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Practicality and Effectiveness of Student Learning Using Smart Apps Creator Media to Improve Critical Thinking Abilities and Student Learning Outcomes

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Abstract: Efforts made by the government to break the chain of spread of the Covid-19 virus include changing the face-to-face learning system to online distance learning, causing learning to be disrupted. The limited knowledge and skills of teachers in operating IT-based learning facilities, for example laptops and electronic learning media, have an impact on teachers having difficulty delivering learning effectively. Likewise, students who during the learning process do not have adequate supporting facilities, and many students cannot even operate IT-based learning media, causing the learning process to be ineffective. So that low student motivation and enthusiasm for learning causes student learning outcomes to decrease. The solution that researchers use in the learning process is to use the learning media "Smart Apps Creator" to facilitate effective learning because the use of Smart Apps Creator media is very practical in its operation, whether used in the online or offline learning process, it can even be used wherever students are, whether outside the schedule learning, so that it can make learning effective online. This can have an impact on improving student learning outcomes. This research aims to create practical learning using Media Smart Apps Creator. This type of research is quasi-experimental research with a learning practicality test using the average percentage of teacher and student responses, and a learning effectiveness test using a paired sample t-test. The average percentage of practical response test results from teachers and students was 93%, meaning that the Smart Apps Creator media is very practical to use as an online learning medium. Continuing research on effectiveness testing with an average pretest score of 53.9 and posttest of 84.4, the results of the paired sample t-test with a significance value of 0.000 means that the Smart Apps Creator media has high effectiveness in improving student learning outcomes. From the results obtained, it can be concluded that the use of Smart Apps Creator learning media is very practical and effective when learning online.

Keywords: Covid-19; Effective learning; Learning outcomes; Practicality; Smart apps creator

Introduction

Covid-19 in the city of Wuhan, China was the first pandemic to be precise on December 11 2011. The Covid-19 pandemic outbreak became increasingly unstoppable with a strong escalation of its spread across space and time on a wide and fast scale, forcing humans to limit interactions between humans. Restrictions have been implemented in various countries to help break the chain of spread of the corona virus. So, what about the

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learning systems used by schools in the world? Of course learning at school is not fine. Schools as formal educational institutions with routine face-to-face conventional teaching and learning activities in classrooms are really feeling the impact (Sintema, 2020; Abidah et al., 2020). The learning change implemented in schools is online learning. This means that online learning in the Covid-19 pandemic era requires appropriate IT-based learning media (Fernando et al., 2020; Reimers et al., 2020).

Reflecting on the learning system in the world, several schools in the United States hold learning activities in the open, this is done so that teachers and students can get fresh air. In New York State, learning uses outdoor activities. In Chinese cities, the learning strategy uses a distance learning system. And one of the schools in La Grand-Croix and Val-de-Reull requires teachers and students to wear masks and face shields during school activities. On the other hand, schools in Neustrelitz, North Germany use shift learning, where the school holds tests every two weeks. Students who are positive for the corona virus must be in self-quarantine for two weeks, and students who are negative receive a green sticker to remain in school.

So, how is learning media used during the learning process in various countries? Do all countries use IT-based learning media? There are many different learning processes in various countries. China, learning in schools uses a distance learning system using applications such as Zoom and Edmodo. In Denmark, learning is carried out by teachers using a distance learning system. This allows several IT-based applications to be used by schools, one of which is Google Meet and Zoom. For Germany, exposure to Covid-19 is relatively small compared to other countries in Europe, so learning is carried out in open spaces or outdoors provided the number of students is small. In the United States, learning carried out by teachers relies on online learning. The online learning category is carried out using distance learning applications with Zoom, Edmodo, Google Meet and other applications.

Of course, all countries carry out online learning, supported by excellent network facilities. The problem found is whether all areas in remote areas of the country have adequate network access? Reporting from i-Ready digital instruction and assessment software, 60% of students have difficulty logging in to online learning. Let's look at the existing learning system in Indonesia. During the Covid-19 pandemic, Indonesia carried out distance learning. Applications that support the distance learning process in schools use the Zoom application, Google Meet, Online Learning, and learning applications provided by the Ministry of Education for teachers. This learning application can be operationalized using good internet network facilities.

