

Interactive Learning Multimedia in Supporting Personalized Learning Grade V Primary School

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ARTICLE INFO

Article history:

Received January 23, 2023

Accepted June 22, 2023

Available online August 25, 2023

Kata Kunci:

Multimedia Pembelajaran,
Mangartikulasikan Alur Cerita,
Bahan Peredaran Darah Manusia.

Keywords:

Learning Multimedia,
Articulate Storyline,
Human Blood Circulation
Material.



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ABSTRAK

Belum adanya media interaktif dan pengembangan media yang dilakukan di suatu daerah menunjukkan belum maksimalnya proses adaptasi dengan teknologi. Tujuan penelitian adalah menghasilkan multimedia interaktif materi peredaran darah manusia untuk kelas V SD dan menentukan kualitas dan kelayakannya dengan melakukan uji coba validasi pada ahli, guru dan siswa. Metode penelitian ini adalah R&D (Research and Development) dengan model ADDIE. Subyek dalam penelitian ini adalah siswa kelas V sekolah dasar. Metode pengumpulan data yaitu lembar penilaian dan dokumentasi. Instrumen pengumpulan data menggunakan kuesioner. Teknik analisis data adalah analisis data kuantitatif dan analisis data deskriptif kualitatif. Hasil penelitian berupa multimedia interaktif berbasis alur cerita artikulasi peredaran darah manusia pada mata pelajaran IPA kelas V SD yang dapat digunakan oleh siswa dengan skor 92,5% dari ahli materi; ahli media 86,66%; ahli pembelajaran 88,88%; ahli bahasa 74,26%; penilaian guru 98,88%; Siswa penialain 93,40%. Skor dari masing-masing penilaian ahli, guru dan siswa kemudian dicari nilai rata-ratanya dan diperoleh nilai persentase sebesar 89,096% dengan kriteria "Sangat Baik". Disimpulkan bahwa multimedia yang dikembangkan memiliki kualitas yang sangat baik dan cocok digunakan dalam kegiatan pembelajaran serta memiliki sifat pembelajaran yang personalisasi yang mendukung kegiatan pembelajaran yang berpusat pada siswa.

ABSTRACT

The absence of interactive media and media development in an area shows that adaptation to technology has yet to be maximized. The research aimed to produce interactive multimedia material on human blood circulation for grade V SD and determine its quality and feasibility by conducting validation trials on experts, teachers, and students. This research method is R&D (Research and Development) with the ADDIE model. The subjects in this study were fifth-grade elementary school students. Data collection methods are assessment sheets and documentation. Data collection instrument using a questionnaire. Data analysis techniques are quantitative data analysis and qualitative descriptive data analysis. The results of the research are in the form of interactive multimedia based on storylines of articulation of human blood circulation in science subjects for class V SD which can be used by students with a score of 92.5% from material experts; media experts 86.66%; learning experts 88.88%; linguists 74.26%; teacher assessment 98.88%; Penialain students 93.40%. The scores of each expert, teacher, and student assessment were then searched for the average value and obtained a percentage value of 89.096% with the "Very Good" criterion. It was concluded that the developed multimedia is very good quality, is suitable for use in learning activities, and has personalized learning characteristics that support student-centered learning activities.

1. INTRODUCTION

The world of education is influenced by the rapid development of information technology in the era of globalization. Global demands demand that the world of education be able to adjust efforts to improve the quality of education with technological developments, especially adjusting the use of Information and Communication Technology in the learning process (Setyoningsih, 2015; Subekti et al., 2020; Susilowati & Suyatno, 2021). The era that is increasingly developing makes technology and information also develop rapidly. Information can be obtained from media that is quickly and easily

accessed by humans with one click and in the palm of their hand. The convenience of information and communication technology which continues to grow rapidly can be utilized in the field of education, especially in learning media (Qekaj-Thaqi & Thaqi, 2021; Vastyanov et al., 2021). The use of information and communication technology that is so sophisticated really supports the success of updating learning strategies and techniques. The teacher's role as a facilitator requires him to be able to respond to student questions, provide information to students and ensure student learning activities. This can be facilitated by the use of ICT in learning (Andarwulan et al., 2021; Hau et al., 2020). With the use of technology, it is hoped that students' learning conditions will condusife be better. Then it can provide a set of media to facilitate and accelerate student understanding, as well as students' ability to use technology better.

