

Smartphone Learning Media Prototype Model Based on SAC (Smart Apps Creator) For 4.0 Learning

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ABSTRACT

Smartphone-based learning media is an alternative for developing learning media that can infiltrate the limitations of space and time. This study aimed to determine the effectiveness of smartphone media for learning in the 4.0 era from media developed using the SAC (Smart Apps Creator) application. This research and development type uses the Hannafin & Peck design model. The research subjects used a purposive sample technique from 35 students of class XI IPS 3 SMA Jepon, Blora Regency, Central Java. Data analysis using Mixed Methods, data obtained by filling out checklists, questionnaires, and filled tests to conclude its effectiveness. Based on the research results, SAC (Smart Apps Creator) media is fun, easy to understand, interesting, practical, and not boring. The level of complete learning reached 91.4%. Students become accustomed to using technology 4.0 in learning, so they are expected to develop critical, creative, communicative, and collaborative thinking.

Keywords:

Learning; Smartphone; Smart Apps Creator; Learning 4.0.

ABSTRAK

Media pembelajaran berbasis smartphone merupakan salah satu alternatif pengembangan media pembelajaran yang mampu menembus keterbatasan ruang dan waktu. Penelitian ini bertujuan untuk mengetahui keefektifan media smartphone untuk pembelajaran di era 4.0 dari media yang dikembangkan menggunakan aplikasi SAC (Smart Apps Creator). Jenis penelitian ini adalah penelitian dan pengembangan dengan menggunakan model desain Hannafin & Peck. Subjek penelitian menggunakan teknik purposive sample dari 35 siswa kelas XI IPS 3 SMA Jepon Kabupaten Blora Jawa Tengah. Analisis data menggunakan Mixed Methods, data diperoleh dengan mengisi checklist, angket, dan tes isi untuk menyimpulkan

keefektifannya. Berdasarkan hasil penelitian, media SAC (Smart Apps Creator) sangat menyenangkan, mudah dipahami, menarik, praktis, dan tidak membosankan. Tingkat ketuntasan belajar mencapai 91,4%. Siswa menjadi terbiasa menggunakan teknologi 4.0 dalam pembelajaran, sehingga diharapkan dapat mengembangkan pemikiran kritis, kreatif, komunikatif, dan kolaboratif.

Kata Kunci:

Pembelajaran; Smartphone; Smart Apps Creator; Pembelajaran 4.0.

1. Introduction

Based on the theory, learning media is a tool to help in the learning and teaching process. Everything that can use to stimulate feelings, attention, and abilities or skills of learner through activity communication and could push the learning process takes place could be a learning media. In the development of education, media education is used as a source to learn what you can give real understanding for participants learn. The type of media that is widely used in learning activities is media with the type of multimedia. Various multimedia studies need to be studied to make a major contribution to achieving learning objectives, and there is a need for adjustments to the latest technology. According to Wijayanto et al. (2018), the demands of the increasingly rapid development of science and technology in the field of education must make users and developers think and act logically to minimize the problems caused, so based on this, innovative solutions are needed. One of the innovative solutions is smartphone media.

Smartphone Media is a mobile device developed with applied system operation based on a computer. Laurillard (2017) argues that using smartphones in education makes this technology have an important role, so this can be used in delivering information to students. Using smartphones as learning media, powered by Rogozin (2012:913), states that using a smartphone allows for learning more deeply for students. Based on experience, by using smartphones, students can develop ways of learning through searching for information on the internet, as well as practicing their skills in carrying out practical learning. A survey from the digital marketing research institute Emarketer estimates that in 2018 the number of active smartphone users in Indonesia will reach more than 100 million people. Based on this amount, Indonesia is the country with the fourth largest active smartphone users in the world after America, India, and China. Smartphone users in Indonesia are evenly distributed, both from children to adults. There is no age limit for owning a smartphone, and the use of its features has not been maximized. The survey by Opera in 2018 in Indonesia showed that 10% of Android users were aged 13-17. This proves that children from junior high to high school pay considerable attention to Using a smartphone will impact student learning activities (Wahyudi, 2015).

