



Development of Multimedia Learning Android on Basic Network Engineering Orientation Material Computer and Telecommunication Vocational Schools

Wiwik Melliana^{1*}; Luluk Mauli Diana²

^{1,2}Informatics Education, Universitas Trunojoyo Madura, Indonesia

^{1*}Corresponding Email: wiwikmelliana@gmail.com, Phone Number: 0857 xxxx xxxx

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Abstract: The era of digitalization of education requires effective learning methods, especially in Informatics subjects. This research develops Android-based learning multimedia for Basic Orientation material for Computer Networks and Telecommunications in Vocational Schools. Multimedia development using the ADDIE model includes Analysis, Design, Development, Implementation, and Evaluation and involves class X TKJ SMKN 1 Sepulu students as research subjects. Data was collected through observation, interviews, and tests. Data analysis was carried out using descriptive and qualitative methods. Two expert validators, material experts and media experts, carried out the validation. The data collection technique uses a questionnaire. Validation results from material experts meet the requirements of 92.5%, which means they are very valid; the media expert results meet the requirements of 92.3%, which means they are valid. At the implementation stage, a trial was carried out. The results of field trials on 30 grade 10 TKJ students obtained an average score of 92.6% with excellent qualifications, which means this medium is accessible for students to learn. The results of testing Android-based multimedia learning show that the media is very suitable as a learning medium for making patterns and helping students' teaching and learning process.

Abstrak: Era digitalisasi pendidikan membutuhkan metode pembelajaran yang efektif, terutama dalam mata pelajaran Informatika. Penelitian ini mengembangkan multimedia pembelajaran berbasis Android untuk materi Orientasi Dasar Jaringan Komputer dan Telekomunikasi di SMK. Pengembangan multimedia menggunakan model ADDIE meliputi: Analisis, Desain, Pengembangan, Implementasi dan Evaluasi dan melibatkan siswa kelas X TKJ SMKN 1 Sepulu sebagai subjek penelitian. Data dikumpulkan melalui observasi, wawancara, dan tes. Analisis data dilakukan dengan metode deskriptif dan kualitatif. Validasi dilakukan kepada dua validator ahli yaitu ahli materi dan ahli media. Teknik pengumpulan data menggunakan angket Hasil Validasi ahli materi memenuhi syarat 92,5% yang artinya sangat valid, hasil ahli media memenuhi syarat 92,3% yang artinya valid. Pada tahap implementasi dilakukan uji coba. Hasil uji coba lapangan yang dilakukan kepada siswa TKJ kelas 10 sebanyak 30 siswa memperoleh nilai rata-rata 92,6% dengan kualifikasi sangat baik, yang artinya media ini mudah dipelajari siswa. Berdasarkan hasil pengujian multimedia pembelajaran berbasis android menunjukkan bahwa media sangat layak digunakan sebagai media pembelajaran pembuatan pola dan membantu proses belajar mengajar siswa.

A. Introduction

In the era of Industrial Revolution 4.0, education must recognize the role of information and communication technology (ICT) in the learning process. Digital transformation has brought significant changes in various aspects of life, including education. In this case, it is essential to pay attention to how technology can improve the quality of learning and prepare the younger generation to face future demands. According to a study by [Amelisa et al \(2023\)](#), the use of information technology in learning positively impacts students' learning motivation and academic results. This shows that integrating information technology in the learning process is relevant and supports achieving educational goals more effectively. [Hasanuddin et al \(2022\)](#) stated that teaching materials can also be interpreted as systematically arranged to enable students to learn independently and are designed to follow the applicable curriculum.

The Development of science and technology has significantly changed various aspects of life, such as the economy, health, education, communication, environment, security, transportation, and culture. According to [Lestyaningrum et al \(2022\)](#), technology has revolutionized the learning paradigm by introducing teaching aids that support the learning process. In this context, technological developments have influenced the learning environments used in education, reflecting a transformation with more innovative approaches and using technology as a practical learning tool. Technology has changed the appearance and operation of classrooms. According to research, modern classrooms are now equipped with various digital tools and resources that facilitate learning and increase student engagement ([Subroto et al., 2023](#)). Teachers today are expected to have skills in using educational technology in the classroom ([Tondeur et al., 2019](#)).

