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Android-Based Learning Media in Supporting the Recovery of Science Learning Class VII

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ABSTRAK

Penelitian yang dilakukan bertujuan menjabarkan efektivitas produk pengembangan media berbasis android dalam mendukung pemulihan pembelajaran sistem organisasi kehidupan yang dianalisis oleh ahli, guru dan siswa. Rancangan penelitian ini berbasis pengembangan berorientasi pada model Borg dan Gall yang direduksi menjadi lima tahapan. Hasil penelitian meliputi merancang dan membangun media pembelajaran IPA melalui lima tahapan. Penilaian media dari ahli isi dan ahli media memberikan tanggapan yang sangat baik. Hal yang sama dengan hasil pengujian media kepada guru dan siswa, kategori sangat baik diberikan oleh guru terhadap media dengan persentase 99 persen dan uji coba kelas memberikan persentase 97 persen dengan kategori sangat baik. Media yang telah dikembangkan memberikan efektivitas melalui uji coba pra eksperimen terhadap hasil belajar peserta didik dan media pembelajaran efektif membantu pemulihan proses pembelajaran pada materi sistem organisasi kehidupan.

ABSTRACT

This research aims to describe the effectiveness of android-based media development products in supporting the restoration of learning organizational life systems analyzed by experts, teachers, and students. This research design is development-oriented based on the Borg and Gall model, reduced to five stages. The research results include designing and building science learning media through five steps. Media assessments from content experts and media experts gave an excellent response. The same thing with the results of media testing for teachers and students; the teacher provided the outstanding category to the media with a percentage of 99 percent, and the class trial gave a rate of 97 percent with an exceptional variety. The media that has been developed provides effectiveness through pre-experimental practices on student learning outcomes, and effective learning media helps restore the learning process of life organization systems.

INTRODUCTION

The pandemic period's influence causes problems in students' learning process and outcomes (Susanto et al., 2022). The problems that occur impact learning loss, resulting in reduced learning motivation, low learning outcomes, and weakening student learning progress (Li et al., 2020; Arifa, 2021; Andriani et al., 2021). The change from the previous learning process with face-to-face to online learning causes a tendency to reduce interaction in the learning process

(Yolanda et al., 2022), and it has an impact on the tendency to decrease the enthusiasm for learning of students (Huwaidi et al., 2021; Ekayana et al., 2021).

Readiness for online learning requires teachers and students to understand technology more deeply (Arsyah et al., 2022). Because when the online learning process is carried out, there must be an internet network, computer devices that facilitate it, understanding of the use of live session applications (zoom, google meet), and other ICT devices (Hazaea & Alqahtani, 2020). The results of several studies explain that the learning process during the pandemic causes less conducive learning processes, a lack of teacher and student interaction, and lack of a dynamic learning atmosphere (Rahmatika et al., 2021).

Research by Sakkir et al. (2020) revealed that teachers in online learning give more assignments and lack explanations about how the task should be completed, thus impacting students who often ask parents for help to do the task (Broadbent & Lodge, 2021). Another study revealed that teachers in the learning process during a pandemic are more likely to choose a teacher-centered learning approach where educators provide much information on the lack of student activity and tend to weaken student achievement (Santyasa et al., 2019; Santyasa et al., 2021), which causes the learning loss aspect to become even more significant.

