



Development of Android-Based Interactive Media Learning Economics Capital Market Materials

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Abstract

This study aimed to produce an Android-based interactive media for economic learning in class X SMA/MA which was valid and practical. This type of research was Research and Development (R & D). The research was conducted at SMA N 1 Salimpaung for the 2020/2021 academic year. The test subjects involved in the research were media, language, material and evaluation validators, economics teachers and students. The model in this development used a 4-D model, namely definition, design, development, and dissemination, but this research was limited to the develop stage. The results of study obtained a score of 86.65%, from the material validator with a very decent category. The media validator obtained a score of 87.3%, with a very decent category. The assessment of the language validator got a score of 83% with a very decent category. Meanwhile, the evaluation validator got a score of 92% with a very decent category. The practicality results of the teacher obtained a score of 92.78% and the assessment of the students was 94.9%. The results of both assessments were in the very practical category. This android-based interactive media was declared very feasible to be applied to economics learning material for capital markets.

How to Cite

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INTRODUCTION

Education is a process of forming knowledge, skills and individual character through learning. This is a provision for someone in the post-education world. Good education is education that can provide useful knowledge for students. Useful knowledge is a very valuable investment in life and must always be maintained through increasing life insight and the application and development of skills already possessed. This process is a means of forming human resources with character and competence as national assets. Through education the development of science and technology will be easily absorbed so as to enable a nation and country to progress.

The involvement of all elements in the world of education will determine the future of this country, not only from policy makers in education. The involvement of teachers in the learning process is needed, the interaction process that occurs in the learning process must be arranged in such a way that the desired behavioral goals are achieved. A teacher must be able to approach as an initial basis for determining student needs, determining appropriate learning strategies so that the methods and techniques applied are also appropriate, with the help of intermediary tools for delivering appropriate messages and information such as learning media.

The continuity of the learning process and good learning will be achieved with the support of all components of education, especially learning media. In the era of modern technology 4.0 with the creation of diverse and interesting learning media as an effort to improve and develop the quality of education. Learning media is able to grow students' learning motivation because they are packaged in different forms, the clarity of the content of material delivery will be much better so that students' mastery of material will increase.

The use of media in classroom learning is a necessity that should not be ignored. This is understandable considering that the learning process experienced by students is focused on

various activities in the classroom to add knowledge and insight as a provision for life in the present and in the future. One of the efforts that must be taken is how to create a learning situation that allows the process of learning experiences to occur in students by moving all learning resources and effective and efficient ways of learning. That is why learning media is an integral part of the learning process in the classroom (Mahnun, 2012).

Good media is media that is easily accessible by students and educators or teachers wherever and whenever. Both in terms of ease of use, ease of obtaining, ease of operation, and most importantly conformity to learning objectives, the more real a learning media will be, the higher the level of student understanding and guarantee the achievement of educational goals. The basis of education relies on sensory experiences interacting directly with sensory-stimulating sources; people remember most of their experiences. It is therefore important to utilize experience in teaching and learning strategies.

Dale (1969) disclosed use of media in learning that explains the existence of experiences that prioritize the use of media at various levels of the cone. Dale's Cone Experience, states in a theory of the cone of experience that he developed that someone gets direct experience with real simulations, then 90% of the material learned will be easy to remember, but for someone who uses the learning method by reading books only, the theoretical ability is remembered only 10%. The more real a learning media is, the better it is for the understanding and development of students' learning (Dwyer, 2010).

The problem that often occurs in the world of education, especially among educators and students, is that the use of the learning model used by the teacher is not in accordance with the needs of the students, so that the approach taken by the teacher tends not to reach the expected goal, as a result, the strategies to be used tend to be inappropriate. Finally, the teacher only uses one-way methods such as the lecture method (Solichin & Nuha, 2019).

This problem was also found by researchers Coal (2015) that learning still uses or applies methods that are still rarely used in schools in the learning process, and the media used has not been developed in the form of learning software that is easily understood by students.

