IJER Indonesian Journal of Educational Review
p-ISSN 2338-2019 | e-ISSN 2335-8407
Vol. 8, No. 1, July 2021, p 56-71

Available online at
http://pps.unj.ac.id/journal/ijer

EFFECTIVENESS SMART APPS CREATOR LEARNING MEDIA IMPROVING STUDENT LEARNING OUTCOMES IN THE ERA OF THE COVID-19 PANDEMIC

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Abstract

This study aims to design learning media smart Apps Creator, validity, practicality, and effectiveness on student learning outcomes using learning media *Smart Apps Creator Android*. This type of research is research and development (R&D) with the DDD-E development model. The output produced is the " *My Ecosystem* " application product from the development of SAC Android media on ecosystem materials with 4C (*Critical Thinking*, *Creativity*, *Collaboration*, *Communication*). The results of the validity test showed 98% validity of learning media, 90.77% validity of the material, and 88% validity of language. The results of the practicality of my ecosystem media by teachers are 97% very practical and students, namely 89.1% very practical. So it can be concluded that my ecosystem media from the development of Smart Apps Creator Android in Biology learning is appropriate to be used as a learning medium and can improve student learning outcomes in online learning in the covid 19 era.

Keywords: Covid 19, Smart Apps Creator, Media my ecosystem, 4C, Learning outcomes

In 2020, to be precise in March, the COVID-19 pandemic began to enter Indonesia. The spread of the COVID-19 virus has had a big effect, namely the closure of educational institutions in the world. As a result of the COVID-19 pandemic, many regulatory systems have changed in Indonesia, including the learning process in schools. Gaining knowledge that used to be in the classroom has now turned into learning in the era of the COVID-19 pandemic with online learning (Gonzalez et al., 2020). Online learning is learning that is not face-to-face or is called online learning. This means that online learning in the era of the COVID-19 pandemic requires appropriate learning media.

To deal with 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 online learning. It is necessary to adjust the time for schools in Indonesia, especially by teachers who must be able to understand, understand, and be able to use IT-based learning media. Online learning is a teaching and learning process that must be carried out by educational institutions, especially schools

(Aristovnik et al., 2020). 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).

In the era of the COVID-19 pandemic, learning media with innovative technology that develops and good learning management are needed for teachers in schools and provide using IT-based learning media in the online learning process (Abbasi et al., 2020). IT-based learning media are interactive media in schools

and can be used by teachers for students in the online teaching and learning process. Interactive media in IT-based learning media can make students active in learning, and improve students' critical thinking skills, creativity, collaboration, and communication in learning. So that teachers are able to facilitate and inspire student learning in exploring the interconnections between the knowledge they have acquired and real-world issues including the use of technology. So that online learning using IT-based media can be used as a solution in conditions of the COVID-19 pandemic (Blake H et al., 2020).

During the online learning process in the era of the COVID-19 pandemic, several problems were found. The problem is that online learning becomes difficult to do in class, online learning that has been done so far has not stimulated student activity during learning activities in class. Teachers have difficulty understanding, using, and developing IT-based learning media. So that IT-based learning media are not effectively used in the classroom. Called ineffective because IT-based learning media requires an internet network connection. The internet network which is still not widely distributed in Indonesia is an obstacle for schools in difficult signal areas to access the internet when learning online. Furthermore, problems are experienced by students who cannot fully understand and use IT-based learning media.

As we all know, learning and teaching strategies in the COVID-19 pandemic era are very important, because learning that can be used is distance learning or what is called online learning (Sundarasen et al., 2020). More effective online learning by using IT-based learning media (Rifai et al., 2020). IT-based learning is important for all teachers to understand. And IT-based learning that can be used offline without the need for an internet network. The IT-based learning uses learning media based on Smart Apps Creator.

Learning media based on Smart Apps Creator is an IT-based learning media that can be used without using the internet network. The application of this media is very easy, there is no need for computer coding, teachers can develop creativity in making learning media with the desired learning material. So that IT-based learning media with Smart Apps Creator media is very important to be used by teachers and students in the era of the COVID-19 pandemic (Hikmah, 2017).

Smart Apps Creator learning media can train students' critical thinking, creativity, collaboration, and communication skills and can improve student learning outcomes during online learning in the era of the covid 19 pandemic (Henriksen et al., 2020; Sriarunrasmee et al., 2015; Swart, 2017). It is important to do research on learning media based on Smart Apps Creator that can be used effectively with the aim of designing learning media, seeing the validity, practicality, effectiveness, and improving student learning outcomes using the *Smart Apps Creator Android* learning media.