Albanna Denpasar Junior High School is one of the private schools located in the center of Denpasar city, Bali. During the pandemic, it also carried out the learning process with an online system following a circular letter from the Minister of Education and Culture and the Education Unit of Bali Province. In the online learning process, teachers only use books as learning resources for students to learn. Based on the data obtained, as many as 75% of teachers have innovated by making PowerPoint slides and learning videos to support the learning process. It is just that not all learning materials can be made due to time constraints and teaching abilities. The results of the initial data collection at Albanna Junior High School from respondents of teachers who teach the science field explain that the material sources used were insufficient to support teaching and learning activities in the post-pandemic period to restore the learning process because the existing learning resources were still conventional and tended to be less attractive to students. Limited learning resources result in teachers not being able to do much and only relying on books for the learning process. The results of the observations and interviews with the principal declare that the school still provides the learning process as informed by the Bali Provincial Education office. It is just that the time and achievement of learning objectives cannot be optimally carried out.Based on the data collection process carried out at Albanna Junior High School on Monday, December 20, 2021, in supporting the recovery of learning after the pandemic, a learning resource is needed to support the current technological developments (Aslik et al., 2022). These learning resources must be able to combine various aspects of existing media to motivate students' enthusiasm for learning. These learning resources can be used by students anytime and anywhere.

The problem of the learning process at Albanna Junior High School is an opportunity to provide the best solution for providing solution assistance in the recovery period of learning activities. The gap aspect that is the focus of this research is the problem of a learning process that is less than optimal to achieve learning objectives in the cognitive realm. One solution that can be provided is learning media (Nurbani & Puspitasari, 2022). The learning media developed will be adjusted to the 2013 curriculum at Albanna Junior High School and lesson plans (RPP) for science subjects so that the KI and KD can be achieved in learning recovery.

They are learning media as an intermediary that helps the smooth learning process by allowing teachers and students to communicate more easily (Aslik et al., 2022). It is beneficial for teachers to teach and assist students in receiving and understanding learning information (Sefriani et al., 2022).

Development of learning media from research results of Afriani & Fitria (2021) explain that media can motivate students to learn (Yasin et al., 2021), give a different feel to learning, and develop students' imagination. Research by Amelia et al. (2021) also explains that android-based learning media help students to be able to access it anytime and anywhere when they want to learn (Andriani et al., 2021; Sari & Huda, 2021; Kumala et al., 2022). Material content created with color visuals makes the learning interesting (Ariyanto et al., 2021; Bulkani et al., 2022). Media can

bridge students in developing thinking skills and creative ideas (Chelysheva & Mikhaleva, 2020; Fan, 2020; Safitri et al., 2019). Learning media provide the artistic value in the learning process, supporting students' enthusiasm for learning (Gorelova & Khilko, 2020).

Research by Sausan et al. (2020) describes the learning process that uses media as learning support to provide authentic experiences to students in shaping their knowledge. Media can control learners' emotions in the learning process and encourage students' intentions to learn better (Muniady & Ali, 2020). Through learning media, it is hoped that the learning process can be more effective and efficient (Syahri et al., 2021; Sumarmi et al., 2021; Purnomo et al., 2020). Media can improve learning achievement, student success, and perseverance in learning, not dull (Khaira, 2020; Surata et al., 2020). Learning media can grow students' analytical, evaluation, and creativity skills in learning activities (Lebid & Shevchenko, 2020; Lebid et al., 2020)

Learning media is a bridge between students and teachers in optimizing teaching and learning activities in the post-pandemic period, thus helping to restore interest in learning and learning outcomes (Sunami & Aslam, 2021; Xie, 2021). Learning loss during the pandemic has created many gaps in the fields of education and learning, so the current momentum can be used as a concrete action to help the recovery of the learning process with the innovation of android-based science learning media to restore learners' enthusiasm, confidence, and activeness in achieving learning competencies to encourage learning recovery. Therefore, the research aims to produce innovation in the form of android-based learning media to support the restoration of the science learning process in grade VII students.

METHOD

Development of educational media and compulsory learning media experience a series of steps to validate products designed to be tested for feasibility and effective use in learning activities in schools (Borg & Gall, 2002). The validation process of a medium requires a development model as a systematic and continuous step in the development and trial process. The development steps of Borg and Gall are used in the design, trial, and implementation process. In this study, not all steps of the Borg and Gall models were used; the researcher reduced them to five steps of product development (Sumarni, 2019) due to time constraints.

