



Development of Android-Based Interactive Media in Educational Teknologi UKI Toraja

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Abstract. This study aims to determine the design of android-based interactive learning media in computer basics courses at the educational technology study program of Universitas Kristen Indonesia Toraja. This research is a type of R & D (Research and Development) or development research using the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) research model. The results of the design, validity and practicality tests of interactive learning media can be used as a reference for the assessment of the learning media. Media that has been developed. This study has conducted a content validity test, the quality of interactive media based on instrumental assessment by teaching material experts shows very valid results, thus the level of content validity in interactive media shows the criteria Worth using. The results of the media validity test, that the quality of interactive media based on instrument assessments by media experts shows very valid results, thus the level of media validity on interactive learning media shows criteria Worth using.

Keywords: Interaktif Media, Android, ADDIE.

1 Introduction

Technology is developing at an ever-increasing rate, particularly information and communication technology. This makes humans seem inseparable by distance, space and time. With the development of advanced technology, humans are capable of creating a wide range of tools to support productivity in a variety of tasks. The rapid development of technology today will continue to produce new patterns in learning and encourage rapid adaptation. In the learning process, the use and utilization of technology in the classroom has become a necessity as well as a demand in the global era (Rijal & Jaya, 2020). This era is often referred to as the digital era (Alami, 2020). Along with these developments, in this case smartphones. One of the nations with the highest percentage of active smartphone users worldwide is Indonesia. The high number of smartphone users can be used by educators as a medium for delivering learning. Learning media is an intermediary that can convey messages or information containing learning material to students from a learner. One of them, an important element of education in the learning process that must follow the flow of technological developments is learning media (Salsabila & Aslam, 2022). Accordingly, educational videos are a useful tool for clarifying aspects of the overall curriculum that are

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challenging to convey orally (Aroni, 2016). This kind of education, supported by technological advancements, can help everyone, students and teachers alike, gain unlimited knowledge (Cecep et al., 2019; Chen & Tsai, 2021; Rorita et al., 2018). Teachers and students can directly experience the benefits of smartphone optimization in the classroom, which includes fostering educational growth (Nurhalimah et al., 2017; Sunismi, 2015). Using learning media is one effort to improve how well lessons are delivered and the learning process works (Lestari et al., 2019). Studies have generally concentrated on the activities, approaches, models, and assessment of certain teaching and learning subjects (Zheng & Xie, 2016). The utilization of technology has almost been applied to every aspect of daily life, especially in the field of education. Now technology is used to help their work and efforts to be more effective and efficient (Pratama et al., 2022). So in this digital era, skills in using technology are additional competencies that must be owned and mastered by an educator (Purnasari & Sadewo, 2021). Along with the development of information and communication technology, learning media is also developing. One of the technology-based media is mobile learning.

Mobile learning developed as a result of the development of communication technology, namely Android smartphones, which is a smartphone operating system that is now popular (Ardiansyah & Nana, 2020). It's just that teachers haven't properly integrated technology into the teaching and learning process, given how popular cell-phones have become among students (H. et al., 2021). In the 21st century, learning media commonly called digital media is needed along with technological developments to support the teaching and learning process (Shoffa et al., 2021). Currently, there are many software that can be used by educators in the process of making supporting media in the classroom learning process, one of which is the MIT App Inventor software. MIT App Inventor is one of the software for creating android and IOS-based applications without using programming code, as well as HTML5, .exe, and .apk outputs. The use of software in making learning media without programming code makes it easy for anyone to make applications easily, especially for students who want to make applications related to learning media. Researchers chose android-based software because it is easier to use to create learning media, especially interactive learning media and can add animations and sound backgrounds to make media content more interesting. Based on Linux, the Android operating system consists of an operating system, middleware, and apps for mobile devices. Android gives developers an open platform on which to build their apps. Over a billion smartphones and tablets use the Android operating system (Putra & Nugroho, 2016). The findings show that the use of technology as a learning medium is limited to the use of presentation media for material delivery. Basic-Computer is a course that has a structure that must be deciphered, be it in theory and concrete help from computer elements. The media used by educators in delivering learning materials are in the form of whiteboards, markers, printed modules and powerpoints. Educators have indeed used information and communication technology-based media, but the use of the media is still not optimal, because the powerpoint used only contains material delivery in the form of images and text only, there is no animation, video, simulation, and evaluation. So that supporting learning media is needed that is able to display text, images, vide-

