# The Development of Interactive Media in Economics for Senior High Schools Students Using Android Platform

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**Abstract:** This study aims to determine the feasibility, practicality, and effectiveness of developing interactive media for economic subjects with the Android platform. This study followed the development research using the 4D model consisting of four stages: defining, designing, developing, and disseminating. The trial subjects used class X SMA Lab school Universitas Negeri Surabaya. The instruments were validated by undergoing sheets and questionnaires. The collected data were further analyzed with descriptive analysis by validating material experts, media experts, practitioners, and students' responses. The findings indicate that the review and validation by a presentation expert showed a validation score of 85.19%. The number of students who have test scores above 78 is 26 out of 30 students. Therefore, the classical completeness obtained is 86.67%. Based on these results, it can be concluded that Android-based interactive media for economics class X is feasible, practical, and effective in improving student learning outcomes.

**Keywords:** Android platform, Economics subject, Interactive media, Senior high schools

## INTRODUCTION

The Covid-19 pandemic has made every country in the world follow through the new normal era. The style of work, travel, worship to study must also adapted this shifiting. Teachers, lecturers, and students are the ones who feel it the most in the field of Education. To deal with, online learning can be the win-win solution. However, many educators feel difficulties in enhancing the educational process and students are difficult to understand the materials (Prakoso, 2020).

Some scholars in beliving that face-to-face learning is perceived more effectives for education success. However, the vaccination process takes long time to reach all components in society. The lack of vaccination for students is a possibility that learning is not fully face-to-face. Several options that can be a solution during this transition period are hybrid learning, flip learning. Concerning with this condition, educators need to prepare an interactive learning media that can be used both online and offline. This media must be prepared immediately as a preventive effort if learning cannot be carried out offline. Additionally, the enhancement of learning media can be useful to increase students' motivation.

The development of Android-based learning media has been conducted and it can improve learning outcomes as well as obtaining positive responses from students (Nurisa & Abdul Ghofur, 2019; Pratama & Sakti, 2020; Setiadi & Ghofur, 2020; Wahyono, 2019). The existing studies on the development of interactive modules for class X SMA is also carried out but across high school science interests (Sufiyah & Sumarsono, 2015). Economics subjects are often developed in research,

but the material developed is not in the whole one academic year, but on certain core competencies (Agustina, 2014; Realita, Rupaidah, & Rizal, 2016; Sriwahyuni & Mardono, 2016; Susana & Masruri, 2015; Wahyono, 2019; Yunus & Rakib, 2016). Additionally, Economics deal with the complex issues that needs a comprehensive understanding.

However, research that develops interactive Android-based material for class X SMA in one academic year has never been performed. With the existence of a pandemic and the incompleteness of interactive economic media for class X SMA, there is a need develop this matter. This research takes the formulation of the problem, in particular how to develop contextual-based interactive media with the Android platform for Economics. The formulation of the problem aims to find out how to validate the feasibility, practicality and effectiveness of the results of developing interactive media.

This study will contribute to the literature on the educational perspectives by providing Android-based model in Economics that are missing in the prior studies. Additionally, this research provides contribution to alternative model for online learning or hybrid learning that can be useful for educators. Lastly, the development model can useful for educators and policyresearch to involve the role of learning media in educational process.