Borg & Gall (2002) disclosed the product development model to be a reference for achieving development goals. The product must refer to a model, and the products resulted from the model must be tested for feasibility. Figure 1 visualizes the development steps that have been reduced to five. The reduced stages of the learning media product development include problem analysis and needs identification, media development, media validation, media effectiveness, and media dissemination. The application of the five development steps is adjusted to the research cluster carried out to facilitate the use of the development model in understanding R&D procedures (Sumarni, 2019). The reduction of development stages provides an opportunity to explore essential stages in the development process due to limited time and energy in the research process.

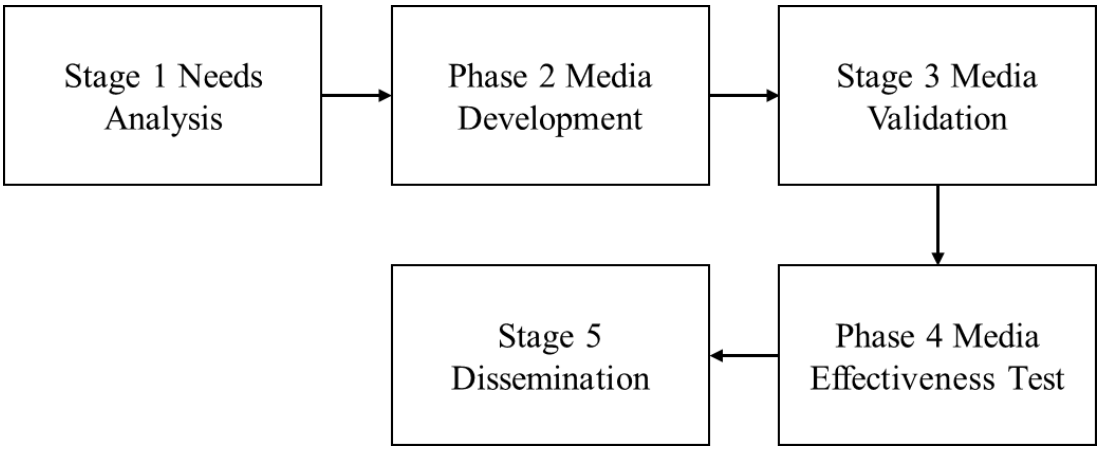

Figure 1. Stages of media development

The media validation process was carried out with the help of material experts (content) and media experts before testing in schools. Product validation uses instrument sheets adjusted to the criteria to be assessed. The instruments are questionnaires to be filled in by material experts, media experts, teachers, also tests taken by learners. The material validation questionnaire is designed to match the RPP of science subjects. Questionnaires were designed using a Likert scale, and tests were compiled using essay tests.

Validation of the contents of the test instrument must be carried out before the test is distributed to students. The content validation test includes IKB analysis with a range of 0.30-0.70 and IDB > 0.20. The content validation test has the aim that the instruments or questionnaires compiled to measure the learning objective in terms of the learning material provided the study subjects used as many as three students for small groups and 30 students for class testing. Feasibility testing of the developed product was carried out by pre-experimental testing in the absence of a control group.

The data analysis used in this study combines qualitative and quantitative to provide more comprehensive research results. The results of the data review from content and media experts, teachers, and students using qualitative and quantitative analysis are used to describe the implementation of the media developed; the data from this analysis is sourced from the Likert scale instrument. The formula for calculating the subject percentage is displayed in the following equation: $Percentage = \frac{\sum X}{\sum Xi} x\ 100\%$ (1)

Information:
ΣX = Number of Scores
ΣXi = Ideal Maximum Score

The formula for calculating the percentage of the subject of the whole is displayed in equation (2).

$Average\ percentage = \frac{F}{N}$ (2)

Information:
F = Total Percentage of the Overall Subject
N = Total Subject

Figure 2. Media eligibility score

The criteria for media effectiveness and media eligibility are classified using Figure 2 and Table 1.

