Android-Based Interactive Media to Raise Student Learning Outcomes in Social Science

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Abstract—Learning media is a part of the important components in the procedures of implementing learning, especially during the current pandemic. But there are still few teachers who use media in the learning process, causing student learning outcomes to decline. Interactive media, which can attract students' attention by combining systems ranging from text, images, videos, and audio/sound, can provide new experiences for students in learning. This study aims to determine learning outcomes of the students after applying android-based interactive learning media in social science subjects. The population group consisted of 70 students from several Cluster 2, Cipinang Muara Village. Then samples were taken using the Slovin formula to get 60 samples of fourth-grade students. The data analysis performed in this investigation was a Boolean analysis utilizing a t-test. The collected data were analyzed through a t-test. The results showed that android-based interactive media positively affected student learning outcomes. Students experienced a significant increase in learning outcomes by using this media. In addition, students experienced more fascinated and untroubled to understand the material by using this application. The results showed that android-based interactive media positively affected student academic achievements. Students experienced a significant increase in learning outcomes by using this media. In addition, students perceived more curious and simpler to understand the material by using this application. The results showed that android-based interactive media positively affected student learning outcomes. Students experienced a significant increase in learning outcomes by using this media. In addition, students undergo more attentive and uncomplicated to understand the content by using this application.

Keywords—Interactive media, Android, learning outcomes

1 Introduction

Entering the revolution of industry 4.0 era, which emphasizes the figure of the cyber economy requires the world of education to be more proactive in innovating to create progress [1]. Cloud-based online learning helps teachers keep a close eye on the entire

curriculum, meeting the learning needs of students. Teachers can use cloud platforms to teach students following the identical processes. In institutions of tertiary education, exams are done digitally through these programs. This inquiry shows that most of students operate smartphones to get entrance through online courses. The remarkable development of smartphones has led to alter the education landscape. As mobile technology reaches every corner of the world, it permits more students to retrieve the cyberspace on the internet. Mobile addiction isn't just about convenience.

Optimization of forthcoming educational chances, the educational pattern requires to proceed to productive capability in solving today's educational problems [2]. This study aligns with the current world of education, which is being affected by the Covid-19 pandemic, where all students must study from home. On the other hand, social science lessons are often boring for some students. The low student achievement and student responses during learning can be seen in this situation. Furthermore, both teachers and students have difficulty in conducting online learning. Teachers find it difficult to convey the material, and students find it difficult to understand it. Understanding these conditions, innovation is currently something that must be done in education as it is by digitizing all existing learning systems, including learning media.

The importance of learning media today is indeed inseparable from the role of technology. Technology in the classroom can positively impact students' encouragement, participation, and interest in studying while inspiring the progress of energetic, exploratory, and inquiring learning styles [3]. The development of today's era allows us to get used to living in a technology that is also constantly evolving. Life will always coexist with technology, including in the classroom. Currently, various schools have implemented technology-friendly learning. With technology, students are taught to develop their abilities and knowledge through themselves with the help of technology. Combining diagnostic mechanisms based on learning games can reduce students' anxiety levels and increase attentiveness in education and problem-solving competence, improving learning achievement [4]. Technology that can stimulate student involvement will cause students' curiosity in the learning process.

In another survey, teachers' point of view toward educational modernization and the fortrights application of modern teaching methods to education were investigated [5]. Strong ICT-based tutoring motivates students to apply positive attitudes to topics. Advantages of implementing ICT to guide learning include increased connection to teaching and learning, visualization of abstract concept, and easier comprehending of the lesson under study. This state can cause studying the substances more attractive and provide interaction. This is under investigation. Focusing on the preference of practicing ICT will inevitably lead to ICT use in education and schools. Schools must always generate significant accomplishments to meet the requirement of these ICT tools.

One of the formidable results of the epidemic is that many students are pushed to pursue homeschooling online, following school termination and face-to-face classes [6–8]. Because of pandemic, the transformation from full-time education to online education has revealed the problematic unfairness of economically handicapped students. This shift in learning methods coerces several groups to join the trackway taken so that learning can occur, and the choice is to implement technology as an online learning means. Automation is like two blades, each of which has the same role, namely the positive and negative sides that influence changes in human civilization. All aspects

of life today cannot be separated from technology. Therefore, technological literacy is especially important for society. The use of technology is beneficial without harm and has a negative impact about life. Especially in education, this technological literacy needs to be learned by all education stakeholders, especially in its application as an online learning form which is presently being done.

