Android-Based Learning Media Design For Measurement And Instrumentation Subjects

Fivia Eliza, Ahyanuardi, Mukhlidi Muskhir, Dwiprima Elvanny Myori, Radinal FadliJurusan Teknik Elektro Fakultas Teknik, Universitas Negeri Padang Prodi Pendidikan Teknologi Informasi, STKIP Muhammadiyah Muaro Bungo

Abstract: Android-based learning media is one of the learning media that is integrated with Information and Communication Technology (ICT). Android-based learning media can be used by lecturers as an alternative learning media to increase student interest, role and learning outcomes, to help the learning process from home that is applied today. In this article, we will describe the design of Android-based learning media in Measurement and Instrumentations subject at electrical engineering technical faculty of Universitas Negeri Padang. This media can be a learning supplement in maximize the process of implementing online learning. This research begins with analysing the system requirements, analysis, design, testing and maintenance. From the results obtained, it can be concluded that the learning media for Measurement and Instrumentations subject based on android have been designed and made and can function properly according to the design.

Keywords: android, ICT, learning media, measurement and instrumentation.

———————————————◆———————————————

I.   INTRODUCTION

Learning is a complex process that occurs in every person throughout life because of the interaction with their environment, therefore learning can occur anywhere and anytime. [1]. Based on the decision of the Minister of Education and Culture regarding the learning process in Higher Education during the Covid-19 pandemic, it was carried out online learning. In connection with the situation and conditions of the COVID-19 Pandemic which are gradually moving towards a new normal, the Directorate of Learning and Student Affairs is making various efforts to encourage the education process to gradually run normally. The education process carried out in tertiary institutions currently refers to the Joint Decree of the Four Ministers to prevent the campus from becoming a new cluster for the spread of Covid-19 and to maintain the health and safety of students, educators, education personnel, families, and the community while still fulfilling student learning rights up to at the end of the semester or until there is further direction from the task force to accelerate the handling of Covid-19. [2] This requires lecturers and students to be able to maximize learning activities even though they are not face to face. This is also a challenge for lecturers to take advantage of technology that can support learning activities, especially as a learning medium. When choosing learning media, of course, you have to think about the positive side because the media used will also make students feel difficult in using it. Choosing suitable media will help achieve learning goals. In choosing media, it must be based on learning objectives that refer to one or a combination of cognitive, affective, and psychomotor aspects. [3] The educational process does not have to be carried out conventionally, but teachers can look for and use alternatives or other learning resources to make the learning process which is initially abstract and difficult to understand into material that is interesting and easy to understand. One of them is by visualizing the material using ICT media in the form of animation and / or sound. Audio visual presentation will make the visualization more interesting. [4] Along with the times, educational experts have succeeded in finding various kinds of creative and innovative learning models. Educators currently can choose and apply appropriate learning models so that they can achieve the objectives of the implementation of learning. [5] This has been accompanied by developments in Information and Communication Technology (ICT). The integration of ICT in the learning process can be maximized by

changing the paradigm of the role of a lecturer as a teacher to become a facilitator, collaborator, mentor, trainer, director and study partner who can provide great choice and responsibility to students to experience learning events. The use of instructional media integrated with ICT can involve the senses of sight and hearing optimally. The optimal use of sight and hearing senses in the learning process will provide a learning experience for students which will have an effect on good learning outcomes. The learning process in educational units is held in an interactive, inspirational, fun, challenging, motivating students to participate actively, and provides sufficient space for initiative, creativity, and independence according to the talents, interests, and physical and psychological development of students. [6] Learning media is an additional thing both printed and audio-visual that can stimulate students to achieve learning goals. The use of instructional media aims to help teachers deliver learning material in front of the class. Students will understand about the learning material because the learning media has a purpose to help achieve learning goals. [7] Learning media is one component of the delivery system that can be used to support the learning process. Media development is assumed to be learning that will be more interesting, effective and fun if it uses learning media that is in accordance with the subject matter. So in choosing media that needs to be defeated with concepts, principles, designs / models and evaluation of learning media. The very rapid development of technology produces new things that make people receive information easily and can help in carrying out daily activities. Mobile phone, which are usually only used as a means of communication, nowadays can also be used to help work, as a medium of entertainment, and even virtual financial transactions since the existence of smartphones, namely smart phones combined with telephone and computer functions. [8] For use in Android-based learning media can be developed. Learning with the help of android-based media can be used by lecturers as an alternative to increase learning motivation, independence and student learning outcomes. The development of mobile technology is currently so fast, one of the most commonly used mobile devices is a cell phone. Nearly 90% of students or university students now have cell phones that are Android. The more students who own and use mobile devices, the greater the opportunity to use technology devices in education. So it is not difficult for a teacher or lecturer to direct students to use Android-based smart phones