os, animations, simulations, and evaluations to improve student understanding. With the variation in the use of various media in the learning process, it is intended to carry out the learning process effective and efficient. Learning time in class is also limited while students' learning speed varies from one to another, this situation can certainly hamper the learning process, so supporting learning media is needed that can be used by students with different learning speeds (Fadli & Hakiki, 2020). Learning media can help the learning activity process which aims to clarify the delivery of learning meaning so that learning objectives can be conveyed more perfectly and well (Fagbola et al., 2013; Kustandi & Darmawan, 2020).

Educators must design media that can cover course concepts in theory, illustrations, and concrete examples. Learning media can also improve the quality of learning for educators as a means to help deliver innovative, creative, comprehensive learning materials, attract students' enthusiasm and create a pleasant learning situation. Educators must be able to create learning conditions to make students easily understand the material by utilizing technology that can produce learning media, especially for courses. It is necessary to encourage renewal in learning so that learning is easy to use, interactive, packaged more interestingly and becomes something new for students by utilizing technology (Muttaqin et al., 2021). Therefore, there needs to be innovation in learning to increase students' interest in learning and learning motivation. There are many types of media that can be used by educators in the teaching and learning process, but educators must be selective in choosing these types of media (Hasan et al., 2021). The need to develop interactive learning media based on Android applications to optimize smartphone features that are popular with students. According to Myori et al. (2019), interactive media is defined as media that may promptly deliver feedback to the user, allowing them to select their preferred course of action. So that android-based interactive media can overcome the problem of differences in the level of understanding of students, because students can be examined. The ability of Android to display multimedia such as images, photos, videos, sound, and text simultaneously, enablesthdataoedmiinsistratorplay the material. Learning more concretely so that learning is not boring (Ahyar et al., 2014; Aina, 2013). Computer utilization that is often used is interactive multimedia because it contains several media such as text, graphics, audio, animation, video, and equipped with user control tools as controllers to organize elements according to user needs (MAWADDAH, 2019). According to Ananta and Waryanto (2018), the term "interactive" refers to a reciprocal interaction between the user and the program in which the user reacts to a request or display from the program, and the program subsequently gives the requested information. Ang graini and Sartono (2019) suggest that students can engage in direct learning through the program's available buttons. Interactive multimedia is an innovation in technology that can be tailored to learning needs (Arham & Dwiningsih, 2016). With interactive, learning can make students more interested in learning from anywhere and anytime. Android-based interactive learning media as an innovative media, has the potential to become a learning trend in today's digital era. Interactive multimedia like this is able to provide a pleasant learning atmosphere and foster student independence, so that the learning process is more meaningful than the lecture method (Monemi et al., 2017).

2 Method

This research is a type of development research. The accuracy of the selection of the development model makes the right product. One of the features of the product under development is its ability to be appropriately deployed and benefit its users. The ADDIE model is one of the media that considers the fundamental stages of media creation design in a straightforward and understandable manner. A systematic method to learning development is referred to as the ADDIE model. Since the product being developed is learning media rather than software engineering, the ADDIE research model was selected by the developer as it is appropriate for the product development process.

The ADDIE model is a generalized learning model that is appropriate when used for development research. The term is almost synonymous with instructional system development. When used in development, the process is considered sequential but also interactive, where the results of evaluating each stage can take learning development to the next stage. The research procedures in the ADDIE model are Analysis, Design, Development, Implementation, and Evaluation.

3 Research Result

The development of a learning product generally goes through systematic stages and also through several feasibility tests to produce products that are useful for users. In the steps of product development, the ADDIE development research model (Analysis, Design, Development, Implementation, Evaluation) is one of the most complex and complete models. Models, learning strategies, learning techniques, media, and instructional materials are just a few examples of the products that can be developed using the ADDIE paradigm for educational purposes (Mulyatiningsih, 2016).

