

Development of Economics Teaching Materials Using Android-Based Mit App Software

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Abstract: The purpose of this research is to develop Android-based economic teaching materials using App Inventor Software. To find out the effectiveness of Android-based economic teaching materials using the App Inventor Software for student independence in learning. The method used in this research development is a modified Borg & Gall model with four steps of initial product development, design validation, product trials and validation. The results of the study showed that the validation of the material expert was workable with an average score of 84%. The assessment of the validator of the media expert is quite decent with an average score of 83.3%. After the validation process was carried out, then continued to a small group trial consisting of 5 students of class X by 92.2% and economics teachers. The results obtained are feasible with an average score of 95%. For field trials also received a decent rating of 88.1% of the responses of 15 students. 100% of teacher responses in economics. The development of Android-based economic teaching materials is declared feasible to improve student learning outcomes because the results of the classical completeness analysis is over 85% which is 93%.

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Introduction

The development of the times accompanied by technological advances has penetrated into various aspects of human life. Humans in their lives now use technology to simplify their work, and in education who have used technology to facilitate learning activities to achieve better results (Al-Malah, Majeed, & ALRikabi, 2023; Kabariah & Adiyono, 2023). To achieve the goals of education, more efforts are needed in improving the quality of education in Indonesia, which is still lagging other countries. As an illustration, in terms of education, the Indonesian people are currently still underdeveloped in Asia, even in a smaller scope in Southeast Asia. In the 1970s, Malaysia still imported many teachers from Indonesia (Fibiger, 2023; Sciortino, 2023). This is caused by several factors that cause the quality of education in Indonesia is still said to be low, including lacking infrastructure and supporting education, lack of competent teaching staff, lack of competent teaching staff, and many other obstacles that influence besides the factors the most important is the awareness of the importance of

education itself in the eyes of the Indonesian people, (Baharun & Hasanah, 2023; Batunan, Kweldju, Wulyani, & Khotimah, 2023)

The responsibility of educational institutions in entering the new era of globalization must prepare students to face all the challenges that change very rapidly in our society (Dewi, 2023; Efendy, Rahman, & Karim, 2023; Sholeh, Mutohar, & Sujianto, 2023). So that educational institutions are required to be able to produce superior Human Resources (HR) that are able to compete in this global competition. Improving the quality and ability of students can be done easily one of them by utilizing the internet and websites as a land to access knowledge to the widest possible extent. This effort can be done through a website for each educational institution (Billett, Choy, & Salling Olesen, 2023; Le, Choy, Smith, & Billett, 2023).

Economics is a subject of Social Sciences which examines human behavior and actions to meet the diverse needs of life, (Bail, 2023; Savin et al., 2023). In the process of delivering economic subject matter, it emphasizes more on verbalism or the teacher in applying the learning method emphasizes on the activities of the teacher, not on student activities so that there is a buildup of information on students. Even if the teacher is able to develop teaching materials that attract students' attention, it will also motivate and increase student interest in learning outcomes.

Teaching material is an important component in learning. Teaching material delivered by a teacher should refer to the objectives outlined in the curriculum (Gupta & Yadav, 2023; Humaeroah, Sardi, & Ermawati, 2023). In addition, teaching materials should ideally also be in accordance with local environmental conditions so that learning is more meaningful. Therefore, the teacher has the discretion to develop teaching materials that will be delivered as long as they do not deviate from the goal.

Interest in learning is important in the learning process because without students' interest, learning cannot be accepted by students themselves. If there is no interest from a student in a lesson, learning difficulties will arise. The presence or absence of interest in a lesson can be seen from the way the child follows the lesson, whether complete notes, pay attention to the lesson or not. An interest in learning is basically the acceptance of a relationship between oneself and something outside of oneself. The closer the relationship between yourself and something outside yourself the greater the interest.

Based on observations at the MA NW Tarekat, In the learning process there are problems faced by teachers in the class, students do not dare to ask. Out of 30 students, only 10 students dared to ask questions and express their opinions. Students are lazy to write what has been delivered by the teacher in front of the class. Students are also preoccupied with talking to their peers when the teacher explains the subject matter. it is known that the teaching and learning facilities and infrastructure that are used are still incomplete such as the lack of LCDs due to limited costs owned by schools. Teaching materials are also incomplete in school libraries, especially textbooks that are used as a reference but the amount is not sufficient for all students and many students.