In developing multimedia projects, the utilization of mobile applications appealed to the awareness of students and guarantee constructive communication [9–11]. The advantage of multimedia is that it has an important role in getting learning objectives, especially in difficult subjects. This shows that multimedia is interesting and innovative. Multimedia can be accessed through gadgets that are needed by students so that they can use all of their learning adventures in answering problems and motivate students to study independently without feeling burdened. Therefore, the purpose of author is to develop valid, practical, and effective android-based interactive media that students can access personally using smartphones.

From several earlier studies that have investigated interactive learning media, it creates to offer a positive reply. Researchers developed Android-based interactive learning media in subjects such as social sciences in elementary schools to improve student learning outcomes. Considering in previous studies, there are still few researchers who have developed interactive learning media based on Android. Hence, researchers need to build these media to acquire quality assurance in education in the digital era. Consequently, the objective of this research is to respond some questions, including:

a) How to develop android-based interactive media to enhance social sciences academic achievement in the forth grade students at elementary school?
b) How to use android-based interactive media to improve social sciences learning outcomes for elementary school students grade four?
c) Can android-based interactive media raise learning results in social sciences for fourth-grade elementary school students?

1.1 Information and communication technology in education

Technology is turning into one of the important aspects of education that assists students apprehend the larger deskription of the world and is not only limited to the content taught by schools and teachers [10]. Of course, advanced technology can replace traditional methods. Some teachers in Europe apply ICT to arrange their material.

Learning has become a powerful component of learning and teaching [12]. In most countries, it is evident that ICT has an essential role in teaching and learning. Educational reforms are being implemented towards the application of technology in the classroom. It is believed that technology can increase the effectiveness of education by providing access to educational content from around the world and enhancing interaction between people who cannot easily communicate face-to-face. In addition, the application of technology allows extended training individually.

Educational technology is a combination of computer hardware, software, and educational theory [13]. Educational technology applies high-quality information reinforcement for students, teachers, parents, and the society. Educational technology is

also utilized to assist learning. In addition to experience in education, educational technology is also on the basis of theoretical skill from variety of disciplines.

Educational technology is an exclusive word for tools and conceptual foundations used to aid learning in teaching. Educational technology is not restricted to multimedia but is included in everything that increase learning in the classroom [14]. As a consequence, condition of learning can alter flexibly and be arrange freely. Studying no longer only depends on educators in the classroom. Still, the process of learning can keep on to be done with variety of technologies in education.

With the increasing demands of society in the utilization of ICT in education, ICT competencies need to be mastered by teachers both in making media and operating existing media. This has led to an ideal shift in education system of education with the teaching concept application with better quality. In this case, technology asks students to be more autonomous in learning and changes the curriculum to be more progressive. By utilizing various advantages of information technology, it is expected that students will find it easier to understand the material provided. The presence and advancement of information technology in the current era of global communication has provided opportunities and enlargement of learning resources occuring anytime and anywhere without any limitation by area and era [15–19]. With the help of ICT, presenting the material becomes more fascinating and amusing. On the other hand, the existence of ICT claims teachers to professionally manage information to utilize ICT media productively and proficiently in the learning process. This is in line with the requirement of the 2013 curriculum, where the field of probing becomes the target to boost teachers to adopt ICT as an instrument or media in assisting students comprehend the material.

1.2 Interactive media

Professional teachers must select variety learning media types to facilitate the transmission of teaching materials and assist students in understanding the material [20]. Media are graphic, photographic, electronic, or mechanical devices for presenting, processing, and explaining information orally or visually. Media can also be said to create conditions that allow learners to receive know-how, expertise, and belief. There are many types of learning media consisting of audio, visual, and audio-visual. Learning media that combines these three types of learning media is interactive multimedia [21]. From some of the explanations above, interactive media are tools, materials, or teaching materials intended for students to learn with or without teacher guidance using a combination of two or more media. Interactive learning media is media developed with a program or software that complements each other to be interactive. The use of interactive learning media offers tremendous educational opportunities. With the introduction of interactive learning media, the focus has shifted to practical teaching methods that provide hands-on experience.