According to [Junaidi \(2019\)](#), the teaching and learning process in learning design involves several essential components: objectives (desired results), materials (learning content), methods (teaching methods), media (supporting tools), and evaluation (measurement of achievement). All of these components work together to create a practical learning experience. Learning media is an essential element in this process because it is used to convey material to students. Selecting appropriate and careful learning media can have a significant impact on learning effectiveness. Good media can help students understand and internalize material better and make learning more exciting and interactive. Therefore, selecting and using learning media that suits learning objectives and student characteristics is crucial in creating an effective learning environment, such as textbooks, images, videos, and learning software ([Dewi & Handayani, 2021](#)).

However, the reality on the ground often needs to reflect the full potential of information technology in education. Several factors, such as limited access, lack of digital skills among educators, and infrastructure challenges, still need to be addressed when using information technology in learning. In this context, developing Android-based learning multimedia can be an effective solution. Using a familiar platform for many students, Android-based learning multimedia can increase student engagement and enrich their learning experience. In a recent study by [Astuti et al \(2021\)](#), using Android-based learning

multimedia has been proven effective in improving students' understanding of concepts and skills in various subjects. This shows the great potential of this approach in improving the quality of learning in schools (Sari & Ali, 2019).

Apart from that, Fauzi et al (2021), the Development of Android-based learning multimedia can also help overcome the problem of unequal access to learning media. Using smartphones that most students already own, learning multimedia can be accessed flexibly and efficiently without being limited by physical or geographical boundaries. In this case, it is essential to highlight the importance of capacity development for educators in integrating information technology into learning. Adequate training and support are needed to ensure that educators can utilize information technology effectively in the learning process. Apart from that, this research also emphasizes the importance of collaboration between various stakeholders in the world of education, including teachers, students, parents, and other related parties. In developing Android-based learning multimedia, participation, and input from various parties is essential to ensure that the resulting solution can benefit all parties involved.

Thus, the Development of Android-based multimedia learning is not just a technological solution but also a strategic step in improving the overall quality of education. In an increasingly digitally connected era, it is essential to continue to innovate and adapt to developments to ensure that education remains relevant and effective in preparing the younger generation to face future challenges. By taking this approach, education can drive social and economic progress and provide more significant opportunities for all individuals to succeed. In this case, developing Android-based learning multimedia can be an essential first step in building a stronger and more inclusive educational foundation for a better future (Hidayat & Nizar, 2021).

The current Development of information technology covers almost all areas of life, not including education. Education by utilizing information technology has two advantages. Firstly, as a driving force in the world of education, including teachers, we are also expected to be more appreciative of maximizing educational potential. Secondly, we are expected to provide more opportunities for students to utilize their potential. The availability of media, technology, learning resources, and an adequate learning environment can help students learn (Pradana et al., 2020). In education, learning media is essential for achieving learning goals at school. The use of conventional learning media such as blackboards and books is considered to have led to student boredom in learning. Therefore, alternative media is needed to support a learning process where students can feel interested in the media used by educators, and it is hoped that it can reduce boredom in the learning process.

Smartphones are devices that students can use to support the teaching and learning process. Smartphones positively impact learning success because they present various innovations in the world of education, one of which is M-learning. M-learning (Mobile Learning) is a type of E-learning learning model that involves mobile devices such as laptops, PDAs, tablet PCs, and smartphones. One of the benefits of M-Learning is its ability

to make it easier for students to access learning materials anytime and anywhere (Wahyono, 2019).

Smartphones have become a trend among students, with most vocational school students having smartphones equipped with advanced features. The type of smartphone that is currently developing rapidly is Android, so the Development of Android-based learning media can simplify the teaching and learning process (Kartini & Putra, 2020). The Development of learning media using Android can support the student learning process, especially in online learning, by providing easy access to material anytime and anywhere. Apart from that, this learning media can attract students' interest, increase learning motivation, and make it easier to understand the material (Wahyuni & Etfita, 2020). Not only is it beneficial for students, but Android-based learning media also makes it easier for teachers to convey teaching material to students.

Based on the results of observations at SMKN 1 SEPULU, especially in class, students can use Android during learning to search for learning materials. However, many students need help to use it. Android is supposed to be used for searching for learning materials but only for things that are not useful, such as virtual entertainment surveys, playing games, and looking at other things. The use of Android during the learning process is not optimal because students do not use Android properly when studying, and students only use Android to play games and social media.