Factors that influence problems in the learning process are students themselves, which is very influential on the lack of interest in learning. The cause of the lack of interest in learning to study economics is because economics is considered a difficult, frightening and less attractive subject so some students do not like economics. Study their textbooks, an economic material that still uses monotonous student worksheets and there are no android-

based economic teaching materials used in the learning process. Therefore, Android-based economic teaching materials to increase student interest in learning are highly needed by participants in class X MA NW of the Tariqa on economic subjects.

Researchers are motivated to do this research because there is still a lack of teaching materials that can make the process of economic learning more enjoyable. Based on the results of interviews conducted by researchers in class X MA NW of the Congregation it is known that students are interested in an attractive appearance and tend to have a lot of colors and images.

In this case, the school allows students to carry cellphones in certain subjects. The regulation is applied after deliberations or internal meetings with the teacher and the head of the foundation. The reason for this regulation was made because it was seen from teaching materials or handbooks for students that were still lacking, so the problem was the strongest reason that allowed students to carry cellphones in certain subjects, one of them was in Economics.

The average student has a sophisticated android mobile phone that can be used to access the internet to find material in accordance with the subject. Of the 100% of students in the NW MA Tarekat, 85% of students have an android mobile phone.

As the pace of development of Information and Communication Technology, especially the presence of smartphone technology that was in great demand by students, especially at the level of high school. (Fahrurrozi, Mohzana, Murcahyanto, & Basri, 2022). This certainly can be used to develop learning technology, especially for Economics subjects. It is also in accordance with Yuniati which states that Android smartphones can be used as an alternative medium or teaching material to improve students' understanding of a certain material (Fahrurrozi, Mohzana, Mispandi, & Murcahyanto, 2023). Multimedia-based teaching systems (technologies that involve sound, images, and video) can present subject matter that is more interesting, not monotonous, and facilitates delivery. Students can learn certain material independently by using a computer equipped with multimedia-based software. Now a lot of software has been classified as an edutainment which is a combination of education and entertainment (Adam, 2015).

When compared with conventional teaching, with the android software application learning faster, it can be done anytime and anywhere. Without having to wait for instructions from educators, students will be challenged to try to learn the application (Triluqman & Mulyoto, 2017).

With the existence of this Android-based teaching material, it is expected that learning becomes more fun, easier and motivates students to understand each material (Yaqin, 2016). With fun learning, students do not feel burdened in learning and they will find out things they do not understand about Economic material just by opening an application and learning it all the time. Android is a Linux-based operating system that is designed for touch screen mobile devices such as smartphones and tablet computers. Android was originally developed by Android, Inc. with financial support from Google. The Development of Applications for Android-Based Economic Teaching Materials in High Schools, hardware, software, and telecommunications aims to advance the open standards of cellular devices (Rokhmah, 2015), (Idris, 2017). Based on these problems, it would be nice if the learning resources of students are packaged in an attractive Android software design. Learners can access the android software related to the material, then the material will be immediately obtained. Many

positive benefits obtained from the procurement of Android-based learning software include students indirectly learning technology, especially the internet so that it can reduce students' learning skills, varied learning will reduce students' boredom in seeking knowledge, learning is not limited by time and space, (Fahrurrozi & Mohzana, 2022; Fahrurrozi & Rahmawati, 2021; Fahrurrozi, Riswanto, & Oktafiani, 2022)

Research Method

This research is a Research and Development (R&D) using a model (Borg & Gall, 1989). The data obtained in this study is in the form of quantitative data or data in the form of numbers derived from questionnaires made for media experts and material experts, besides that questionnaires are also made for students as test subjects the results of this quantitative data can be concluded about the feasibility of the model learning (Fahrurrozi & Mohzana, 2020). In addition to quantitative data, researchers also used qualitative data derived from validator comments, teacher assessments of learning models produced by researchers, and also the results of interviews with teachers in Economics.