1. Methods

The use of Research and Development (R & D) is the research to develop instructional media that has tested the validity, practicality, and effectiveness of instructional media aimed at improving student learning outcomes. The media development planning model uses the DDD-E model, namely Decide, Design, Develop, and Evaluate (Ivers & Barron, 2002). The research subject was conducted with 2 Senior High School teachers and 225 Senior High School students. The type of data used is quantitative data to measure the validity, practicality, and effectiveness of learning media, as well as qualitative data in the form of suggestions by experts and respondents through interviews. The data analysis technique used is to test the validity of the calculation of the statistical CVR and CVI, test practicality with Likert and test the effectiveness with the calculation of the average pretest and posttest average increase. To show the results of the study, it was described using image media development, a percentage table, and then described descriptively.

Results

The results of the research are the development of learning media with the DDD-E model, test the validity of learning media, test the practicality of learning media, and test the effectiveness of learning media.

1. Model DDD-E

a. Decide

Researchers make SAC-based learning media using ecosystem materials. Ecosystem materials taught to students can provide students with an active deep learner experience. Thus, researchers will create an SAC-based learning media with ecosystem materials in which there are student activities with 4C. Of course, the main determination in an application to be designed is the background according to the theme, the appropriate color combination, a good font style, the appropriate writing color, the selection of high-resolution images, animation in the media, media background sound, and material content from the ecosystem.

b. Design

At this stage, learning media are designed in the form of flowcharts, screen designs, and writing storyboards. The form of flowcharts in Figure 1, screen design in Figure 2, and writing storyboards in Figure 3 below.

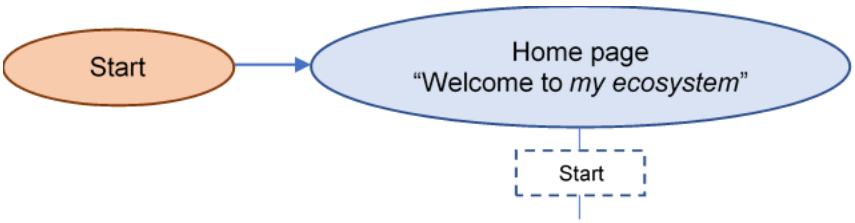

Figure 1. Flowchart's SAC-based learning media

Screen design	
Start page	**NAMA APLIKASI MATERI** Logo **Created by:** Nama Pembuat Nama Prodi Nama Universitas
Home page	**NAMA APLIKASI** Start Sound on/off Icon
Start menu	Profil Deskripsi Materi Petunjuk Referensi Icon home

Figure 2. Screen design of SAC-based learning media

Frame Name: Start page
General description:
My ecosystem start page display : consists of the name of the application located at the top. Then underneath there is a small Mulawarman University logo. Below the logo is written the name of the maker, the name of the study program, the name of the university, and the year of manufacture.
Captions of images, text (color, size, font), and logos:
The background color on the start page is black. The text is white in the Montserrat style font. The Mulawarman University logo is green.
For font type and font size:
Material application name: Montserrat (30) University name: Montserrat (25) Name of maker: Montserrat (20) Year of manufacture: Montserrat (25) Study program name: Montserrat (25)
Audio:
There is no audio

Frame Name: Home page
General description:
My ecosystem home page display : consists of *my ecosystem* writing which is located at the top (curved). Then under it there is a medium-sized start. Under the word start, there is a sound on (if clicked, the text changes to sound off, and vice versa). There is a sound on icon which will change to a sound off icon when clicked on the icon.
Captions of images, text (color, size, font), and logos:
The background color on the start page is green, as is the ecosystem theme. The combination of shaded green leaves makes the impression of the display more artistic. *My ecosystem* text is green with gradation play. The start and sound icons are in the form of a cartoon design, adding an impression of enthusiasm for learning and playing. The start icon is in the shape of a rectangle with a black list green color and white writing. The start icon moves to the right and left, which makes product connoisseurs immediately click on the start icon. Under the start icon there is a sound icon, in the form of a rectangle with a light brown color on the background and green writing. As well as a square sound on icon with a brown background color and a white image.
For font type and font size:
My ecosystem : Dimitri (50) Start: Dimitri (35) Sound on/off: Dimitri (20)
Audio:
bensound-ukulele

Frame Name: Start menu
General description:
My ecosystem start menu display : consists of 5 menu options, namely profiles, descriptions, materials, instructions, and references. Writing 3 menu options located at the top and 2 others located at the bottom. Then below it there is a medium-sized home icon. The 5 menu options have slowly popping animations that give a beautiful impression of the start menu design.
Captions of images, text (color, size, font), and logos:
The background color on the start menu is shades of green as with the ecosystem theme. The combination of two green leaves on the top left and bottom right makes the impression more artistic. Added a shadow image of pine trees at the bottom of the view. The text of the menu options has

different colors. Profiles are green, descriptions are orange, matter is light purple, hints are turmeric yellow, and references are pink palms. The 5 menu posts have a color gradation game. Added a home icon to return to the home page menu, which is located on the bottom left in green with a white home logo image.
For font type and font size:
Profile: Dimitri (35) Hint: Dimitri (35) Description: Dimitri (35) Reference: Dimitri (35) Material: Dimitri (35)
Audio:
bensound-ukulele

