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Learning Innovation through the Development of Interactive Multimedia Based on Local Wisdom for Sociology Learning in the Digital Era

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ABSTRAK

Kurang inovatifnya media pembelajaran digital membuat aktivitas pembelajaran menjadi kurang menarik bagi siswa. Padahal perkembangan teknologi telah memberikan jalan bagi kehadiran berbagai macam inovasi – inovasi untuk aspek pembelajaran, seperti multimedia interaktif. Penelitian ini memiliki tujuan untuk mengembangkan multimedia interaktif yang layak untuk pembelajaran sosiologi. Penelitian ini termasuk dalam penelitian dan pengembangan (RnD) dengan model 4D. Metode pengumpulan data menggunakan non tes yakni angket analisis kebutuhan dan angket kelayakan media. Instrument pengumpulan data menggunakan kuesioner. Teknik analisis data memakai Teknik deskriptif dan persentase. Hasil penelitian menunjukkan bahwa siswa memiliki Pandangan yang baik dan setuju dengan kehadiran multimedia interaktif. Hal ini sejalan dengan temuan bahwa selama proses pembelajaran ternyata guru sudah memanfaatkan TIK. Hasil rata – rata penilaian produk multimedia oleh ahli materi memperoleh skor 83% yang termasuk dalam kategori sangat layak, oleh ahli media memperoleh rata-rata 86% yang termasuk dalam kategori sangat layak. Disimpulkan media interaktif termasuk dalam kategori layak sehingga dapat menjadi salah satu media pembelajaran sosiologi. Diharapkan hasil riset ini dapat menjadi inovasi proses belajar berbasis TIK.

ABSTRAK

The need for innovative digital learning media makes learning activities less attractive to students. Even though technological developments have paved the way for various innovations in aspects of learning, such as interactive multimedia, this study aims to develop appropriate interactive multimedia for sociology learning. This research is included in research and development (RnD) with a 4D model. The data collection method uses a non-test: a needs analysis questionnaire and a media feasibility questionnaire. The data collection instrument used a questionnaire. Data analysis techniques use descriptive and percentage techniques. The study results show that students have a good view and agree with the presence of interactive multimedia. It is in line with the finding that during the learning process, teachers have used ICT. The results of the average evaluation of multimedia products by material experts obtained a score of 83% which was included in the very feasible category, by media experts obtained an average of 86% which was included in the very feasible category. Interactive media is included in the appropriate category for sociology learning media. It is hoped that the results of this research can become an innovation in ICT-based learning processes.

1. INTRODUCTION

Education is one of the efforts that can be carried out by individuals in order to add insight, skills and expertise in accordance with the needs and progress of science and communication technology. In line with this, education is one of the foundations for creating quality human resources, therefore the implementation of education must be able to facilitate individuals so that all the potential that exists within them can develop optimally (Mulyasa, 2013; Sari et al., 2020). The successful implementation of the education system in order to create superior human resources is influenced by several factors, one of

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which is the learning process (Syamsuar & Reflianto, 2018; Setiawan, 2019). During the learning process, teachers are expected to be able to always innovate in creating an interactive learning climate, so that students become motivated to take part in the learning process in class and students will be more facilitated to construct knowledge or information that the teacher conveys (Susanti & Junaidi, 2020; Budiarto et al., 2020). Thus, students can easily achieve competency, both from cognitive, affective and psychomotor aspects which are expected as one of the outcomes of the learning process (Krathwohl, 2002; Ören, 2019).

The current implementation of the learning process seems to be experiencing a paradigm shift, apart from the development of information technology, as well as the consequences of the corona virus pandemic (Covid-19) that has hit the whole world (Vilchez et al., 2021; Syarif & Mawardi, 2021). The Covid-19 pandemic has restricted gatherings in all areas of life as well as in the world of education. Since March 16 2020 all schools in Indonesia have been ordered to carry out distance education. This is the challenge for teachers, namely to apply online learning to facilitate student learning (Mithhar et al., 2021; Schneider & Council, 2021). According to the Association of Indonesian Internet Service Providers (APJII), represented by its chairman Jamalul Izza, the number of internet literate in Indonesia in the second quarter of 2020 reached 196.7 million or 73.7% of the population. This is due to the rapid spread of internet infrastructure due to the COVID-19 pandemic since March 2020 (D. I. Sari et al., 2020; Rohida, 2018).