in learning. [9] However, in reality, among students and teachers, smartphones are mostly only used to access social networks such as Facebook and Twitter and have not played an important role in education, namely the use of mobile learning for learning support media. [10] Learning media that make use of cell phone technology is called mobile learning. Mobile learning (m-learning) is a part of e-learning. M-learning is a learning medium that uses devices to run it by phones, PDA and tablet PC. With this mobile learning, the learning process will be more effective. Students can access subject matter from anywhere without being limited by space and place and have flexibility, because it is not related to time. [11] Mobile learning is an alternative development of learning media. The presence of mobile learning is intended as a complement to learning and provides opportunities for students to study material that is poorly mastered anywhere and anytime. [12] Mobile learning will not actually replace conventional learning in the classroom. However, mobile learning is only to add to existing learning resources and can provide opportunities for students to test material that has not been mastered perfectly whenever and wherever they are. This condition will provide new experiences for students in learning. [13] Seeing this potential, the development of learning media using cellular phones is by making mobile learning aimed at all mobile phones with the Android platform. The reason is because the Android operating system is transformed into a system that is most widely used on smartphones. Android-based mobile learning is expected to produce supporting media for independent learning for students, because online-based technology is very effective in learning, especially for the Covid-19 pandemic. The resulting supporting media is not only monotonous with text, but also contains audio and visual multimedia elements and even animation that makes it easier to understand the material. In this learning concept, Mobile Learning brings the benefits of the availability of teaching materials that can be accessed at any time and the visualization of interesting material. It is important to note that not every teaching material is suitable for using Mobile Learning. [14] Measurement and Instrument Learning is learning that contains the types of measuring instruments and their characteristics and working principles. Therefore, in learning, lecturers need media assistance that can help students understand learning material well, also integrated with ICT to facilitate online learning as it is today. Therefore it is necessary to design an Android-based learning media in the Measurement and Instrumentation course, as a learning supplement in helping to maximize the process of implementing online learning.

II. RESEARCH METHODS

This research uses a systematic approach starting from system requirements analysis to data analysis, design, testing and maintenance. This approach must be carried out sequentially from the beginning to the end. The following is a flowchart that describes the flow of this research.
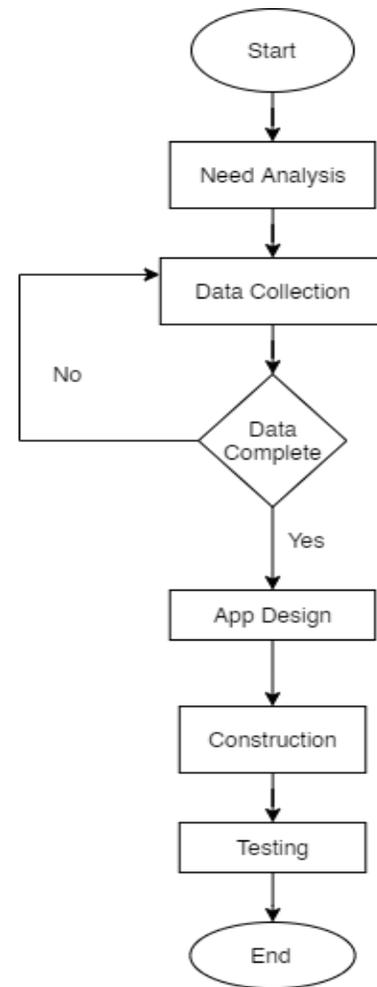
Fig 1. Flowchart of Research

III. DESIGN OF SYSTEM

The design of this learning media begins with a system requirements analysis. The system requirements analysis stage is the most important stage in the development of a system, because at this stage that the performance evaluation of the identification of existing problems is carried out, the system design and the steps required for the desired design to the expected analysis. Then proceed with designing the application interface design, then implemented in the making of learning media systems (coding).