3.1 Results

Analysis.

The analysis step is the initial phase. Observation and interview techniques are used in this step to examine the needs and traits of the students. In light of the study that was done, the needs analysis stage aims to determine the extent to which the learning process in computer basics courses in the educational technology study program is carried out. Based on the results of observations obtained information that the teaching and learning process in computer basics courses has not utilized media that can provide a concrete picture related to the material provided by the lecturer. The media currently used focuses on presentation media whether it is offline or online based. Computer basics courses contain structured materials related to computer devices and basic applications that are commonly used.

Design.

The design stage is the stage of designing interactive media which includes the formulation of the objectives of making interactive media, making flowcharts for the flow of media, collecting design objects according to the material contained in the media, and preparing instruments for media feasibility testers.

- a. Formulation of Learning Media Creation Objectives
- b. Plan Object Set (Collecting materials images, videos, buttons, etc.)

Development.*Interactive Media Creation.*

The stage of making media is by assembling all components such as material, images, and videos into Interactive Media using MIT Inventor Software. The results of the design using MIT Inventor Software are in the form of an application extension file (*.apk), then the application is transferred to the MIT Inventor software.

In creating interactive media through three stages, namely:

- 1) Learning Media Design

The following is a display of the learning media design that has been developed by researchers according to the flow that has been made on the flowchart. When starting the application, an initial display will appear before entering the main menu of the interactive media application. In the initial menu there is the UKI Toraja logo and the Educational Technology button which is used as the start button to the main menu of the interactive media application.



Fig. 1. Home Page Display

The main page is a menu page display of interactive media. The menu page displays about, material, e-learning, books and articles, applications, and tutorials.



Fig. 2. Menu Page Display

Validation Result.

The next stage after designing interactive media is to conduct a validity test. The validity test is carried out to determine the extent of the feasibility of the media that has been designed. After obtaining a feasibility assessment, the learning module is revised according to the criticism and suggestions of the validator. Validators consist of material expert validators and media expert validators who are experts in their respective fields. Material expert validation is a lecturer in the Educational Technology Study Program who has expertise in the field of content or material raised by researchers in the research conducted. The following are the results of material validation by material expert validators:

Table 1. Hasil Validasi Ahli Materi

No.	Deskripsi	Skor
1	Clarity of purpose	4
2	The suitability of the chapter title with the content of the material in each chapter	4
3	Encourages students to be actively involved	4
4	Suitability between Learning Objectives and material	4
5	Clarity of material description	4
7	Appropriateness between illustrations/images and material	4
9	Appropriateness between tasks and exercises and materials	4
10	Appropriateness of visual impressions and materials	4
11	Appropriateness of the end-of-chapter test with learning objectives	4
12	Use of appropriate language	3
13	Simplicity of sentence structure	3
Average		3,8

Based on the data in table 1, it can be seen that the quality of the learning module is as follows Based on the assessment by the teaching material expert lecturer, it shows an average of 3.8 from the maximum average score of 4.00, thus the module shows the criteria for feasible use.

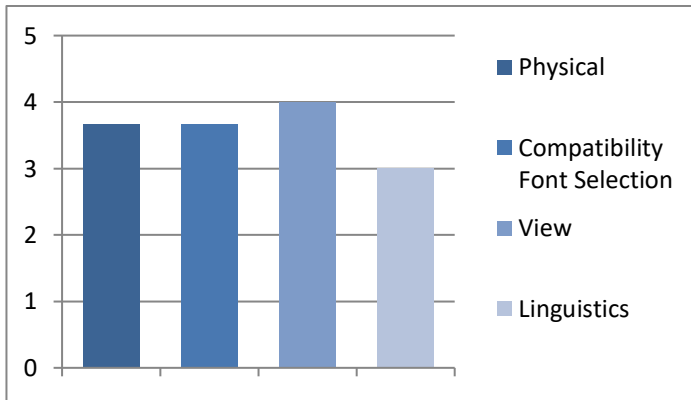


Fig. 3. Media Expert Validation Results

Based on the data in Figure 2, it can be seen that the quality of the learning module based on the assessment by the media expert lecturer shows the average score of 3.58 from the maximum average score of 4.00, thus the module shows very valid criteria and media worth using.