Interactive multimedia that can combine images, text, video, and audio on a screen has several advantages to attract students' attention. Students can learn in a fun learning atmosphere. In addition, utilizing interactive multimedia as a complement in learning can increase student activities and learning outcomes [22]. An important feature of

the modern pedagogical curriculum is innovativeness, which implies the development of new achievements of students of professional and cultural experiences in teaching project activities based on creative and critical thinking, multimedia, and cognitive activities. The extensive use of media provided through student-prepared multimedia helps to advance to higher levels of academic achievement rapidly. In the project work, students use multimedia materials generated by them to stimulate students' independence and motivate learning. Appropriately structured project activities contribute to the successful shaping of a student's educational outcomes.

1.3 Learning outcomes

A key aspect of effective educational practice – high-quality educational substances; thematic and ad hoc organizing the curriculum; cognitive load dissemination during training; establishments of tools to engage students; effective attendance of students in the educational system; synergies of ability collection and transfer in the studying surrounding; Thematic general interactions of study group participants [23]. Learning outcomes can be interpreted as a change in students in the form of cognitive, affective, and psychomotor aspects resulting from learning activities that students have carried out. The cognitive dimension is the primary components in the educational curriculum and becomes a criterion for evaluating children's growth. Cognitive is an aspect related to reasoning or thought processes, particularly the competences and productivity of the brain to enhance rational skills. Affective aspects are dimension related to appreciation, feelings, enthusiasm, interests, and attitudes towards something. The psychomotor aspect is a territory that includes progress action and visible regulation, motor abilities, and a person's physical competences.

Learning outcomes can also be interpreted as a change in overall behavior, not just one aspect of human potential [24]. This means that learning outcomes categorized by education experts, as mentioned above, are not seen as fragmentary but comprehensive. For the learning to be of high quality and students have achievements, schools must focus on students' happiness and learning outcomes. Student fulfillment has an essential role in developing knowledge and skills to enhance academic achievements [25]. This happens because when students feel happy and motivated in learning activities, students' emotions will affect the quality of mastering the material provided. It can reach an agreement that learning outcomes are changes that occur in students not only from one aspect but comprehensively which includes aspects namely cognitive, affective, and psychomotor obtained by students after participating in the learning process by the learning objectives that have been set previously by still paying attention to student satisfaction in participating in learning.

The intent of this research is to determine the power of using Android-based interactive media in learning social science material on cultural diversity on the learning outcomes of fourth-grade elementary school students. Through this test, it is expected that elementary school teachers, mainly grade IV, can have an idea about the use of this interactive media in social science learning to raise students' performance in this era of globalization.

2 Method

2.1 Research design

This research applied research design of experiments examining the causal relationship between variables. Through experimental studies, researchers can observe the influence of one independent variable on one or more dependent variables. This evaluation finds a use for a single group pre-test – post-test. This pattern includes one group given a pre-test (O), treatment (X), and a post-test. In single group pre-test post-test research, the first step is to decide about the sample utilized and break it down into one-class research. The next step is to pre-test to measure academic achievement before being assigned treatment using interactive media. In the next stage, the sample was treated utilizing interactive media. Then, the sample was given a post-test at the last stage to measure the outcome afterward. The difference between the average values of the pre-test post-test shows the influence of the independent variable on the dependent variable.

Table 1. Android-based interactive media use research design

Pre-Test	Treatment	Post-Test
O_1	X	O_2

Notes: O_1 = Pre-test given treatment; O_2 = Post-test given treatment; X = treatment in the form drawing on metaverse applications.

2.2 Population and research sample

The population extracted is grade IV elementary school students in Cluster 2, Cipinang Muara sub-district for 2020/2021, as many as 70 students. Then the sampling was carried out using the Slovin formula to get the number of 60 students. The research was done in 2020/2021 academic year.

2.3 Research instruments

The instrument utilized is a cognitive learning outcome test for students' social science subjects using android-based interactive media. Data collection techniques using pre-test and post-test techniques are used to find out the effectiveness of android-based interactive media on the content of social science class IV Elementary School in Cipinang Muara Village. The collected data will be analyzed using descriptive statistical calculations. The final data analysis in a t-test was used to determine the average difference in social science academic achievements before and after applying learning media.