IV. DESIGN OF USER INTERFACE

Interface design is a form of temporary display design from making this Android-based learning media. This design is made to make it easier to implement applications and will facilitate the development of applications that meet the principles of good interface design. The following is the display design for Android-based learning media that will be built.

A. Design of Start Page

This start page is the page which displayed for the first time when the user opens the application.

Media Pembelajaran

Logo
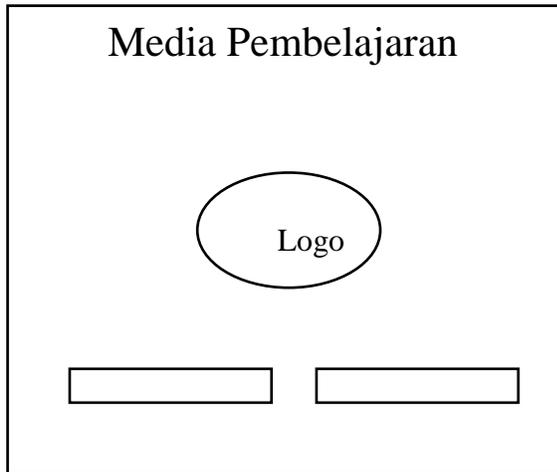
Fig 2. *Design of start page*
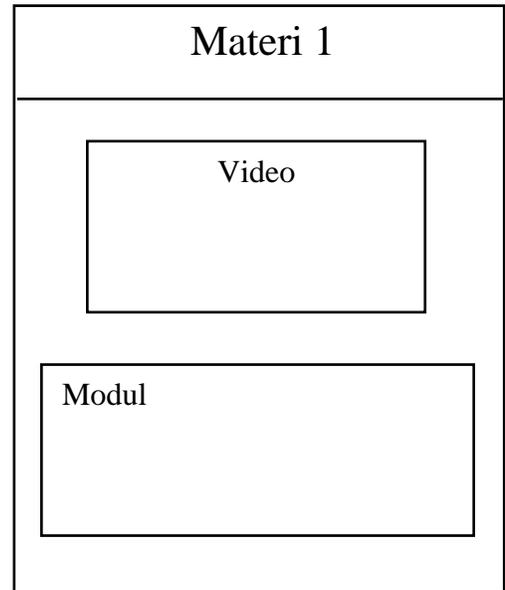
B. Design of Main Page

On the main page, a selection of materials will be displayed from the measurement and inetrumentation course, where later application users can choose the material to be studied by clicking one of the displayed material menus.

Pilihan Materi

Materi 1
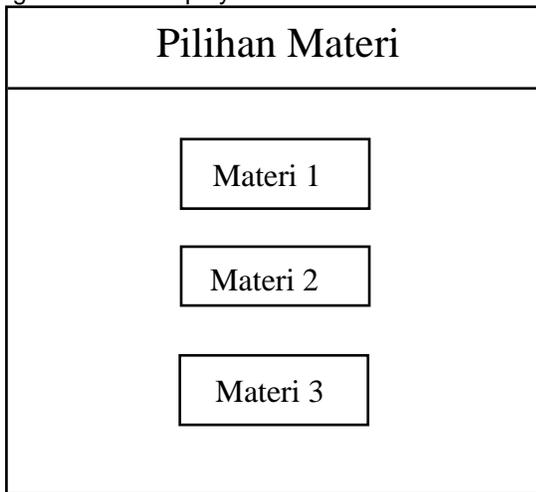
Materi 2

Materi 3

Fig 3. *Design of main page*

C. Design of Course Material Page
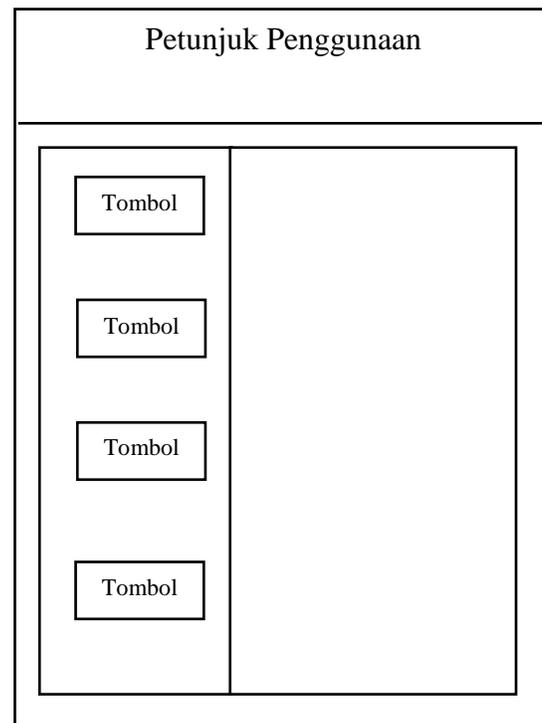
On the material page, material through modules and videos are provided, so there are module and video menu options.