The importance of using media in learning is in fact still ignored by teachers in schools, such as the problems that occurred at SMA N 1 Salimpaung. The results of the researchers' observations while carrying out educational field practice activities, in general, teachers still use the lecture method in the learning process which tends to be one-way, the media used is mostly still in the form of student worksheets, printed books and power-points which are also monotonous, containing the text as a whole, still images and do not differ much from the textbooks that students hold on to.

Especially the economics teacher, based on the researcher's interview with the economics teacher of SMA N 1 Salimpaung, it was found that the teacher used textbooks lent by the library to students, and student worksheets prepared by the economics teacher in learning. These problems have an impact on students in the learning process, namely students still have difficulty understanding the subject matter presented by the teacher, so students are not interested in studying economics lessons. When asked a question, the students were mostly silent. Students are less creative and get bored quickly with the delivery of mo-

notonous subject matter, so learning becomes less meaningful.

The fact in the field is that there are still many students who do not understand economics learning, for example in the economics material for class X SMA in even semesters, namely the capital market material. The teacher conveys capital market material with a one-way tendency in the form of lectures, where this material needs real illustrations with students playing more roles in learning. There needs to be a new experience for students in this material, if the media is only in the form of graphics, it is not appropriate to apply this material.

However, good media also involves all the senses of the eyes, ears and even emotions, making it easier for students to understand the material, such as the material on transaction mechanisms in the capital market and investment in the capital market. With a long and complicated plot, with a lecture method and only abstract illustrations, it will be difficult for students to understand the material. This fact is supported by the test results of SMA N 1 Salimpaung students as shown in Table 1.

Table 1 shows the results of daily test scores for students of SMA N 1 Salimpaung on capital market materials. It can be seen in the table that the percentage of students' daily test results that were not completed was greater than the percentage of completed test scores. Students of class X IPS 1, which amounted to 36 people, amounted to 61%

Table 1. Student Test Results

No	Class	Amount	KKM	Complete	Not Complete	% Complete	% Not Complete
1	XI IPS 1	36	70	14	22	39%	61%
2	XI IPS 2	28	70	8	20	29%	71%
3	XI IPS 3	23	70	2	21	9%	91%
4	XI MIPA 1	36	70	25	11	69%	31%
5	XI MIPA 2	23	70	11	12	48%	52%
6	XI MIPA 3	22	70	22	0	100%	0%

Source: Processed Data, 2021

who did not complete, students of class X IPS 2, which amounted to 28 people, the percentage of daily test incompleteness was 71%. While the students of class X IPS 4, amounting to 23 people, 91% did not complete the daily test on the capital market, a number that could be considered large. Students X MIPA 1 as many as 36 people by 31% who did not complete the daily test. X MIPA 2, 23 students 52% who did not complete, while X MIPA 3 entered the category of all completed.

The above explanation proved that there were still many students of SMA N 1 Salimpaung who did not understand the capital market material. One of the causes was the use of inappropriate learning media. Based on the case in economic learning, especially the capital market material as described previously, the researchers felt the need to develop interactive media for capital market material economics learning. This research was conducted with the aim of developing an interactive learning media based on Android in the subject of Capital market material Economics. This media can be used for students of class XI MIPA/IPS.

METHODS

This research is a Research and Development (R & D) development research conducted at SMA N 1 Salimpaung in the 2020/2021 academic year. The test subjects involved in this research were: media product validation by a lecturer at the Faculty of Economics: Mrs. Dr. Susi Evanita, Ms., Mrs. Nita Sofia, S.Pd., M.Pd. and Mrs. Dr. Abna Hidayati, M.Pd., from the Department of Educational Technology FIP UNP. Material validation by lecturers of Banks and Financial Institutions Faculty of Economics: Ms. Menik Kurnia Siwi, S.Pd., M.Pd., and Ms. Erly Mulyani SE., M.Sc., Ak., Accounting lecturer and builder of the Indonesia Stock Exchange Gallery, Faculty of Economics Universitas Negeri Padang.