The development of learning media using smartphone technology is one alternative to provide 21st-century skills to students, including: (1) Communication, (2) Critical Thinking and problem solving, (3) Collaboration, and (4) Creative and Innovative. Based on Bloom's Taxonomy (forehand, 2010), which has been revised by Krathwoll and Anderson, the abilities that students need to achieve

are not only LOTS (Lower Order Thinking Skills), including C1 (knowing) and C-2 (understanding), MOTS (Middle Order Thinking Skills) namely C3 (applying) and C-4 (analyzing), but also be an increase to HOTS (Higher Order Thinking Skills), including C-5 (evaluating), and C-6 (creating). The application of 21st-century learning (4C), HOTS, scientific processes, PPK, and integration of literacy in learning aims to improve education quality to answer future challenges. Both internal challenges to achieving the 8 (eight) National Standards for SNP Education and external challenges are globalization. Learning using smartphones as a system is seen as an effort to improve the quality of learning by trying to infiltrate the limitations of space and time (Darmawan, 2016). Mobile learning complements learning and provides opportunities for students to learn less mastered material anywhere and anytime (Musa, 2019). This learning media will provide a different experience for students.

The smartphone media uses the Smart Apps Creator application, which can be developed based on Android and iPhone OS. According to Syahputra & Prisma (2021), Smart Apps Creator is an application to create android/ ios mobile apps without programming code. The output is html5 and exe. The media has the potential to be developed because it is relevant to the technology now used in education. In addition, among students at SMAN 1 Jepon, 100% already have an Android mobile phone. So, the chances that this learning media can be applied in education are getting higher. The specific target in education is the "whole brain". Education quality is a challenge and opportunity in the era of the 4.0 industrial revolution. So this becomes a challenge for educators to help realize faithful and devoted students with character, healthy, educated, skilled, and ready to compete.

Students have high-level thinking skills and can distinguish between facts and opinions, identify relevant information, solve problems, and conclude the information that has been analyzed. Three assumptions about higher-order thinking processes are related to thinking and learning. First, the level of thinking cannot be separated from the level of learning and is even interdependent. Second, thinking is related to the content of the subject matter in real life, which will help to learn higher-order thinking skills. Third, higher-order thinking involves various thought processes applied to complex situations with many variables and even in difficult situations. So the researchers made a prototype model of smartphone learning media based on Smart Apps Creator.

2. Methods

2.1 Research Methods

This type of research is research and development (Research & Development). Sugiyono (2010) argues that research and development methods are used to produce certain products and test their effectiveness of these products. In this research, Research & Development uses the Hannafin & Peck model. This model consists of a needs assessment stage, a design stage, and the third stage is development and implementation, in all these stages involve an evaluation and revision process (Tegeh et al., 2014). In education, products produced through R&D research are expected to increase

education productivity, namely graduates who are numerous, qualified, and relevant to needs (Haryati, 2015).

2.2 Population and Sample

This research was conducted at Jepon High School, Blora Regency, Central Java. The sampling technique used was the purposive sampling technique. Purposive sampling is used as a sampling technique based on the consideration that the data obtained can represent the population in a representative manner (Arikunto, 2010; Sugiyono, 2010). The sample of this research is class XI IPS 3, which consists of 35 students.

2.3 Data Collection

The data collection technique used Mixed Methods, filling out questionnaires and tests. Questionnaires were used to determine students' perceptions regarding the developed learning media and media needs to strengthen the need to create learning media. The data from this questionnaire are quantitative. The test is used to analyze student knowledge after applying the media so that the data is obtained in the form of quantitative data. The form of this test is in the form of a quiz made in this learning media.

2.4 Data analysis

The analysis technique is descriptive qualitative, and quantitative. Descriptive analysis creates a picture of a situation or phenomenon (Mulyawan, 2013). Qualitative descriptive analysis is used to describe the learning media developed both in the manufacturing process and the results, to describe students' perceptions of the developed learning media, and to describe the needs of the media to strengthen the need to create learning media. Quantitative descriptive analysis analyzes students' knowledge after treatment through media applications.

This quantitative descriptive analysis provides a description or discussion of the research results in scores/numbers. The test result data in scores/numbers are converted into percentage form, then described by tabulating the data in the relative frequency distribution table. The data is presented in tables and diagrams to make it easier to understand the contents.