Materi 1

Video

Modul

Fig 4. *Design of Material Page*

D. Design for User Manual Page

This application is equipped with instructions for using the application with the following display design.

Petunjuk Penggunaan

Tombol

Tombol

Tombol

Tombol

Fig 5. *Design of User Manual Page*

E. Design of Evaluation Page

The application is also equipped with an evaluation page which is equipped with a value menu and description. The design of the evaluation page display is as follows.
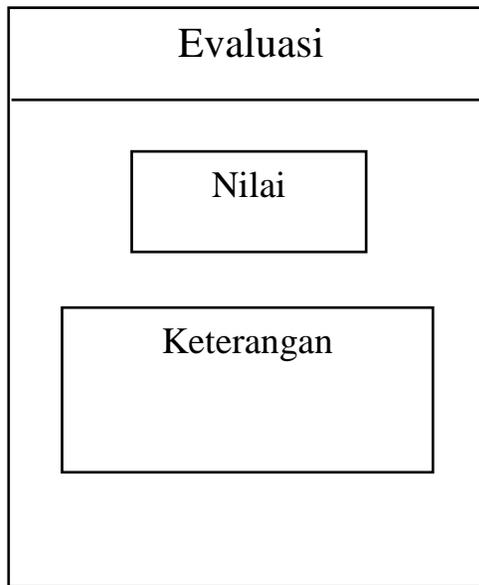
Fig 6. Design of Evaluation Page

V. RESULTS AND DISCUSSION

This Android-based learning media application for measuring and instrumentation courses is made using Adobe Flash CS6. Adobe Flash CS6 is a software specially designed by Adobe and a professional standard authoring tool application program that is used to create animation and bitmaps that are very attractive for the purposes of building interactive and dynamic web sites. The following are the results of making learning media for measuring and measuring tools based on Android.

A. Start Page

This start page displays the title of the course and the menu options "continue" and "exit". For the "continue" menu, the system will move to the next page and for the "exit" menu the system will close the application.

Fig 7. Start Page View

B. Main Page

On this page, there are material menu options in the measurement and instrumentation course and the evaluation menu. The material menu will display the material page

according to the selected topic, while the evaluation menu displays the evaluation page.

Fig 8. Main Page View

C. Course Material Page

On the material page, a learning module is displayed that uses language that is easier to understand and is equipped with a learning video with an attractive appearance, so that users can understand the material more optimally.

Fig 9. Material Page View

D. User Manual Page

The user manual page displays a description of each menu in the application and instructions for use.
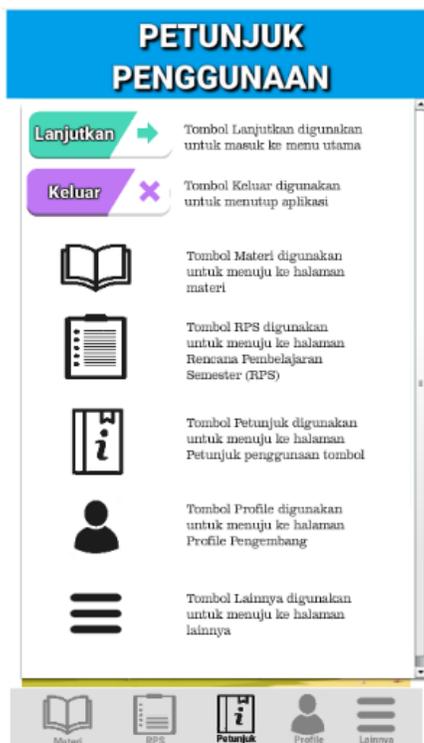
65

Fig 10. *User Manual Page View*

E. Evaluation Page

The evaluation page displays multiple choice questions in which the user can choose the answer. After the user completes the answers to these questions, this page will display the results obtained by the user and their description.