The result of the Program for International Student Assessment (PISA) is regarding educational attainment around the world. This study is an activity to compare the ability of math, reading, and science performance of 15-year-old children from 79 countries. Based on the results of PISA, it is known that Indonesia is far behind its neighboring countries. It is noted that Indonesia has participated in PISA for 18 years, meaning that since 2000 Indonesia has participated and the abilities of Indonesian students in reading, arithmetic and science have not changed much (Browne et al., 2014; Hewi & Shaleh, 2020). So with this it can be seen that the quality of Indonesian education has decreased from studies in the previous year and shows that the quality of Indonesian education is still far behind compared to neighboring countries (Fitri, 2021; Pratiwi, 2019). Therefore an effort is needed to be able to improve the quality of Indonesian students through learning activities. Learning activities are influenced by various elements, one of the elements that cannot be separated is the media element which acts as an important tool. The use of teaching media in the learning process can generate new desires and interests in students, generate motivation and stimulate learning activities, and can bring psychological influences to students (Setiyawan, 2021; Winarto et al., 2020). The learning media used by teachers vary, ranging from teaching aids, learning videos, and Power Points. This means that if students are enthusiastic about learning if they use learning media, learning will be more memorable for students, this is in accordance with the learning principle that state motivation factors for learning can produce memorable learning and interest factors in learning can make someone able to learn something (Alturise, 2020; Boyadzhieva, 2016). Based on the results of interviews with Muhammadiyah Poso Elementary School teachers, it is known that the use of learning media in the classroom is still limited to the media provided by the school in the form of teaching aids in accordance with the needs of the subjects, besides that the teacher also uses computer-based learning media, namely MS Power Point which was made independently, but in practice only two teachers are used to using it while the other teachers use video-based media taken from YouTube. Interactive multimedia based on articulate storylines which are declared valid, practical and have the potential to increase student motivation in high school (Hanim et al., 2021; Septiana et al., 2022). So that this can be used as a basis for developing articulate storyline-based learning multimedia in SD Muhammadiyah Poso. The results of interviews conducted with teachers, around 50% of teachers at SD Muhammadiyah Poso provided information that they had never used and did not know about interactive learning multimedia. This problem supports the development of interactive learning multimedia that is used to assist learning and add and reproduce school learning media so that it is more varied. In general, the teacher provided information that he was able to develop learning media, but for interactive multimedia learning the teacher did not have the skills to support developing it (Bustanil S et al., 2019; Maria et al., 2018).

Multimedia can be interpreted as a combination of various types of media (text, images, video, audio, animation) which are integrated and then adapted to learning objectives by utilizing computers. By using this method, the teaching and learning process can be more interesting, so as to improve the quality of student learning. Interactive multimedia in learning can produce effective learning and allow students to develop according to their abilities through the combination of text, graphics, audio, video/animation and interesting demonstrations (Fitriani, 2014; Nugroho & Surjono, 2019). To integrate various kinds of media (text, images, video, audio, animation), computer assistance and application programs are needed. One of the application programs used to develop interactive learning multimedia is Articulate storyline, which has a function similar to Microsoft Power Point but has the advantage can produce presentations that are more interesting, creative and comprehensive and have main features (timeline, movie, picture, character, etc.) that provide added value in creating interactive learning multimedia (Liliana et al., 2020; Suharman et al., 2020).

This is evidence of the low use of articulate storylines, so it is necessary to develop interactive multimedia based on articulate storylines as an effort to implement learning by utilizing ICT. The results of the interviews showed that teachers at SD Muhammadiyah Poso did not know about the articulate storyline application program in developing interactive learning multimedia. Teachers still use learning media with one to two media elements (text, images, video, audio), such as power points, visual aids and YouTube videos, so that in their use not all students are interested in learning due to the different

characteristics of each student (Aprilliyah, 2014; Solikah & Novita, 2022). This means that the teacher's understanding of the articulate storyline as an application in developing interactive multimedia is still minimal. The teacher also provided information that further understanding was needed about applications that could be used to create interactive multimedia such as articulate storylines from any party. Based on the results of observations regarding computer and network facilities in Poso district schools, some information was obtained regarding the availability of ICT infrastructure to support learning activities in schools. Several leading schools in Poso have computer/laptop facilities that are used for learning. Some schools are also equipped with an internet network connected to a computer/laptop (Shahroom & Hussin, 2018; Tsaniyah & Juliana, 2019). However, there are also several schools that do not yet have adequate computer and network facilities. At SD Muhammadiyah Poso it is known that learning activities with computers/laptops are still used by teachers to assist in loading teaching materials and administrative needs, while students have not been given access to operate them independently, this is influenced by the limited available devices, therefore the utilization ICT in learning is not maximized, so it can be seen that schools have ICT facilities but have not used them in individual learning for students (Ahdhianto et al., 2020; Garba et al., 2015).