Table 1. Eligibility categories based on rating scale

Achievement Level (%)	Qualification	Information
90 - 100	Very Worthy	No need for revision
75 - 89	Worthy	No need for revision
65 - 74	Decent Enough	Revised
55 - 64	Less Viable	Revised
0 - 54	Very Less Feasible	Revised

The results of the initial and final tests carried out on learners were related to the use of android-based science learning media; then, an analysis was carried out using the T-test. H0 hypothesis was tested: there is no difference in science learning outcomes between before and after learning to use android-based science learning media. The significance level of the test α = 0.05; if sig is higher than the degree of significance, then H0 is accepted; on the contrary, if sig. is lower than the degree of significance; H0 is rejected.

RESULT

Android-based science learning media is designed to be built starting from the initial production, production, and publication process. In developing android-based science learning media, pre-production stages were carried out to create supporting characters used as components of science learning media, background color selection, button making, animation, and other supporting assets in the media production process. Figure 3 shows the process of creating characters of the media to be developed.

The final stage of the pre-production process was coloring the assets that have been made. Assets are used as visualizations of the developed media to provide more meaning to learning. The forms of assets are adapted to the subject matter of science. The asset coloring used consists of primary, secondary, and tertiary colors, as shown in Figure 4.

Furthermore, worksheet arrangements are carried out at the production stage, importing assets, converting assets, creating keyframes, and making script actions. At this stage, all characters and assets were combined on the working page to create a keyframe and timeline of the developed media. Adding the script action to the production process aims to provide an interactive impression on the media, and switching between layers will be smoother and optimal.

The production process of this learning media uses several layers to become a container of assets and characters; setting layers in the application is very important to produce learning media that can interact with students. In Figure 5 are the layer settings for the supporting components of the learning media. The next stage of media development is the publishing process (Figure 6); at this stage, all assets and characters are rearranged to match the appearance of the smartphone screen. In this process, the .apk format of the learning media is set to be used on Android smartphones.

As a result of the process of developing android-based science learning media that has been completed, this science learning media is an alternative solution to help students and teachers in the post-pandemic learning recovery process. The initial page display of the learning media product can be seen in Figure 7.