2.4   Data analysis

The test of normality was finalized on the scores of pre-test and post-test with Kolmogorov Smirnov formula using Monte Carlo approach. Sig or p-value is at 5% level of alpha significance. If $p > 0.05$, then the data is normally distributed. Calculation of normality using SPSS version 26.1.0 After the normality test, the homogeneity test was done. To test the homogeneity of the statistical test of variance (test of variance) in the distribution of the group concerned. The homogeneity of the pre-test and post-test scores was done with the rules if the significance value was greater than the significance level of 0.05 (5%). The homogeneity test with the paired sample t-test was used to decide about the difference of the mean of the paired two samples.

The technique of data technique utilized to test the hypothesis in this research is the t-test. The t-test is attempted to test the average value between the scores of pre-tests, and the post-test having a significant difference. SPSS 26.1.0. was used to analyze data.

3   Results

3.1   Analysis stage

Stages of analysis are carried out in an outline analysis of the media program. The analysis includes two steps, namely: (1) curriculum material analysis and (2) learning aspiration. The curriculum materials are analyzed to designate and rearrange the material for Indonesian cultural diversity to suit the 2013 Indonesian curriculum. Furthermore, confirmation and preference of evidence relevant to interactive multimedia are carried out so that the essential competencies of the curriculum can be executed. The review resulted in the formulation of learning intentions. To comprehend the styles of plane and solid numerical symbols, the material boundaries of interactive multimedia are decided at this stage. This stage also determines what materials can be made of geometry, both in animation and simulation.

3.2   Design stage

We frame a flowchart to settle the research trace at the design stage. The flowchart is a flow of program produced from the beginning, subjects to leave the program; the scenario is distinctly described in the flowchart. The creation of a flowchart involves the following steps.

- **Create storyboards**
  Before making a storyboard, the researcher carried out a paper-based stage. This stage contains a delineation that starts from sketching an image on paper. After plotting in a paper-based form, begin with making storyboards. The storyboard is a version that contains visual and audio commentary of each plot in the flowchart. One column on the storyboard represents one view on the screen. This stage aims to get an idea of the shape and display on PowerPoint. The design consists of several menus. The menu consists of learning objectives, materials, and quizzes.

- **Application design**
  It is splitted into two stages: (1) Gathering the materials desired to discharge an interactive multimedia disposition. This stage includes making ideas from storyboards to computers. Materials that wanted to get ready include video, sound, animation, and pictures, (2) joining all the existing material. Interactive media is one of the media that can introduce learning material expressed systematically and concretely to make it manageable for students to apprehend. This stage is carried out on Microsoft PowerPoint by adding a hyperlink to each button that will be enabled and not forgetting to add images and audio.

3.3   Development stage

In the interactive media development stage, the material on Indonesian cultural diversity was carried out using the iSpring Suite 9 software and the Web2Apk builder software. After opening the media design in Microsoft PowerPoint, proceed with publishing the design into the iSpring Suite 9 software. The media design, originally in a PowerPoint file, is converted into flash or HTML form with this software. After the file is in HTML, we must convert it into an android application using the Web2Apk builder. Thus, the design of learning media that is made apart from interactive can also be accessed through students' smartphones in the form of an android application.

3.4   System interface

The following are some descriptions related to the display of interactive PowerPoint media based on Android that researchers have developed. The interactive PowerPoint developed will be converted to form an android application. The application will later be shared via a WhatsApp group. Then students can install the application on their respective devices. After installing the application, students are directly directed to the login page. Here is how the application login page looks like in Figure 1.

Fig. 1. Login page

After students press the play button on the login page, then students are directed to the menu page, which contains several features such as objectives, materials, and quizzes. Students can directly choose where they will start the application. Here's what the menu page looks like in Figure 2.

Fig. 2. Menu page

If students select the material button, students will be explained the nature of cultural diversity and knowledge about traditional clothes and houses from several regions in Indonesia. Here's how it looks in Figure 3.

Fig. 3. Material page

This page shown in Figure 4 contains questions that can be done as a form of evaluation practice questions for their understanding of the material that has been studied.