3.2 Evaluation

At this stage, the interactive media that has been developed is then implemented to the 2022 class of educational technology students in the basics course computer. The implementation of the media test or practicality test was carried out in two stages, the first stage was tested on a small group of 5 students. The results of the small group test as an illustration to get the running of the program whether it is in accordance with the initial design. Furthermore, the large group consisted of 15 students to perfect the media that had been tested in the small group test. Small group tests and large group tests are carried out in computer laboratories so that students can run the media individually with the educational technology laboratory internet network facilities. Before starting to distribute the media, the researcher demonstrated the media before the students installed the media. After that, students were allowed to use Students were then asked to fill in the respondent questionnaire to provide feedback on the interactive learning media.

4 Conclusion

The development of android-based interactive learning media uses the ADDIE development research model (Analysis, Design, Development, Implementation, Evaluation). The ADDIE model is one of the most complex and complete models for developing interactive media. The results of the validity and practicality tests can be used as a reference for assessing the media that has been developed. This study has conducted a content validity test, the quality of interactive media based on the assessment by teaching material expert lecturers shows an average of 3.8 from a maximum average score of 4.00, thus interactive media shows very valid criteria and media Worth using. The results of the media validity test, that the quality of interactive media based on the assessment by media expert lecturers shows an average of 3.58 from a maximum average score of 4.00, thus interactive media shows very valid criteria and is suitable for use. The results of the Validity Test of interactive learning media in computer basics courses in terms of material / content and media are very relevant to be developed, but there are some minor revisions that must be made for the sake of perfection of the media that has been developed.

References

1. Ahyar, R., Lufri, & Ramadhan, S. (2014). Pengembangan multimedia pada materi struktur dan fungsi organ manusia untuk siswa kelas xi sekolah menengah atas. 20–30.
2. Aina, M. (2013). Efektivitas Pemanfaatan Multimedia Interaktif Pembelajaran IPA-Biologi dalam Meningkatkan Motivasi Belajar Siswa Pria dan Wanita SMP 9 Kota Jambi [Effectiveness of the Utilization of Interactive Multimedia Learning Science-Biology in Improving Student Mot. *Prosiding Semirata FMIPA Universitas Lampung*, 125–130. <http://www.jurnal.fkip.uns.ac.id/index.php/prosbio/article/viewFile/3155/2195>
3. Alami, Y. (2020). Media Pembelajaran Daring pada Masa Covid-19 Online Learning Media during the Coronavirus Disease. *Jurnal Pendidikan Agama Islam*, 02, 49–56.
4. Ananta, A. R., & Waryanto, N. H. (2018). Pengembangan media pembelajaran berbasis multimedia interaktif dengan pendekatan kontekstual materi lingkaran kelas VIII SMP. *Jurnal Pendidikan Matematika - S1*, 7(4), 1–9. <http://journal.student.uny.ac.id/ojs/index.php/pmath/article/view/11180/10718>
5. Anggraini, M. S. A., & Sartono, E. K. E. (2019). Kelayakan Pengembangan Multimedia. *Jurnal Teknologi Pendidikan*, 07(01), 57–77.
6. Ardiansyah, A. A., & Nana, N. (2020). Peran Mobile Learning sebagai Inovasi dalam Meningkatkan Hasil Belajar Siswa pada Pembelajaran di Sekolah. *Indonesian Journal Of Educational Research and Review*, 3(1), 47. <https://doi.org/10.23887/ijerr.v3i1.24245>
7. Arham, U. U., & Dwiningsih, K. (2016). Keefektifan Multimedia Interaktif Berbasis Blended Learning. *Kwangsan*, 04(02), 111–118.
8. Aroni, H. (2016). Pengembangan Media Pendidikan. *Ilmu Gizi Teori & Aplikasi*, 5(1), 467–471.
9. Bates, A. W. (2022). Teaching in a digital age – second edition. In TONY BATES ASSOCIATES LTD. (Vol. 37, Issue 3). <https://doi.org/10.1080/02680513.2022.2056008>
10. Cahyadi, R. A. H. (2019). Pengembangan Bahan Ajar Berbasis Addie Model. *Halaqa: Islamic Education Journal*, 3(1), 35–42. <https://doi.org/10.21070/halaqa.v3i1.2124>