3. Results and Discussion

3.1 Results

The first stage is the needs assessment stage, the results of the needs analysis of the learning media using the checklist given to the students. Most students chose and were interested in smartphone learning media based on SAC (Smart Apps Creator). One student named Aldi, class XI IPS 3, said, "learning using smartphones is fun, makes me not sleepy, makes me more concentrated" (interview result, 10 February 2020). The next stage is the design stage. This stage is preparing a graphic design (interface display) for making a prototype of a learning media, including how to use

it, designing and determining what goals to achieve, what indicators are used to achieve these goals, and what competencies to be considered including content (materials, activities & evaluation forms) of the media. According to Pribadi (2009), in the design stage, the developer must find answers about 1) special abilities and competencies that students must have 2) indicators used to measure student success, 3) what equipment or conditions are needed so students can do something to master these competencies, 4) teaching materials and activities that support the learning program.

Researchers made the prototype model of smartphone-based learning media to make it easier for teachers to teach sociology. The steps for making smartphone-based learning media are as follows:

- (1) The prototype model begins with installing the SAC (Smart Apps Creator) application, then making material for an application called sociology.Q.

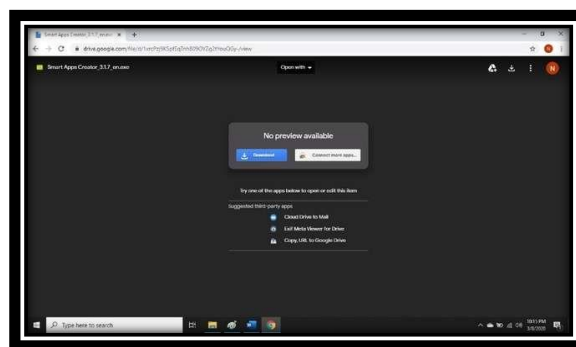


Figure 1. Installation of SAC (*Smart Apps Creator*) application

- (2) Enter the download address for the application master file (Smart Apps Creator) in the web browser and press enter <http://bit.ly/SAC-installfix>.
- (3) Download the file that matches the computer specs by right-clicking the download. When the downloaded file is successfully downloaded, print the screen or print the display screen on the screen. After that, extract the zip file.
- (4) Open the Smart Apps Creator_3.1.7_en.exe application file by double-clicking to install. There will be a question on the screen. Double-click on the Smart Apps Creator_3.1.7_en.exe file, and click yes to continue the installation.
- (5) Open Application Smart Apps Creator_3.1.7_en,
- (6) Make the chart map learning multimedia competence based on android as in Figure 3.

