Does Digital Books Based Android Device Application Matter for Effective Distance Learning? A Lesson from Universitas Terbuka Indonesia

Yasir Riady
Universitas Terbuka
UPBJJ UT-Jakarta. Indonesia
yasir@ecampus.ut.ac.id

ABSTRACT: *In order to provide more easiness of access, facilities and user-oriented for tutorials, registrations and examination, Universitas Terbuka (an Indonesia Distance Learning University) creates learning material based on Android device application. It is a new platform in distance education system and in line with the increase usage of smart phone in Indonesia, not only in communication but also in learning purpose. The fact revealed that more than 10.000 users had downloaded this application in the beginning of 2017. This paper aims to explore the implementation of android device application in digital teaching material. This paper evaluated the platform's effectiveness and efficiency through 6 measurements; they are system quality, number of users, purposes, simplicity, user-oriented of application and time of use. It employed 55 respondents as the sample by using questionnaire, interview and applied a descriptive conceptual. The conclusion that the application of Android Based Digital Teaching Materials is really help students at the Universitas Terbuka in Indonesia to understand and comprehend materials for online learning, face to face tutorial and also final examination.*

1. Introduction

Currently there are so many applications developed by many universities such as Open Universities in Indonesia, from easy access, facilities and user needs oriented to tutorials, registration and examination. In general, applications and facilities are developed to assist students in accessing many facilities and services in completing their academic tasks. The digital transformation supported by the Internet and technology made everything easier to comprehend, achieve and also competition between users and institutions (Wilson-Higgins, 2018).

At this time, one of the applications that has been developed by the Universitas Terbuka is the Digital Books, it is a new application and facility for all students to access Digital Books of Universitas Terbuka, Digital Books or referred to as Bahan Ajar

Digital (Digital Printed Material or BA Digital) is the adaptation of the UT Basic Printed Materials (BMP) which has been used as the main material of the students. It can be accessed offline via android device. This service has been launched on January 30, 2017 (Universitas Terbuka, 2017).

BA Digital UT is a repository system and electronic book reader developed by Universitas Terbuka. This service is developed with the objective that students can access BMP / Books using mobile device easily and practically. This system allows students to be able to access, download, and read BMP according to the courses that have been registered. Nowadays, the book industry also playing important roles to update knowledge and information (Jiang & Katsamakas, 2010).

This study discusses the detail application of digital books developed by the Universitas Terbuka, focusing more on the activities and guidelines and the use of android applications as one of the systems that can be analyzed based on aspects of usability, effectiveness and efficiency (Universitas Terbuka, 2017).

The quality, usability and evaluation in the application of digital books based on android can be seen on the quality of the system, the number of users, purpose, ease of application and time in using it. This study can be drawn the conclusion that Application of Android-Based Digital Books is able to facilitate students at the Universitas Terbuka in understanding the material for learning, The simple model of Android apps can be install in everyone smart phone, it is really effective and efficient to and open for everyone to develop (Chau & Jung, 2018).

Figure 1. Home Page of Bahan Ajar Digital UT / UT Digital Library in Android version (*source : play.google.com*)

2. The Android System

Wikipedia described Android (/æn.drTjd/; AN-droyd) as a Linux-based operating system designed for Touch-screen mobile devices (*Android*, 2018), it runs for smart phones and tablet in computers. The Android users are based on direct operation, using trace input which are actions in the real world, such as swiping, tapping, pinching, and flipping the pinch to operate the object on the screen (Razak et al., 2019). Android is the operating system with open source. In addition, Android has various application developer communities (apps) that extend device functionality, generally written in a customized version of the Java programming language. Android application is really popular among smart phone users, and it has great impact to develop new technology and information (Li et al., 2019).

Characteristics of Android
Based on the description above, in their site (www.android.com) stated that there are 4 characteristics of Android (*Android*, 2018), they are :

2.1. Openness

One of the important characteristic that different with the other system is openness, as we might know that Android is completely open, so many applications can be developing for many functions. The standard function of phone such as making calls, sending text messages, using the camera and others are regular mode. Android specifically designed to boost and update the memory and resources within the device, it can be enlarge into the bigger functions. Android is open source, it can be freely expanded, rebuild, adapted to be more advanced technologies. This platform will continue to advance to build mobile applications and expand into different ways.