**METHODS**

Model Development in contextual-based teaching materials and problem-solving using a 4-D model adapted from Thiagarajan et al. (1974) consists of four defining, designing, developing, and disseminating. However, this study only involved the stage of developing and further disseminating. In detail, the defining stage is performed by analyzing the needs needed before providing development products, including curriculum analysis, student analysis, task analysis, concept analysis, and analysis of learning objectives. This stage is purposed to design interactive media drafts for high school economics subjects, covering the selection of teaching materials, formats, and initial design of interactive learning media. The developing stage contains activities for realizing product designs that have previously been made. A conceptual framework for implementing a new product was developed in the previous stage. The conceptual framework is then realized into a product ready to be implemented. It is necessary to propose instruments to measure product performance at this stage. In developing this textbook, a validation process was performed by two experts who were relevant to the scientific field. This is intended to assess the feasibility of the book in terms of the components of the feasibility of the material (content), language, media, and presentation of the book. Then, the researcher made a revision based on the expert's evaluation. The revision results will produce a draft of a CTL-based research method textbook that is ready to enter the pilot stage. The expert review instrument consisted of a content feasibility validation sheet, presentation, language, and graphics. This validation sheet is filled out by evaluation experts and linguists by placing a checkmark in the "Yes" or "No" column. Filling out this validation sheet will produce quantitative data to assess the

feasibility of self-assessment and peers. Self and peer assessments are included in alternative assessments (non-test assessments).

**Instruments**
The instruments for this research are provided as follows. First, the validation sheet is a sheet that experts adopt in observing and assessing the quality of the developed book and assessing the book's design. The validation sheet is intended for material experts, module development experts, and practitioners who will assess the quality of the book's feasibility. The expert validation sheet covers language, content substance, and form of presentation. The questionnaire is aimed at students to find out their response to the development of Android-based interactive media. The scoring of the questionnaire is based on a Likert scale with a score range of 1 to 5. The preparation of the questionnaire items is based on predetermined indicators.

**Trial Subject**
The trial subjects in this study were students of class X at the high school (SMA) level. The study incorporated students from SMA Lab school Universitas Negeri Surabaya (Unesa) class X IPS with 30 students as test subjects. Textbooks need to be tested on 10-20 students who represent the target population. This is because less than ten data obtained can describe the target population.

**Data Analysis**
This study adopted descriptive data analysis to determine the feasibility of the textbooks that have been developed. This data analysis technique is used to process data from the validation results of material experts, media experts, practitioners, and student responses. The study sheet data that material experts have filled out, graphic experts, and learning/presentation experts are analyzed in qualitative descriptions. This analysis obtains information about the shortcomings that need to be corrected from the assessment developed by the researcher. The qualitative description analysis was obtained from the criticisms and suggestions given by the experts.

**Validity**
This test was conducted to analyze the expert's assessment of the developed media. The analysis results are used to decide whether or not the developed media needs to be revised. The decision-making criteria can be seen in Table 1.

**Table 1.** Decision Making Criteria

| Learning Accomplishment | Criteria | Revision |
|---|---|---|
| 81-100% | Excellent | No |
| 61-80% | Good | No |
| 41-60% | Average | Yes |
| 21-40% | Fair | Yes |
| 0-20% | Poor | Yes |

This test analyzes feedback from students in product development trials (interactive media). The criteria for the feedback will be classified in Table 2. The

feedback results will be used for the classification of the use of the developed product.

**Table 2.** Classification of Feedback on Media Use

| Percentage | Criteria |
|---|---|
| 81-100% | Excellent |
| 61-80% | Good |
| 41-60% | Average |
| 21-40% | Fair |
| 0-20% | Poor |

## RESULTS & DISCUSSIONS

### The Defining Stage
The definition stage aims to identify the curriculum, students, and learning objectives. These components are used as the basis for compiling teaching materials, namely textbooks based on the research methodology that will be developed. These components are described as follows.

### *Curriculum Analysis*
The curriculum used in this study is the K-13 curriculum which is applicable at the high school (SMA) level. An analysis of the essential competencies, indicators, and study materials will be carried out at this stage. These components are used as a basis for planning the development of interactive media for economics class X at the high school (SMA) level. Based on the analysis of the curriculum in economics class X at the high school level, the interactive media developed to include nine topics (chapters), namely: (1) Economics concepts, (2) Economic problems, (3) The role of economic activity actors, (4) Markets, (5) Banks and other financial institutions, and financial services authority, (6) Payment systems and instruments, (7) Management concepts, (8) Business entities, and (9) Cooperatives.