On the other hand, learning sociology is one of the subjects held at the senior secondary education level. Through this learning it is hoped that students will be able to have complete competence regarding the phenomena, values, social laws that occur (Hariyani et al., 2021; Better, 2013), Thus it is hoped that students will be able to become individuals who are ready to jump in and communicate socially in their community environment (Patrick et al., 2018; Januarti & Hendrastomo, 2018). Several issues that are closely related to the study of sociology are multiculturalism, globalization, and local wisdom (Nurwahidah, 2017; Prayogi et al., 2019). Through the issues raised, it is expected to be able to transfer values that can bring harmony in various characteristics of society, maintain social equality of the components of society, maintain multiculturalism, and the ability of communities that will be able to face globalization (Sarsar et al., 2021; Bria et al., 2020). Thus, a social order will be created that maintains social stability. It's just that, during the Covid-19 pandemic, sociology learning was one of those that was affected so that the continuity of learning was considered less than optimal.

During the Covid-19 pandemic, there were several obstacles to the shift in the learning paradigm from conventional to digital as it is today (Bujang et al., 2020; Sanmartin et al., 2020). As with field facts obtained through discussions with upper-middle-level sociology subject teachers at SMAN 1 Ngemplak Boyolali, many complain that it is increasingly difficult to get students' attention and it is difficult to transform character values in networks. Findings from the field show the average learning outcomes of class XII or third grade students at the upper secondary level. The average midterm test score for class XII students is low because the average score is below the school's KKM (Minimum completeness criteria), which is 70 for sociology learning.

Given the importance of learning sociology, especially material regarding local wisdom for students, the implementation of sociology learning requires a strategy, media, teaching materials, methods that are in accordance with the characteristics of students through various forms of innovation in the components of the learning system, thus students will find it easier to achieve defined competencies. Where, the learning process is an interaction that occurs between the teacher and students, through this interaction it is hoped that a change in behavior will occur, and additional knowledge insight from the individual as a learner (Belichenko, 2017; Rahmi et al., 2019), to be able to create an optimal learning process in order to achieve competency both in terms of affective, cognitive, and psychomotor, it must be ensured that the components of the learning system such as learning objectives, materials, learning media, methods and assessment of the learning process function according to their respective roles.

One of the innovations that can be applied in ensuring one of the components of the learning system, namely learning media is by presenting digital technology that is indeed in accordance with the times. As stated that there are several ways for predetermined learning objectives to be achieved, namely by organizing learning, conveying learning content by managing interactions that occur between students and learning media as one of the learning resources used during the learning process (Diana et al., 2019; Susanti & Junaidi, 2020). As it is known that learning media is a form of learning resources, learning media based on communication and information technology are considered to have attractive features, so that they can support the learning process and can accommodate learning styles, and can attract attention and motivate students to learn (Arsyad, 2013; Siregar & Marpaung, 2020). Educational technology has a focus on solving various problems in the field of education, especially learning, through the implementation of ideal learning that is expected to contribute to providing innovations. As stated that educational

technology plays a role in creating a technology in the form of appropriate technological resources to be able to facilitate learning activities (Kashina et al., 2018; Mishra, 2009). So that learning innovations that are aligned with the field of educational technology work are the creation or development of an instructional product that is able to facilitate and improve student performance during the implementation of learning (Ören, 2019; Fletcher et al., 2020). The importance of the presence of technology in the field of education is the basis for educators to be able to provide facilities in the learning process to help students achieve competence.

