Android-Based Interactive Learning Multimedia: Social Studies Material for Fourth Grade Elementary School Students

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ABSTRAK

Media pembelajaran yang digunakan saat ini belum sepenuhnya memfasilitasi siswa untuk terlibat aktif dalam proses pembelajaran. Penelitian ini bertujuan untuk mengembangkan dan menganalisis efektivitas multimedia pembelajaran interaktif berbasis android pada materi kegiatan ekonomi dan hubungannya dengan berbagai bidang pekerjaan, serta kehidupan sosial dan budaya di lingkungan sekitar siswa sekolah dasar. Model pengembangan yang digunakan adalah model Borg and Gall dengan 10 langkah pengembangan. Subjek penelitian menggunakan 86 siswa dan 4 guru kelas IV sekolah dasar. Uji coba dilakukan sebanyak dua kali dan uji operasional atau efektivitas menggunakan desain quasi eksperiment dengan jenis nonequivalent control-group design. Data dikumpulkan menggunakan metode wawancara, angket, skala dan tes. Teknik analis data yang digunakan adalah teknik kualitatif dan kuantitatif menggunakan uji-T. Hasil penelitian pengembangan ini menunjukkan bahwa multimedia pembelajaran interaktif berbasis android yang dikembangkan memenuhi kriteria kelayakan "sangat layak" dengan skor 91 dari ahli materi dan skor 102 dari ahli media, melalui hasi uji coba di lapangan memenuhi kriteria kepraktisan "sangat praktis". Hasil analisis uji-t yaitu terdapat perbedaan yang signifikan hasil belajar IPS siswa yang menggunakan pembelajaran multimedia interaktif berbasis Android. Disimpulkan bahwa multimedia pembelajaran berbasis android layak, praktis, dan efektif digunakan dalam pembelajaran IPS siswa kelas IV sekolah dasar.

ABSTRACT

Today's learning media have yet to facilitate students' involvement in the learning process fully. This study aims to develop and analyze the effectiveness of Android-based interactive learning multimedia on economic activity material and its relationship to various fields of work and social and cultural life in the environment around elementary school students. The development model used is the Borg and Gall model with 10 development steps. The research subjects used 86 students and 4 grade IV elementary school teachers. The trial was conducted twice, and the operational or effectiveness test used a quasi-experimental design with a nonequivalent control-group design. Data was collected using interviews, questionnaires, scales, and tests. The data analysis technique used is qualitative and quantitative using the T-test. The results of this development research show that the developed Android-based interactive learning multimedia meets the eligibility criteria of "very feasible" with a score of 91 from the material expert and a score of 102 from the media expert, through the results of field trials fulfilling the practicality criteria of "very practical". The t-test analysis results show a significant difference in social studies learning outcomes of students who use Android-based interactive multimedia learning. It was concluded that multimedia based on Android is feasible, practical, and effective for fourth-grade elementary school students' social studies learning.

1. INTRODUCTION

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Era Society 5.0 is an era where human resources coexist with technology. The development of society 5.0 aims to create a human-centered society, where products and services will be available to meet the various potential needs of an individual (Gladden, 2019; Calp & Bütüner, 2022; Yaraş & Öztürk, 2022). The successful impact of the implementation of society 5.0 produces quality individuals who are able to make the best use of technology to make it easier to carry out daily activities. Apart from that, this era will have a positive impact on an individual's cognition in solving problems for himself or others. Thus, collaboration from various parties is needed, especially in the educational aspect to provide transformation for students. Technological advances are currently providing changes or transformations to the learning process which was originally conventional to become technology-based (Kerssens & Dijck, 2021; Liu, 2022). Therefore, teachers are invited to adapt to technology in order to create learning that is relevant to the times (Faridah et al., 2021; Rahmadi, 2021; Dhillon & Bharti, 2022;).Good use of technology is a measure of the success of the quality of human resources in its implementation in everyday life. This can be seen from the daily life of the community, where almost all of them use technology as a tool to fulfill their daily needs. Thus, the teacher as a facilitator should utilize technology in the learning process starting with the elementary school level.