### *Students' Analysis*
The students who were analyzed in this development research were the students who were the research subjects. In connection with the curriculum used in this study, the students who were used as the study subjects were class X students at SMA Lab school Unesa. Based on data from the administration section, there are four classes of class X students at SMA Lab school Unesa divided into three science classes and one social studies class. Based on these data, the students who were used as test subjects were class X IPS with 30 students.

Class X Social Sciences consists of 15 male students and 15 female students. Based on the assessment results in the classroom in the form of cognitive, affective, and psychomotor, it shows that there is no significant difference between students. In this case, the academic ability of the research subjects is, on average, the same or homogeneous, so there is no high heterogeneity. Based on the information obtained from the class economics teacher, many students still have difficulty understanding economics material, especially related to hybrid learning situations, where the duration of offline learning is minimal and dominated by online learning.

On the other hand, many students do not have teaching materials such as economics textbooks. Although teachers have often provided teaching materials in the form of soft file materials, they rarely want to read or study material that the teacher has prepared. This can be seen in learning situations, where the teacher often gives oral questions, and only a few of the students can answer correctly. In detail, the main cause of these difficulties was that students felt lazy to study soft file materials that the teacher had given. For this reason, it is necessary to develop interactive learning media that are easily accessible by students anywhere and anytime via smartphones.

### Concept analysis
Concept analysis in this development activity is needed to determine the concepts needed by students in achieving the final competence of learning.

### The Designing Stage
In this stage, we provided an initial design related to the appearance of the Android-based interactive media. There are three things to do, namely selecting the basic color, determining the menu that will be displayed, and designing the icon for each menu. For the color selection, we decided to use a blue background color to reflect the affiliate identity of the Universitas Negeri Surabaya (Unesa) as the originating agency for the application. Then, we adopted four icons for the menu to make the application developed to be simple. The menu consists of application usage instructions, materials, quizzes, and application developer profiles (see Figure 1).
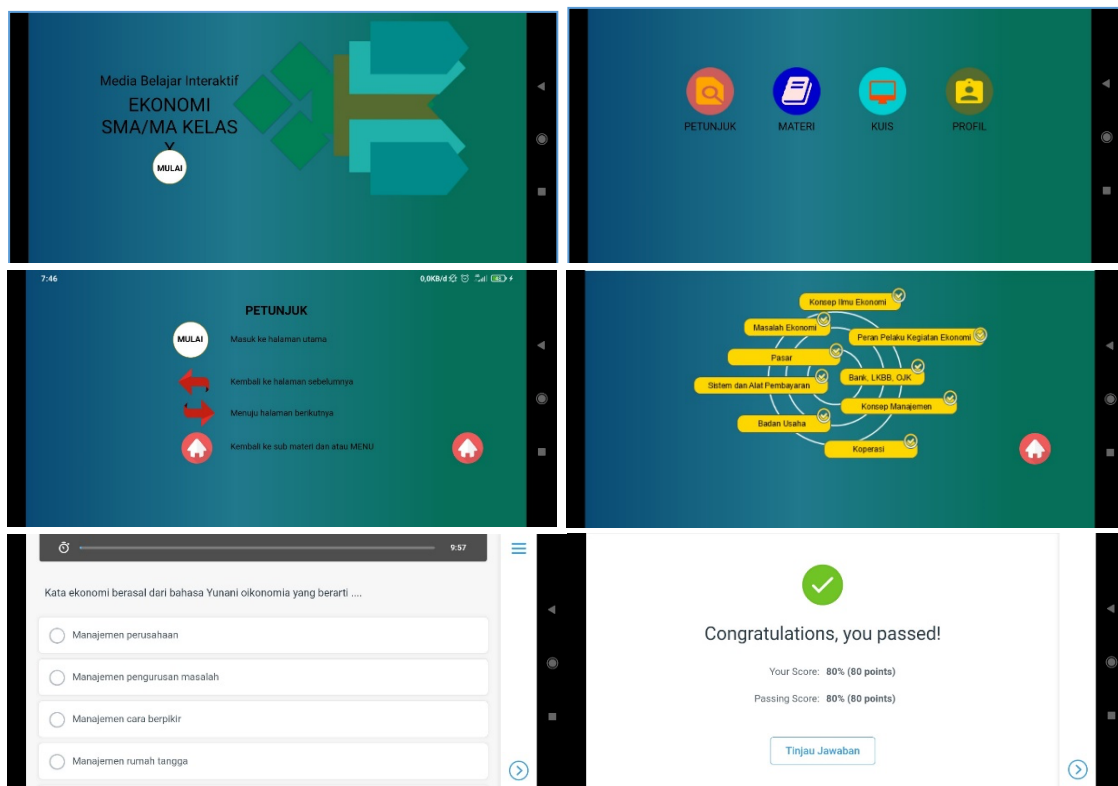
**Figure 1.** Preface for Application