Interactive multimedia as one of the learning media based on information and communication technology (ICT) is an option to be able to bring technology into the learning process. This is supported by research which reveals that interactive multimedia is a combination of various media formats as one of the innovations in presenting information or subject matter with a more attractive appearance (Guo & Jia, 2016; Beydoğan & Hayran, 2015). In line with that, the use of interactive multimedia is also considered to be able to have a direct influence on improving student academic achievement, both cognitively, affectively and psychomotorically (Fathoni et al., 2021; Syawaludin et al., 2019). Other research shows that the use of media that has interactive elements like multimedia is very important, because interactive media besides functioning as a tool, interactive media also influences the creation of an atmosphere and conditions for an interesting and dynamic learning environment (Maharani et al., 2018). This is also reinforced by other research which shows that learning using interactive multimedia tends to be easier for students to operate, this is because interactive multimedia can create an independent learning process which then requires students to play an active role (Komalasari & Rahmat, 2019). In line with this, research conducted by previous researchers also stated that the use of interactive multimedia has also been proven empirically to be able to improve student learning outcomes, this refers to the acquisition of data showing that there is an effect of interactive multimedia on increasing student achievement as indicated by increased post-test results compared to when students learn not to use interactive multimedia (Caetano & Zaro, 2018; Yue, 2017; Uge et al., 2019).

Referring to various findings from field facts in sociology learning at the high school level, it was identified that the average score of students for sociology subjects, especially in achieving competency regarding local wisdom, was found to be still low. In addition, another finding is regarding the availability of learning facilities during the Covid-19 pandemic which still tends to be limited, this can be seen from the signal of cellular devices which are still uneven in several schools located in the Boyolali area, apart from teacher competency they also tend to be limited in operating technology-based devices such as computers/laptops. Besides that, the various findings above regarding TPACK and the use of digital teaching materials during learning activities, one of the learning media that reflects the integration of the use of TPACK is interactive multimedia (I. P. I. Kusuma, 2021; Budiarto et al., 2021). As it is known that multimedia is one of the tools or channels commonly used in communication systems to convey information or material (Wiana et al., 2018; Simanjuntak, 2019). Multimedia has quite complex characteristics compared to several other types of media, multimedia is composed of various components, namely text, animation, video, graphics and even sound (Qu, 2018; Rachmadtullah et al., 2018). The use of interactive multimedia during learning activities will have a very significant impact if the manufacturing and development process complies with the guidelines in designing both in terms of appearance and material construction (Iztiqa & Jampel, 2022; Komaro et al., 2021).

As one of the efforts to create learning innovations, one of which can be through the implementation of learning multimedia. Although there are still many factors that need to be considered and considered by teachers to be able to develop an interactive multimedia product. It is undeniable that interactive multimedia is a type of innovation and solution to address sociology learning in high schools. Interactive multimedia as proven by several previous studies can support the learning process, create a learning atmosphere that is more student-centered, especially for social learning such as sociology (Xu, 2017; Suminar, 2019). This research certainly has novelty and differences with several previous studies (Li & Ren, 2018; Rejeki & Mukminan, 2020; Manurung & Panggabean, 2020), where in the research conducted this will contain a local wisdom approach that is integrated into the flow of the module program so that it is relevant to the competency needs of the 21st century (Kapi Kahbi et al., 2017; So et al., 2019; Trevallion & Nischang, 2021). The results of the analysis of the various descriptions and results of research that has been done before, seem very important to be able to present innovation in the learning process. Interactive multimedia is seen as capable of having a positive impact on student competency achievement. In addition, students are now very familiar with the presence of technology, computers, and even smartphones, which of course makes teachers think that it will be easier for students to access and learn material.

Students who are very familiar with technology will find it easier to access digital material. Therefore, this study aims to develop innovative learning media products in the form of interactive

multimedia whose material is combined with local wisdom approaches for Sociology subjects that are suitable for use by students during the learning process, this is one of the efforts to improve students' social attitudes.