Figure 3. Outline characters in media

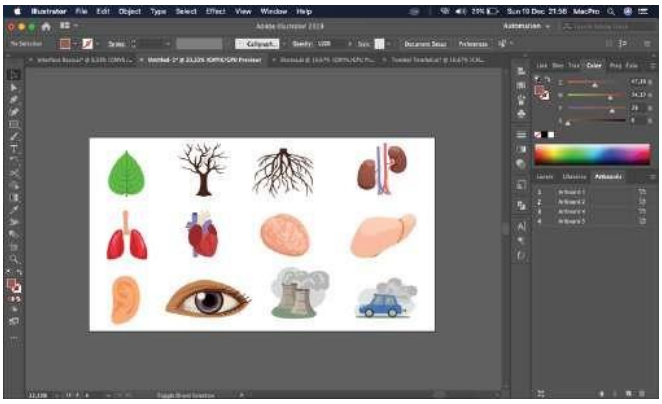

Figure 4. Shape and coloring of media supporting assets

Figure 5. Keyframe and layer creation

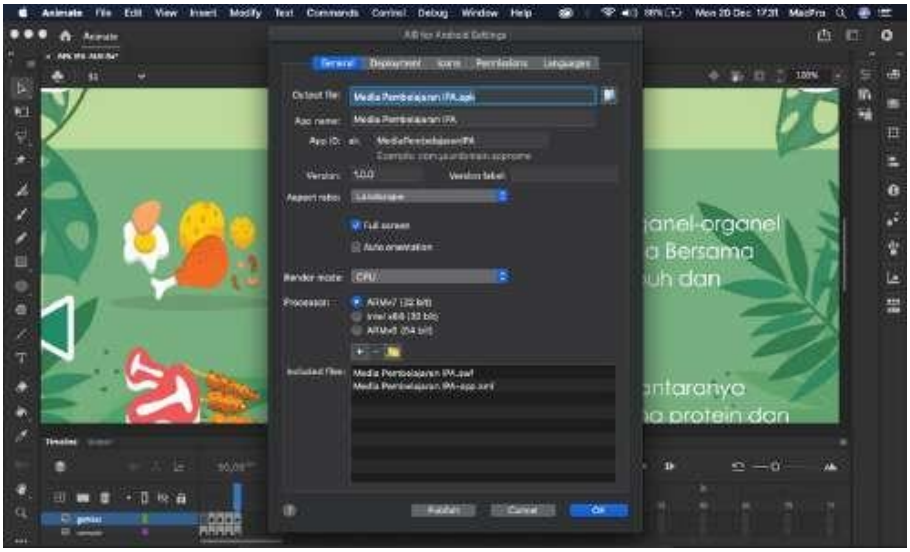

Figure 6. The process of publishing android-based science learning media

Figure 7. Initial view of android-based science learning media

Figure 8. Main menu display of science learning media

In Figure 8, the main menu of android-based media products is shown; this menu page's appearance shows the teacher's character as a moderator of the use of this learning media. The main menu page has several buttons that will lead to a different page from this learning media, namely the material button leading to the material menu page. The evaluation button is illustrated with a quiz icon to go to the evaluation menu page in the form of practice questions. The hint button is symbolized with a magnifying glass icon to go to the help page. The profile button will direct the user to the profile page. In the upper right corner are two buttons, a button with an audio icon that functions to turn on and off the back sound.

The next step of android-based media product development is product validation by material and media experts. The first test was carried out by content experts related to the content or material contained in the media. The content validator of the android-based science learning media asked for help from a lecturer with a field of natural science expertise from the Ganesha University of Education. The instrument used to validate the content of the media was developed using a questionnaire with two options, appropriate and inappropriate, and there a note column for validators to provide input on suggestions or improvements to the developed media.

After the content expert carried out the product trial, the science learning media product continued with the media expert. Media expert validators ask for help from lecturers in the DKV/Art science field at the STIKI Indonesia Campus. Aspects tested by media experts include media appearance, the accuracy of illustrations, media suitability, operating techniques, design organizing, and usefulness. The instrument for product trials to media experts was a questionnaire on a scale of four. The results of the trial of android-based science learning media products from content experts and media experts can be seen in Table 2 and Table 3. Based on the results of product trials from material experts, media experts have several inputs and suggestions for improvement to improve the learning media that has been developed. Product trials to content experts provide results that the material contained in the learning media follows the science learning material; from the four aspects evaluated, it is stated following the Learning Implementation Plan contained in the science learning material at Albanna Junior High School Denpasar. The suggestions for improvement given by the content expert validators are some typos contained in the media, and sentences must pay attention to the margins of the media.

Table 2. Product trial results from content experts

No	Learning Content	Appropriate	Not Appropriate
1	Eligibility of Material Content	√	
2	Language Consistency	√	
3	Feasibility of Presenting the material	√	
4	Media interest	√	

Table 3. Product trial results from media experts

No	Assessment Aspects	P (%)	Remark
1	Media Display	96	Excellent
2	Accuracy of Illustrations	94	Excellent
3	Media Conformity	90	Excellent
4	Operating Techniques	92	Excellent
5	Design Organizing	92	Excellent
6	Benefits	90	Excellent
	Average	**92**	**Excellent**

Based on input from content experts, when correcting types errors and adjusting sentences in the media so that students can well receive the material to support post-pandemic learning recovery, students must be given a refresher related to learning resources learned, one of which is using android technology as a vehicle for learning media. The test results from media experts provide suggestions for improving the color composition used; navigation from the media is made more user-friendly so that students are easier to use. From these inputs, improvements are made to the color composition used in the media and provide information on the navigation of the media.