From the problems above, researchers have developed Android-based learning multimedia to overcome the problem of limited display media and the large number of uses of Android, which are less useful in learning. This method utilizes smartphone technology owned by students as a learning medium that can facilitate students' learning and improve student learning outcomes.

This development research was carried out to update and become a new solution in the use of learning media, which is still considered conventional. It also reminds teachers that it is very important to utilize and update media to support the learning process and make it more effective and efficient in line with current developments.

This research uses a development research approach. This approach is used in the ADDIE (Analyze, Design, Development, Implementation, Evaluation) model (Asmayanti et al., 2020; Sugihartini & Yudiana, 2018). The ADDIE development method in its stages can be seen in the following picture.

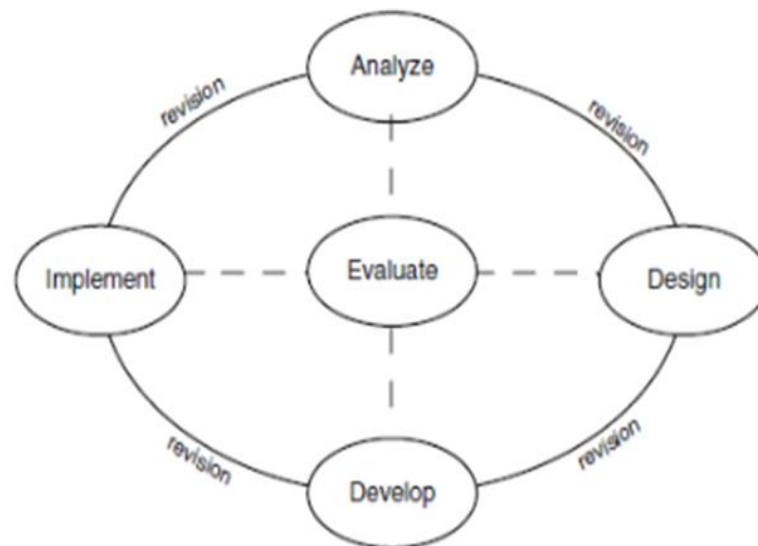


Figure 1. ADDIE Development Model (Asmayanti et al., 2020)

The complete research flow using the ADDIE model can be described in the following table:

Table 1. Stages of Development Activities and Research Results

| No | Activity | Results |
|----|---|--|
| 1 | Analysis: This process is a stage of analyzing various aspects used in application development. This study analyzed the learning needs for ODTKJT material in class X SMKN 1 Sepulu. | The results of interviews and observations are used for the application. |
| 2 | Design: This stage is the design process for developing Android-based learning multimedia. At this stage, you will design all the displays from start to finish. | Application design plan |
| 3 | Development: This process is the stage of developing or realizing the design. This research uses <i>PowerPoint</i> , <i>Ispring</i> , and Website 2 APK Builder Pro to develop Android-based multimedia learning. The application results must also be validated to obtain eligibility from the expert validator and perfected if the expert validator provides revision notes. | Validated application |
| 4 | Implementation: This research's implementation stage involves implementing Android-based learning multimedia in real classroom situations. During implementation, the developed multimedia is applied to actual conditions, and the teaching materials are delivered in accordance with the learning. | Results of application trials that have been carried out |
| 5 | Evaluation: Evaluate the application after testing | Improvements according to evaluation results |

Table 2. Information Mark Secor
Source: Modification (Lamada et al., 2020)

| Category | Score |
|-----------------------|-------|
| Very In accordance | 5 |
| In accordance | 4 |
| Enough In accordance | 3 |
| It is not by | 2 |
| Very No In accordance | 1 |

C. Result and Discussion

Result

This research is a type of development research that results in multimedia applications used in the learning process, especially in Basic Orientation material for Computer Network and Telecommunications Engineering (ODTJKT). By general application, this was developed using base Android, which can be used as an infrastructure in activity learning. Where in Development application This can help develop innovative media learning Which can used by Teachers in face development technology fast. In the Development of multimedia android, This uses model development ADDIE, which can be seen in the following presentation:

1. Stage Analyze (Analysis)

SMKN 1 SEPULU, particularly class X, generally refrains from using learning media in the learning process, especially in learning about primary orientation material for computer networks and telecommunications engineering. However students can use Android during learning to search for learning materials, but many students need to use it better. Android is supposed to be for searching learning materials but only for useless things like virtual entertainment surveys, goofing around, and looking at other things. So, using Android moment process learning did not yet feel maximum because students use Android with Good when studying, whereas students only use Android for playing games and social media.