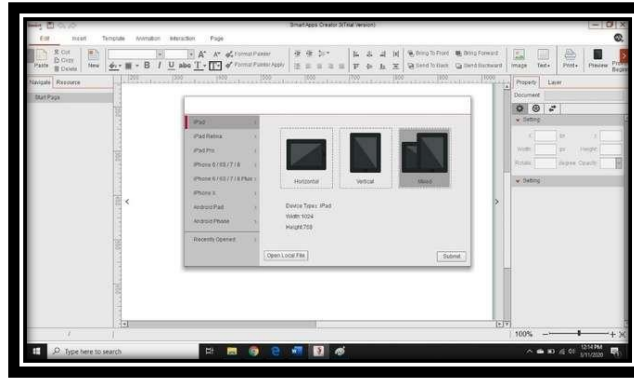


Figure 2. Display Application *Smart Apps Creator*

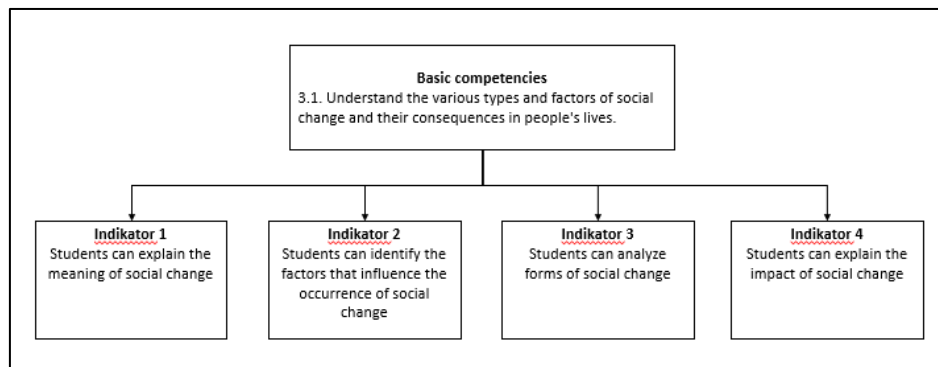


Figure 3. Basic Competency Map

The function of making this basic competency map as the main material will be an application in android-based learning media. Four indicators will be delivered, and this will make it easier for teachers to make media visualizations.

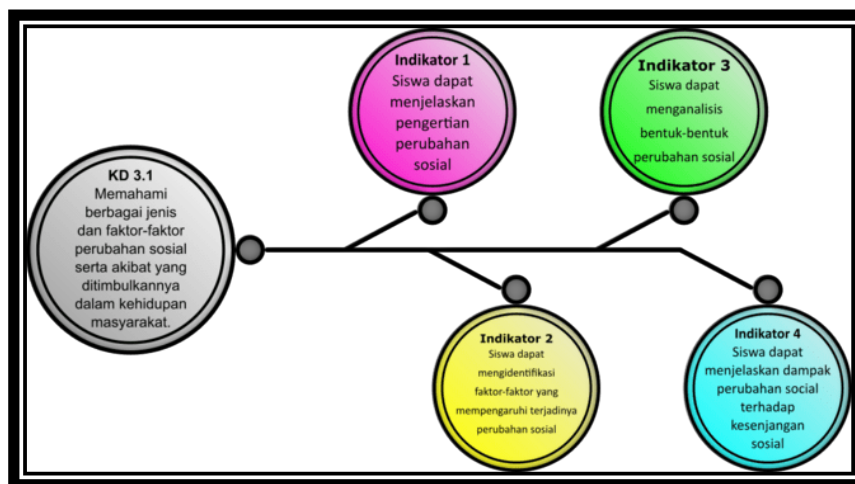


Figure 4. Visualization map competence based on application *Sociology.Q*

Figure 4 explains that in KD 3.1, understanding the various types and factors of social change and their consequences in people's lives is translated into four indicators. The first indicator is that students can explain the meaning of social change. The second indicator is that students can identify factors that influence social change. The third indicator is that students can analyze forms of social change. The fourth indicator is that students can explain the impact of social change on social inequality.

(7) After making chart map competence, then make map Theory from map competence base in Figure 5.

The material map displayed in the Sosiologi.Q application is an understanding of social change, the factors that influence the occurrence of social change, forms of social change, and the impact of social change on social inequality.