During the Covid-19 era, the learning process that was originally face-to-face turned into the network. This creates gaps in various aspects in the field of education, including the process of transferring knowledge to students. Which requires all objects in the field of education such as teachers, students, and parents to adapt to a new life. Therefore, the learning process is carried out only through the WhatsApp Group or video conference which causes teachers, students and parents of students to feel very difficult in dealing with it because the adaptation process is certainly not easy, many things have not been prepared properly in dealing with the disasters that have occurred. quite sudden. Changes in learning methods create gaps in the learning process which results in a decrease in the competence of students. A study in the Palembang region revealed problems in online learning (in the network) is the limited facilities that support the learning process such as learning methods to learning media used to shape students' understanding (Wibowo, 2021). The second problem from research in the Central Java region reveals that online learning has not been effectively implemented because there has not been good cooperation between teachers and parents of students in the utilization of information and communication technology used in the learning process (Juliawan et al., 2021). Thus, this gap has a major negative impact on the cognitive and skills of students in participating in the learning process.

Implementation of learning patterns with the aim of transforming students, one of which is through social studies learning. Social Sciences in education is a concept that develops knowledge, attitudes, and social skills in order to form and develop good citizens (Sapriya, 2012; Siska, 2016; Surahman & Mukminan, 2017). IPS learning in the 2013 curriculum has many material components that must be given to students (Suswandari et al., 2020; Warman et al., 2021; Jumriani et al., 2021). Social studies learning should no longer be learning that is only based on theory, but can be presented with more interesting things such as making material adjustments based on where they live which can be associated through project-based learning or problem-based learning to train students in solving problems. Thus, learning no longer places the teacher as the only source of knowledge and books as the only source of information. Teachers in the learning process tend to focus more on learning outcomes than observing the learning process of students in understanding a given material concept (Lao et al., 2021; Prachagool, 2021; Bulkani et al., 2022). So far, the learning process has only pursued learning achievement targets that have been formulated so that teachers still apply one-way learning where students are not yet the center of the learning process. The teacher should make students the student center so that students can experience the learning process themselves, which they can understand through their knowledge (Palavan, 2021; Priyanto & Dharin, 2021).

Through disclosing the results of interviews with grade IV elementary school teachers in Gondokusuman District, it was found that efforts had been made to apply the student center learning process so that it was easy for students to gain an understanding of the concept of the material, but this was only applied to certain subjects and had not been fully implemented in social studies lessons. This is due to the fact that there is so much IPS material that the teacher only focuses on the target learning objectives that must be achieved at the end of the semester. Therefore, teachers need to be assisted to develop a learning media that can accommodate students to be the main actors in the learning process, especially in social studies subjects (Arifin et al., 2020; Istifci & Ucar, 2021). From the researcher's review, it is known that the books currently available are still limited to providing factual information that is integrated with other lessons, so they do not fully contain social skills such as giving examples of real social cases in accordance with the environment of students.

The results of the interviews also resulted in the statement that teachers still have limitations in facilitating students in the learning process, especially in social studies subjects. At present, the efforts made by the teacher only provide learning media in the form of pictures or videos from YouTube, the pictures or

videos provided by the teacher have given interest to students but are only temporary where when the teacher gives the media there are still many students who have not focused their concentration on the material concepts provided through the media. This is because the media used is not student-centered so that not all students can understand the concept of the material provided by the teacher. Apart from that, the results of the media used by the teacher from pictures or YouTube videos are not in accordance with the concept of material that should be given to students so that readjustments are needed according to the needs of students in the field. the media used is not student-centered so that not all students can understand the concept of the material provided by the teacher. Apart from that, the results of the media used by the teacher from pictures or YouTube videos are not in accordance with the concept of material that should be given to students so that readjustments are needed according to the needs of students in the field. the media used is not student-centered so that not all students can understand the concept of the material provided by the teacher. Apart from that, the results of the media used by the teacher from pictures or YouTube videos are not in accordance with the concept of material that should be given to students so that readjustments are needed according to the needs of students in the field.