For this problem, the researcher developed multimedia learning based on Android to overcome the limitations of the media and the many uses of Android that need to be more beneficial in learning. Utilizing smartphone technology owned by students as a learning medium can facilitate students' Studies and increase their results.

a. Analysis content Requirements/ontent

In needs analysis, in this case, learning media is needed, Which can help the Teachers in the learning process and utilize the use of Android, Which is Still Not yet used in a way maximum. For analysis, I need this, especially regarding the material orientation base technique of network computer and telecommunication ODTJKT in class X TKJ SMKN 1 SEPULU. This is the result of an interview with the teacher of ODTJKT students at SMKN 1

SEPULU, where he said that learning did not attract students' interest in participating in learning. The use of Android by students at school could have been more valuable, so researchers felt that developing Android-based learning media benefited teachers in cultivating students' enthusiasm for learning.

b. Analysis Need Software (Device Soft)

Analysis need (need analysis) on stage This develop application multimedia learning Which can access use android where to use software Which easy obtained that is a *PowerPoint, spring, And Website 2APK Builders Pro* in application development This. The following are the features that will be created and their uses:

- **Interactive Learning Module:** This feature will allow students to access learning materials interactively. Using PowerPoint and iSpring, learning modules will be presented in an attractive format with images, graphs, and animations supporting the material's understanding.
- **Interactive Quizzes and Exercises:** The application will provide features for conducting quizzes and interactive exercises. Students can test their understanding of ODTJKT material through the various questions and exercises.
- **Learning Videos:** Using iSpring will allow the integration of learning videos into the application. These videos will provide additional explanations and examples that support students' understanding of the material.
- **Discussion Forum:** This feature will allow students to interact and discuss learning material. They can exchange ideas, answer questions, and help each other understand the material.
- **Evaluation Quiz:** The application will provide an evaluation quiz to measure student understanding after they complete the learning module. The results of this evaluation quiz will help students and teachers to evaluate their learning progress.

2. Stage Design (Design)

Application multimedia learning with material Orientation Base Network This Computer and Telecommunications (ODTJKT) is operated by one user. The user-in-operation application is used to do orders, which will be executed by the system so that students can look for information as soon as possible from materials available in the application without any time limit for each menu. At the design stage, the application is multimedia learning based on Android. This will be explained more in Figure 2.