Figure 3. Writing storyboards for SAC-based learning media

c. Develop

1) background graphics	2) Insert image
3) Interaction	4) Audio

5) My ecosystem app view	

d. Evaluate

1. Media Validity Test

The media validity test is to see the results of the validation score by a team of experts, with the aim that my ecosystem media products are validated first by media, material, and language

experts. The results of the assessment of learning media experts are in table 1. The results of the assessment of material experts can be seen in table 2. And the results of the assessment of linguists can be seen in table 3.

Table 1. Assessment Results of Learning Media Experts

No.	Rating Points	Score					Comment
		1	2	3	4	5	
1.	**General Appearance Aspek**						
	1. The application design is eye-catching.						
	2. The application has a simple and neat appearance.						
	3. In-app color selection.						
	4. The accuracy of the font selection.						
	5. The suitability of the type and size of the letters.						
	6. The type and size of the letters are easy to read and in accordance with the characteristics of students.						
2.	**Special View**						
	7. Regular image layout.						
	8. The composition of the displayed image is appropriate.						
	9. Interesting image animation.						
	10. The images displayed do not seem old-fashioned.						
	11. Good image contrast.						
	12. Images are sharp and not blurry.						
	13. Adequate size.						
	14. Real pictures match the concept.						

3.	**Application presentation**						
	15. The appearance of the application is attractive and easy to carry.						
	16. The components in the *My ecosystem* application do not obscure the learning objectives.						
	17. The application design presents examples of everyday life problems.						
	18. There are ways to use the application.						
	19. Easy to use.						
	20. Easily visible for all students in a class to use						
MARK		**98% (Very valid)**					
Improvement Suggestions:							

Table 2. Results of Material Expert Assessment

No.	Rating Points	Score					Comment
		1	2	3	4	5	
1.	**Aspect of Readability**						
	1. The suitability of the discussion with the intellectual development of students.				□		
	2. Use terms that are in accordance with the concept in the problem.				□		
	3. The accuracy of identity writing is in accordance with the revised 2013 curriculum.				□		
	4. The suitability of learning questions with learning objectives on Ecosystem material.					□	
	5. The suitability of explanation explanation of answers with supporting information related to Ecosystem material.					□	

	6. The accuracy of the selection of teaching materials references using the latest data (*Up to date*).				□		
	7. The media used is interesting and in accordance with the level of students.					□	
	8. The question words used are appropriate.				□		
	9. Ease of use and application of the application.					□	
	10. The questions and explanations presented in the *my ecosystem* application are clear and easy to understand.					□	
	11. The appearance and content of the *my ecosystem* application as a whole is good.				□		
	12. The sentences used in the *my ecosystem* application are easy to understand.					□	
	13. *My ecosystem* application can be used as a learning medium for students.					□	
MARK		**90.77% (Very valid)**					
Improvement Suggestions:							

Table 3. Assessment Results of Linguists

No.	Rating Points	Score					Comment
		1	**2**	**3**	**4**	**5**	
1.	**Aspect of Readability**						
	1. Use the rules of good and correct language.				□		
	2. Use terms that are in accordance with the concept in the problem.					□	
	3. The language used is simple and easy for students to understand.				□		

	4. The language used is communicative.				□		
	5. The accuracy of language selection in describing questions and answer keys.				□		
	6. Consistency in the use of terms.					□	
	7. Consistency in the use of symbols and icons.					□	
	8. The question words used are appropriate.				□		
	9. Conformity with the intellectual development of students.				□		
2.	**Application Instructions**						
	10. The language used is communicative.				□		
	11. The language used is easy to understand.					□	
	12. Sentences used to represent the content of the message or information to be conveyed.				□		
	13. The sentences used are simple and straight to the point.					□	
	14. Spelling accuracy.				□		
	15. The accuracy of sentence structure.					□	
MARK		**88% (Very valid)**					
Improvement Suggestions:							

2. Media Practicality Test

The results of the practicality test by teachers of SMA Negeri 3 and SMA Negeri 4 Samarinda are seen in table 4.