Based on the results of interviews with the Principal and Class Teachers of Muhammadiyah Poso Elementary School, it is known that the learning process in class V SD is experiencing obstacles. The science field is known to be of great interest to students, but learning is hampered by the teacher's time and limited media. Circulatory system material was chosen because students did not fully understand the material due to limited media and teacher time. Based on the description above, an interactive learning multimedia innovation based on Articulate storyline is needed in the Poso Regency area. The existence of concrete tasks makes students need to learn with something concrete too, but this cannot be done on all material, especially on material that students cannot see and touch directly. Like material on the human blood circulation system which cannot be seen directly in the classroom, so media is needed to help students understand the material. With the various features in interactive learning multimedia students can more effectively understand the material coupled with the teacher's limited time, with this the author is trying to develop an interactive multimedia based on Articulate storyline on one of the natural sciences materials, namely human blood circulation and its function in class V of elementary school . The purpose of this study was to developing interactive multimedia based on Articulate storyline on human blood circulation and its functions in class V Elementary School. In order for this research to be carried out more in-depth, focused and specific, the authors limit the problem to the absence of development of interactive multimedia based on Articulate storyline on the subject of Human Blood Circulation and Its Functions at SD Muhammadiyah Poso, so that it is necessary to develop interactive multimedia as a solution in better learning and based on Articulate storyline in class V Elementary School.

2. METHOD

This research uses the type of research development or Research and Development (R&D). In the development that will be done, researchers use the design of the development of Reiser and Mollenda with ADDIE (Analysis, Design, Development, Implementation and Evaluation) approach (Branch, 2010; Widyastuti, 2019). There are five stages in this ADDIE method, namely analysis, design, development, implementation, evaluation. The subjects in this study were 5th grade students of SD Muhammadiyah Poso with a total of 13 students. To obtain quality values, multimedia was tested on 4 experts, namely material experts, media experts, learning experts, and linguists as well as a class teacher to determine the feasibility of multimedia. The data collection method used is the assessment sheet which is a data collection instrument which contains several/a number of questions that must be filled by the respondents. In this study the assessment sheets used are product feasibility assessment sheets and product quality assessment sheets. This assessment sheet was distributed to four validation experts each. There are six assessment sheets that will be used in the study, namely: material expert validation sheet, media expert validation sheet, learning expert validation sheet, language expert assessment sheet, teacher assessment sheet, and student assessment sheet. The grating of the material expert assessment sheet consists of 8 questions divided into 3 criteria, namely content, material suitability and language. The grid of material expert assessment instrument is show in Table 1.

Table 1. Material Expert Assessment Instrument Grid

No.	Criteria	Indicator	No. Item
1.	Contents	In accordance with KI and KD applicable	1
		According to the indicators	2

		In accordance with the purpose of learning	3
2.	Material suitability	Can attract students interest (motivation) in learning	4
		According to the student's thinking level	5
		Using tables, images/animations	6
		The material is presented from easy to difficult	7
3.	Languages	Using good and correct Indonesian language	8
Total			8

Base on Table 1, the grid of the media expert assessment sheet consists of 15 questions divided into 3 criteria, namely ease of navigation, aesthetics and suitability of the multimedia characteristics of learning. The grid of material expert assessment instrument is show in Table 2.