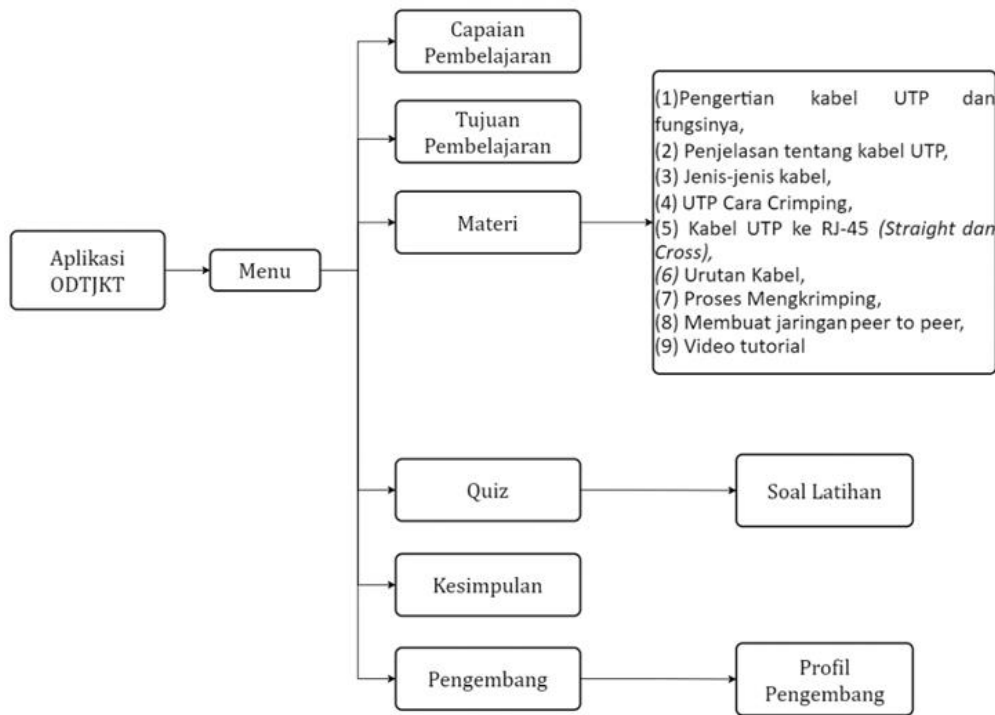


Figure 2. ODTJKT Application Design

3. Stage Development (Development)

At this stage, researchers create media products according to predetermined designs. After completing the product, the researcher continued preparing validation instruments for material and media experts. Aspects assessed by material experts include the quality of the content, suitability of presentation, and suitability of practice questions. Meanwhile, aspects assessed by media experts include software engineering, learning design, and visual communication. This development research produced a learning media product as an Android application based on iSpring, which was used for the Basics of Computer Networks and Telecommunications Engineering subject, especially in the basic orientation of TJKT. This application contains reading material and video material. The following is the display on the media called the ODTJKT Application :