To face these problems, schools need advanced technology including hardware and software to be used effectively in online learning (Mukhtar et al., 2020). In this case, the use of IT-based learning media is suitable for distance learning. Time adjustments are needed for schools in Indonesia, especially by teachers who must be able to comprehend, understand and be able to use IT-based learning media. Online learning materials are carried out by teaching using IT-based media, so teachers must be able to develop IT-based media and learning methods in accordance with the online learning process in the Covid-19 pandemic era (Li et al., 2020; Sahu, 2020; Wu & McGoogan, 2020).

To overcome problems that exist in remote areas of various countries, namely inadequate internet network facilities, Smart Apps Creator-based learning media is IT-based learning media that can be used without using an internet network. The application of SAC media is very easy, because SAC media does not require computer coding; teachers can develop their creativity in making learning media with the desired learning material. So that IT-based learning media in the form of Smart Apps Creator media has become a media that is very easy to use by teachers and students in the era of the Covid-19 pandemic (Hikmah et al., 2017; Maulidah & Prima, 2018; Sobron et al., 2019; Muhajarah & Sulthon, 2020; Sari et al., 2020; Dewi, 2020; Handayani & Alfina, 2022).

Smart Apps Creator learning media is learning media that has high effectiveness and practical learning for teachers and students and is easy to use. Media Smart Apps Creator can improve student learning outcomes during online learning in the era of the Covid-19 pandemic (Sriarunrasmee et al., 2015; Lebuda et al., 2016; Swart, 2017; Agnoli et al., 2018; Yeh et al., 2019; Henriksen et al., 2020).

Method

This research uses Quasi Experimental research with a pretest-posttest control group design (Sugiyono, 2012). The research was conducted at SMA Negeri 3 Samarinda with 6 classes and SMA Negeri 4 Samarinda with 1 class. The research subjects were 225 class students. The type of data used is quantitative data to measure the practicality and effectiveness of the Smart Apps Creator learning media. The data analysis technique used is a practicality test using a Likert scale and an effectiveness test by calculating the pretest average and the posttest average increase. These results were then continued with paired sample t-test analysis to determine the effectiveness of Smart Apps Creator media as a learning medium in schools.

Samples	The Beginning Condition	The treatment	The End condition
The Experiment Class	O_1	X	O_2
The Control Class	O_3	Y	O_4

Figure 1. Pretest-posttest control group design

Result and Discussion

Practicality Test

The Student Practicality Test was carried out at SMA Negeri 3 Samarinda with six classes X MIPA and SMA Negeri 4 Samarinda with one class X MIPA. The average percentage of students' practicality tests can be seen in Table 1.

Table 1. Student Practicality Test

School	Class	Percentage of Student Practicality
SMA Negeri 3 Samarinda	X MIPA 1	84.9
	X MIPA 2	89.1
	X MIPA 3	92.4
	X MIPA 4	90.9
	X MIPA 5	89.1
	X MIPA 6	87.9
SMA Negeri 4 Samarinda	X MIPA 5	89.1
Average Percentage of Student Practicality		89.1
Category		Very Practical

Description: Recap of practicality test results by students of 89.1% in the very practical category so that the Smart Apps Creator media is very practical for use in online learning for students at SMA Negeri 3 Samarinda and SMA Negeri 4 Samarinda.