The response of media experts to the development of android-based IPA media is that the media developed has supported the use of the latest technology, the appearance of the media is good and exciting, in terms of media operation is good, because it is equipped with narratives and also information on the navigation in the media. This android-based science learning media provides a new way and atmosphere for students to learn; in this post-pandemic period, they need a novelty to restore motivation and enthusiasm for learning.

The next stage of this media development is to revise and improve the media based on input from content and media experts. After the revision and improvement process is carried out, the next step is to conduct field trials; in field trials, several tests are carried out, including small group testing using three students, teacher testing, and class testing involving one predetermined class.

The small group trial involved three students. In this trial, several aspects are assessed, namely the appearance, technical operation, quality of the material, and the benefits of learning media. The instruments used in small group trials were questionnaires with a Likert scale and response columns to allow students to evaluate learning media in written form according to what they felt when using the media that had been developed. The results of the small group trials can be seen in Table 4. The results of the questionnaire assessment are then converted into a rating scale to get conclusions from media development reviewed from small group trials. Once converted to scale, the average of small group trials of 98% is on excellent/very worthy qualifications and does not need to be revised. Students also respond that the media products developed are exciting and worthy of use as learning resources. The media developed motivates them to try the evaluation features provided, and the use of android technology makes it easier for students to access via smartphones.

After the small group trial, it proceeded to test teachers who teach science subjects. Testing the teachers of this subject aims to explore responses and assessments from the media developed from the teacher's point of view of the aspects assessed. The aspects assessed include appearance, operating techniques, material quality, and expediency. The results of testing teachers of science subjects against the developed media are shown in Table 5.

Table 4. Small group trials

No	Assessment Aspects	P (%)	Remark
1	Display	100	Excellent
2	Technical operation,	98	Excellent
3	Material quality	96	Excellent
4	Benefits	98	Excellent
	Average	**98**	**Excellent**

Table 5. Media trials to science subject teachers

No	Assessment Aspects	P (%)	Remark
1	Display	100	Excellent
2	Technical operation	98	Excellent
3	Material quality	100	Excellent
4	Benefits	98	Excellent
	Average	**99**	**Excellent**

The results of the media assessment of teachers who teach science subjects get an average score of 99%. Then the results are converted into a rating scale, where the teacher assessment results are in excellent qualifications. The assessment given by the teacher follows the aspects assessed and the teacher's responses related to the learning media that have been developed; this media is beneficial for the teacher in the learning process because this media can bridge the communication between the teacher and the learner. The developed media provides a new atmosphere for teachers and students to support learning recovery. This media provide opportunities for students to be more active in learning. The next test is a class trial, carried out in one class with 22 students. The media that has been developed is uploaded to Google Drive and downloaded and installed by each student on their respective smartphone devices.

Furthermore, students are given time to try all the features in the media and an evaluation quiz for science subjects on the learning media. The results of the class trials are shown in Table 6. The results of the class testing get an average score of 97%; if converted to a rating scale, the results are included in the excellent / very decent qualifications without needing revision. The assessment results from the class trial get responses from students that the media developed is very good, more interactive to dabble, the design is good, and the material delivered is by the science subjects being studied.

Testing the effectiveness of the media that has been developed using pre-test and post-test instruments, the results of these tests are analyzed using the T-test with the help of statistical applications. Before the test is carried out for students, the instrument used in the validity and reliability test with the aim that the instrument used the results are valid and measure what should be measured. The reliability of the test with Alfa Cronbach showed a result of 0.825, which concluded that the instrument used had a high internal consistency. The normality test results using Kolmogorov Smirnov found that the data distribution was in the standard distribution, so the T-test could be continued. The results of the pre-test and post-test tests can be observed in Table 7.