Result and Discussion

The development of Android-based economic teaching materials to improve student learning outcomes was developed based on various stages of the needs analysis needed.

This initial product development stage is the initial stage of development research activities. Researchers develop learning media in accordance with what has been designed. The learning media developed were tested for their effectiveness and validity before they were applied in the learning process in accordance with Borg and Gall's development research. In testing the validity of the development of this learning model used several experts who validate the product that has been made. In addition, there are also instruments of teacher and student response regarding learning models that have been developed.

a. Design validation

Components that will be assessed in the validation of teaching materials in the display of teaching materials are aspects of the quality of content, aspects of eligibility, language eligibility and aspects of product attractiveness. The following is an analysis of the results of the material expert validation.

Table 1. Results of Validation by Material Experts

Aspect	Presentage (%)	Validation criteria	Conclusion
Content	83,5	Valid enough	Fair enough / No revision needed
Presentation	90	Valid	feasible / No revision needed
Language	78,5	Valid enough	Fair enough / No revision needed
Assessment	87,5	Valid	feasible / No revision needed
Average	84,0	Valid enough	Fair enough / No revision needed

Based on table 1. it can be seen that the assessment of the material experts for the aspect of content obtained criteria is quite valid with a percentage of 83.5%. As for the presentation aspects also obtained valid criteria of 90%. for linguistic eligibility also obtained criteria quite valid with a percentage of 78.5%, and assessment aspects obtained by a valid criterion with a percentage of 87.5%. The results of the validation of material experts

regarding the development of android-based economic teaching materials obtained an average of 84.0%. From some of this data it can be concluded that the android-based economic teaching materials are quite feasible to be used by students in the MA Assyafi'iyah NW Tarekat.

Components that are assessed in the display's validation of economic teaching materials are the size of teaching materials, cover design aspects, content design aspects of instructional materials, and aspects of content illustrations. The following is an analysis of the results of the validation of media experts.

Table 2. Results of Validation by Media Material Experts

Aspect	Presentage (%)	Validation criteria	Conclusion
Icon Size	75	Valid enough	Fair enough / No revision needed
Cover	87,5	Valid	Feasible / No revision needed
Content	85,7	Valid	Feasible / No revision needed
Illustration	75	Valid enough	Fair enough / No revision needed
Average	83,3	Valid enough	Fair enough / No revision needed

Based on table 2, it can be seen the assessment of media experts for the aspect of icon size obtained criteria are quite valid with a 75% percentage. As for the cover aspect also obtained valid criteria of 87.5%. For the content aspect, it is found that the criteria are valid with a percentage of 85.7% and for the illustration also the criteria are quite valid with a percentage of 75%. The results of the validation of media experts regarding the development of android-based economic teaching materials obtained an average score of 83.3%. From some of this data it can be concluded that the android-based economic teaching materials are quite feasible to be used by students at MA Assyafi'iyah NW Tarekat. From the Validation questionnaire that was filled out by the media expert validator, in addition to obtaining quantitative data, qualitative data were also obtained in the form of descriptions, namely comments and suggestions. The following outlines the results of comments and suggestions from the media expert validator of the Android-based economic teaching materials.

b. Product Trial

At this stage, researchers conducted a small group trial of 5 students and teachers in the field of economic studies. Inputs and comments given when small group trials as a form of revision of the Android-based economic teaching material products developed. After the revision, then a field trial was conducted on 15 students of class X MA NW Tarekat and reassessment by the economics teacher.

Table 3. Student Responses Regarding the Development of Android-Based Economic Teaching Materials

No	Assessed aspects	Results	Maximum score	Presentage (%)
1.	Interest (Display)			
	The appearance of these economic teaching materials is interesting	19	20	39
	this teaching material made me more enthusiastic in studying economics	20	20	40
	By using this teaching material can make learning economics not boring.	19	20	39

	These economic teaching materials support me to master economics, especially the market	18	20	38
	With the Android-based economic teaching materials can provide motivation to learn the material	19	20	39
	Average score	95	100	95
2.	content (materials)			
	The material presented in this teaching material is easy for me to understand	19	20	29
	In this economic teaching material there are several sections for me to find my own concepts	17	20	27
	This economic teaching material contains an evaluation test that can test how far I understand the market material	18	20	28
	Average score	54	60	90
3	Linguistic			
	The sentences and paragraphs used in this teaching material are clear and easy to understand	20	20	40
	The language used in these economic teaching materials is simple and easy to understand	17	20	37
	The letters used are simple and easy to read	17	20	37
	Average score	54	60	90
	Whole Average score	203	220	92,2

Referring to table 3. above, it can be seen from all aspects assessed, the feasible results are obtained, namely an average of 92.2%. Further results of each aspect can be explained in the following table.

