, as well as provide direct experience to students in learning Natural Sciences material that tends to be abstract, so that it affects the improvement of student learning outcomes.

II. RESEARCH METHODS

2.1 Development Model

This study used the research and development (R&D) method. According to (Sugiyono, 2013) R&D is a research method that functions to test, develop, and create certain products. This study developed a product in the form of interactive multimedia using the Ispring suite 9 application, and the development of this application used the ADDIE development model. (Tegeh, 2014) explained that ADDIE model is easily understood and implemented to establish development products, such as teaching materials, learning modules, learning videos, multimedia, etc. This model had five stages, consisting of analysis, design, development, implementation, and evaluation.

2.2 Development Procedure

The selection of this development model was because the ADDIE model directed to conduct learning sequentially and interactively and an evaluation was carried out at each stage.

The first stage, the analysis included activities in the form of:

1. Conducted competency analysis required for students.
2. Conducted characteristic analysis of students regarding their learning capacity, knowledge, skills, and attitudes of the students
3. Conducted material analysis in line with competency demands. Through this phase, the analysis could be carried out in terms of the curriculum, syllabus, lesson plans, which contain Competency Standards, Basic Competencies, and indicators of student learning achievement in Natural Sciences subject of IX grade.

The second stage was the design phase. The design phase was carried out with the following reference framework:

1. For whom the learning was designed, in which the learning was designed for IX grade of Junior High School students.
2. What abilities were desirable to be learned (competencies), in which the expected abilities were to improve aspects of students' knowledge or cognitive.
3. How the subject matter or skills could be learned (learning strategies), in which the learning was carried out in class using a computer or laptop. The teacher acted as a facilitator for students during the learning process. The students did tutorial learning by following the directions of the teacher.
4. How to determine the level of mastery of learning that had been achieved (assessment or evaluation), in which the assessment was conducted through a pretest-posttest and competency test by giving 30 items of questions to students and in the form of multiple choice.

Through this stage, it could be carried out by designing learning for the IX grade students of junior high school, and the learning process led to the achievement of learning objectives, as well as the design of efficient learning to be carried out in class according to the material, to the design of assessment tests on students' ability, and designing media flowchart.

The following is the display of the interactive multimedia flowchart using the Ispring Suite 9 application for the Natural Sciences subject of IX grade in the attachment (Figure 1).

Interactive multimedia flowchart using the ispring suite 9 application for the Natural Sciences subject of IX grade).