The limited availability of learning media is due to various factors, one of which is time (Rejeki et al., 2020).The time available for the teacher to prepare the media is still insufficient where there are still many other administrations that must be fulfilled by the teacher, apart from that, the amount of material that must be provided with a short deadline makes the teacher take an alternative path by using the simple media that are widely available on google or other internet sites only. This problem is very unfortunate if no solution is found because it will result in a decrease in student competence in the learning process. One of the media that combines several other media elements is multimedia. Multimedia is able to present a combination of text, images, animation, audio and video in one container. Interactive learning multimedia is a learning resource that can be used by individual users through a control device. According to Septiani et al., (2020); Wong & Adesope, (2021) states that interactive learning multimedia has advantages, one of which is being able to make learning innovative, effective, creative, and efficient. Besides that, the advantages of learning multimedia make it easy for users to operate it, especially at time and place, meaning that there is interactivity between students and the multimedia used. Therefore, it can be concluded that learning multimedia can be a solution to facilitate teachers in forming students' conceptual understanding in the social studies learning process.

Learning multimedia can be used in smartphones. This makes it easy for students because they can learn on their own and are free to operate multimedia anywhere and anytime (Syawaludin et al., 2019; Juniari & Margunayasa, 2022). Facts in the field based on the results of the distribution of questionnaires found that as many as 75% of teachers stated that they had not properly implemented the use of technology as a learning medium, even though as many as 75% of students could operate smartphones/gadgets themselves. Apart from that, as many as 78% of students like learning related to technology, especially those that they can use themselves. Nevertheless, interactive learning multimedia has characteristics that are in accordance with what students like during learning activities in class so that it makes it easier for students to understand a concept of social studies material presented. Based on the various problems and facts described above, it can be concluded that Android-based interactive learning multimedia will have a good impact on being developed as a supporting medium in the learning process. Apart from that, this Android-based interactive learning multimedia is a solution to fulfilling the needs of learning media, especially in social studies material for fourth grade elementary school students so students don't feel bored in participating in the learning process. Therefore, researchers are interested in developing interactive learning multimedia based on Android on social studies material for fourth grade elementary school students.

2. METHOD

This research is research that uses Research and Development research. The development model used is Borg and Gall. The Borg and Gall model has 10 stages of development, but in this study, it was only carried out up to 10 steps. This is due to the limited time of researchers and implementation costs. This model was chosen because it has systematic and structured steps that can facilitate the development of technology-based products (Sugiyono, 2019).The steps used in this research are as follows 1) Research and information collecting, 2) planning, 3) developing preliminary form of product, 4) preliminary field testing, 5) main product revision, 6) main field testing, 7) operational product revision, 8) operational field testing, 9) final product revision, 10) disemination and implementation. The subjects in this study were as follows: 1 material expert, 1 media expert, 86 students and 2 grade IV elementary school teachers in Gondokusuman District. This study consisted of 3 field trials, namely the initial field test, namely product testing on a small scale involving 10 students and 1 class IV teacher, where the selection of students in this test was carried

out according to their cognitive abilities (high, medium and low). Furthermore, product testing was carried out in the main field test, namely testing on a large scale involving 28 students and 1 class IV teacher. Then proceed with operational tests to determine the effectiveness of Android-based interactive learning multimedia in improving social studies learning outcomes for fourth grade elementary school students.

The methods used to collect data in this study are interviews, scales, questionnaires, and tests. Interviews were conducted to obtain information about the issues to be studied related to the needs of students and teachers in the field through a list of questions. Then, the scale is useful for collecting data in testing the validity of the feasibility of the product, the questionnaire is useful for providing a set of written statements to respondents to provide responses or answers to teachers and students about the practicality of the product when it is being tested, and tests to find out the increase in learning outcomes before and after being given treatment in 2 different groups. The instruments used in this study is presented in Table 1, Table 2, Table 3, Table 4, and Table 5.