In Table 7, it can be explained that there are differences in the results of pre-tests and post-test on science learning outcomes. The average pre-test score was 60.23, while the average post-test score was 81.55. This pre-test and post-test test give the result that there is a difference in the mean score (average) of learning outcomes. However, it cannot be concluded whether this difference in learning outcomes is caused by the use of android-based science learning media or not; for that, it is necessary to conduct a T-test with the help of the SPSS application.

Table 8 shows the results of the T-test with statistical applications. The pre-experimental results from the media, analyzed using the SPSS-assisted T-test, in the paired samples test table above obtained the mean between pre-tests and post-test of 21,318 with an std deviation of 10.965.

Table 6. Class trials

No	Assessment Aspects	P (%)	Remark
1	Display,	96	Excellent
2	Technical operation,	98	Excellent
3	Material quality	96	Excellent
4	Benefits	98	Excellent
	Average	**97**	**Excellent**

Table 7. Pretest and postest learning outcomes using science learning media

Statistik	Science Learning Outcomes	
	Pre-test	Post-test
Mean	60,23	81.55
Std Deviasi	10,109	7,143
Varian	102,184	51,022
Max	75	92
Min	40	68

Table 8. Paired samples test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretes - Postes	-21.318	10.965	2.338	-26.180	-16.457	-9.119	21	.000

Furthermore, from this table, the sig value is obtained. Of 0.000, if the sig, compared to a significant degree of α = 0.05, then the value of the sig. Much smaller than 0.05, so from these results, H0 was rejected, that there was a difference in science learning outcomes as measured from the cognitive aspects of students between before and after using android-based science learning media.

DISCUSSION

Based on the results of interviews and direct observations of schools related to the learning recovery process in the post-pandemic period, there is a need for an innovative learning technology product that can foster students' enthusiasm and confidence in learning. Students significantly experience the event of learning loss (loss of learning) during the pandemic. Many students complain that the learning process is not conducive and challenging to understand the material, and they lack motivation during online learning (Li et al., 2020).

Creativity and innovation are indispensable in the learning recovery process; from the analysis of student characteristics obtained from observations to school, students need a medium that can provide a more active learning nuance and can be accessed through today's smartphone technology. Android-based science learning media is a solution to provide updates on the learning process in supporting learning recovery (Sausan et al., 2020; Syahri et al., 2021). The learning media developed has undergone several structural and systematic stages to produce a supportive media from what has been analyzed and prepared in advance.

The results of the development of learning media that have been produced, it is necessary to carry out validation and a series of trials, to test whether the resulting media is feasible as a learning medium. Content experts carry out the first test. In content expert testing, an evaluation has been carried out in terms of material and content in the media. An assessment from a content expert explains that the material or content in the media is by the RPP of science subjects. Responses from content experts to the media development revealed that the media has been well developed, systematic, and accommodates the needs of students to be creative in learning. The results of research strengthened this by Lebid et al. (2020) reveal the development of media based on the characteristics of students able to provide creativity to students in finding and solving problems around them. Muniady & Ali (2020) also reveals the use of appropriate media capable of providing meaningful interaction in learning activities (Fan, 2020).

Further testing by media experts is carried out to validate learning media from the aspects of the media display, accuracy of illustrations, media suitability, operating techniques, and the media's usefulness. The results of the media expert test get an average of 92% if included in the rating scale, including the excellent/decent category. Responses from media experts to the media developed that the media produced is good has a quality display that supports students to feel at

home using the media, and can arouse student motivation in learning. Syahri et al. (2021) stated that using learning media to increase student motivation in learning activities and increase learning recovery to be efficient and effective, have higher learning motivation (Yasin et al., 2021).