Language validation was carried out by Indonesian lecturers at the Faculty of Language

and Arts: Mr. Dadi Satria, S.Pd., M.Pd. Evaluation validation by one of the evaluation experts of the Faculty of Economics: Mrs. Dr. Friyatmi, S.Pd., M.Pd. Practicality, namely Economics teacher: Mrs. Dra. Adrinan, Ms. Tosli Yelni S.Pd., M.Pd., and Ms. Sri Yenni Elfia, S.Pd., and 30 students of class XI IPS SMA 1 Salimpaung. In this trial, what was tested was the practicality of media products which included media display, material presentation, and the use of interactive learning media in the economic learning process.

The object of this research was Android-based interactive media in learning capital market material economics. The development model in this study used the development model (Thiagarajan., 1974) known as 4-D (Four D), which consists of 4 stages, namely: defining, designing, developing, and disseminating. The spread phase was not carried out by the researcher in this study due to time constraints. The data analysis technique used validity analysis and practicality analysis.

RESULTS AND DISCUSSION

This study aimed to make a product in the form of interactive learning media based on Android in learning capital market material economics development using 4-D models. The flow of the 4-D model development, namely define, design, develop, disseminate, but this last stage was not carried out due to time and cost constraints. The following is an explanation of the stages of developing android-based interactive media products for learning economics on capital market materials.

Define

Based on the curriculum applied at SMA N 1 Salimpaung, this is directly related to basic competencies, namely financial service institutions in the Indonesian economy with several sub-sections of material, ranging from financial services authorities, banking financial service institutions, capital markets, insurance, pension funds, financial institutions, financing, and pawnshops. The material

taken for this android-based learning media is the capital market. The main topics of discussion are the understanding of the capital market, the history of the capital market, the function of the capital market, the role of the capital market, capital market supporting institutions, capital market instruments or products, the mechanism of capital market transactions and investment in the capital market.

At this stage, several aspects of needs were also identified, namely: the number of students based on class and gender which was described in Figure 1. Based on the analysis of the students in the XI Social Sciences field who became the object of the study, there were 90 students; the number of male students was 30 and the number of female students was 60 people. Another aspect was the distribution of parents' occupations, as shown in Figure 2. In terms of parental occupation, 65% of the total students were children of farmers, 8.9% of students whose parents worked as traders, 8% of parents from students as civil servants, 7% as entrepreneurs and 11.1% others.

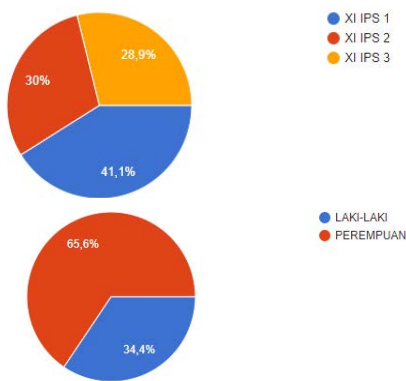


Figure 1. Number of Students by Class and Gender

Source: Processed Data, 2021

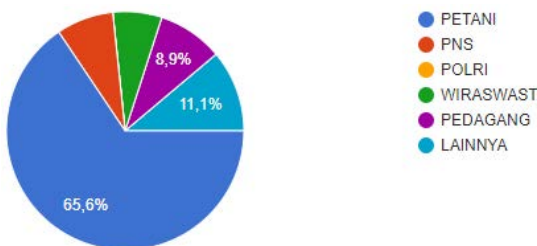


Figure 2. Parents' Jobs

Source: Processed Data, 2021

The next aspect that was identified was the student's learning style. Students had different learning styles, 61% of them preferred audio-visual learning. Another 35% liked visual learning, while the other 3% liked audio learning. This data was detailed in Figure 3. Students' personal facilities and infrastructure were also an aspect in the definition stage. Figure 4 shows that 98% of students said they had an android phone, which was one of the facilities and infrastructure they had.