Table 2. Media Expert Assessment Instrument Grid

No.	Criteria	Indicator	No. Item
1.	Ease of navigation	Easy to select command button	1
		Easy to use multi-user interface	2
		Easy to choose multimedia learning materials	3
		Easy in selecting multimedia learning main menu	4
		Easy to access material evaluation	5
		Easy to use multimedia learning	6
2.	Aesthetics	Size and type of font used	7
		Multimedia learning layout	8
		Color combinations used	9
		Attractive appearance design	10
		Use of text, illustrations/ images, audio, video	11
3.	Suitability of multimedia learning characteristics	Compatibility of content with learning objectives	12
		Use of various media elements	13
		Supports independent learning	14
		Interactive	15
Total			15

Base on Table 2 show the grid of the learning expert assessment sheet consists of 9 questions which are divided into criteria for the suitability of interactive multimedia models and the suitability of media functions in learning. Table 3 show grid of learning expert assessment instrument.

Table 3. Learning Expert Assessment Instrument Grid

No.	Criteria	Indicator	No. Item
1.	Compatibility with interactive multimedia	The relevance of the tutorial model in multimedia learning	1
		Learning materials are presented concretely	2
		Multimedia learning capabilities in reducing misconceptions in students	3
		Multimedia learning capabilities in manipulating learning activities	4
2.	The role of media in learning	Can overcome the limitations of space and time	5
		Ability to attract the attention of students	6
		Multimedia learning capabilities to increase knowledge and understanding	7
		Multimedia learning capabilities stimulate students ' imagination in learning	8
		Multimedia learning capabilities increase student motivation	9
Total			9

Base on [Table 3](#) show the grid of the linguist assessment sheet consists of 7 questions with criteria for the use of PUEBI and conformity to the level of development of the student. Below is a grid of the linguist assessment instrument is show in [Table 4](#).

Table 4. Linguist Assessment Instrument Grid

No.	Criteria	Indicator	No. Item
1.	Use Of Indonesian Spelling General Guidelines	Word writing accuracy	1
		Accuracy of use of letters	2
		Proper use of the term	3
		Punctuation accuracy	4
		Using language that is easy to understand	5
		Effective and efficient	6
2.	According to the level of development of students	Suitability of the use of language with the level of development of students ' thinking	7
Total			7

Base on [Table 4](#) the grid of the teacher's assessment sheet consists of 15 questions divided into 5 criteria, namely the suitability of the material, language, ease of navigation, presentation of information and media functions. Teacher assessment instrument grid is show in [Table 5](#).

Table 5. Teacher Assessment Instrument Grid

No.	Criteria	Indicator	No. Item
1.	Material suitability	In accordance with KI and KD applicable	1
		In accordance with the indicators and learning objectives	2
2.	Languages	Clarity and ease in reading writing in multimedia learning	3
		The language used is simple and easy to understand	4
		Easy to use multimedia learning	5
3.	Kemudahan navigasi	Multimedia learning provides easy-to-understand instructions	6
		Easy to choose material in multimedia learning	7
		Easy to interact with multimedia learning through quizzes and evaluations	8
4.	Presentasi informasi	Clarity of presentation of learning materials (text, images/ graphics, video)	9
		Clarity of presentation of KI, KD, indicators and learning objectives	10
		Provide a good learning experience for students	11
5.	The role of media in learning	Multimedia learning capabilities in providing a memorable learning experience for students	12
		Multimedia learning capabilities in increasing student motivation	13
		Multimedia learning capabilities attract the attention of students	14
		Multimedia learning capabilities improve effectiveness and efficiency in learning	15
Jumlah			15

Data analysis techniques used in this study are quantitative data analysis and descriptive qualitative data analysis. The data analyzed include the feasibility of media, materials, language and learning. Activities carried out when collecting data include summarizing important data, presenting data through brief descriptions, charts and graphs, and summing up. The collected Data are derived validation expert assessment. The Data obtained are then analyzed to determine the results of the assessment of the

product developed. For quantitative data processed using equations and then presented in the form of numbers. As for the qualitative data reprocessed by summarizing the important parts as material improvements in research and product feasibility. After the data is collected, analyzed, processed, and summarized, then the data is presented. Presentation of data in the form of brief descriptions such as the results of observations, criticisms and suggestions from teachers and validators. Furthermore, the data is summed up thoroughly based on what has been analyzed into one description as a result that previously did not exist. The results obtained are then taken into consideration in product development at a later stage.