**The Developing Stage**
The developing stage aims to enhance interactive media for economics class X SMA, which will cover nine topics, namely: (1) The concept of economics, (2) Economic problems, (3) The role of economic activity actors, (4) Markets, (5) Banks and other financial institutions, and financial services authority, (6) Payment systems and instruments, (7) Management concepts, (8) Business entities, and (9) Cooperatives. The developing phase consists of three stages: review, validation, and limited trial.

*Expert Review and Validation*
This interactive media review includes three instruments, namely (1) the feasibility of the substance of the material, (2) the feasibility of graphics, (3) the feasibility of learning/presentation with the criteria of conformity with the description of the material with the syllabus used, presentation feasibility, presentation technique, learning presentation, completeness of presentation. The review sheet uses five answer choices based on a Likert scale from a score of 1 to 5 with comments and suggestions. The validation and review from the experts are presented in Table 3.

**Table 3. Material Expert Validation Results**

| No | Aspect | Score Validation 1 | Score Validation 2 |
|----|--------|--------------------|--------------------|
| 1 | Material Coverage | 32 | 38 |
| 2 | Material Accuracy | 29 | 35 |
| 3 | Update issue | 30 | 39 |
| 4 | Containing Productivity Insights | 30 | 41 |
| 5 | Stimulating Curiosity | 28 | 34 |
| 6 | Developing a sense of Diversity | 31 | 39 |
| 7 | Developing Life Skills | 32 | 38 |
| 8 | Using Indonesian Languages tandard | 28 | 34 |
| **Total** | | 240 | 298 |
| **Percentage** | | 66.67 | 82.78 |

Criticisms and suggestions obtained from experts are used as material for improving draft one interactive media into draft two interactive media. Criticisms and suggestions obtained from material experts in draft one is used as the basis for making improvements to draft two, which are then submitted back to the experts. The results of the review and validation of draft two by material experts indicate that draft one has been improved and is declared "very feasible" for testing. This is evidenced by the acquisition of a validation score of 82.78%. The score obtained from the material experts is 66.67% which is categorized as decent. Based on these results, the next step is to review and validate by graphical experts.

Based on a study by a graphic expert, there are suggestions, namely adjusting the application display theme (media) in terms of the main display (homepage), the display for the material, and the display for the quiz menu. Each theme chosen should not interfere with the content (content) of the media so that the media is still easy to read and understand by students. In addition, it is necessary to pay attention to the proportion of the size of writing, graphics, and tables with the screen size field so that users can read the information displayed in the interactive media. The results of the validation by graphic experts are shown in Table 4.