2.2. Similar Access

Android does not make any difference from main application into the other part of application that develops the program. Most of applications can be expand and have same access to provide users with different purposes. It is user oriented, so users can apply the application without feel difficult or afraid using it.

2.3. Resolve Problems

Android system is flexible, it can attract everyone to develop new mode with the innovation and creativity. As one of the example, a user's data in contact can be share into several applications such as calendar, location, email, address, affiliation and also reminder.

2.4. Fast and Easy Application Development

Android present users with general access to better applications and it can be updated easily every time. It has a set of tools that can be used to improve productivity, efficiency, errors and feedback when construct new or different.

3. Digital Books for Learning Material in Android

Digital Books is one of the most important parts in the learning process, because the source of information in the can on the learning process can be started from teaching materials. It is a great thing if an institution made some electronic book which has the regular custom to support every students to access the books materials (Park, Kim, & Lim, 2019).

The teaching materials is one part of teaching resources that can be interpreted something which contains learning messages, both specific and general nature that can be utilized for the benefit of learning (Mulyasa, 2006). Based on these materials, students can learn by themselves and find the easy way to complete their task and preparing the final examination (List, 2019).

The explanation of the definition of teaching materials is further explained by Widodo and Jasmadi in Ika Lestari (Lestari, 2013) which states that teaching materials are a set of learning tools or tools containing learning materials, methods, limitations, and ways of evaluating systematically designed and Interesting in order to achieve the expected goal, it is designed to achieve competence and sub-competence with all its complexity.

In the assist of technology, the Directorate of High School Development classifies teaching materials into four categories (Mulyasa, 2006), they are *printed materials*; Such as the distribution of notes in lectures, books, modules, student activity sheets, brochures, leaflets, wallcharts, photographs or drawings, and modules. Then, *audio materials*, for example cassettes, radio and audio compact disks as assist student to comprehend more about learning materials. In addition there is *audio-visual learning materials* such as video compact disks, projectors and movies, and the last category is *Interactive multimedia* teaching materials such as CAI (Computer Assisted Instruction), interactive multimedia compact disc (CD) and web-based learning materials (web based learning materials).

Based on previous exposure, the definition and term of teaching materials used in this study is a systematic learning materials or materials used by teachers, lecturers, tutors, teachers and students in learning to achieve the expected goals (Zhang & Li, 2006). Most of students learn in many different ways, some students use social media, communities and also they can share many things with tutors, other students, and academic or administration staffs (Riady, 2014)

4. Types of Teaching Resources

In general, teaching materials can be divided into two types, such as printed and non-printed materials. Printed teaching materials can be handouts, books, modules, brochures, and student worksheets. While non-teaching materials include, audio

teaching materials such as tapes, radio, video and audio compact discs (Korat, Graister, & Altman, 2019).

The teaching materials referred to in this study are more into printed textbook material. This is because textbooks are closely related to the curriculum, syllabus, competency standards, and basic competencies. (Riyana, 2007) stated that the textbook is a book about a particular field of study or science that is structured to facilitate the teachers and students in an effort to achieve learning goals.

This type of teaching materials is developed based on the needs of its users and the characteristics of the community in the environment. The Universitas Terbuka initiated the use of non-printed digital teaching materials through digital libraries in the Virtual Reading Room or RBV and then redeveloped on android-based applications in Digital Teaching Materials or Digital Books. It is intended that students can access in and also outside Indonesia can access the materials easily, and the purpose of this non-printed materials can be done with easy ways through online platform (Jiang & Katsamakas, 2010).
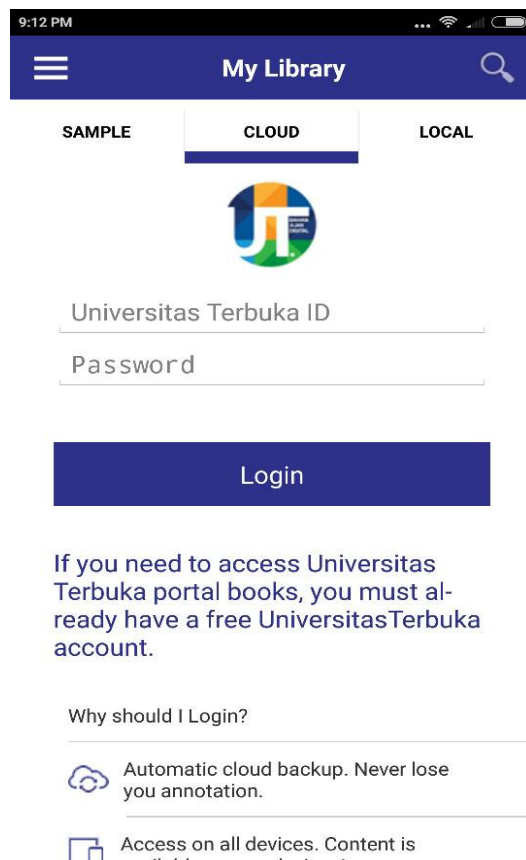