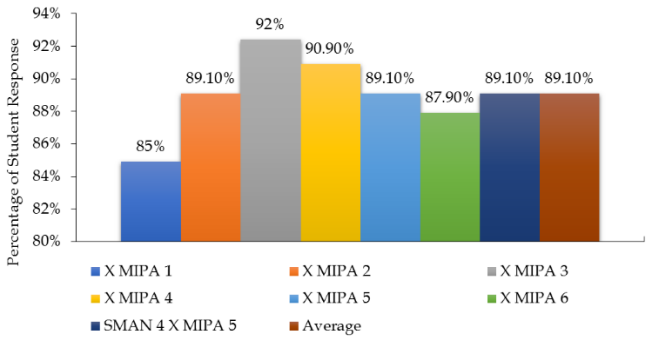

Figure 2. Percentage of student response assessment

The percentage of Smart Apps Creator media practicality tests in each class can be seen in Figure 2. Figure 2 shows the percentage of student responses from SMA Negeri 3 and SMA Negeri 4 Samarinda. The results of this data provide an average practical test score for students in seven classes, so the average practicality test responses of teachers and students can be seen in Table 2 and Figure 3.

Table 2. Average Practicality Test

Practicality Test	Percentage (%)
Teacher response	97
Student response	89.1
Average percentage	93
Category	Very Practical

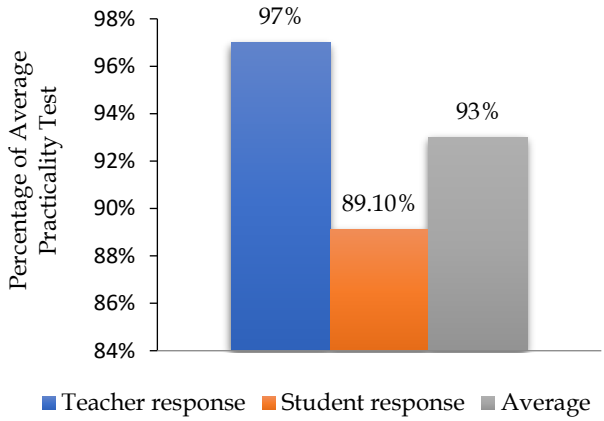

Figure 3. Average practicality test

Figure 3 shows the percentage of teacher and student response assessments with an average of 93% in the very practical category. The percentage of total practicality of Smart Apps Creator media can be seen in Figure 4.

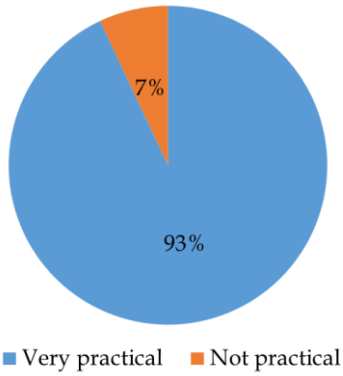

Figure 4. The percentage of media practicality test

Effectiveness Test

The effectiveness test was carried out at SMA Negeri 3 Samarinda using six classes X MIPA and SMA Negeri 4 Samarinda using one class X MIPA. The effectiveness test was carried out using students' pretest and posttest scores. A recap of the effectiveness test analysis can be seen in Table 3 and Figure 5.

Table 3. Recap of Effectiveness Test Data Analysis

School	Class	Score	
		Pretest	Posttest
SMA Negeri 3 Samarinda	X MIPA 1	53.1	84.8
	X MIPA 2	54.4	81.7
	X MIPA 3	55.8	81.8
	X MIPA 4	53.3	90.4
	X MIPA 5	53.3	86.3
	X MIPA 6	54.5	84.2
SMA Negeri 4 Samarinda	X MIPA 5	52.8	81.3
Average Pretest - Posttest Score		53.9	84.4

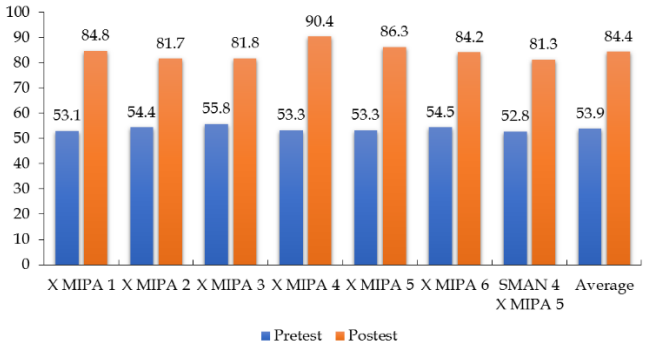

Figure 5. Analysis of effectiveness test data

Figure 5 shows the analysis of effectiveness test data with recap data of the average student pretest score of 53.9 and student posttest score of 84.4. There is a significant value, namely 30.5, so learning using Smart Apps Creator media is very effective for use in SMA Negeri 3 Samarinda and SMA Negeri 4 Samarinda class X MIPA.