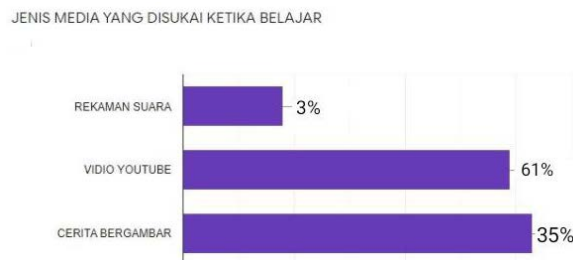


Figure 3. Student Learning Style

Source: Processed Data, 2021

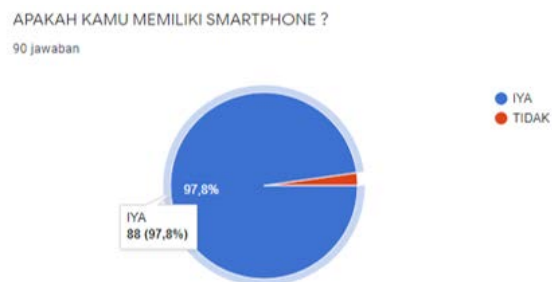


Figure 4. Student Private Facilities

Source: Processed Data, 2021

The last aspect identified was the quality of the student network, which was presented in Figure 5. The results of the research findings in the field found that 80% of students were still in the medium category of internet network quality, and 6.7% in low or weak internet network quality. Only 13.3% of students were in a strong and good network quality. Based on the concept analysis, systematic and relevant concepts were compiled with curriculum analysis. Based on the analysis of learning objectives and identification of needs, the stage of formulating goals was based on the analysis of the previous concept so that it can be used as the basis for designing learning and test equipment.

BAGAIMANA KUALITAS JARINGAN INTERNET DI TEMPAT TINGGAL KAMU ?
90 jawaban

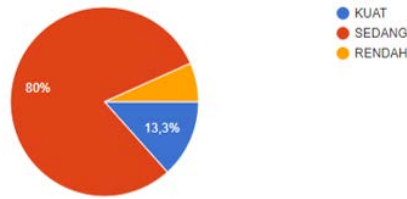


Figure 5. Network Quality
Source: Processed Data, 2021

Design

This design stage was to prepare the foundation needed in making Android-based interactive media on capital market materials. The results of interactive media in detail were shown in the following figures. In Figure 6, there was the initial view when a new application was opened, with a description of wanting to open the application with a view from the beginning or continuing the last time it was opened. The main screen of the application contains the title, the button to start, the title of the material and the name of the researcher with a background view of a building.



Figure 6. Product Cover Page



Figure 7. Help Center and Help Center Pages

The next display is the user manual which consists of 7 points. The menus available in this screen are: cross in the upper left corner which serves to return to the home screen. The image of the house in the upper right corner which serves to go to the main menu and the arrow in the lower right which serves to continue to the next slide. The next slide from the previous is the help center or contains a description of the navigation buttons available in the application. It is also equipped with a cross button to return to the home screen, a home button to go to the main menu, and an

arrow in the lower left corner to return to the previous slide or screen.



Figure 8. Main Menu and Profile

The main menu contains the core menus in this learning application, which consists of competency/learning syllabus, capital market materials, learning videos related to the material, evaluations containing quiz questions, researcher profiles and help center menus. In the lower of right corner there is a cross to return to the home screen (the function is

the same as the previous one). On the profile screen contains the name, nim, department, and the name of the supervisor. Figure 9 also shows the competence page. The competency screen contains core competencies that must be implemented in the learning curriculum. The next screen contains: competencies which contain basic competencies, indicators and basic material about the capital market.



Figure 9. Core and Basic Competencies



Figure 10. Material Menu

This material screen on Figure 10 is the menus for the material that contains the main titles of the material that will be discussed in this application (the main menu of the material) consisting of understanding the capital market, the history of the capital market, the function of the capital market, the role of the capital market, capital market institutions and capital market products. All discussion titles are used as navigation buttons, so that when clicked, the details of the material will appear. When the capital market understanding menu on the previous screen is clicked, it will enter a menu that contains a description of the material about the capital market, as well as for other sub materials.