Table 1. Material Expert Scale Grid

No	Aspect	Item Number	Number of Items
1	Clarity of learning objectives	1	1
2	The suitability of the material with the learning objectives	2,3	2
3	The truth of the concept of matter	4,5,6,7,8	5
4	The accuracy of the material with the developmental conditions of elementary school students	9,10	2
5	The accuracy of the practice questions with the material being taught	11,12	2
6	Appropriateness of grammar in the presentation of the material	13,14,15	3
7	Clarity of instructions in the presentation of the material	16	1
8	The use of media in providing opportunities for students	17	1
9	The suitability of the material with student learning activities in social studies subjects	18,19,20,21,22,23	6

Table 2. Media Expert Scale Grid

No	Aspect	Item Number	Number of Items
1	The attractiveness of interactive learning multimedia design	1	1
2	Font selection accuracy	2,3,4,5	4
3	Background color selection accuracy	6,7,8	3
4	Sound/audio selection accuracy	9,10	2
5	Appropriateness of the image and its presentation	11,12	2
6	Clarity of instructions	13,14,15	3
7	Appropriate display design used	16,17,18,19,20	5
8	Accuracy, attractiveness, convenience, and speed in accessing the navigation buttons	21,22,23,24	4
9	Ease of operation	25,26,27,28	4

Table 3. Teacher Response Questionnaire Grid

No	Aspect	Item Number	Number of Items
1	Learning material presented in interactive multimedia learning based on android	1-12	12
2	Android-based interactive learning multimedia display/design	13-21	9
3	Learning strategies	22-23	2

Table 4. Student Response Questionnaire Grid

No	Aspect	Item Number	Number of Items
1	Learning material presented in interactive multimedia learning based on android	1-2	2

2	Android-based interactive learning multimedia display/design	3-8	6
3	Learning process	9-10	2

Table 5. Test Questions Grid

No	Aspect	Item Number	Number of Items
1	Explain	1-3	3
2	Compare	4-6	3
3	Give an example	7-9	3
4	Decipher	10-12	3
5	Summarize	13-15	3

The data analysis technique used is descriptive qualitative and quantitative. Qualitative descriptive analysis techniques are used to process data from the results of perceptions given by respondents which can then be drawn conclusions. Apart from that, quantitative analysis techniques are used to obtain real data based on the results of trials and effectiveness tests conducted by respondents. The researcher conducted an analysis of the feasibility and practicality of the product by adding up the scores obtained from the results of the scales and questionnaires that had been distributed to expert validators, teachers and students. The score categorization used is a scale of four, along with details of the score categorization formula used in assessing product feasibility and practicality. The catecorization formulas is presented in Table 6.

Table 6. Feasibility and Practicality Score Categorization Formulas

No.	Score Range	Category
1.	Ri+1.5 Sdi < score ≤ maximum total score	Very Decent/Practical
2.	Ri < score ≤ Ri+1.5 Sdi	Decent/Practical
3.	Ri - score ≤ Ri+1.5 Sdi	Less Feasible/Practical
4.	Total maximum score ≤ score ≤ Ri - 1.5 Sdi	Not Feasible/Practical

The effectiveness analysis was carried out by means of a T-test where before this test was carried out, a prerequisite test was carried out through the normality test and homogeneity test. The acceptance and rejection criteria in the hypothesis test are at a significance level of 0.05, that is, if the significance is > 0.05, there is no difference in increase between students who take part in social studies learning activities using interactive multimedia learning based on Android and students who do not use the product, but if <0.05, there is a difference in increase between students who take part in social studies learning activities use interactive multimedia learning based on android with students who do not use the product.

3. RESULT AND DISCUSSION

Result

In this development research, the Borg and Gall development model used consisted of 6 steps. **First**, at the research and information collecting stage where data is generated based on needs analysis in the field which was conducted through interviews with 4 grade IV teachers in Gondokusuman District, the results of the needs analysis obtained that the teacher stated that Social Sciences material has a lot of material and is quite complex so that the presentation This material will be very difficult because students feel bored with the presentation of too much material. Many teachers speculate that social studies lessons are just additional lessons where these subjects are not so essential to be taught. Even though social studies material is material that produces social skills that are useful for the social environment. The teacher also revealed that there was a lot of material that had to be given, so not all material could be given by the teacher to students. This would certainly cause gaps in students' understanding in social studies lessons. So far, the learning techniques or methods used are still conventional, such as the lecture method and giving assignments, therefore the social studies material will be increasingly unattractive to students. Therefore, supporting infrastructure is needed, such as more innovative and interactive learning media, such as learning multimedia. So far, the learning techniques or methods used are still conventional, such as the lecture method and giving assignments, therefore the social studies material will be increasingly unattractive to students. Therefore, supporting infrastructure is needed, such as more innovative and interactive learning media, such as learning multimedia. So far, the learning techniques or methods used are still conventional, such as the lecture method and giving assignments, therefore the social studies

material will be increasingly unattractive to students. Therefore, supporting infrastructure is needed, such as more innovative and interactive learning media, such as learning multimedia.