Table 4. Student Response Results in Small Group Trials

No	Aspect Assessed	Presentage (%)	Validation criteria	Conclusion
1	Attraction	95	Very good	Very Good/ no revision needed
2	Material (content)	90	Very good	Very Good/ no revision needed
3	Linguistic	90	Very good	Very Good/ no revision needed
	Average	92,2	Very good	Very Good/ no revision needed

Based on table 4. it can be seen that the response of students in small group trials to the aspect of eligibility of interests obtained very good criteria with a percentage of 95%. As for the aspect of the feasibility of the material / content also obtained very good criteria by 90%. for linguistic eligibility also obtained very good criteria with a 90% percentage.

b. Field Trial

Field trials were conducted by making Android-based economic teaching materials as one of the learning media used during teaching and learning activities take place. Researchers replace the position of the teacher when teaching and learning activities take place. The role of the teacher is to oversee the ongoing teaching and learning activities. Before teaching and learning activities, researchers provide questions to determine the level of student understanding of the material that has been learned at a previous meeting. After completing the answers, the teacher will explain the material with different example problems. After that, the researchers then gave the same problem as before. So, researchers can compare how effective the improvement of student learning outcomes before and after using Android-based economic teaching materials. As for filling out the questionnaire responses of students and teachers conducted in the last session. So the success rate of developing Android-based economic teaching materials to improve student learning outcomes is equal to 93%.

Meanwhile, for students' responses to android-based economic teaching materials in field trials can be seen in the following table.

Table 5. Results of Student Responses in Field Trials

No	Aspect assessed	Research result	Maximum score	Presentage (%)
1.	Interest (Display)			
	The appearance of these economic teaching materials is interesting	56	60	93,3
	this economic teaching material made me more enthusiastic in studying economics	56	60	93,3
	Using these economic teaching materials can make learning economics not boring.	56	60	93,3
	These economic teaching materials support me to master economics, especially the market	48	60	80
	With the existence of economic teaching materials can provide motivation to study the material	53	60	88,3
	Average score	269	300	89,7
2.	Content (materials)			
	The material presented in this economic teaching material is easy for me to understand	50	60	83,3
	In this economic teaching material there are several sections for me to find my own concepts	48	60	80
	this economic teaching material contains an evaluation test that can test how far I understand the market material	54	60	90
	Average score	152	180	84,4
3	Linguistic			
	The sentences and paragraphs used in	55	60	91,7

this teaching material are clear and easy to understand			
The language used in these economic teaching materials is simple and easy to understand	51	60	85
The letters used are simple and easy to read	55	60	91,7
Average score	161	180	89,4
Overall Average Score	582	660	88,1

Referring to table 5. above, it can be seen from all aspects that are assessed that the results are feasible namely an average of 88.1%. Further results of each aspect can be explained in the following table.

Table 6. Results of Analysis of Student Responses in Field Trials

No	Aspect Assessed	Presentage (%)	Validation criteria	Conclusion
1	Attraction	89,7	Very good	Very good /no revision needed
2	Material (content)	84,4	Good	Good /no revision needed
3	Linguistic	89,4	Very good	Very good /no revision needed
	Average	88,1	Very good	Very good /no revision needed

Based on table 6. it can be seen that the students' responses to the field trials for the feasibility aspect of the interest obtained very good criteria with a percentage of 89.7%. As for the aspect of material/content eligibility obtained good criteria of 84.4%. for linguistic eligibility also obtained very good criteria with a percentage of 89.4%. The results of responses by students regarding the development of android-based economic teaching materials obtained an average score of 88.1%.