2. METHOD

This study adopt research and development type (Silalahi, 2015), with the research and development model being 4D which is composed of Define, Design, Develop, and Disseminate (Gorbi et al., 2018). This research will tell the process of needs analysis to the feasibility assessment of the interactive media being developed. The population of this study were students and teachers of senior high schools in Boyolali Regency, Central Java, who were supplemented by experts or specialists. This study took a sample of 33 students of class XII high school. Meanwhile at the product development stage, which contains an assessment of the feasibility of the media, it will take research subjects, namely experts and practitioners. The experts consist of media expert validators (2 people), material expert validators (2 people), so that the total sample in this development stage will be 4 people.

In this study, data collection used a non-test technique, namely a questionnaire (Abdullah, 2015), The questionnaire will consist of a needs analysis questionnaire and a media feasibility assessment questionnaire. The questionnaire used adopts a tiered questionnaire according to Likert 1 – 5 consisting of Very Less, Less, Fair, Good, and Very Good (Chetty et al., 2019). The validity of the instruments used is validated by means of expert judgment, where each instrument is consulted and validated in advance by experts who are competent in their field (Widoyoko, 2018; Oducado, 2021). The instrument items used in this study adopted questions from needs analysis research that had been used previously by (Hanif et al., 2018; Cahyo et al., 2019; Budiarto et al., 2021), and adapted to the needs of this research. Table 1 shows the questionnaire grid of the needs analysis instruments used in this study. Meanwhile, the interactive media feasibility questionnaire will adopt several previous studies, Table 2, and Table 3 are each media feasibility instrument for media experts and material experts.

Table 1. Analysis Questionnaire Grid

No.	Indicator
1	Types of Use of Learning Media
2	Jenis Penggunaan Metode Pembelajaran
3	Supporting Facilities Owned by School
	Adapted from (Hanif et al., 2018; Cahyo et al., 2019; Budiarto et al., 2021)

Table 2. Instrument Validation by Media Experts

No.	Aspect	Indicator
1	System Quality (Kualitas Sistem)	Program Functioning
		Program Operation
		Interactive
		Availability of Navigation Controls
		Display & Color Composition
2	Service Quality (Kualitas Layanan)	Easily Obtained
		As Needed
		Feedback
		Adapted from (Ngabekti et al., 2019; Lutfi et al., 2021)

Table 3. Instrument Validation by Media Experts

No.	Aspect	Indicator
1	Learning Aspects	Compatibility of basic competencies with learning objectives
		Clarity of instructions in learning
		Clarity of learning objectives
		Ease in selecting menus or learning materials
		Evaluation questions
2	Aspects of Content	Material quality
		Illustration used
		Summary writing

	Appropriateness of the language used
	Clarity of language used

Adapted from (Sofyan et al., 2019; Setiawardhani, 2021)

The results of the student responses were then analyzed using percentage techniques (Ivanovich, 2014). Furthermore, the data from the results of the needs analysis questionnaire will be analyzed in percentage terms (Roemintoyo & Budiarto, 2021), Likewise, the results of the media feasibility questionnaire will be analyzed on a percentage basis, however, for decision making the eligibility will refer to the Table 4.

Table 4. Multimedia Interactive Eligibility Criteria

No.	Percentage	Qualification	Declaration
1	82 – 100%	Very Good	Very Eligible
2	63 – 81%	Good	Eligible
3	44 – 62%	Enough	Less Eligible
4	25 – 43%	Less	Not Eligible

Adapted from (Arikunto, 2010; Perdana et al., 2021)

The research procedures carried out will focus on the needs analysis process to the development of a feasible product. Beginning with the distribution of needs analysis questionnaires to students to see how opportunities for development are, then the initial product is developed and then validated by media experts and material experts. The results of the needs analysis questionnaire and the feasibility results were then analyzed to obtain the percentage score and revised the product if comments were found from each validator.

3. RESULT AND DISCUSSION

Results

The results of the distribution of questionnaires to 33 class XII students in high schools regarding the types or formats of learning media that teachers usually use when delivering sociology material. Student responses indicated that almost all teachers had used digital learning media, it's just that it was still in audio-visual format and digital material books which they usually downloaded from Google.