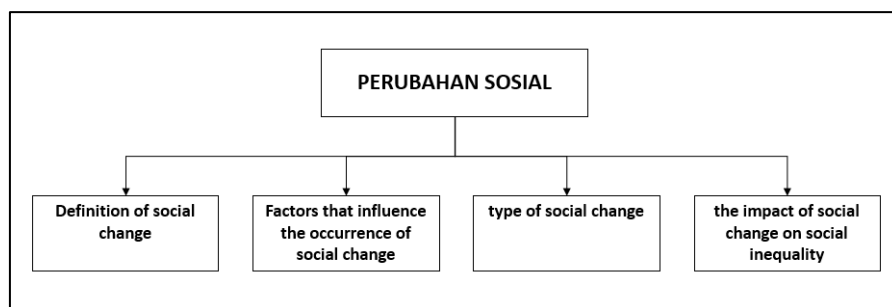


Figure 5. Material Map

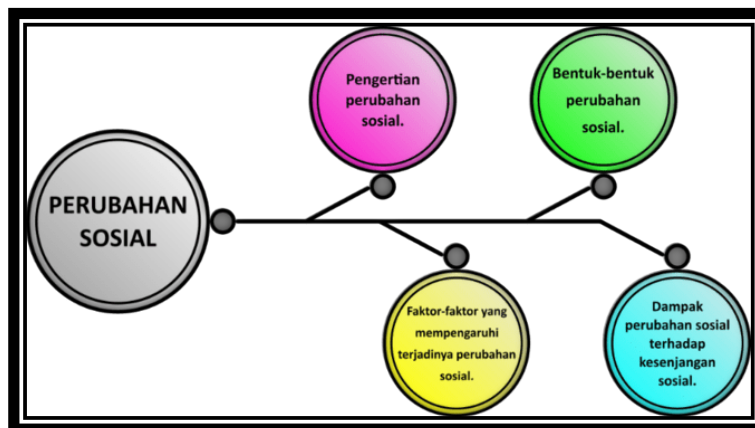


Figure 6. Visualization map material in app Sociology.Q

(8) This outlines the contents of android-based learning multimedia media, making it easier to create learning media. The following outlines the learning multimedia media in 1.

After outlining, the next stage is the final stage of development & implementation. This outline will be developed into media content to make it easier to visualize the application, like text, video, and images. Each indicator describes the subject matter, the media used, and the competency test. As in the example in the first indicator, students can explain the meaning of

social change. The media used is an image that shows: social change, text to explain the meaning of social change, and Video/Audio: video related to social change. Meanwhile, the competency test uses a game to match questions and answers.



Figure 7. Matchmaking

Figure 7 is a game of matching/matching questions and answers. This game, functions as entertainment and reinforcement of social change material.

Table 1. Outline of Learning Multimedia Media Content

No	Indicator	Theory tree	Media	Competency Test
1	Students could explain the definition of changing social	definition change social	<ul style="list-style-type: none"> Image showing: change social Text for giving description definition change social Video/ Audio: related videos with changed social 	Matching game questions and answers
2	Students can identify the factors that influence the occurrence of social change	factors that influence the occurrence of social change	<ul style="list-style-type: none"> Text to explain the factors that influence the occurrence of social change. Figures show the occurrence of factors that influence the occurrence of social change. 	Figure matching game with factors influencing social change
3	Students can analyze the type of social change	Type of social change	<ul style="list-style-type: none"> Text to describe the type of social change Image showing type of social change 	Guessing game Figure the type of social change
4	Students can explain the impact of social change on social inequality	impact of social change	Text to describe the impact of social change	Practice questions related to the impact of social change

(9) Description of android-based learning multimedia materials.

The description of the multimedia material makes it very easy to visualize the media based on the description of the material from the existing indicators. The description of the material contains what things will be conveyed in the application, for the description of the material can be described in full. Relating in full to make it easier to make applications, it can be made in

PowerPoint. If the material and its visualization have been created, making media with the SAC (smart apps creator) application will be fast. Then proceed with making the flow chart, which can be seen in the Figure. Making this flow chart is effective for seeing the design of the smartphone-based media that will be made. This smartphone-based learning media begins by clicking start. Motivational sentences and apperception videos will appear. The opening contains a menu. The menu has five icons: home, basic competencies, materials, evaluation, and developer.

(10) Learning media prototype using SAC (*Smart Apps Creator*)

Install the SAC application on a PC (personal computer) or desktop computer, followed by opening the SAC application by clicking on the android phone. There are three choices of horizontal, vertical, and mixed screen shapes. Select the vertical shape, and set the Length to 720 and the width to 1280 to fit the smartphone screen.

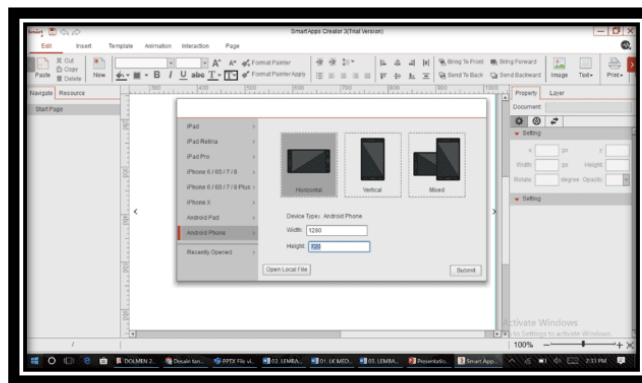


Figure 8. Display SAC screen

The screen that appears after clicking submits on the initial SAC screen. Then create a section on the worksheet consisting of five sections: Start Page, Opening, Home, Content, and Developer.