Figure 11. Quiz Page

In the initial display of the capital market quiz (Figure 11), it contains a start button to start the quiz and a preview to return to the previous screen. In this quiz menu there is a biodata display that must be filled in before starting the quiz, which includes name, e-mail address, and class. There are also instructions for working on questions, the display of multiple choices quiz questions whose contents can be directly clicked on one of the selected options. The final display when you have done

the quiz and got a score above the minimum completeness criteria (KKM) that has been set. The final page of the learning media is equipped with a home menu to return to the main menu.

Develop (Development)

The development stage conducts valid and practical trials for each validator, so that valid and practical products will be produced to be used in capital market economics lear-

Table 2. Material Expert Validation Results

No	Instrument	Validator 1	Validator 2	Score Percentage	Category
1	Concept Truth	80%	100%	90%	Very Worthy
2	Material Depth	60%	100%	80%	Very Worthy
3	Evaluation	80%	100%	90%	Very Worthy
Percentage		73.3%	100%	86.65%	Very Worthy

Source: Processed Data, 2021

Table 3. Linguist Validation Results

No	Assessment Aspect	Score	Category
1	The language used is easy to understand.	4	Valid
2	Use easy-to-understand language	4	Valid
3	The use of the word does not contain a double meaning	4	Valid
4	Use of clear legible text	5	Very Valid
5	The terms used are written correctly	4	Valid
6	The language used is communicative	4	Valid
7	The accuracy of language selection in outlining the material	5	Very Valid
8	The sentence used has the content of the message or information to be conveyed	4	Valid
9	The sentences used are simple and straight to the point	5	Very Valid
10	Spelling accuracy	4	Valid
11	Spelling consistency	3	Quite Valid
12	Consistency of use of terms	4	Valid
13	Consistency in the use of symbols or icons	4	Valid
Total Score		83%	Very Worthy

Source: Processed Data, 2021

ning. Validation by 2 material experts (Table 2) obtained a score of 86.65% and it was stated that this media was very feasible to use in terms of material.

Language validation by an Indonesian lecturer at the Faculty of Language and Arts, Padang State University (Table 3) with a score of 83%, means that this media was very feasible and was declared valid in terms of the language used. Meanwhile, to test the feasibility of this media, it was validated by three lecturers who are experts in their fields, with the consideration of getting more input for the feasibility of the media. Table 4 on the results of media expert validation, obtained an average rating of 87.3%, so this media can be categorized as very feasible from the assessment of the three expert validators.

Evaluation validation is also included in the media validity test because the media

used is accompanied by a learning achievement evaluation test sheet with these considerations; the questions used are also validated by the evaluation validator. There are several assessment criteria for evaluation questions as shown in the table. An average assessment of 92% was obtained from evaluation experts with the category of evaluation questions very suitable for use in this interactive media.

The practicality test for the teachers in this study was the Economics Teachers of SMA N 1 Salimpaung, totaling 3 people. The average practicality assessment from Economics teachers was 92.78% with the very practical category used in learning economics on capital market materials (Table 7). Practicality tests were also conducted on students of class XI majoring in Social Sciences at SMA N 1 Salimpaung, totaling 30 people as users of capital market interactive media. The ave-

Table 4. Media Expert Validation Results

No	Instrument	Validator 1	Validator 2	Validator 3	Percentage	Category
1	Design	86.7%	76.7%	83.3%	82.2%	Very Worthy
2	Procedure	95.6%	91.1%	82.2%	89.6%	Very Worthy
3	Additional Features	85%	90%	90%	88.3%	Very Worthy
4	Navigation Keys	96%	96%	96%	96%	Very Worthy
5	Media Carrying Capacity	80%	70%	80%	76.7%	Worthy
Percentage		90.8%	84.8%	86.3%	87.3%	Very Worthy