Second, the planning stage is carried out by analyzing basic competencies and conducting focus group discussions with teachers and colleagues. At this stage it results that the basic competencies that will be used to become material content in interactive learning multimedia are basic competencies 3.3 Identifying economic activities and their relationships with various fields of work, as well as social and cultural life in the surrounding environment up to the province. 4.3 Present the results of identifying economic activities in improving people's lives in the fields of work, social and culture in the surrounding environment up to the province. This competency is a competency in social studies subjects with the subject matter of economic activities spread across themes 4 and 8 in the 2013 curriculum.

Third, the developing preliminary form of product consists of several steps, namely the determination of Unity3D software as the software used in the development of Android-based interactive learning multimedia. Designing interactive games as materials used for learning reflection where game content is adapted to the content of the material provided, interactive learning multimedia is also equipped with achievement competencies, games, and social studies literacy activities. The results of the development of Android-based interactive learning multimedia designs are presented in Figure 1.

Figure 1. The Results of Development

At this stage, the product feasibility validation has been carried out by material experts and media experts. This validation is carried out by lecturers with appropriate areas of expertise, namely, Social Science Elementary Education and Learning Multimedia. The validation stages were carried out twice, while the validation results are shown in Table 7.

Table 7. Material Expert Assessment Results

No	Stages	Score		Predicate
		Material Expert	Media Expert	
1	Stage 1	87	86	Worthy
2	Stage 2	91	102	Very Worth it

Based on the Table 7, the assessment results from material experts and media experts have met the very feasible category at the second stage of the assessment. As for the first stage of assessment, the material and media expert validators were given some input on the material content section and features of Android-based interactive learning multimedia. The input given by material experts is to ensure that all quiz questions are prepared based on the learning indicators used. The results of the input given by the material experts have been corrected according to suggestions by the researchers so that in the second stage of the assessment a score of 91 was given with a very decent predicate. The results of the input obtained from media experts are improvements to the navigation tools in the conversational text feature, this has also been adjusted based on suggestions so that in the second assessment a score of 102 is obtained with the title of very decent. Therefore, it can be concluded that learning multimedia based on Android on social studies material for fourth grade elementary school students is very feasible for field trials.

Fourth, at the stage of preliminary field testing. This trial involved 10 students and 1 class IV teacher. The data obtained is based on the results of the teacher and student response questionnaire after

using Android-based learning multimedia on social studies material. The results of teacher and student responses at the preliminary field-testing stage is presented in Table 8.

Table 8. Results of Teacher and Student Responses Initial Trial

No	Respondents	Score	Predicate
1	Teacher	70	Practical
2	Student	26	Practical

Based on the Table 8, the score results have been obtained from the teacher and student response questionnaire where each score meets the practical criteria. As for the results of the teacher's response questionnaire, input was obtained after conducting trials using Android-based interactive learning multimedia, namely that there was a double sound on the back sound with the video available in the material features. The input given was immediately followed up by the researcher to make improvements to voice coding in multimedia. Therefore, based on the results of the teacher and student response questionnaire in the initial trial, this android-based interactive learning multimedia product is practically used in the social studies learning process and can be continued in the next trial.

Fifth, at the main product revision stage, improvements have been made based on the results of the input given in the previous trial. This improvement is a form of refinement of the product before it is used on a large scale and to minimize problems when used in the next stage. This is because the target users of Android-based learning multimedia are fourth grade elementary school students, so they must pay attention to aspects that can make it easier for students to follow the social studies learning process. Thus, the product has been improved according to the suggestions given and can be continued in the next trial.

Sixth, in the main field-testing stage, 28 students and 1 class IV elementary school teacher were involved. The number of subjects for this trial was more than the previous buckwheat trial, this was adjusted to the conditions that had been set based on the development model used. The trial scheme was carried out by implementing interactive learning multimedia based on Android during social studies learning with material that matched the content in the product. Meanwhile, the results of the trial were based on a detailed questionnaire on the responses of teachers and students, as shown in Table 9.