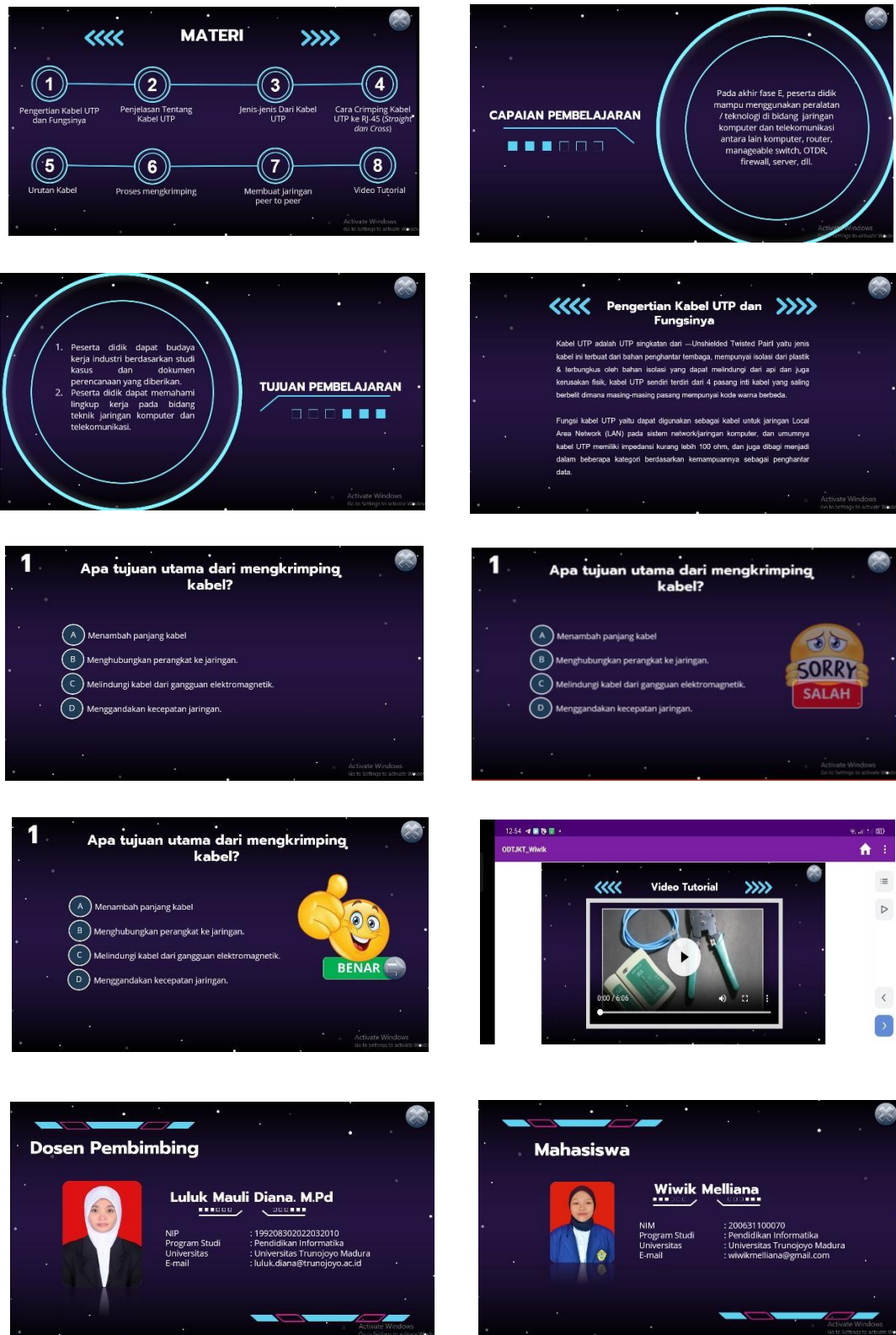


Figure 3. Screenshot of the ODTJKT Application

In developing learning media using Android applications in the Basics of Computer Network & Telecommunications Engineering subjects, especially in the basic orientation of TJKT at SMKN 1 Sepulu, there are two expert validators, of which the media validation expert is a Lecturer at Kiai Haji Achmad Siddiq State Islamic University (UIN TYPICAL) Jember and the material expert is a staff teacher program for ODTJKT Class X TKJ SMKN 1 SEPULU. The trial was carried out on 30 TKJ 10th-grade students. The following describes the validation and trial results analysis with the feasibility assessment criteria shown in Table 3.

Table 3. Validity Percentage Table
Source: modification (Rahmanto & Hotijah, 2020)

| Level Achievement | Qualification | Information |
|-------------------|-----------------|--------------------------------------|
| 90% - 100% | Very Good | Very Valid, No Need Revised |
| 75% - 89% | Good | Valid, revised Necessary |
| 65% - 74% | Enough | Enough Valid, Enough Lots Revised |
| 55%-64% | Not enough | Not enough Valid, Lots Revised |
| 0 | Very Not enough | Very Not enough Valid, revised Total |

a. Results Validation Expert Media

Validation of expert media is done to validate experts in the field. The researcher validated the media expert with Mr. Dr. H. Moh Sahlan, M.Ag. He is a Lecturer at Kiai Haji Achmad Siddiq State Islamic University (UIN KHAS) Jember. Apart from that, he is the senate secretary of the Kiai Haji State Islamic University Achmad Siddiq (UIN KHAS) Jember. The following are the results of validation by expert validators media. This device was developed using the *PowerPoint application* Ispring and Website 2 APK Builders Pro to produce multimedia learning-based Android. Following Figure 4 are the results from validation expert media:

Tabel Penilaian Materi/Isi Pengembangan multimedia Interaktif berbasis android

| No | Indikator | Skala Penilaian | | | |
|-----|---|-----------------|---|---|---|
| | | 1 | 2 | 3 | 4 |
| 1. | Kesesuaian SK, KD, Indikator dengan media yang dikembangkan | | | | ✓ |
| 2. | Keberanan materi yang ada pada Praktik Dan Konfigurasi Penyambungan Kabel | | | | ✓ |
| 3. | Kedalaman materi yang ada pada multimedia Interaktif berbasis android | | | ✓ | |
| 4. | Pentingnya materi yang ada pada multimedia Interaktif berbasis android | | | | ✓ |
| 5. | Kemudahan media sesuai dengan karakteristik siswa | | | ✓ | |
| 6. | Penggunaan bahasa yang sesuai dengan karakteristik siswa | | | | ✓ |
| 7. | Konsep yang diberikan dapat dilogikakan dengan jelas | | | | ✓ |
| 8. | Materi mudah dipahami | | | | ✓ |
| 9. | Kesesuaian materi dengan karakteristik siswa | | | ✓ | |
| 10. | Kemampuan multimedia dalam memberikan gambaran nyata tentang materi yang dipelajari | | | | ✓ |

Sumber: Hasil olahan Peneliti dari Akbar (2011:178)

Aspek pengembangan multimedia Interaktif berbasis Android

Petunjuk:

Apabila terdapat kesalahan atau ketidaksesuaian pada tampilan misalnya, kesalahan konsep, susunan kalimat, kebenaran arti kata, dll mohon dituliskan pada kolom kesalahan sebagai perbaikan dari pengembangan multimedia Interaktif berbasis android ini. Selain itu mohon dituliskan saran dan kritik yang membangun demi kesempurnaan pengembangan multimedia Interaktif berbasis android yang akan dibuat.