**Table 4.** Graphic Expert Validation Results

| No | Aspect | Score Validation 1 | Score Validation 2 |
|----|--------|--------------------|--------------------|
| 1 | User interface | 3 | 4 |
| 2 | Home section | 4 | 5 |
| 3 | Media content section | 29 | 37 |
| **Total** | | 36 | 46 |
| **Percentage** | | 65.45 | 83.64 |

The score obtained from the graphic expert is 65.45% which is in the "decent" category. The results of the review and validation of draft two by graphic experts indicate that draft one has been improved and is declared "very feasible" to be tested. This is evidenced by the acquisition of a validation score of 83.64%. Based on these results, the next step is to review and validate by a presentation expert. Based on the results of the analysis of the ancient presentation, there is a suggestion that a particular menu should be given containing instructions for using the application, how to go to the material, return to the previous page or go to the next page, and how to return to the main menu. This is to make it easier for students who are using interactive media for the first time. In addition, there should be instructions for using interactive media applications so that students can easily use the application. The results of the validation by the presentation expert are shown in Table 5.

**Table 5.** Validation Results of Presentation Experts

| No. | Aspect | Score Validation 1 | Score Validation 2 |
|-----|--------|--------------------|--------------------|
| 1 | Systematics in presenting the material must be consistent | 35 | 42 |
| 2 | The logic in presenting the material must be in accordance with the flow of deductive and inductive thinking | 29 | 36 |
| 3 | Confusion in the presentation of material | 31 | 38 |
| 4 | Presenting material reviews in the form of pictures or illustrations | 31 | 38 |
| 5 | Using image presentations that match the chapter on the material | 32 | 39 |
| 6 | Make practice questions | 32 | 39 |
| 7 | Make practice questions | 32 | 38 |
| 8 | Scientific approach | 30 | 37 |
| 9 | Creativity and variety of materials | 31 | 38 |
| **Total** | | 283 | 345 |
| **Percentage** | | 69.88 | 85.19 |

The overall score obtained from the masters of tuning is 69.88% which is in the "decent" category. The results of the review and validation of draft two by a presentation expert indicate that draft one has been improved and is declared "very feasible" to be tested. This is evidenced by the acquisition of a validation score of 85.19%. The next step is to conduct a limited trial based on these results.

### Limited Trial Stage

After review and validation were carried out by material, graphic, and presentation experts, a limited trial was carried out. This trial was conducted to determine the practicality of interactive media for Android-based 10th-grade economics subjects. The subjects used as a limited trial in this research were 30 students of SMA Lab school Unesa class X IPS. In addition to students, trials were also conducted on economics teaching teachers. Data on the practicality of interactive media for Android-based class 10 economic subjects can be seen in Table 6.

**Table 6.** Practicality Trial Results

| User | Average | % | Decision |
|---|---|---|---|
| Students | 4.5 | 87.75 | Appropriate |
| Teachers | 4.4 | 88.5 | Appropriate |

The practicality of interactive media for class X economics based on Android from the students' perception is 87.75%. While the practicality obtained from the teacher is 88.5%. Thus, this interactive media is "very practical" and does not need to be revised.

### Effectiveness Test Results

The effectiveness of the Android-based class X economic map interactive media was measured through a test after the learning took place. The method used is a one-shot case study. The minimum completeness criteria used is 78. The number of students who had test scores above 78 was 26 out of 30 students. Therefore, the classical completeness obtained is as much as 86.67%. Thus, interactive media for Android-based class X economics can be concluded as "very effective" to improve student learning outcomes.

### The Feasibility of Interactive Media

The results of developing Android-based interactive media for economics class X are seen from three aspects, namely material, graphic, and presentation aspects. First is the material aspect. The results of the first validation by the expert showed that from the material aspect, a score of 66.67% was obtained with several inputs, namely the separation of material between the basic competence (KD) displayed, the use of simple and straightforward language, the questions in the quiz must represent each existing KD. After being revised based on material expert input, the score obtained increased to 82.78%, with a very decent category.

The second is the graphic aspect. The results of the first validation by the expert showed that from the graphic aspect, it obtained a score of 65.45% with several inputs, namely it was necessary to adjust the theme of the application display (media) from the side of the main display (homepage), the display for the material menu, and the display for the quiz menu. Each theme chosen should not interfere with the content (content) of the media so that the media is still easy to read and understand by students. After being revised based on input from graphic experts, the score obtained increased to 83.64%, with a very decent category.