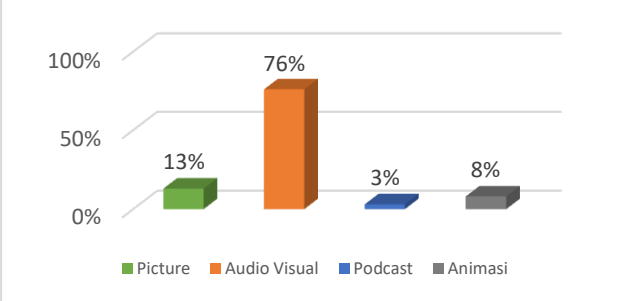

Figure 1. Student Preferences Regarding Learning Media

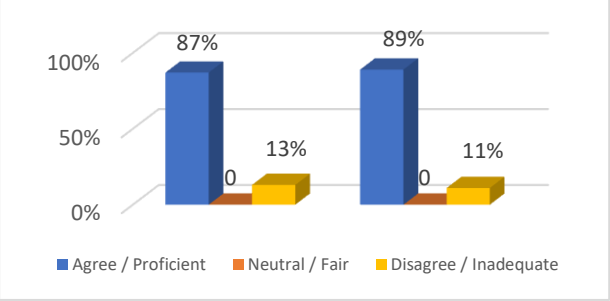

Figure 2. Student Perceptions of Interactive Multimedia

From the data in Figure 1, it can be seen that students actually have a higher preference for audio-visual learning media (76%), followed by 13% image formats, 8% animation formats and 3% audio-based learning media with podcast formats. Students' preferences regarding learning media will form the basis for seeing opportunities and students' views on interactive multimedia innovations. This is because interactive multimedia contains audio-visual components, images, animations and sounds that are integrated into one learning media format. The results of student responses after being given an explanation of what interactive multimedia was, they immediately realized that so far they had used this kind of media, only not for learning but in application formats for entertainment or games.

From the results of student responses in Figure 2, it shows that students are very familiar with using ICT devices, be it laptops/computers or smartphones. This is indicated by data analysis which shows that 87% of students feel themselves proficient and able to operate the laptops they use. This certainly can be a capital in the use of ICT in the learning process. The results of student responses further indicate that most students have a good view and agree with interactive multimedia innovations as a

medium for sociology learning, this can be seen from student responses which show 89% of students agree with the presence of interactive multimedia to support the sociology learning process, which currently dominated by learning resources from YouTube in audio-visual format. Some of the findings from the results of the questionnaire show that overall, students agree with the presence of interactive multimedia innovations as one of the sociology learning media, moreover they are very familiar with the presence of technology such as laptops and smartphones, this certainly opens up opportunities for the development and application of multimedia. interactively into the learning process.

Thus, further research is the process of developing materials and preparing several assets for the development of interactive multimedia products. The result of product development is media which is validated by media experts and material experts. As it is known that learning media in interactive multimedia format will make students more accessible to all subject matter starting from materials, videos, animations, to practice questions. Figure 3, and Figure 4 shows the results of the development of interactive multimedia learning for sociology learning in high school.