Figure 4. Results Validation Expert Media

Results evaluation obtained from sheet validation. Then, the calculation to determine the validity percentage results developed media. Results validation expert media will be calculated with the formula from Nurulaini et al (2022) following:

$$\text{Validation (V)} = \frac{\text{total validation score by validators}}{\text{total maximum score}} \times 100\%$$

Based on Figure 2, we can withdraw the conclusion that the device Which results is in the form of multimedia Development for Basic Engineering Orientation learning Android-Based Computer and Telecommunications Network (ODTJKT) in Class X TKJ SMKN 1 SEPULU, validator gives a value of 48 with a percentage, so it is obtained The average validator percentage value is 92.3%, and if converted based on table 3 percentages validity so including categories very valid.

b. Results Validation Expert Material

The teacher guardian did validation expert material for the eye lesson ODTJKT Class X TKJ SMKN 1 SEPULU, namely Mr. Mat Salim, S. Pd. Data was obtained from expert validation material form sheet validation, which later, as reference appropriateness material, was used in the application of multimedia learning-based Android. Sheet validation consists of 10-item statements with a range score of 1 – 4 per item. The assessment results obtained from the validation sheet are then calculated to determine the percentage of valid material used. Following Figure 5 is the results from the validation material expert:

Tabel Penilaian Materi/Isi Pengembangan multimedia Interaktif berbasis android

| No | Indikator | Skala Penilaian | | | |
|-----|---|-----------------|---|---|---|
| | | 1 | 2 | 3 | 4 |
| 1. | Kesesuaian SK, KD, Indikator dengan media yang dikembangkan | | | | ✓ |
| 2. | Kebenaran materi yang ada pada Praktik Dan Konfigurasi Penyambungan Kabel | | | | ✓ |
| 3. | Kedalaman materi yang ada pada multimedia Interaktif berbasis android | | | ✓ | |
| 4. | Pentingnya materi yang ada pada multimedia Interaktif berbasis android | | | | ✓ |
| 5. | Kemenarikan media sesuai dengan karakteristik siswa | | | ✓ | |
| 6. | Penggunaan bahasa yang sesuai dengan karakteristik siswa | | | | ✓ |
| 7. | Konsep yang diberikan dapat dilogikakan dengan jelas | | | | ✓ |
| 8. | Materi mudah dipahami | | | | ✓ |
| 9. | Kesesuaian materi dengan karakteristik siswa | | | ✓ | |
| 10. | Kemampuan multimedia dalam memberikan gambaran nyata tentang materi yang dipelajari | | | | ✓ |

Sumber: Hasil olahan Peneliti dari Akbar (2011:178)

Aspek pengembangan multimedia Interaktif berbasis Android

Petunjuk:

Apabila terdapat kesalahan atau ketidaksesuaian pada tampilan misalnya, kesalahan konsep, susunan kalimat, kebenaran arti kata, dll mohon dituliskan pada kolom kesalahan sebagai perbaikan dari pengembangan multimedia Interaktif berbasis android ini. Selain itu mohon dituliskan saran dan kritik yang membangun demi kesempurnaan pengembangan multimedia Interaktif berbasis android yang akan dibuat.

Figure 5. Results Validation Expert Material

Results evaluation obtained from sheet validation. Then, the calculation was used to determine the percentage of results of the validity of the material used. Results validation expert material will calculated with the formula from Nurulaini et al (2022) following:

$$alidation (V) = \frac{\text{total validation score by validators}}{\text{total maximum score}} \times 100\%$$

Based on Figure 5, we can withdraw the conclusion that the device result is in the form of multimedia Development for Basic Engineering Orientation learning Android-Based Computer and Telecommunications Network (ODTJKT) in Class X TKJ SMKN 1 SEPULU, the validator gives a value of 37 with a percentage, so it is obtained The average validator percentage value is 92.5%, and if converted based on table 3 percentages validity so including categories very valid.