After testing from experts continued small group testing, this test involved three randomly selected learners. The test results of small groups get an average of 98% of the media developed and are included in the category of excellent/feasible. The next test is testing the teachers teaching science subjects in the school. The assessment carried out by the teacher on the developed media consists of four aspects: appearance, operating techniques, material quality, and expediency; the results of trials to teachers get an average of 99% and are included in the very good/decent category. Several responses were also given to the resulting media, that the media that was built influenced the teacher in supporting the learning process, the addition of learning resources, and bridging the communication process between teachers and students to add impressions in learning activities. (Sausan et al., 2020; Hazaea & Alqahtani, 2020).

Furthermore, class testing was carried out, and class trials were carried out to get responses to android-based science learning media from the overall side of students in class VIIA, which amounted to 22 students at Albanna Denpasar Junior High School. The results of the class trials received an average of 97% and were included in the category of excellent/decent. Students gave several responses to the media developed that the resulting media was exciting and equipped with character narratives in each part of the media. There was a quiz feature for students to practice questions related to science subjects.

The final stage of testing this android-based science learning media is to test the effectiveness, which is carried out by providing test instruments. Pre-tests are given to learners before learning media, while final tests are given after students use the learning media. The test instruments given to students have gone through validity and reliability tests, as well as the analysis of the Item Difficulty Index (IDI) and the Differential Power Index (DPI) so that the instruments used measure what should be measured to provide valid results. The results of the pre-tests are an average score of 60.23, while the post-test very average score of 81.55. These results indicated that the learning media designed to build had a considerable influence on the learning outcomes of learners. The opinion should be further tested with a pre-experimental test without a control group. The results were obtained from the pre-experimental test on the sig value paired samples test table. Of 0.000, smaller, compared to the significance level of $\alpha = 0.05$, then Ho was rejected, for which it can be concluded that there was a significant difference before and after using the media in the learning science results.

The development of IPA media products based on android technology is beneficial for students to develop the ability to express themselves,(Gorelova & Khilko, 2020), fostering self-confidence and increasing curiosity through communication skills (Syahri et al., 2021; Kumala et al., 2022). Using media tailored to analyze student needs impacts improved learning outcomes (Ariyanto et al., 2021; Andriani et al., 2021; Bulkani et al., 2022).

Based on discussions related to media that have been successfully developed, it positively influences student learning outcomes on cognitive aspects. Various testing processes have been carried out to validate the media developed to help teachers and learners learn. Through the results of pre-tests, post-test, and pre-experimental trials, android-based science learning media has proven to be practical and feasible in supporting learning recovery in life organization system materials in the post-pandemic period.

CONCLUSION

Learning loss and learning gaps during the pandemic need to be provided solutions to help the recovery of future learning activities. The development of media products that are tailored to the characteristics and needs of learners is a solution to be given in encouraging enthusiasm and motivation to learn. Interactive learning media products for science subjects material of the android technology-based life organization system have been successfully developed and tested to get excellent and effective results to help to learn recovery in terms of learning outcomes. The resulting learning media has supported the latest technology, namely android-based, so students can use smartphones to run the learning media.

The learning media developed has been adapted to the learning implementation plan of science subjects on the material of the life organization system. The material aspects, appearance, operating techniques, and usefulness of the media have obtained good results from all the tests. The media developed has had significant implications on aspects of student learning outcomes; testing through pre-experiments concludes that using science learning media provides different learning outcomes before and after using media products. The practical benefit of the results of this study is that teachers teaching science subjects can use this learning media to assist in the learning process, provide students with science learning materials in different ways, and help to learn resources for teachers and students who are more utilizing technology.

The success of developing learning media, certainly, does not escape the accompanying limitations, and recommendations for further research where learning media still do not support the overall essential competencies that exist in science subjects in the material of the life organization system, so that in the future learning media can be developed to accommodate other essential science competencies in the hope of perfecting the core competencies of science subjects through learning media help. The hope of the learning media that has been developed is to provide new ways of learning to students to raise enthusiasm and self-motivation in learning in the post-pandemic period, and learning loss can be minimized by providing innovation and renewal in the learning process, one of which is using android-based interactive learning media.

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