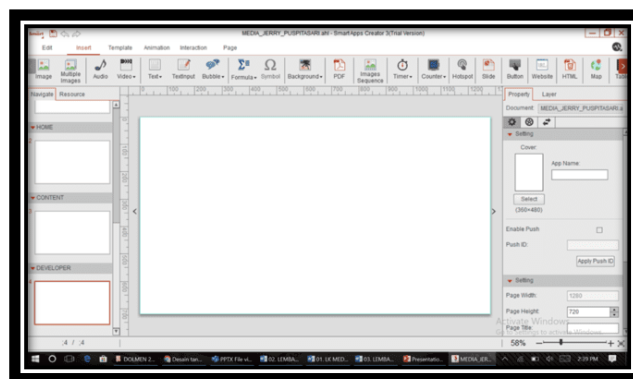


Figure 9. Section on Sheet SAC Work

Create a section by right-clicking the sheet and renaming it according to the required section of the worksheet, which consists of 5 sections, including Start Page, Opening, Home, Content, and Developer.



Figure 10. Display start page

Logo creation begins with designing according to the author's imagination, associated with the suitability of the material. For asset images, you can make your own or search on google.



Figure 11. Insert Background, Text, and Video/audio

Insert the background image from the design on the canvas into each section and page in SAC. The number of pages adjusts the material displayed and the teacher's needs.

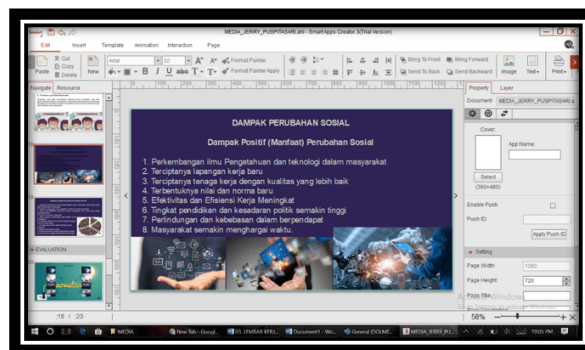


Figure 12. Enter Assets On The Page

Put assets on each canvas. This adjusts the material and images associated with the material. Assets can be images, animations, music, or videos that match the material displayed. Try not to include too many unrelated images.

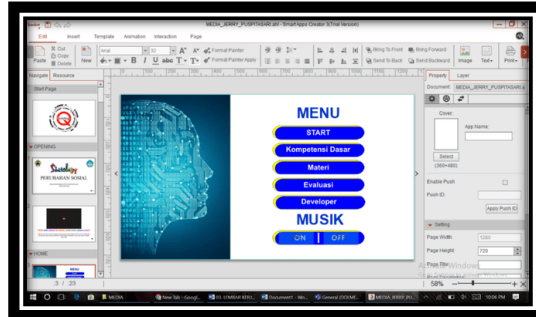


Figure 13. Menu Display

The menu display, according to the needs that will be displayed in the application, the application includes five things: start (initial display), basic competencies, materials, evaluation, and developers. The music menu gives a different feel. The button will automatically light up when the application is opened. The off button is used to turn off the music sound. If the music is too loud, you can turn it down via the volume buttons on the smartphone.



Figure 14. Shape Evaluation Matchmaking

The form of evaluation in the SAC application is matchmaking. Matchmaking can be **Figures** or writings, such as the example in the **Figure**. Matching evaluation is more of a game and a reflection to remember the material differently.

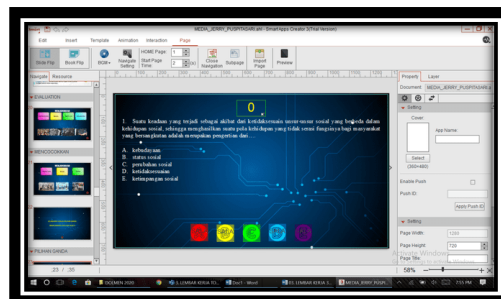


Figure 15. Making Question Choice Double And Scoring

Other evaluations can be made yourself, such as the example in the Figure. The form of the questions in the evaluation is HOTS. The questions are prepared first; then, to answer, press the letters A, B, C, D, and E. If the answer is correct, then the number 10 will appear. If the number of questions is ten, all correct answers get 100 points.