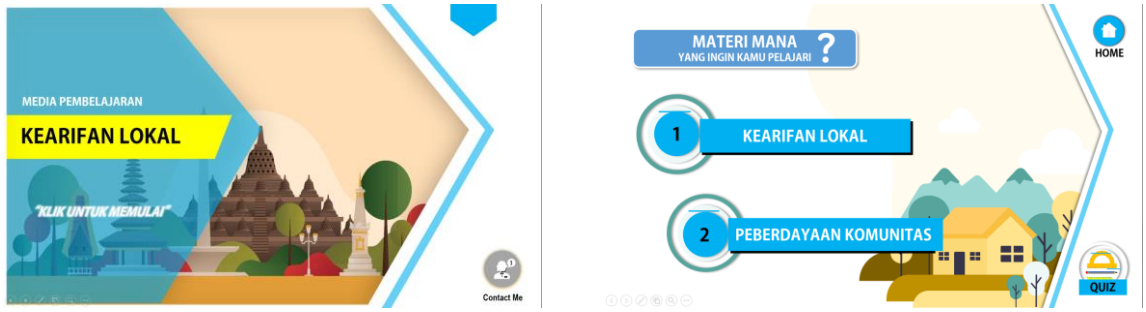

Figure 3. Main Display and Material Menu

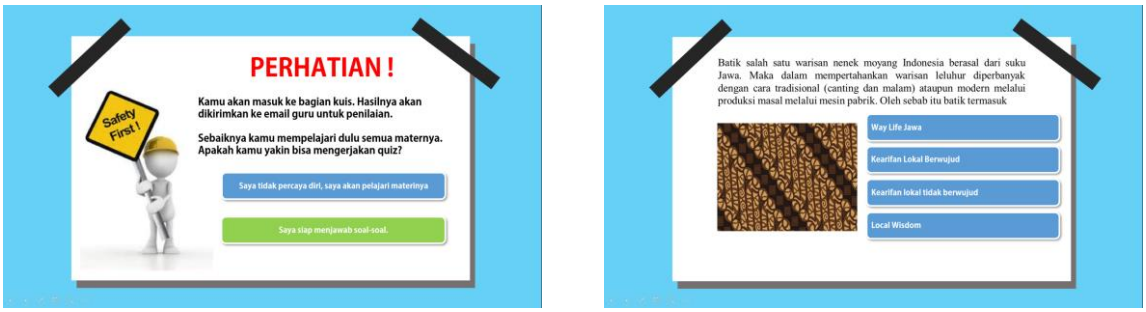

Figure 4. Quiz Menu Display

To obtain information about the feasibility of the media being developed, it is necessary to make decisions from experts, both media experts and material experts. In Figure 5, the results of the validation by material experts will be presented.

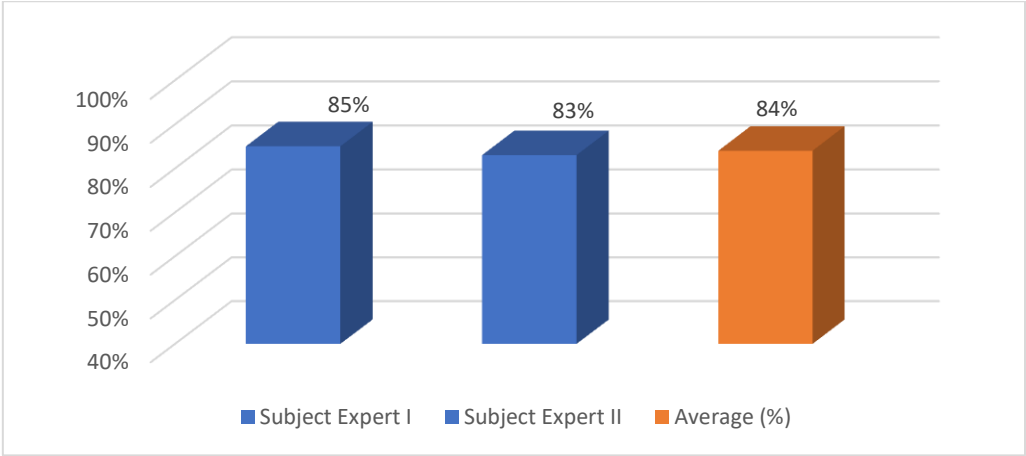

Figure 5. Results of Assessment by Subject Experts

Looking at the illustration, you can see the results of the subject matter expert's assessment of interactive multimedia products. Subject matter expert I gives an assessment of 85%, this result is included in the 'very good' qualification, then the results of the assessment by material expert II obtain a total score of 83% which is included in the 'very good' qualification. The results of the analysis of the two experts were then analyzed on average, a score of 84% was obtained, included in the qualification of 'very good' and obtained a decision of 'very feasible'. Thus, these results provide a representation that the material components contained in the media are included in the appropriate category according to the point of view of material experts. The next assessment is by media experts, here are the results of the media expert's overall assessment which is illustrated in Figure 6.