Fig 11. *Evaluation Page View*

VI. CONCLUSION

Based on the design and manufacture of Android-based learning media for the Measurement and Instrumentation course, it can be concluded as follows.

(a) The importance of having an integrated learning media with Information and Communication Technology to support the success of learning activities.

(b) Learning media Android-based for measurement and instrumentation course have been designed and made well starting from the process of needs analysis, design, manufacture and testing of the media that has been made.

(c) This Android-based learning media application can run well, so it can be continued to the next testing phase.

REFERENCES

[1] Arsyad, Azhar. Media Pembelajaran. Rajawali Press :Jakarta. 2009

[2] Direktorat Pembelajaran Dan Kemahasiswaan Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan Dan Kebudayaan Ri. 2020. Buku Panduan Penyelenggaraan Pembelajaran Semester Gasal 2020/2021 Di Perguruan Tinggi.

[3] Eliza, Fivia, D.E. Myori, Hastuti, O. Candra, S. Islami. The Validity Of Trainer On Material Science And Devices Subject At Department Of Electrical Engineering. Int. J. Of Scientific & Technology Research Vol. 8, Issue 09, Pp 642-645, 2019

[4] Anggraeni, Retno Dian & Rudy Kustijono. (2013). Pengembangan Media Animasi Fisika Pada Materi Cahaya Dengan Aplikasi Flash Berbasis Android. Jurnal Pendidikan Fisika Dan Aplikasinya (Jpfa) Vol 3 No 1, Pp 11-18

[5] Fivia Eliza, Suriyadi, Doni Tri Putra Yanto. Peningkatan Kompetensi Psikomotor Siswa Melalui Model Pembelajaran Project Based Learning (Pjbl) Di Smkn 5 Padang : Pds Project. Jurnal Inovasi Vokasional Dan Teknologi Volume 19 Number 2, Pp 57-66, 2019

[6] Depdiknas. Peraturan Pemerintah N0. 19 Tahun 2005 Tentang Standar Pendidikan Nasional. Jakarta: Depdiknas. 2005

[7] Mugi Jayanti1 , Yogi Wiratomo2, Perancangan Media Siap Un Matematika Smp Berbasis Android. Jurnal Sap Vol. 2 No. 1, Pp 22-32, 2017

[8] Pramuditya, Surya Amami, Muchammad Subali Noto, Henri Purwono. Desain Game Edukasi Berbasis Android Pada Materi Logika Matematika. Jnpm (Jurnal Nasional Pendidikan Matematika) Vol. 2, No. 2, Pp: 165-179, 2018

[9] Muhammad Zuhair Zahid, Aplikasi Berbasis Android Untuk Pembelajaran : Potensi Dan Metode Pengembangan. Prisma (Prosiding Seminar Nasional Matematika) 1 (2018). Pp. 910-918 Https://Journal.Unnes.Ac.Id/Sju/Index.Php/Prisma/

[10] Zaus, Mahesi Agni , Rizky Ema Wulansari, Syaiful Islami, Doni Pernanda. Perancangan Media Pembelajaran Listrik Statis Dan Dinamis Berbasis Android. Intecoms: Journal Of Information Technology And Computer Science Volume 1 Nomor 1, Pp : 1-7, 2018

[11] Astra, I.M., Umiatin, Dan Ruharman, D. Aplikasi Mobile Learning Fisika Dengan Menggunakan Adobe Flash Sebagai Media Pembelajaran Pendukung. Jurnal Pendidikan Dan Kebudayaan, 18 (2): 174-180. 2012

[12] S, Fatimah. 2014. Pengembangan Media Pembelajaran Ipa-Fisika Smartphone Berbasis Android Sebagai Penguat Karakter Sains Siswa. Jurnal Kaunia Vol. X No. 1, Pp: 59-64. 2014

[13] Ririndwi Agustin, Mika Ambarawati. Mathematics Encyclopedia Media As Android Based Learning. Int. J. Of Scientific & Technology Research Vol. 8, Issue 09, Pp 1-4, 2019

[14] Tri Listyorini, Anteng Widodo. Perancangan Mobile Learning Mata Kuliah Sistem Operasi Berbasis Android. Jurnal Simetris, Vol 3 No 1, Pp 25-30, 2013