From the result of data analysis, it can be concluded that the android-based economic teaching materials are feasible to be used by students in MA Assyafiiyah NW Tarekat without needing revision.

For a large scale assessment by a teacher in the field of economic studies the following results are obtained.

Table 7. Overall Aspects of Assessment

No	Research subjects	Assessed aspects	Assessment result	Maximum score	Presentage (%)	Conclusion
1	Material expert	Content, presentation, language and assessment	74	80	84,0	Feasible enough/ no revision needed
2	Media expert	Icons, covers, contents, and illustrations	50	60	83,3	Feasible enough/ no revision needed
3	Five students	Display, content and language	203	220	92,2	Very good/ no revision needed
4	2 teachers of	Software	114	120	95,0	Very good/

	economics	engineering, learning design, and visual communication				no revision needed
5	15 students	Display, content and language	582	660	88,1	Very good/ no revision needed
6	1 teacher in economics	Software engineering, learning design, and visual communication	60	60	100	Very good/ no revision needed

Research and development that has been carried out by researchers regarding the development of android-based economic teaching materials to improve student learning outcomes answered about the process of developing learning media and the effectiveness of instructional media. The process of developing this learning media goes through five stages, as described in the above research results. In line also found by (Fahrurrozi & Mohzana, 2019; Fahrurrozi & Rahmawati, 2021)

Some stages carried out in the development process in this study include: (1) preliminary research, in which at this stage researchers conducted observations and interviews with students and teachers of economic subjects to find out some problems that occur at school during the teaching and learning process in the area. This stage is also carried out by spreading questionnaires to students to analyze the needs of the learning model applied by the teacher and which will be applied later by the researcher. (2) Initial product development, where at this stage researchers have begun compiling products to be developed, namely products developed in the form of Android-based economic teaching materials. (3) design validation, at this stage the researcher conducts expert validation on the products that have been made against two validators namely material experts and media experts to find out how valid the products are made before being trialled. (4) product trials, at this stage researchers conducted product trials directly on small groups and then revised if there were deficiencies. And (5) completing the product, at this last stage the researcher conducted a field trial, to find out the level of success of the learning model that has been developed by the researcher and to make the product permanently.

While the effectiveness of this learning media can be seen from three things namely the teacher's response, student response and learning outcomes, (Fahrurrozi & Sari, 2018) in seeing the effectiveness of this learning media, the class chosen as the test subject is the class X which consists of 15 students at the time field trials conducted. The effectiveness of this Android-Based Economic Teaching Material is 31%, this is in line with the Classical Completeness theory proposed by (Mulyasa, 2009) that the effectiveness of teaching materials can be seen one of them by looking at student scores above 75 (above KKM) and with the provisions classical by 85%. Because the results of this study reached 93%, the development of Android-Based Economic Teaching Materials was declared effective in improving student learning outcomes. While the response of teachers in economic studies get an average of 95% aspects of overall aspects and 87% of students'

responses, so this learning model is feasible to be applied in teaching and learning. This is in line with the eligibility test criteria tested by descriptive analysis with the percentage of response results obtained above 85.01% then it is feasible or unnecessary to be revised (Akbar, 2013). So, because the results of the teacher's response in the field of economic studies and student responses get results above 95%, the Android-Based Economics Teaching Material is declared suitable for use in the teaching and learning process.

Conclusion

Based on the discussion that has been presented, it can be concluded that the development of Android-based economic teaching materials is carried out through several stages starting from preliminary research, initial product development, initial product, final product trial, and final product. As for the various stages, some validation needs to be done to determine the validity level of the product that has been made so that what has been developed can be applied according to the purpose. The validator's assessment of material experts is workable with an average score of 84%. The assessment of the validator of the media expert is quite decent, with an average score of 83.3%. After the validation process was carried out, then proceed to a small group trial consisting of 5 students of class X by 92.2% and economics teachers. The results obtained are feasible with an average score of 95%. Field trials also get a decent assessment of 88.1% of the responses of 15 students and 100% of the responses of teachers in economics. The development of Android-based economic teaching materials is declared feasible to improve student learning outcomes because the value of the results of the classical completeness analysis is more than 85% which is 93%.

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