Source: Processed Data, 2021

Table 5. Evaluation Expert Validation Results

No	Assessment Aspect	Score	Category
1	Sufficient amount of practice	5	Very Valid
2	Instructions for doing the exercises are easy to understand	5	Very Valid
3	Easy-to-read questions in the media	4	Valid
4	Display of interesting exercises in the media	4	Valid
5	The use of time when doing the exercise is right	5	Very Valid
Percentage		92%	Very Worthy

Source: Processed Data, 2021

Table 6. Economics Teacher Practical Results

No	Instrument	Teacher 1	Teacher 2	Teacher 3	Average	Category
1	Creativity	82.5%	95%	92.5%	90%	Very Practical
2	Effectiveness	90.91%	98.2%	92.73%	91.2%	Very Practical
3	Efficiency	95%	90%	95%	93.5%	Very Practical
4	Interactive	93.33%	100%	100%	98%	Very Practical
5	Interesting	86%	98%	90%	91.2%	Very Practical
Average		92.78%				Very Practical

Source: Processed Data, 2021

rage student assessment was 94.9% in the very practical category to be used in learning capital market material economics.

Table 7. Student Practical Results

No	Instrument	Average Score	Category
1	Creativity	95%	Very Worthy
2	Effectiveness	95.1 %	Very Worthy
3	Efficiency	94.9%	Very Worthy
4	Interactive	94.5%	Very Worthy
5	Interesting	95.2%	Very Worthy
Average		94.9%	Very Practical

Source: Processed Data, 2021

This study aimed to develop a product in the form of media for learning in which the media developed was a media that had also been developed by other studies, and researchers further developed this media in the form of android for high school economic learning, especially on capital market material. This media was further developed in order to meet the needs of students and teachers in learning because it was in accordance with the analysis that the researchers did in the field, namely in the school that was the object of research at SMA N 1 Salimpaung.

The development of this android-based interactive media had to go through the validity test phase given to validators and practicality given to economics teachers and students. The validation stage went through four tests, namely material validation, language validation, media validation and evaluation validation. Validation results were obtained from all validators with very decent/very valid categories. These results were in accordance with the research Sugiyono (2013) which stated that product validation can be carried out by experts or experienced experts to assess the strengths and weaknesses of a product.

Data on the practicality of learning media products were obtained from distributing questionnaires to 3 economics teachers and 30 students. Based on the results of teacher and student assessments, it was concluded that interactive media was very feasible/very practical. Practical or not a media product could be seen from the ease of using it, besides that the usefulness of the product in the field was also a consideration of its practicality as revealed by Andrizar & Arif (2017); Jalinus & Nabawi (2018); Wang, Nieveen & van den Akker (2007). In line with research Apsari & Rizki (2018); Astuti, Sumarni & Saraswati (2017); Prasetyo (2017) who agreed to find the ease of learning for students when using android-based learning media.

Based on the results of the pretest and posttest conducted by students, it was clear that the difference in student scores was clear, the results of the pretest showed that 91% of

students were not complete in working on daily questions about the capital market, after being given Android-based learning media and a post-test, only 13% of students were not complete in doing the evaluation given. In accordance with the learning achievement criteria, learning can be said to be successful or complete if at least 85% of students have scored above the minimum completeness criteria in learning outcomes, as revealed Manalu & Arif (2018); Qodariyani (2021) in his research.

It is natural when students get low grades because the methods commonly used by teachers in learning are not in accordance with students' learning styles. From the research findings, out of 90 students of class XI IPS, 61% of them liked the audio-visual learning style. They needed media in the form of images that had sound like video. This android-based learning media is equipped with material presented in the form of learning videos. Video makes a very important contribution to the media, which can present real capital market simulations to them.

This is in accordance with research Dale (1969); Davis & Summers (2015), stated in a theory of the cone of experience that he developed that one gets direct experience with real simulations. The more real a learning media is, the better for the understanding and development of student learning. Also in line with Azhar (2006); Emda (2011) that the media can provide real experiences, foster continuous thinking, provide experiences that are not obtained in other ways.