In this research, researchers used a paired sample t-test with the SPSS 24 program to see whether there were differences before using the Smart Apps Creator learning media and after using the Smart Apps Creator media. The paired t-test (Paired sample t-test) uses pretest scores and posttest scores from a sample of 7 classes X MIPA at SMA Negeri 3 and SMA Negeri 4 Samarinda. The results of the paired t test (Paired sample t-test) can be seen in Table 4.

Table 4. Paired T-Test

Paired Samples Test							
		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	Posttest - Pretest	30.69778	21.03605	1.40240	21.889	224	.00

Based on the results of the paired t-test (Paired sample t-test) in Table 4, it shows that the significance value (P) is 0.00 with the test criteria P (0.00) < α (0.05), then H0 is rejected and Ha is accepted, which means that there is an influence of media use Smart Apps Creator learning in class X MIPA ecosystem material. So it can be said that the use of Smart Apps Creator learning media has high effectiveness in learning class X MIPA at SMA Negeri 3 and SMA Negeri 4 Samarinda.

Discussion

Based on the results of the practicality test of the Smart Apps Creator learning media for SMA Negeri 3 students on ecosystem material, it showed a score of 89.1%, meaning it was in the very practical category. Likewise, in the practicality test of the Smart Apps Creator learning media, the teacher's assessment showed an average of 97% in the very practical category. So the average practicality test for teachers and students is 93%. This is because the use of Smart Apps Creator learning media can be operated by students and teachers without using an internet network (offline) and can be used anywhere and anytime. This is in line with the opinion of Pertiwi et al. (2020) that the Smart Apps Creator learning media is student-centered learning so that it can carry out problem solving activities and make students think more critically, present creative ideas and communicate with lessons more broadly.

Practicality is a very important point in developing learning media, especially Smart Apps Creator media. Media can be said to be practical if the media can be used anywhere, and at any time without time limits and circumstances. This is in line with the opinion of Primandari (2019) which states that learning media is in the form of learning process aids to convey lesson material. According to researchers, the media developed is very practical to use in schools, especially for teachers and students, both in online and offline learning. Utilization of this media can be carried out anywhere and at any time without time limits.

This is in line with the opinion of Prabowo et al. (2016) who states that the level of practicality of a learning media can be measured based on the ease of use in learning activities and with the aim of developing the learning media. According to the researchers, the use and application of the Smart Apps Creator media is very practical, this is because when teachers and students operate it, it is very easy/practical to try the process of installing the application to the use of the media in the biology learning process, especially and what is important when using the learning system by The government changed from face-to-face learning to

distance/online learning because the Covid-19 pandemic situation is still high. In line with the opinion of Susanti et al. (2019) which states that the characteristics of an educational product that has high practical qualities is that the product can be used practically and easily by students and teachers in using the product.

Based on the results of testing the effectiveness of learning media through pretest scores and posttest scores using Smart Apps Creator learning media. In ecosystem material combined with the Problem Based Learning (PBL) model, researchers hope that students' abilities will be formed in terms of critical thinking skills, skills and communication skills. This is in line with the opinion of Suryani (2018) who said that the effectiveness of interactive learning media on learning outcomes can be visualized with biological material. According to researchers, Smart Apps Creator media visualization. To be effective because there are animation, Sound, images, and background theme.

The existence of animation facilities in the Smart Apps Creator media makes student learning active because learning animations are a collection of images that are processed in such a way as to produce movements that are equipped with audio so that they appear alive and store learning messages (Furoidah, 2009). Learning animation can be used as a teaching tool used to convey lesson material. This means that one of the vehicles used by a teacher is in the form of moving images which can attract students' attention and motivate students during the learning process. Apart from that, animation provides advantages, for example messages that can be received more evenly by students when the teacher explains a process more realistic, can be repeated and stopped as needed.