3. RESULT AND DISCUSSION

Result

At the stage of needs analysis, researchers conducted an analysis of computer specifications and internet network researchers. It is known that computer and network researchers can be used to develop multimedia-based learning articulate storyline. Then the researchers conducted an analysis of the availability of devices / smartphones, laptops at school or in Grade V Elementary School students. It is known that some elementary schools in Poso Regency already have ICT facilities both computers/laptops and internet networks so that they can support learning activities with articulate storyline-Based multimedia. The next need analysis conducted by the researcher is the availability of interactive multimedia articulate storyline in schools. Based on the results of the analysis, it is known that the school already has a power point-based learning media, however, the school does not yet have an articulate storyline-Based interactive learning multimedia that can be used to assist in the learning process.

The development of interactive learning multimedia based on articulate storyline can help teachers in carrying out learning activities. Multimedia interactive learning can also provide students with a varied learning experience and teachers can also be helped in understanding the concept of technology-based learning. This stage of analysis selects the theme and subtheme of learning. The theme chosen is theme 4 "healthy is important", the subject of learning 1 subtheme 1 "My Blood Circulation is healthy". The result of this curriculum analysis is that the researcher obtained data on core competence (KI) and basic competence (KD 3.4 understanding circulatory organs and their functions in animals and humans and how to maintain human circulatory organs), indicator (3.4.1 understanding human circulatory organs and their functions, 3.4.2 understanding how to maintain the health of human circulatory organs) on theme 4 subtheme 1. The design phase is carried out by compiling multimedia flowcharts to facilitate multimedia design. Then compose a storyboard to find out what elements are needed by multimedia to answer the needs of analysis. Next is to collect materials and begin to compose interactive multimedia components. At this stage also prepared multimedia assessment instruments. The development stage is to create a product based on the results carried out at the design stage. Interactive Multimedia based on Articulate Storyline on science subjects human circulatory material and its functions for Grade V Elementary School students was developed with development steps ranging from knowing the output of html5-based products, designing multimedia displays, designing multimedia elements, to configuring pages to be used with the web. The multimedia display consists of an initial display containing the intro, User class level, and start button. Then the content display consists of instructions for use, materials, images, videos, KI&KD, developer information and bibliography. The development phase is carried out by small group trials to determine the quality of the raw product from interactive multimedia so that adjustments can be made. Based on small group trials conducted, it is known that interactive multimedia based on articulate storyline needs adjustment before being tested by experts. After prbaikan, the product is tested on 4 experts to get validation of product quality until it is ready to be implemented. Implementation phase where the product that has been developed by researchers is used by (student) users. At this stage the researchers tested the use of the product in a large group with a total of 13 students or all fifth grade students of SD Muhammadiyah Poso. At this stage the researchers handed over interactive multimedia products to the class teacher for use in learning activities, while the researchers listened to the progress of learning activities using multimedia that has been developed. At the end of the lesson each student is given an assessment sheet about learning using interactive multimedia. 11 out of 13 students stated that they were happy with learning using interactive multimedia, while 2 others stated that interactive multimedia was ordinary or did not have a major effect. Based on large group trials, it is known that interactive multimedia based on articulate storyline developed is feasible and can be used to assist learning activities in Grade V elementary school. This evaluation stage is present at every stage, the researcher analyzes the results of quality and feasibility tests, if there are still deficiencies or weaknesses in the product then the revision process is carried out. That way the development process produces a final product that is worthy of use in learning activities. At this stage interactive multimedia products that have

been developed by researchers have been assessed by validation experts, namely material experts, media experts, learning experts, linguists. Quantitative data analysis was obtained from the results of quality tests and product feasibility tests. The average value obtained from the assessment of interactive multimedia products is presented in [Table 6](#).

Table 6. Quantitative Data Analysis Results

No	Assessment	Value	Categories
1.	Material Expert	92.5	very good
2.	Media Expert	86.66	very good
3.	Learning Expert	88.88	very good
4.	Linguist	74.26	good
5.	Teacher Assessment	98.88	very good
6.	Student Assessment	93.40	very good
Total		534.58	
Average		89.096	
Criteria		Very good	