Based on concept analysis, this media is very suitable for high school economics material, especially the capital market, because it is rich in concepts and terms in the language of economics so that it can replace the role of the teacher in the classroom when learning online. This media is equipped with evaluation questions which become the benchmark for students of their abilities and mastery of the material. Students can do evaluations and open material on the application repeatedly to learn without having to depend on the internet network or android signal.

This android-based interactive learning media is said to be very feasible in terms of concept, because the material used covers everyday life which has become a common issue that is widely consumed by the public. The material which is said to be a little complicated for students to understand if it is delivered in one direction, is packaged attractively in an Android-based interactive learning media. according to Azhar (2006) the media is also able to provide actual concepts in reality and meticulously even the media is able to generate motivation and stimulate student learning activities.

This media is very useful for teachers and students in the learning process because learning becomes more interesting, interactive and even learning can be done by students wherever and whenever it can be accessed without an internet network. Students only download once, after that they are free to use without having to think about quotas and internet network access, so students who have problems with the network have no more difficulty in learning. In line with research Suhartono (2016); Wirawan (2012) that m-learning is present as a complement to learning for students and provides the freedom to learn anywhere and anytime.

The feasibility of the media is also seen in terms of the use of language that is in accordance with good Indonesian, because the language used is easy to understand by students, does not contain confusing double word meanings and every sentence used contains a communicative, simple and direct message to the target. Android-based learning media is very feasible to say technology-based media, because this learning media can be accessed by students through the technological facilities and infrastructure they have.

After going through the validation test phase by media experts and media technology experts, this is said to be very feasible because it is seen from the attractive media design. This media is equipped with a background and supporting background and the media file size is not too large, so students don't have to

worry about small android storage. This media display is also equipped with a color selection that is not too flashy, because according to Diartono (2008) the use of color in the media can attract users to open the application and can also improve performance when using the application. However, using too much color in the media can also damage the appearance of the media and be detrimental.

Digital-based learning media using the latest technology according to the times faced by students, which will be able to increase student learning motivation and learning, becomes more interesting for students because they feel they are in their world, and then the output will improve student learning outcomes. These results are supported by research Dewi, et al (2019); Dirgatama, et al (2021); Martanti & Rusdarti (2019); Yektyastuti & Ikhsan (2016), which revealed that the developed learning media could increase students' motivation in learning and cognitive learning outcomes because the media was developed in accordance with the students' thinking level.

This media as a whole after going through several stages of validation is declared very feasible to use. Similar to the research that has been done by Oktaviani (2015) who also raised the topic of research on android-based learning media. With the results of learning media that are easy to carry everywhere, applications with the latest innovations using smartphone technology can be developed in accordance with the development of science and technology. Furthermore, similar research conducted by Cahyani & Patrikha (2019); Dasilva, et al (2019); Pahlifi & Fatharani (2019), which produce Android-based learning media products as alternative learning media in accordance with the eligibility criteria for media and materials

CONCLUSION

The conclusion of this paper is that the development of android-based interactive media for learning economics on capital market materials was developed by using a

4-D model, define, design, develop and disseminate. However, this research was limited to the dissemination stage; this stage was not carried out by the researcher due to time and financial constraints. The development of android-based interactive media on capital market material economics learning was declared "very feasible" after going through the stages of validity testing and revision by material experts, language validity testing, media validity testing, validity testing and revision by evaluation experts, and this media product was very feasible for tested. Android-based interactive media was declared "very feasible" to be applied to high school capital market economics learning material.

Based on the quality of the media assessment, the shortcomings and limitations that the researchers have conveyed previously, the researchers provide several suggestions for the development and use of media products in the future, namely: this Android-based interactive learning media needs to be developed in terms of selecting HD quality images. It is hoped that this media will be developed more widely for other economic materials, not only focusing on one basic competency. Interactive media should also be developed for other smartphone versions. Suggestions for further researchers are that Android-based interactive media applications should be distributed more widely, not only in one class and one school.

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