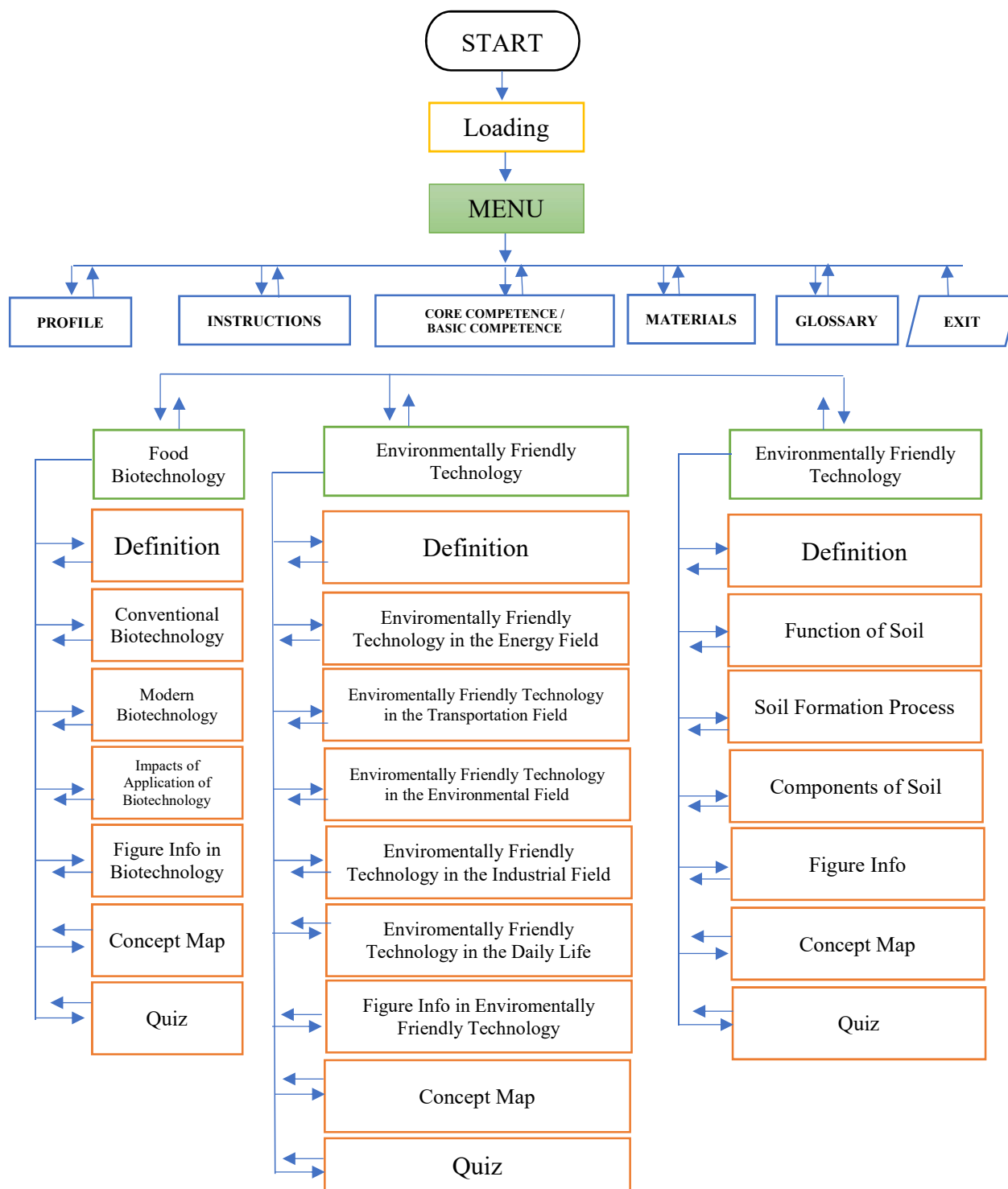


Figure 1. Interactive multimedia flowchart using the ispring suite 9 application for the Natural Sciences subject of IX grade.

The third stage was the development activity which in essence was the activity of translating the design specifications into physical form, so that this activity produced an appropriate overview of the development product.

The next stage was making the developed product using Ispring Suite 9 software with Power Point and assisted by other programs, such as Software, Camtasia, Adobe Photoshop.

2.3 Product Trial

It was followed by the product trial developed which had been previously validated by the expert. There were three expert validation, including material experts, media experts, and linguists using a Likert scale. The next stage was the development test consisting of practicality tests for students and teachers aimed to measure how practical media development products were made.

2.4 Test Subjects

The trial research subjects were 30 students in IX grade, and one Natural Sciences teacher at State Junior High School 5 Panyabungan. The population was all of grade IX students at State Junior High School 5 Panyabungan registered in second academic year 2018/2019. The sample was taken by using purposive random sampling technique. As a result, IX 3 was as development class.

2.5 Data Effectiveness Analysis.

The effectiveness test of learning outcomes was performed through the Paired Sample T-test and gain test. Paired Sample T-test analysis was performed along with with the SPSS application to conduct a T-test of pre-test and post-test data. The gain-test data analysis technique was performed by calculating the gain value (g) to find out the increase in student understanding.

III. RESULTS AND DISCUSSIONS

3.1 Results of Validity Test

The initial design of interactive multimedia using the Ispring Suite 9 application before being trialed must be validated first by experts. It aims to determine the feasibility of the initial interactive multimedia design using the Ispring Suite 9 application. This validation was performed by expert lecturers consisting of material expert lecturers, media expert lecturers, and linguist lecturers. Based on the description of the results of validation of the experts and interactive multimedia development test using Ispring Suite 9 on Natural Sciences learning is shown in the table 1.

Table 1. Validity Assessment Recapitulation

No	Description	Score	Category
1.	Material	96	Very Valid
2.	Media	88	Very Valid
3.	Language	82.5	Valid

Source: Processed Data.