The third is the presentation aspect. The results of the first validation by the expert showed that from the presentation aspect, the score was 69.88% with several

inputs, namely a special menu should be given containing instructions for using the application, how to go to the material, return to the previous page (back) or go to the next page (next). Furthermore, how to return to the main menu. This is to make it easier for students who are using interactive media for the first time. After being revised based on input from graphic experts, the score obtained increased to 85.19%, with a very decent category.

**The Practicality of Interactive Media**
The practical aspect of Android-based interactive media for economics class X SMA subjects was obtained from the questionnaire scores given to users, namely students and teachers after a limited trial was carried out for the use of the media. The questionnaire results for the practicality aspect of students obtained a score of 87.75% and teachers 88.5%. This shows that the Android-based interactive media developed is considered practical for economic learning activities. The questionnaire results for the practicality aspect measure three things: effectiveness, interactivity, efficiency, and creativity of the developed media. First, for the aspect of effectiveness. Additionally, it can be seen that the developed media can be used to help understand the material, as evidenced by the acquisition of scores of 87.75% from students and 85% from teachers. This is reflected in the increase in students' understanding of the economic material taught by the teacher after using the developed Android-based interactive media.

The second is the interactive aspect, namely students' perceptions of the user interface and the ease of using the media. Students' questionnaire scores showed an average of 86.75% and 85% from teachers. This reflects that the Android-based interactive media developed is easy to use by students and teachers. The third is the aspect of efficiency, where this aspect measures the ease of use of media anywhere, anytime, as well as the ease of carrying media. The score of the students is 91%, and the teacher is 90%. This reflects that Android-based interactive media was developed efficiently to be easy to carry and use anywhere and anytime. The last is the creative aspect of the media, which measures the presence of questions in the form of exciting quizzes and how this media helps students be active in the learning process. The questionnaire results show the score of the students was 85.5%, and the teacher's score was 90%. This shows that this media can make students more active in learning. On the other hand, presenting questions in the form of quizzes can make students more interested in practicing practice questions to measure the level of understanding of the material contained in the interactive media.

**The Effectiveness of Interactive Media**
The effectiveness of Android-based interactive media for economics class X SMA is obtained from the learning outcomes test. The test was given in a limited trial with a minimum score of 78. The test results showed that of the 30 students of class X Social Sciences who were the subject of the limited trial, 26 students scored above the minimum score. This means that the classical completeness of the results of a limited trial using Android-based interactive media is 86.67%. The results of this learning outcome test indicate that the Android-based interactive media developed effectively improves learning outcomes. The in-depth analysis results show that several factors cause this interactive media to improve student learning outcomes.

First, with this Android-based interactive media, students can easily access learning materials using smartphones anytime and anywhere. Second, this learning media is packaged in the form of an easy application that can be easily installed on an Android-based smartphone and has an easy-to-understand user interface with an attractive appearance. Third, this media is also equipped with practice questions packaged in the form of a quiz so that students can easily measure the level of understanding of the material through the quiz menu in this learning media application. Finally, this media is packaged in an interactive form to guide students to be more active when using media to understand economic material. With the three advantages offered by the media, students can easily use learning media and, in the end, can improve student learning outcomes in economics subjects.

## CONCLUSIONS

Based on the study results, it can be concluded that the Android-based interactive media developed are in the feasible and practical category for use in learning activities. In addition, the media has also proven to be effective in improving student learning outcomes in economics subjects. This research focuses on developing Android-based interactive media adapted to the curriculum's characteristics and high school students of class X at SMA Lab school Unesa, so the results of this study cannot be generalized to a broader research subject. We also suspect a possible discrepancy when used in other schools with different student characteristics. For this reason, we suggest that further researchers develop the same media based on the characteristics of different students to test the effectiveness of Android-based interactive media.

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