Table 9. Results of Teacher and Student Responses to the Main Trial

No	Respondents	Score	Predicate
1	Teacher	86	Very Practical
2	Student	37	Very Practical

Based on the Table 9, it is known that each score obtained from the teacher and student response questionnaire is in very practical criteria. Thus, learning multimedia based on Android on IPS material can be used on a wider scale, it's just that there are still problems during the trial run but the obstacle lies not in product features, but in technical trials carried out such as the specifications of the Android smartphone used students where the student's smartphone is activated in parental supervision mode so that it is not possible to install or download the product being developed. However, as a whole it can be concluded that the developed Android-based interactive learning multimedia is very practical to use in social studies material for grade IV elementary school students. Seventh, at the operational product revision stage there is no more input given by the teacher and this is also adjusted to the results of student response scores that have fulfilled very practical criteria. So, it can be concluded that the product can be continued at the next stage.

Eighth, at the operational field-testing stage, the researcher conducted the research by looking at the effectiveness of student learning outcomes through the pretest and posttest. The value of the pretest was obtained before the IPS learning process used interactive learning multimedia based on Android. Meanwhile, posttest scores were obtained after students participated in the social studies learning process using Android-based interactive multimedia learning. Based on the results of the research that has been done, the average pretest score in the control group is 46.1, while the average pretest score in the experimental group is 47.2. Then, the average posttest score in the control group was 52.7 and the average posttest score was 73.3. These results mean that there is an increase in learning outcomes in the experimental group with a much higher and significant increase compared to learning outcomes in the control group. This is because in the experimental group, the social studies learning process uses interactive multimedia learning based on Android developed by researchers. Meanwhile, the control group was not given any treatment.

Thus, these results are continued with statistical data analysis techniques to find out whether there is a significant effect from the use of Android-based interactive learning multimedia that has been developed. Before testing the hypothesis using the independent sample t-test, the normality test and homogeneity test were carried out. The results of the normality test through the Kolmogrov Smirnov one-sample test with the help of SPSS 25 showed results > 0.05 in the control group and the experimental group, which means that the data distribution was normally distributed. Meanwhile, the results of the homogeneity test through the Levene test showed results > 0.05 in the control group and the experimental group based on the results of the pretest and posttest data.

A summary of the results of the independent sample t-test on student learning outcomes scores using IBM SPSS 25 is shown in Table 10. The table shows a sig value on the t-test of 0.000. This shows that there are significant differences in social studies learning outcomes of students using interactive multimedia learning based on Android in the experimental group and those not using interactive multimedia learning based on Android in the control group.

Table 10. Summary of T-Test Results

No	Group	Sample	Means	Standard deviation	Df	Sig (2-tailed)
1	Control	24	52.66	10.15	46	0.000
2	Experiment	24	73.33	12.18		

Ninth, in the final stage of product revision, there were no features or systems that were repaired, this was because the product had received the title of very proper and very practical based on expert validators and teacher and student responses. Tenth, at the dissemination and implementation stage it is intended for researchers to disseminate products to a wider range so that the value of usefulness and usability is more beneficial, especially in the educational aspect.

Discussion

In the development research conducted by the researcher, the resulting product is an android-based interactive learning multimedia on social studies material for fourth grade elementary school students. This product was developed as one of the answers to existing needs in the field, where this Android-based learning multimedia makes it easier for students to understand social studies material which has been considered boring for elementary school students. This is also adapted to the development of the 21st century where communication technology such as smartphones is something that needs to be taught to elementary school students (Ningrum et al., 2021; Hartley & Andújar, 2022; Izhar et al., 2022). Thus, the developed Android-based interactive learning multimedia has a positive impact on the use of smartphones as a tool in the learning process in the classroom.

The use of interactive learning multimedia is not new in the world of education, but has existed in the previous period. However, innovation in learning is an obligation for teachers to realize learning according to the needs of students in the present and the future. Therefore, innovation in this development research is related to the use of Android as a tool packaged through interactive learning multimedia. Ease of access and flexibility in its use and can be used repeatedly according to students' wishes are the advantages of this Android-based interactive learning multimedia so that it can increase the frequency of students' cognitive understanding of social studies material (Sartono & Wulandari, 2020; Handayani, 2022).