4. Stage Implementation

On stage, this is the process of implementation of multimedia learning based on Android on class X ODTJKT material at SMKN 1 Sepulu. This stage is carried out on Tuesday, 07 November 2023, with 30 respondents from class X TKJ2 SMKN 1 Sepulu. On stage, this is a process of evaluating appropriateness from a multimedia Android-based interactive, which in this research has received validation from material experts and media

experts, as well as assessments from users at the trial stage. Users were carried out on students of SMKN 1 Sepulu. In user trials with The total number of respondents, 30 were conducted in class X TKJ SMKN 1 SEPULU, producing an F value on each respondent displayed in the Table 4 following:

Table 4. Results Questionnaire Respondent

| No | Respondent | Results | No | Respondent | Results | No | Respondent | Results |
|----|--------------|---------|----|-----------------|---------|----|---------------|---------|
| 1 | Fauzen | 68 | 11 | Ariel W | 69 | 21 | Amrullah | 66 |
| 2 | Noval | 69 | 12 | Andes F.P | 72 | 22 | Rahmaniya | 67 |
| 3 | m Irfan | 70 | 13 | Arifin S | 71 | 23 | Reno DS | 74 |
| 4 | Parihah | 62 | 14 | Lia S | 69 | 24 | m Rijal | 74 |
| 5 | Shohibul B | 74 | 15 | Muhridatul R | 72 | 25 | Luna Latula L | 73 |
| 6 | Syahrul Z | 75 | 16 | Ferdi US | 73 | 26 | Julia A | 72 |
| 7 | m Anasrullah | 72 | 17 | Lysis Suganda W | 64 | 27 | Haud | 69 |
| 8 | Husni m | 75 | 18 | Sifa | 66 | 28 | Faisal G | 68 |
| 9 | Ferdi H | 64 | 19 | Maslahah | 65 | 29 | Mahsus | 66 |
| 10 | Ramadani | 66 | 20 | Faidatul H | 71 | 30 | Diky A | 69 |

A calculation mark questionnaire was produced on test tries for user application multimedia learning ODTJKT with assessment criteria according to Table 2. So, *the User Acceptance Test* (UAT) results will provide data in the form of student answers or results questionnaires processed by adding all total answers to each respondent. After that, all the results will be added to the questionnaire respondents in Tab, producing whole questionnaires totaling questionnaires. If you have obtained the total results of the questionnaire, you will do process calculation based on [Nurulaini et al \(2022\)](#) formula following:

$$P = \frac{f}{N} \times 100\%$$

Explanation:

P = Practicality value;

F = Obtained score; and

N = Maximum score

Based on test results done to student respondents class X TKJ SMKN 1 SEPULU can conclude that, in a way, the whole evaluation of Multimedia ODTJKT learning obtains results that meet all aspects, starting from the aspects of material, media, and appropriateness, with a score of 92.6%, which is very valid in the category and does not need to be revised, according to Table 3. The educational application from multimedia interactive-based Android is worthy of use.

Discussion

The "ODTJKT" application is created through a feasibility test process by material and media experts and then tested directly on students. Based on the test results by material experts, a score of 92.5% was obtained, and it is a very valid category, thus indicating that the subject teacher uses the material used. The second product test is a test by media experts. During this test, the ODTJKT application obtained a percentage of 92.3%, and if converted based on Table 3, the percentage validity, including categories very valid, does not require revision.

The user trial involved thirty students of SMKN 1 Sepulu with the same instrument. The results show a percentage of 92.6 %, which is included in the valid category and does not require revision. The indicators assessed are: (1) the attractiveness of the learning media is 91%; (2) the benefits of learning media are 90%; (3) trust in learning media is 90%; (4) satisfaction with learning media is 90%. Based on a series of validations and trials that have been carried out and referring to the assessment criteria according to Cahyani (2021), overall, the results state that the learning media developed is suitable for student learning.

D. Conclusion

Based on the development research, an Android-based multimedia learning application on ODTJKT material for Class X TKJ students at SMKN 1 SEPULU was successfully produced. The use of PowerPoint, iSpring, and Website 2 APK Builder Pro software has significantly contributed to the creation of this application. The average respondent's perception of the application reached 92.6% by the ADDIE development research model. From the test results, this application was assessed in the "Very Good" category for use in the ODTJKT learning process.

The implications of this research show that using technology in the learning process can provide positive results. This Android-based multimedia learning application can help students understand ODTJKT material better and more interactively. Developing this application using various software also provides insight into the potential for integrating technology into the learning process in schools.

Further research is recommended to evaluate the effectiveness and efficiency of using this application to further increase students' understanding of ODTJKT material. Further research can also explore the Development of additional features in the application to improve its quality and usefulness in a broader learning context.

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