11. Cecep, C., Mutaqin, A., & Pamungkas, A. S. (2019). Pengembangan Modul Quick Math Berbasis Mobile Learning sebagai Penunjang Pembelajaran Matematika di SMA. *Prisma Sains : Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, 7(2), 148. <https://doi.org/10.33394/j-ps.v0i0.1761>
12. Chen, C. H., & Tsai, C. C. (2021). In-service teachers' conceptions of mobile technology-integrated instruction: Tendency towards student-centered learning. *Computers and Education*, 170(August 2020), 104224. <https://doi.org/10.1016/j.compedu.2021.104224>
13. Daryanto, Dwicahyono, A., & Purwanto, D. (2016). Pengembangan perangkat pembelajaran : (silabus, RPP, PHB, bahan ajar) / Daryanto, Aris Dwicahyono ; editor, Djanji Purwanto (Cet. 1). Gava Media.
14. Fadli, R., & Hakiki, M. (2020). Validitas Media Pembelajaran Interaktif Berbasis Android Pada Mata Pelajaran Komputer Dan Jaringan Dasar Di Sekolah Menengah Kejuruan. *Jurnal Inovasi Pendidikan Dan Teknologi Informasi (JIPTI)*, 1(1), 9–15. <https://doi.org/10.52060/pti.v1i1.302>
15. Fagbola, T. M., Adigun, A. A., & Oke, A. O. (2013). Computer-Based Test (CBT) System For University Academic Enterprise Examination. *International Journal of Scientific & Technology Research*, 2(8), 336–342.
16. H., N., Gani, H. A., Pratama, M. P., & Wijaya, H. (2021). Development of an Android-based Computer Based Test (CBT) In Middle School. *Journal of Education Technology*, 5(2), 272–281. <https://doi.org/10.23887/jet.v5i2.33527>
17. Hasan, M., Pd, S., & Pd, M. (2021). Media Pembelajaran. Tahta Media Group.
18. Kustandi, C., & Darmawan, D. (2020). Buku di Google Play Pengembangan Media Pembelajaran: Konsep & Aplikasi Pengembangan Media Pembelajaran bagi Pendidik di Prenada Media Group.
19. Lestari, A. I., Senjaya, A. J., & Ismunandar, D. (2019). Pengembangan Media Pembelajaran Berbasis Android Menggunakan Appy Pie Untuk Melatih Pemahaman Konsep Turunan Fungsi Aljabar. *Pedagogy : Jurnal Pendidikan Matematika*, 4(2), 1–9. <https://doi.org/10.30605/pedagogy.v4i2.1437>
20. MAWADDAH, N. F. (2019). Pengembangan Modul Pembelajaran Pada Kompetensi Dasar Menerapkan Komunikasi Bisnis Kelas X Pemasaran Di Smk Negeri 1 Jombang. *Jurnal Pendidikan Tata Niaga (JPTN)*, 7(3), 533–538.
21. Monemi, R., Lufri, & Leilani, I. (2017). Pengembangan Multimedia Interaktif Berbasis Power Point disertai Games Kuis Course Maza pada Materi Sistem Ekresi untuk Peserta Didik Kelas VIII SMP E. *Journal Biosains*, 1(2), 252–260. <http://www.games.co.id>.
22. Mulyatiningsih, E. (2016). PENGEMBANGAN MODEL PEMBELAJARAN Endang Mulyatiningsih.
23. Muttaqin, H. P. S., Sariyasa, & Suarni, N. K. (2021). Pengembangan media pembelajaran interaktif berbasis android pada mata pelajaran ipa untuk siswa kelas VI SD. *Jurnal Teknologi Pembelajaran Indonesia*, 11(1), 1–15. https://doi.org/10.23887/jurnal_tp.v11i1.613%0A
24. Myori, D. E., Hidayat, R., Eliza, F., & Fadli, R. (2019). Peningkatan Kompetensi Guru dalam Penguasaan Teknologi Informasi dan Komunikasi melalui Pelatihan Pengembangan Media Pembelajaran Berbasis Android. 5(2), 102–109.
25. Nurdin. (2007). Pengantar Komunikasi Massa. PT. Raja Grafindo Persada.
26. Nurhalimah, S. R., Suhartono, S., & Cahyana, U. (2017). Pengembangan Media Pembelajaran Mobile Learning Berbasis Android pada Materi Sifat Koligatif Larutan. *JRPK: Jurnal Riset Pendidikan Kimia*, 7(2), 160–167. <https://doi.org/10.21009/jrpk.072.10>