The combination of text, audio, images and video in one system is the main principle in multimedia learning. As for the existence of navigation and interactivity that allows two-way interaction between the system and the user to be part of the fun as well as providing feedback to the user (Ayuningtyas & Rinawati, 2020; Hasanah et al., 2021). Through this interactive learning multimedia it makes learning activities more fun and increases student learning activities so that learning independence is realized which will eventually lead to meaningful learning for students (Kadarsih & Fitria, 2022; Lauc et al., 2020).

The design is designed to facilitate students in understanding the concept of IPS material (Brugar & Whitlock, 2020; Choiriyah et al., 2022).The interactivity contained in this learning multimedia system makes it easy for students as users to control the use of this learning multimedia so that it fits the existing goals (Shahzad et al., 2021; Suprianti et al., 2021). It can be concluded that the developed Android-based interactive learning multimedia has a high practicality value considering that this has been adapted to the developmental characteristics of grade IV elementary school students.

Building knowledge and solving difficulties in conceptual social studies material can be balanced by changes in the learning environment by using technology as a teaching medium in the social studies learning process (Yuanta, 2020; Fajrianti & Meilana, 2022). The pedagogical basis for the use of Android-based interactive learning multimedia is a driving force for transformation where learning is student-

centered (Bulut, 2019; Lasfika et al., 2022). Thus, students are naturally able to construct their knowledge so that it can be applied in their social environment.

Android-based interactive learning multimedia on IPS material has many advantages if it is carried out on target and as needed (Elangga et al., 2022; Kristanti & Sujana, 2022). Therefore, this product was developed as a need based on the constraints felt by teachers when they wanted to implement digital technology-based learning. Currently in Indonesia, there are still many teachers who have limitations in using digital technology in the learning process, especially at the elementary school level. Even though the use of digital technology will greatly affect the growth and development of elementary school students, due to the current age of elementary school students who are in the Z and alpha generations where the needs of this era require all aspects to mingle with sophisticated digital technology (Nindya & Dafit, 2020; Handayani et al., 2022). Thus, interactive learning multimedia based on Android on social studies material developed will provide great benefits for teachers in the learning process.

Based on the results of the tests that have been carried out, it is known that the developed Android-based interactive learning multimedia can improve social studies learning outcomes for fourth grade elementary school students where this will also affect students' conceptual understanding of social studies material. Interactive learning multimedia can support the teaching and learning process, the meaning of the message conveyed will become clearer, and the direction of learning can be carried out properly because problems in learning can be resolved properly (Sari & Mutiara, 2022). Interactive learning multimedia makes a positive contribution to students' ability to concretize and reinforce concepts by visualizing them (Çoruk & Çakır, 2017). The products developed in it integrate examples in the form of illustrations as they are in the original, therefore students can learn more clearly and help understand the concept.

The development of Android-based learning multimedia is the main goal of this development so that students can access and learn whenever and wherever they are. This is of course able to overcome the limitations of space and time for student learning at school for social studies subjects, because the more time students' study, the higher social studies learning outcomes they get. Apart from that, the teacher will easily implement meaningful learning for students so that it will also form independent learning for students. This is certainly in accordance with 21st century skills through learning concepts that integrate communication technology as a strategy in creating quality learning.

The interactive learning multimedia developed by researchers at this time is of course still far from perfect, so there are limitations in the development research that has been carried out at this time, namely this product has not been disseminated online via the PlayStore, so there are still limitations in using the product being developed at this time. There are several student smartphones that are activated in parental control mode so that this product cannot be downloaded freely. Not all student smartphone specifications match the minimum specifications for the product being developed, causing the product to not operate properly. Thus, there is a need for testing on a wider scale with a larger and proportional number of subjects.

4. CONCLUSION

Based on the results of data analysis on the development of Android-based interactive learning multimedia, the qualifications are very feasible based on the results of the assessment of material experts and media experts. Then, demonstrating very practical qualifications based on the results of teacher and student responses. So that Android-based interactive learning multimedia products are effectively used in the social studies learning process for fourth grade elementary school students.

5. REFERENCES

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