Figure 16. How to Enter A Score

The score can be increased from question 1 to a value of 10. If it's a question of 10, the total is 100. Open interaction then touches, click the object, click the counter and add.

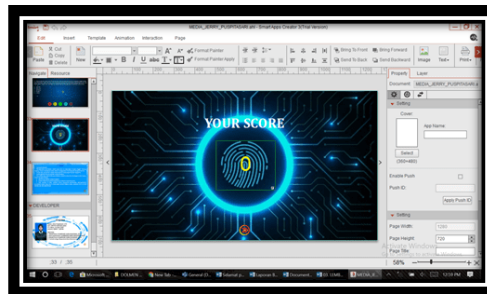


Figure 17. Page Total Score

On this canvas, the total score obtained by students who have answered the questions in the evaluation will appear.

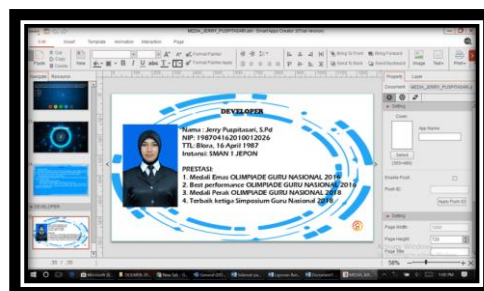


Figure 18. Developer

At the end of the menu, there is a developer canvas containing a bio media maker. After creating all sections and pages, make it into an apk by clicking the top left that says smart. Click smart then three options appear android, exe and html5. Choose android because this application will be used on android. Fill in the name of the application, such as the example of Sociology.Q.

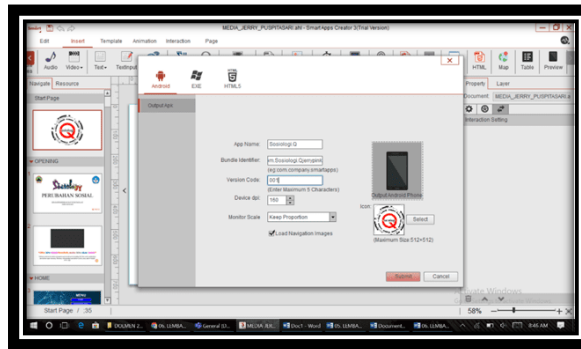


Figure 19. Making Smartphone App



Figure 20. Display Apk On *Smartphone*

3.2 Discussion

The prototype of sociology.Q learning media is a new learning media. According to (Allen, 2011), there are nine media groups: silent visuals, television films, three-dimensional objects, recordings, programmed lessons, demonstrations, printed textbooks, and oral presentations. Tools that function as learning media include modules, books, interactive VCDs, videos, slides, and so on. The tools used include computers, laptops, VCD players, and TVs. The next development is android which can be used as a tool in learning media. According to the new media theory, this media is smartphone-based learning media. Smartphones have an android base. Android is a mobile technology that is currently highly developed in the world (Ambarwulan, 2016). Android device users are spread across all segments of the world community. The facilities provided greatly facilitate the users of this device in their daily activities (Speckmann 2008).

After the development of the media, it was then implemented to find out the opinions of students regarding the use of the Sosiologi.Q application in the table. The data was obtained by filling out a questionnaire on google form as a form of evaluation for further development. The result is that most students answered pleasant, easy to understand, interesting, practical, and not boring. Only three students normally responded because the manufacturer has been designed attractively with structured learning activities, music, animations, and interesting quizzes. Some things need to be evaluated in the Sosiologi.Q application, including 1) an error occurred due to ignorance of opening the task first and finally couldn't do it, 2) the application is fun, but sometimes it's difficult to click on it, 3) the

application may be a bit confusing, 4) it's easy when you know how to do it. But when you enter one of them, it's like the material, and the exit must be until the end, you can get out of the material chapter.