Table 4. Teacher Practicality Test

No	Rated components	Teacher	
		Public High School 3	**Public High School 4**
Aspect of Readability			
1	The suitability of the discussion with the intellectual development of students.	4	5
2	Use terms that are in accordance with the concept in the problem.	5	5
3	The accuracy of identity writing is in accordance with the revised 2013 curriculum.	4	5
4	The suitability of learning questions with learning objectives on Ecosystem material.	5	5
5	The suitability of explanation explanation of answers with supporting information related to Ecosystem material.	5	5
6	The accuracy of the selection of teaching materials references using the latest data (*Up to date*).	5	5
7	The media used is interesting and in accordance with the level of students.	5	5
8	Ease of use and application of the application.	5	5
9	The information in the *my ecosystem* application includes all Ecosystem materials.	5	5
10	The questions and explanations presented in the *my ecosystem* application are clear and easy to understand.	4	5
11	The appearance and content of the *my ecosystem* application as a whole is good.	5	4
12	The sentences used in the *my ecosystem* application are easy to understand	5	5
13	*My ecosystem* application can be used as a learning medium for students.	5	5
Score obtained		**62**	**64**
Maximum score		**65**	
Percentage Value (%)		**95**	**98**
Final Grade Average Teacher Practicality Test		**97**	
Category		**VERY PRACTICAL**	

Description: Table 4. Recap of practicality test results by teachers is 97% with a very practical category so that the my ecosystem application can be used for students at SMA Negeri 3 Samarinda and SMA Negeri 4 Samarinda.

The Student Practicality Test was conducted at SMA Negeri 3 Samarinda with 6 grades X MIPA and SMA Negeri 4 Samarinda with grade X MIPA. The average percentage of students' practicality tests can be seen in table 5 below.

Table 5. Student Practicality Test

No	School	Class	Rated components
			Student Practicality Percentage
1	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
2	SMA Negeri 4 Samarinda	X MIPA 5	89.1
Average Student Practicality Percentage			**89.1**
Category			**VERY PRACTICAL**

Description: Table 5. Recap of practicality test results by students is 89.1% with a very practical category so that my ecosystem application is very practical to be taught to students at SMA Negeri 3 Samarinda and SMA Negeri 4 Samarinda.

3. Discussion

This study aims to design learning media, see the validity, practicality, effectiveness, and student learning outcomes using Android Smart Apps Creator learning media on ecosystem materials with 4C (Critical thinking, Creativity, Collaboration, Communication).

The validity of learning media is an activity carried out by researchers with the aim of obtaining a valid quality of learning media, so that learning media can be used by teachers and students in the online teaching and learning process. The value of the learning media validation test carried out, obtained a value of 98% with a very valid category for use in learning at school.

The developed my ecosystem media is validated first by material experts, before the media trial stage is carried out. Validation by media experts aims to obtain information, suggestions, and criticisms so that the developed my ecosystem learning media becomes a quality product in terms of readability of ecosystem material with my ecosystem media. The value of the learning material validation test that was carried out, obtained a value of 90.7% with a very valid category for use in learning at school. The results of this study indicate that from several elements of material validation, namely from the aspect of content and material content, and the readability aspect of the material in the my ecosystem media has been very well fulfilled.

The developed my ecosystem media was validated first by linguists, before the media trial stage was carried out. Validation by linguists aims to obtain information, suggestions, and

criticism so that the developed my ecosystem learning media becomes a quality product in terms of readability and instructions for using my ecosystem media for use in schools. The value of the language validation test obtained 88% data with a very valid category, meaning that the validity in terms of the suitability of Indonesian writing and spelling is very good. So that the development of my ecosystem media has met the requirements as a good learning media and can be used in schools.

Practicality is one of the most important points in the development of learning media, especially my ecosystem media. Media can be said to be practical if the media can be used anywhere and anytime without time and circumstances. And the media is very easy to run by teachers and students in the learning process at school. Practicality is measured from the assessment of two response questionnaires, namely the teacher response questionnaire and the student response questionnaire.

Teacher and student responses were obtained from response questionnaires given to teachers and students after being tested. From the teacher's response, the average percentage was 97% with a very practical category. Meanwhile, from student responses, the average percentage was 89.1% with a very practical category. So that my ecosystem learning media is very practical and easy to use by teachers and students in online learning.

Test the effectiveness of learning media through pretest and posttest scores using my ecosystem learning media on ecosystem materials with 4C. The average result of the students' pretest scores was 53.9 and the average posttest scores of students were 84.4. There is a difference in the value of pretest and posttest of 30.5, this value is significant, there is a difference in the ability of students before and after being given learning using my ecosystem media. So from the data above, it can be concluded that learning using the my ecosystem media application is very effective for use by teachers and students in online learning and the my ecosystem media application can improve student learning outcomes in online learning in the covid 19 pandemic era.

Conclusion

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

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