Fig. 4. Quiz page

3.5   Effect of android-based interactive media on learning outcomes

Based on the test results, the analysis spefification of the examined data were used to determine the level of normality and homogeneity of the research data of pre-test and post-test scores achieved by students before and after using the metaverse application. The Kolmogorov-Smirnov normality test applies the Monte Carlo approach with the Sig 5% rule. If $p > 0.05$, then the data is normally distributed. The calculation of normality with the help of SPSS version 26.1.0 can be seen as follows:

Table 2. One-sample Kolmogorov-Smirnov test

		Unstandardized Residual
N		60
Normal Parameters	Mean	.000
	Std. Deviation	7.138
Most Extreme Differences	Absolute	.143
	Positive	.143
	Negative	−.077
Test Statistic		.143
Asymp. Sig. (2-tailed)		.004
Monte Carlo Sig. (2-tailed)	Sig.	.153
	99% Confidence Interval — Lower Bound	.144
	99% Confidence Interval — Upper Bound	.162

Based on the normality test results using the Kolmogorov-Smirnov, the p-value of significance was $0.153 > 0.05$. The decision-making of the pre-test and post-test data of significance obtained a value bigger than 0.05 so that H1 was accepted. So it can be dissolved that the pre-test and post-test data are normally distributed.

Table 3. Test of homogeneity of variances

Levene Statistic	**df1**	**df2**	**Sig.**
.022	1	118	0.882

The homogeneity test was doneon the pre-test and post-test scores with the rules with a calculated significance value greater than the 0.05 level. The homogeneity calculation was carried out with SPSS version 26.1.0 computer program. The hypotheses are as follows:

H0: All variants are the same or homogeneous
H1: All variants are not the same or not homogeneous
p value > 0.05 (5%), H0 is accepted; H1 rejected
p value < 0.05 (5%), H0 is rejected; H1 accepted

On the basis of SPSS output, it is sensed that the significance value is 0.882, which represents it is larger than 0.05, so it can be ceased that H0 is accepted. Then to test the product's effectiveness using rametik statistics through t-test using the Paired Samples Test formula. The data tested shows the same variance (homogeneous) for the reacon

that the data from the calculation of normality and homogeneity tests proclaim normal and homogeneous.

Table 4. Paired sample t-test

t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
−21,423	59	.000	−24.667	1.151	−26,970	−22,362

Based on the SPSS output, it is informed that the value of Sig. (2-tailed) of 0.000 > 0.05 since the value of Sig. (2-tailed) is equal to 0.000, smaller than 0.05, so it can be culminated that the value of android-based interactive learning media has a positive effect. Overall, these results indicate that android-based interactive learning media can augment learning development in social science subjects material on Indonesian Cultural Diversity.

4   Discussion

This interpretation was designed to determine the effect of implementing Android-based interactive media on the learning outcomes of fourth-grade elementary school students in social science subjects on cultural diversity in cluster 2, Cipinang Muara Village, Indonesia.

The results of this study signal that the use of android-based interactive media has succeeded in improving student learning outcomes. Several other researchers have previously shown that interactive media has a affirmative effect on student learning outcomes. It is proven that android-based interactive media is needed during this pandemic. This media has the advantage of having a more attractive design and easy to use, easy for students to understand [26–29]. This is what underlies researchers to develop android-based learning media, given the positive impact it provides and its suitability with the current conditions of the world of education. In addition, the development of interactive media has also been carried out in various subjects in schools which also have a promising impact on learning effect. The use of digital media has been proven to significantly improve students' skills compared to traditional learning [30].

This is because students can dig up their information about the material provided through digital media to increase students' curiosity about the material. Due to the pleasant learning experience, student achievement also experienced a significant increase. It is contemplated an beneficial way to revamp student versatility, such as optimistic thinking, collaboration, and dissemination. It is regarded as a crucial part of significant innovation. The ability to respond to the increasing demand for education according to the needs of the 21st century has developed, which has brought about a paradigm shift from the existing teaching method to a new teaching method. It also shows some significant results in integrating technology into learning, including a positive student experience. This includes improving student focus, flexible access to learning materials, and using mobile technology for e-learning.

Technologies can simplify and enhance information communication while teaching and learning [31]. Various sources of educational information and how to receive and transmit it are currently available. This should be ordered to codify. This trend calls for the dynamic requirement of visualization methods for learning and retaining in modern educational processes. In addition, state-of-the-art technology and methods achieve high-level visualization of educational materials, saving time for both students and teachers. Technology positively impacts student learning outcomes, especially on the human framework material. The students find it easier to learn the lessons. Due to using technology, the students are presented with boring writing. The material is shown in a mind map equipped with interesting pictures and audio. The use of technology can increase student motivation in learning so that it affects student learning outcomes.