Based on the evaluation above, to avoid miscommunication, it is necessary to have an explanation and simulation in advance of the application that will be used in learning, that it is necessary to improve the interface design so that the button options that are set can be more optimal in their use. The results of learning using Sociology.Q application media for class XII IPS 1 are as follows. The scores obtained from 35 students who got a score of 70 were three, people who got 80 there were seven people, and those who got 90 there were 11 people. Who got a value of 100, there are 14 people. From the table, the percentage of KKM is 91.4% of 35 students, with only 3 who have not completed it.

Several studies that apply smartphone-based media have proven successful. Research by Haryaka (2017) about the 'User Satisfaction Model for e-Learning Using Smartphone' shows that the statistical value in the model of e-learning user satisfaction has a highly significant correlation value. The model can be considered in developing an e-learning application in the future. Strengthened by Sarker (2019) said that smartphone is a challenge and future directions for effectively learning rules from smartphone data to build rule-based automated and intelligent systems.

However, implementing smartphone-based media is new in education, especially at Senior High School 1 Jepon. Students use the application of sociology.Q to study independently. The teacher makes the WhatsApp group, followed by the students doing the orders. Students learn and do assignments independently or in groups through conversations on WhatsApp. In this case, the social interaction carried out by students is indirectly and through the media with students, between teachers and students in two directions. The sociology. Q has an impact on changes in student learning patterns.

The prototype of sociology.Q learning media, based on Smart Apps Creator, is a new learning media. Based on the success obtained from the results of previous data analysis, it was later strengthened by the research. Khoirudin et al. (2021) state that using Smart Apps Creator can improve learning outcomes. Pebriani's research (2022) states that using Smart Apps Creator increases scientific literacy. Another research by Pramuda (2019) said that students' Scientific Literacy could increase based on the results of implementing smartphone media in learning in the experimental class. In addition, Putranta's research (2021) shows that the use of smartphones by most students is very high. Still, they have not been able to make an optimal contribution to students' scientific literacy. Therefore, special treatment is needed in using smartphones in physics learning so students' scientific literacy can be more optimal.

Motivation is a complex concept, closely aligned with 'the will to learn' and encompassing self-esteem, self-efficacy, effort, self-regulation, locus of control, and goal orientation (Harlen, 2003). Susanti et al. (2022) state that using Smart Apps Creator increases students' learning motivation.

Based on this, using the Smart Apps Creator learning media that is fun and easy to understand is very helpful for students. Several studies' results indicate the importance of interest in the depth of text comprehension, the use of learning strategies, and the quality of the emotional experience while learning (Schiefele, 1991).

Smart Apps Creator learning media also make students face challenges in Era 4.0. This 4.0 era is focusing on developing skills. A wide range of skills, knowledge, and competencies are required and expected from students to solve current problems for digitalization (Zarte, 2019). The more important is the part of the teacher. Based on the research by Sudibjo (2019), learning characteristics in the era of Industry 4.0 and Society 5.0 are rapidly changing. They need to be accommodated in higher education institutions' teaching and learning processes. The digital era 4.0 is considered important for teachers to master in the 21st century, including the ability of teachers to use digital-based learning media (Rahmatullah, 2022).

Students will be accustomed to using technology in learning thoughts to solve problems that will occur in the future. Technology in learning includes learning media or facilitating learning in class. Smart Apps Creator learning media is one of the learning media based on technology. Technology-use strategies for supporting student learning are also implemented in different integrated science, technology, engineering, and mathematics learning environment (Means, 1993). In general, the technology used had a positive impact (Lei, 2007). This media may have implications for practice and future research.

4. Conclusion

Based on the results of research, it is shown that learning supported by SAC (Smart Apps Creator) media is very effective. Most learning is fun, easy to understand, interesting, practical, and not boring. This is due to variations in learning practices combined with interesting music and animation. The achievement of student learning completeness reaches a percentage of 92.4%. The SAC (Smart Apps Creator) learning media is very supportive and helps students learn to face the challenges of developing the learning environment in Era 4.0. Students will be accustomed to using technology in learning to equip them with critical, creative, communicative, and collaborative thinking in the future. Students are accustomed to solving problems both individually and in groups.

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