Based on [Table 6](#), a total value of 441.18 and an average of 88.236 is obtained which has the criteria of "Very Good". The results of the assessment of material experts is 92.5 with the criteria of "Very Good". This shows that the quality of the material in the developed interactive multimedia is very good for use by students. The results of the assessment of media experts is 86.66 with the criteria of "Very Good". This indicates that the quality of interactive multimedia in terms of media is very good for use. The assessment results from learning experts were 88.88 with the "Very Good" criteria which indicates that the quality of learning in interactive multimedia is very good for use. The results of the assessment by linguists show the criteria of "Good" with a value of 74.26 which indicates that the quality of language in interactive multimedia is good for use. While the results of the teacher's assessment were 98.88 with the criteria "Very Good" which shows the quality of interactive multimedia is very good for use in learning activities. As well as student assessment with a score of 93.40 (Very Good). Based on the data obtained from expert and teacher assessments, it can be concluded that the development of interactive multimedia learning based on articulate storylines is very well used for fifth grade elementary school students who are supported by the results of student assessments.

Discussion

The final product of this research is an articulate storyline-based interactive learning multimedia for fifth grade elementary school students. Learning multimedia contains material for fifth grade students on Theme 4 Healthy is Important Sub-theme 1 My Blood Circulation is Healthy Learning 1 science subject. The learning used is interactive learning where students can learn with the media and the media provides feedback. This product has been tested on experts and teachers to determine the quality and feasibility of interactive multimedia ([Indriani et al., 2021](#); [Septiana et al., 2022](#)). Along with the development of increasingly advanced technology, education must adjust its development, in this case, learning in the classroom. In every learning activity requires media that can support students to learn effectively and efficiently. With the development of technology, various media have emerged that support learning in the classroom ([Rahmawati, 2020](#); [Saripudin et al., 2021](#)). Media with a good and interesting combination can help and attract students to learn. This is in accordance with the statement that interactive multimedia can be used to clarify the learning process if it is supported by learning media that can attract students' interest and attention so that it can provide an adaptive and varied learning environment ([Alfiansyah et al., 2022](#); [Apriati et al., 2021](#)). This interactive multimedia product can be accessed using a computer or PC (personal computer) but cannot be accessed using a cellular or mobile device. This is because the features have changed in the latest articulate storyline so that researchers experience problems in making multimedia accessible by mobile. Interactive multimedia has material features in the form of text, images, audio and video and is equipped with a feature on the percentage of student learning outcomes assessed from student answers when answering evaluation questions ([Alfiansyah et al., 2022](#); [Rohmah & Bukhori, 2020](#)). This score can be used by the teacher to evaluate learning activities so that it is easier for the teacher to record which students have problems with the material.

This interactive multimedia product supports independent learning because the learning focuses on students and the material presented is adapted to the 2013 curriculum to assist students in learning. The limitations in conducting this research were that the trials were limited to SD Muhammadiyah Poso

and the learning materials for this interactive multimedia were still limited to the topic of human blood circulation and its functions for class V SD. Compared to the development carried out previously by Hesta Rafmana, Umi Choitimah, and Alfiandra in 2018 which produced multimedia for PKn subjects for high school students, this research produces multimedia resulting from this research focusing more on science subjects for Grade V elementary school students. In addition, compared to the development carried out by Rika Kurnia Sari and Nyoto Harjono in 2021 which produced multimedia with thematic material, while this research produced multimedia that focused on the subject of human blood circulation in Grade V elementary school science subjects. The most striking difference in these 2 studies is the sample that affects the assessment results for multimedia learning, where this study used a sample of Grade V elementary school students in Poso Regency.

4. CONCLUSION

Based on the results of research on the development of articulate storyline-based interactive learning multimedia on human blood circulation material in science class V elementary school subjects, it can be concluded that this research has produced interactive learning multimedia based on articulate storyline on human blood circulation material in science class V elementary school using ADDIE's development models are Analysis, Design, Development, Implementation and Evaluation. Based on the results of research development of interactive learning multimedia based articulate storyline human circulatory material in science subjects Class V SD, it can be concluded that this study has produced Interactive Learning multimedia based articulate storyline about human circulatory material in science subjects Class V SD using ADDIE development model that is Analysis, Design, Development, Implementation and Evaluation. Multimedia development stages starting from curriculum analysis to students, then do the development design to develop flowcharts, storyboards to create icon designs and images and prepare assessment instruments, develop multimedia with articulate storyline software, implement multimedia and assessed by experts, and evaluations carried out at each stage. The quality result of interactive multimedia is "very good" obtained from expert assessment, and the feasibility result of multimedia is "very decent" obtained from teacher assessment and trials conducted.

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