27. Pratama, M. P., Al-gifari, M. K. G., & Pertiwi, A. (2022). Aplikasi Notifikasi Tagihan Penggunaan Air Pelanggan PDAM Kota Makassar Berbasis SMS Gateway Menggunakan Metode FIFO (First In First Out). *Patria Artha Technological Journal*, 6(2), 168–173.
28. Purnasari, P. D., & Sadewo, Y. D. (2021). Strategi Pembelajaran Pendidikan Dasar di Perbatasan Pada Era Digital. *Jurnal Basicedu*, 5(5), 3089–3100. <https://jbasic.org/index.php/basicedu/article/view/1218>
29. Putra, D. W., & Nugroho, A. P. (2016). GAME EDUKASI BERBASIS ANDROID SEBAGAI MEDIA PEMBELAJARAN UNTUK ANAK USIA DINI. 1(1), 46–58.
30. Riduwan. (2012). *Skala Pengukuran Variabelvariabel Penelitian*. Alfabeta.
31. Rijal, A. S., & Jaya, R. (2020). Pengembangan Media Pembelajaran Berbasis Web Untuk Meningkatkan Kreativitas Guru Ahmad. *Jurnal Ideas*, 21(1), 1–9.
32. Rorita, M., Ulfa, S., & Wedi, A. (2018). Pengembangan Multimedia Interaktif Berbasis Mobile Learning Pokok Bahasan Perkembangan Teori Atom Mata Pelajaran Kimia Kelas X Sma Panjura Malang. *JINOTEP (Jurnal Inovasi Dan Teknologi Pembelajaran) Kajian Dan Riset Dalam Teknologi Pembelajaran*, 4(2), 70–75. <https://doi.org/10.17977/um031v4i22018p070>
33. Salsabila, F., & Aslam, A. (2022). Pengembangan Media Pembelajaran Berbasis Web Google Sites pada Pembelajaran IPA Sekolah Dasar. *Jurnal Basicedu*, 6(4), 6088–6096. <https://doi.org/10.31004/basicedu.v6i4.3155>
34. Shoffa, S., Holisin, I., F, J., Palandi, Cacik, S., Indriyani, D., Supriyanto, E. E., Basith, A., & Giap, Y. C. (2021). *Perkembangan Media Pembelajaran Di Perguruan Tinggi (M. I. A. Fathoni (ed.)). CV. AGRAPANA MEDIA.*
35. Sunismi. (2015). DEVELOPING GUIDED DISCOVERY LEARNING MATERIALS USING MATHEMATICS MOBILE LEARNING APPLICATION AS AN ALTERNATIVE MEDIA FOR THE STUDENTS CALCULUS II. *CAKRAWALA PENDIDIKAN*, 334–346. <https://doi.org/https://doi.org/10.21831/cp.v3i3.7340>
36. Zheng, Y., & Xie, Y. (2016). Metamodel for evaluating the performance of ICT in education. In *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* (Vol. 9757). https://doi.org/10.1007/978-3-319-41165-1_19

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