Based on the validity category, the validity results of the development of interactive multimedia using the Ispring Suite 9 application are categorized as very valid. After the interactive multimedia using Ispring Suite 9 was considered to be very valid and received suggestions for improvement by the validator, the overall application of the product was given improvements developed to obtain practicality data in accordance with the research objectives.

The revisions and suggestions submitted by expert lecturers regarding the developed media are as follows:

1. Revision of Material Experts

In terms of the material aspect regarding the interactive multimedia using the Ispring Suite 9 application, there are some suggestions for improvement from the validator including the improvement for the preparation of more ordered materials so that students can understand the material easily, and delivery of material using a more standard language that is easily to understand by students.

2. Revision of Media Experts

In terms of the media aspect regarding interactive multimedia using the Ispring Suite 9 application, there are some suggestions for improvement from the validator in several sections, including:

- The music instruments can be changed with audio dubbing from text that appears on the media.
- It would be better if the concept map can be linked to an associated page.

3. Revision of Linguistic Experts

In terms of the language aspect regarding interactive multimedia using the Ispring Suite 9 application, there are some suggestions for improvement and opinions from the validator in several parts, including:

- The media can be understood easily, but it is better to reorganize the arrangement of the words so that the words are not spaced away and to make it neater.
- Sentences used are similar to those used in comics,

which is very good, so it is easier for students to understand.

3.2 Practicality Test Results

The assessment of practicality of the students was performed on 30 students of IX.3 grade of State Junior High School 5 Panyabungan. The assessment covers 11 aspects. Based on the results of the student practicality test, the average interactive multimedia practicality using the Ispring Suite 9 application is 90% that is categorized as a very practical category. Teacher practicality assessment performed for Natural Sciences teachers in IX grade of State Junior High School 5 Panyabungan includes 11 aspects of assessment. Based on the results of the teacher practicality test, the average interactive multimedia practicality using the Ispring Suite 9 application is 95% with a very practical category. The description of the results of the practicality of interactive multimedia development using the Ispring Suite 9 application is shown in table 2.

Table 2. Recapitulation of Practicality Assessment

No	Description	Score	Category
1.	Students	90	Very Valid
2.	Teachers	95	Very Valid

Source: Processed Data.

Based on the practicality category, the results of the practicality assessment of students and teachers are included in the very practical category. This indicates that interactive multimedia is very practical for use in Natural Sciences learning.

3.3 The Effectiveness Test Results

The effectiveness test was conducted to find out the

increase in students' understanding of the Natural Sciences subject through the interactive multimedia learning using the Ispring Suite. The effectiveness test was carried out by giving pre-test and post-test to the students. The effectiveness test data was tested by using the SPSS (Statistic Product for Service Solution) Statistic 16 program using Paired Sample T-Test and calculating the gain value.

1. T-Test

a. Analysis and interpretation of the Paired Sample Statistic output

Table 3. Results of Comparison of Pretest and Posttest

1.	2. Mean	3. N	4. Std. Deviation	5. Std. Error Mean
Pair 1 Pre Test -	8. 54.27	10. 30	12. 7.84	14. 1.43
7. Post Test	9. 83.33	11. 30	13. 6.22	15. 1.14

Source: Processed Data.

Comparison of statistics on the pre-test and post-test showed that the students' average score of pre-test was 54.27 with a standard deviation of 7.84, while the students' average post-test score was 83.33 with a standard deviation of 6.22. Based on the analysis of the paired samples statistic, it can be seen that there was an increase in the average pre-test and post-test score of students by 29.06.

b. Analysis and interpretation of the Paired Sample Test output

The table below is a calculation to see the difference in values obtained between the pre-test and post-test.

Table 4. Test of Pretest and Posttest Differences

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean			
Pair 1 Pre Test-	-29.07	9.85	1.80	-16.16	29	.000

Post						
Test						

Source: Processed Data.

Based on Table 4, it can be tested the differences in the average pre-test and post-test scores of the students, which was 29.07. The t value obtained was 16.16 with a significance of 0.00. Because the significance value was $0.00 < 0.05$, it can be concluded that there was a difference between the pre-test and post-test scores in students.

2. Calculation of Gain Score

To find out the increase in student understanding, it was measured using the gain value. It was known that the average post-test score of students was 83.34, while the average pre-test score of students was 54.27, and the maximum score of students was 100.00. From these data, the calculation of the gain value was 0.63, so that the criteria for the gain value according to Hake is Moderate. This showed the ability of the interactive multimedia using Ispring Suite 9 in improving student understanding.