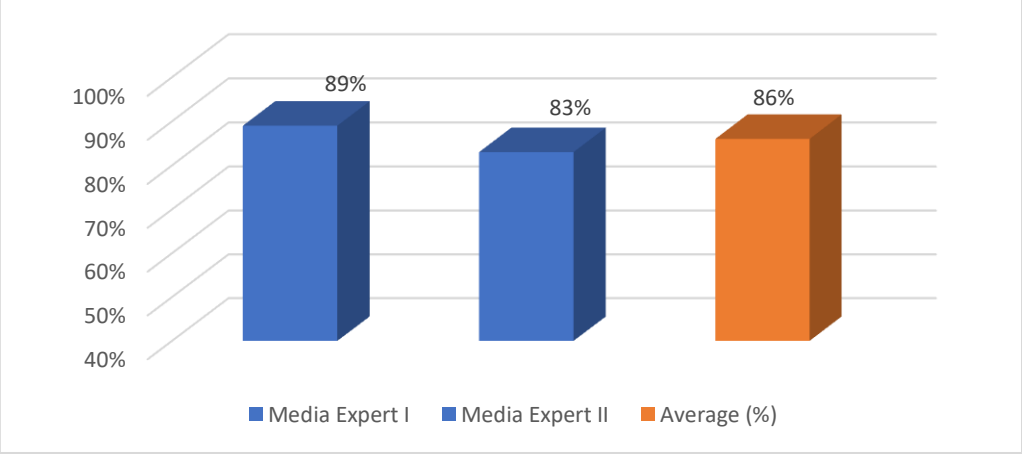

Figure 6. Results of Assessment by Media Experts

The results of the assessment from media experts regarding interactive multimedia products, namely for media experts I gave an assessment of 89%, this result was included in the qualification of 'very good', then the results of the assessment by media experts II obtained a total score of 83% which was included in the qualification of 'very good' '. The results of the analysis of the two experts were then analyzed on average, obtaining a score of 86%, included in the qualification of 'very good' and obtained a decision of 'very feasible'. Thus, these results provide a representation that the interactive media constituent components contained in the media are included in the appropriate category according to the perspective of media experts. So that as a whole a conclusion can be decided from the results of the assessment that interactive multimedia products are included in the 'very feasible' category by all validators as sociology learning media in high school.

Discussion

As is known, several periods ago we have faced a very terrible epidemic and as a result, many structures have changed in human life, both socially and economically (Paetsch & Drechsel, 2021; Tawafak et al., 2021). The Covid-19 pandemic demands that all individuals use it, this results in students and teachers getting used to using technology in their daily lives (Utomo et al., 2020; Ferdig & Kaplan-rakowski, 2020). It is undeniable that the use of technology is an important requirement in the learning aspect (Mahmood, 2021; Lim et al., 2020), therefore with the existence of increasingly sophisticated technology at this time facilitates the implementation of learning activities (Wiana et al., 2018; Zaheer et al., 2018). Apart from technology, changes in aspects and structure of learning activities are also marked by the emergence of various models, strategies and new learning media (Kartikasari et al., 2018; Akkaya, 2021).

One technology that is emerging and widely used in the learning process is interactive multimedia, interactive multimedia is almost certain to facilitate students in achieving learning goals and mastering various 21st century skills (Yusniza, 2019; Ilgaz, 2021). This is because, through the media, the material packaged in it becomes more interactive and interesting for students to read and study (So et al., 2019; Ma'ruf et al., 2019), because it contains various media components such as narrative text, video, animation and even sound. At present, the presence of interactive multimedia has penetrated at various levels of education from elementary to higher education in almost all parts of the world (Rejekiningsih et al., 2021; Kurniawan et al., 2019; Han & Niu, 2019). The tendency to use interactive multimedia to support learning activities is currently increasing, this is indicated by the policies of various educational institutions which require teachers to be able to make ICT an integrative form in learning activities. This is

in line with research results which show that the majority of students agree with the development and use of interactive multimedia to support learning activities. It can be seen from the survey that 89% of students were interested in interactive multimedia.