Animation media can make abstract subject matter more concrete. Likewise, complex subject matter can be presented more simply with the help of animation media. Animation media can also overcome the constraints of limited space and time. Something that happens outside the classroom, even in outer space, can be presented in the classroom through the help of animation media. Likewise, we can present several events that have occurred in the past in front of students at any time. With animation media, an important event that is happening on another continent can be presented instantly in the classroom. Apart from that, animation media can help overcome the limitations of human senses. Lesson objects that are too small, too big or too far away can be learned through the help of the media. Likewise, objects in the form of events that are very fast or very slow, we can see clearly through animation media, by slowing down or speeding up the event.

Next is the Smart Apps Creator media visualization becomes effective because there is sound, with the sound system on the Smart Apps Creator media, it can make students more interested in learning. Because a sound system is an arrangement of electronic components designed in such a way as to increase the power of sound, so that sound can be heard clearly by many people, especially students when using learning media (Davis & Jones, 1990). The sound system plays an important role in carrying out activities as well as in learning activities. With sound in live performances, it becomes an inseparable part of the stage setting and even the performance itself. Sound management is closely related to sound reinforcement settings so that they sound loud without neglecting the quality of the sounds being amplified.

As is known by the Smart Apps Creator media. becomes effective because of the image contained in the media. Of course, this can create an attraction for students because as Subana et al. (1998) states the benefits of pictures as a learning medium. It creates an attraction for students, because it really makes it easier for students to understand and comprehend, it also makes abstract understanding easier, clarifies and enlarges parts what is important/small so that it can be observed, as well as abbreviating a description, information that is clarified with words that might require a long description.

Next is the Smart Apps Creator media visualization becomes effective because there is a visualization of the background theme. The meaning of Background is the background of an object. Another meaning states that Background, or what is known as background, is one of the quite important design components. Backgrounds are mainly used to provide visual decoration to an element, which will result in increased ease of reasoning or understanding of a piece of content. Having a background that has attractive colors and images can really increase students' learning motivation media that is suitable for ecosystem materials. As well as Smart Apps Creator learning media could be a substitute for ecosystem material in biology learning.

Smart Apps learning media is a learning media that is suitable for use in order to improve the online learning process in the Covid-19 pandemic era. Because the Smart Apps Creator learning media is a learning medium that uses advances in ICT (information and communication technology). Use of Smart Apps Creator learning media which is easy for teachers and students to operate, making it a Smart Apps Creator learning media very effective. Smart Apps Creator learning media has high effectiveness, thus providing better IT-based media implications for classroom application.

So from the data above, it can be concluded that learning uses the Smart Apps Creator media application is very effective for use by teachers and students in

online learning and Smart Apps Creator media applications can improve students' critical thinking skills, students' communication skills, student learning outcomes in online learning in the era of the Covid 19 pandemic.

Conclusion

Learning media based on Smart Apps Creator Android is IT-based learning media that can be used easily, effectively, and without an internet/offline network by teachers and students in online learning in the era of the Covid-19 pandemic. Learning media based on Smart Apps Creator Android has high validity, very practical in use, and effective in improving student learning outcomes. Smart Apps Creator Android-based learning media can train students' critical thinking, student creativity, student collaboration and student communication in the online learning process. The design appearance of Smart Apps Creator Android-based learning media is very attractive, making students enthusiastic about learning and easily understanding ecosystem material. So learning media based on Smart Apps Creator Android is very important for high school teachers to develop in online learning in the era of the Covid-19 pandemic.

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Author Contribution
Elsje Theodora Maasawet conceptualized the research idea, designed of methodology, management and coordination responsibility; K. P Candra and Herlan Perdana Putra analyzed data, conducted a research and investigation process; Jullya Christin Kolow conducted literature review and provided critical feedback on the manuscript.

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Conflicts of Interest
The author declared no conflict of interest.

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