Other empirical results also state that technology can be exerted to advance the independent learning process [32]. With an independent learning process, students can actively improve their cognitive abilities in solving problems and determining the right attitude in dealing with a problem. Technology gives students access to numerous resources on the subject they want to study. If students can use this skill, they will become independent learners. Technology makes it easy for students to learn and acquire hands-on knowledge. Technology provides students with instant information on the topics that are searched. Technology is available, so students don't have to go straight to the person they want to learn. Interactive lessons that use technology can be more effective and provide students with more independent learning. Technology allows students to explore other people's work and provides valuable feedback. This would make student learning ideal. Using advanced technology, students can come along the condition of their learning. Learning things with the help of various technologies is much better and of better quality than traditional classroom instruction.

In the development of education, technology plays an important role in it. The existing technology brings so many positive impacts for the progress of education [33]. The positive impacts include facilitating rationality, abstract reasoning, problem-solving, and experimentation and can increase children's involvement and learning curve. This is supported by a study that says that android-based learning media can tweak motivation and learning success of students who suffer from attention difficulty, hyperactivity, and impulsiveness. Students will find it difficult to concentrate and focus their attention during learning. However, students are more focused on following the lesson when using interactive media.

Interactive media can motivate and reward students for improving their skills [34]. By using the media, students feel more valued because they listen and do the teacher's tasks. Still, they are also involved in the learning process. Schools are increasingly using digital learning environments for learners. Technology has enabled students to critically select, analyze and review data found on the Internet. Interactive media use in the field of education has paid off. This is used appropriately and appropriately. Students are now Deployed in almost all schools and educational institutions in the training process because of its usefulness and efficiency.

Students desperately need better content and learning perspectives not available in the curriculum [35]. Because the students are very easily bored and are not interested in monotonous lessons, teachers must be creative in developing content that can attract their attention by providing a different perspective than before. Interactive learning

media has succeeded in overcoming the disturbances in social-cognitive students needed in learning and knowledge construction [36]. With interactive media, students can increase their knowledge through simple things that are close to their daily activities. From some of the studies that have been mentioned, it can be concluded that the potential of social media is conditioned by the level of participant involvement in interactions that are strengthened by the right community [37]. Researchers realize that there are still many shortcomings and limitations in this study. As for some of these limitations, including the media that was made could not display the number of scores, the pre-test, and post-test assessments were still done manually by means of the help of google forms. This is due to feature limitations in the iSpring Suite application. However, this does not mean that these limitations make interactive media development less than optimal. It is still the primary purpose of the media itself. They motivated and stimulated students' interest in exploring their abilities independently and being fun. So that the expected results are appropriate, namely by increasing their learning achievement at school. Other limitations are: the number of samples taken is only 60 people, which is still very lacking in describing the real situation. The research was conducted online due to the ongoing Covid-19 pandemic situation. In other words, researchers take data through the help of the google form application. The learning outcomes data provided by respondents through the google form sometimes do not show actual results because we do not know the honesty factor of each respondent in answering the pre-test and post-test questions.

Other researchers are also expected to continue the enlargement of this android-based interactive media; it is hoped that other researchers can develop interactive media which includes all subjects. Given the positive impact of interactive media on student learning outcomes in subject social Sciences, it is not impossible if interactive media can positively influence student learning outcomes in other subjects.

5   Conclusion

Overall, this study shows that the use of Android-based interactive media positively influences student learning outcomes in social science subjects on Indonesian cultural diversity. Students can learn the diversity of traditional clothes, traditional clothes, and greetings from various regions in Indonesia just by using their smartphones. Interactive media is equipped with animated images of Indonesian children from various regions, provided with interesting audio. By using interactive media, students have a new experience in learning. Students can see and listen for real about this diversity. Therefore, this study shows the appropriate changes in the tests carried out before using the media with the tests after using the media on the material of Indonesian cultural diversity. This study focuses on the effectiveness of using Android-based interactive media on student learning outgrowth. Increased knowledge about the application of various technology-based learning media is used to make teaching materials easier to understand by students. Besides, that learning materials can be conveyed more attractively and well-organized and support renewable learning models in the era of globalization.

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7 References

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