Besides that, it has been explained that interactive multimedia technology can also be filled with material that is not only in the form of text or narration, but can be filled with a number of text, images, to audio-visual in one application program (Han & Niu, 2019; Wiyono et al., 2019), the results of the needs analysis in this study also show that so far the teacher has used learning media in an audio-visual format, of course with interactive multimedia it will be able to accommodate the teacher's habit, not even eliminate it. Another thing that is an advantage of interactive multimedia is the flexibility of operating interactive multimedia, interactive multimedia can be operated on several technological devices such as laptops, computers, or smartphones, all three of which are very familiar and are often used by students (Roy, 2019; Martín-Gutiérrez et al., 2017; Sekarwangi et al., 2021; Mahdi, 2019; Kusuma et al., 2022). It cannot be denied that there are many benefits attached to interactive multimedia when used as learning media to support and facilitate student learning activities. Therefore, the development of this interactive multimedia product is based on the results of the needs analysis. The results of the development of interactive multimedia products also succeeded in showing that this product was feasible according to material experts and media experts who respectively obtained an average rating of 83% and 86%, both of which were included in the very feasible category to be used as learning media. The results of this assessment are of course inseparable from the several components that make up interactive media and all of them are fulfilled in the program that was developed (Perdana et al., 2021; Lutfi et al., 2021). The use of interactive multimedia through several empirical facts that prove that interactive multimedia contributes significantly to achieving academic achievement, increasing student competence both stated in the learning objectives and other soft skills they need (Wiyono et al., 2019; Wang et al., 2019).

It should be noted that, the results of this research indicate that it is very possible to create learning by utilizing technology that suits the needs of students, where the creation of interactive media is of course based on the results of a needs analysis, then obtaining a feasibility assessment from experts and practitioners. The assessment given by experts and practitioners is included in the good and proper category so that the results of this research can be a reference for readers that each learning media before being used must go through a series of assessment processes first to determine the level of feasibility (Risma & Revi, 2022; Rohmah & Tegeh, 2022). Therefore, it is hoped that through innovative digital-based learning media in interactive multimedia formats which in its development based on the results of the needs analysis can create an effective learning atmosphere. many experts argue that learning media has benefits in increasing and directing students' attention to always focus on subject matter, so that it can motivate students to take part in learning activities, and allows students to study independently according to their learning style (Li & Ren, 2018; So et al., 2019).

Thi results was product in the form of interactive multimedia can be the first step for an innovation in the application of digital learning media for learning activities, especially for sociology subjects in high schools which have a major contribution in increasing student tolerance and tolerance. However, this research has limitations, namely the research only focuses on needs analysis of the development process and product feasibility, the trial process was not used by students either to find out its feasibility or the level of effectiveness of the interactive media product. Therefore, it is necessary to carry out empirical tests regarding the effect of products that have been developed on competency variables that need to be measured. Besides that, another suggestion for further research is to be able to develop an interactive multimedia product for other subjects that require it according to needs analysis, as well as measure the impact and influence of the use of interactive multimedia on student academic achievement, it is hoped that through the creation of various digital learning media products it will make it easier students in accessing learning materials.

4. CONCLUSION

Referring to the results of the research, information was obtained that basically the teacher was accustomed to using technological devices, it can be seen from the format of learning media that he usually uses, such as audio-visual media. Besides that, students also have proficient competence on how they operate technological devices such as laptops and smartphones. The results of this study seem to be in line with the research objectives, which are successful in creating an interactive media product that has been assessed by material experts, media experts and sociology subject teachers with a good level of feasibility so that it can become a learning resource for high school students. Therefore it is very important for educational institutions through teachers to be open to the presence of technology and then integrate it into learning activities.

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