IV. DISCUSSION

4.1 The validity of the Interactive Multimedia used the Ispring Suite 9 application on Natural Sciences subject in IX grade of Junior High School

The validity test results from the material aspect were obtained, in which the validation results obtained an average of 96%, which showed very valid criteria. The material used was in line with the lesson plan and syllabus based on the learning process.

The validity test of the media aspect obtained an average of 88% with very valid criteria. The criteria were very valid because the developed media was in accordance with the principles of instructional media and all programs contained in the media run well. While from the aspect of language, the validity test results were also obtained, showing an average of 82.5% with valid criteria.

4.2 The practicality of the Interactive Multimedia used the Ispring Suite 9 application in Natural Sciences subject in IX grade of Junior High School

1. Testing the Practicality of Students

The practicality test results of the use of Interactive Multimedia using the Ispring suite 9 application in science

subjects in Class IX SMP by respondents covering aspects of appearance, presentation of material, and benefits obtained an average score of 90% with a very practical category.

2. Teacher Practicality Test

The practicality test results of the use of the Interactive Multimedia using the Ispring Suite 9 application on Natural Sciences subject were carried out by involving 1 teacher of Natural Sciences subject in State Junior High School 5 Panyabungan. It included aspects of appearance, presentation of material, and benefit, which obtained an average score of 95%. This study was also supported by empirical data which showed that the results of the practicality of the use of Interactive Multimedia using the Ispring Suite 9 application in Natural Sciences subject are very practical.

4.3 The Effectiveness of the Interactive Multimedia using the Ispring Suite 9 application on Natural Sciences subject in IX grade of Junior High School

The results of the effectiveness test using pre-test and post-test in one group of students of class IX.3 with a total of 30 people showed that the average pre-test score of the students was 54.27 with a standard deviation of 7.84, while the average post-test score of the students was 83.34 with a standard deviation of 6.22. There was an increase in the average pre-test and post-test score of the students by 29.07. This study was also supported by empirical data analysis on the Paired Samples Test. The t value obtained was 16.16 with a significance of 0.00. Because the significance value was $0.00 < 0.05$, it can be concluded that there was a difference between the pre-test and post-test scores on students. Thus, there were significant differences in the results of the pre-test and post-test.

V. CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

Based on the research and development of interactive multimedia using the Ispring Suite 9 application on Natural Sciences subject in IX grade of Junior High School, it can be concluded some aspects as follows:

1. The development of interactive multimedia using the Ispring Suite 9 application in Natural Sciences subject in IX grade of Junior High School was

developed using the ADDIE model which was carried out through 5 stages, including the analysis, design, development, implementation and evaluation stages.

2. The results of interactive multimedia validity using the Ispring Suite 9 application in Natural Sciences subject in IX grade of Junior High School were obtained. The material validation was 96%, which showed highly valid criteria, the media validation was 88%, which showed highly valid criteria, and the language validation was 82.5%, which showed valid criteria, and the validation by experts was corrected once.
3. The practicality test results of the use of Android-based mobile learning showed that the practicality of students was 90%, which showed the very practical criteria and the practicality of teachers was 95%, which showed the practical criteria after the practicality assessment.
4. The results of the effectiveness of the interactive multimedia development product using the Ispring Suite 9 application in Natural Sciences subject in IX grade of Junior High School showed the effective criteria. Student learning outcomes based on pre-test and post-test were tested using the T Paired formula, which obtained t value of 16.16 with a significance of 0.00. Because the significance value was $0.00 < 0.05$, it can be concluded that there was a difference between the pre-test and post-test scores on students.

5.2 Suggestions

Based on the results and discussion of the research and development, the following matters can be suggested:

1. Interactive multimedia using the Ispring Suite 9 application needs to be further developed for the material in other subjects.
2. Interactive multimedia using the Ispring Suite 9 application should be applied in rural schools because it is offline, so that it can expand students' knowledge in rural areas regarding digital learning.
3. Interactive multimedia using the Ispring Suite 9 application can be used as a learning tool for Natural Sciences materials in IX grade of Junior High School.

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