Figure 2. Home Page of UT Digital Library in Android version (*source : play.google.com*)

5. Digital Instruction Service

This Digital Teaching Service can only be obtained free of charge by all students who have registered on certain subject in the running semester. Students can access the Digital Books by entering their student's number and name of the course that are registered, not all teaching materials can be downloaded. UT students who do not register courses in the current semester cannot access Digital Books.   To be able to use this service, students must first do the registration of the course at the beginning of the semester. UT students are able to access BA Digital content a week after the ending of registration period.

The use of this Digital Books begins with installing the app, by opening Google Playstore and using the keyword 'BA Digital UT'. In addition students also get email notifications sent to the official email account which registered in UT database from their *ecampus.ut.ac.id* email address.
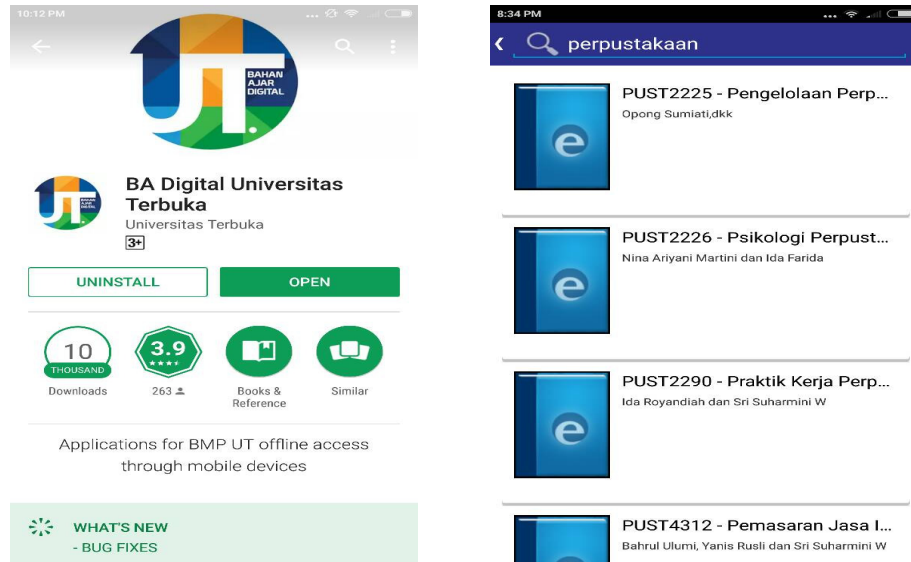
Figure 3. Homescreen and Searching features (*source : play.google.com*)

Students can login using their data along with notification on email. If they success to login, students can get a list of BMP titles that can be accessed for free. Since its launch in January 2017 until April 2017, there have been over 10, 000 users downloading this app on their mobile device.

Students can access this application freely with the user name: studentsnumber@ecampus.ut.ac.id and initial password: Ut + mmddyy For example: Ut + mmddyy (Ut22031997). This Digital BA can only be accessed online and offline. BMP can be downloaded and opened anytime and anywhere without the need of internet connection (offline access). The collection of BA Digital contained in this system has been protected by a security system to avoid illegal access. This application can run on tablets or smart phones with minimum specifications of 600/900 MHz, requires a memory space of 53,036 Mb and newest android or Android Jelly Bean Operating System from 4.1 – 4.3.1. (Safaat, 2013)
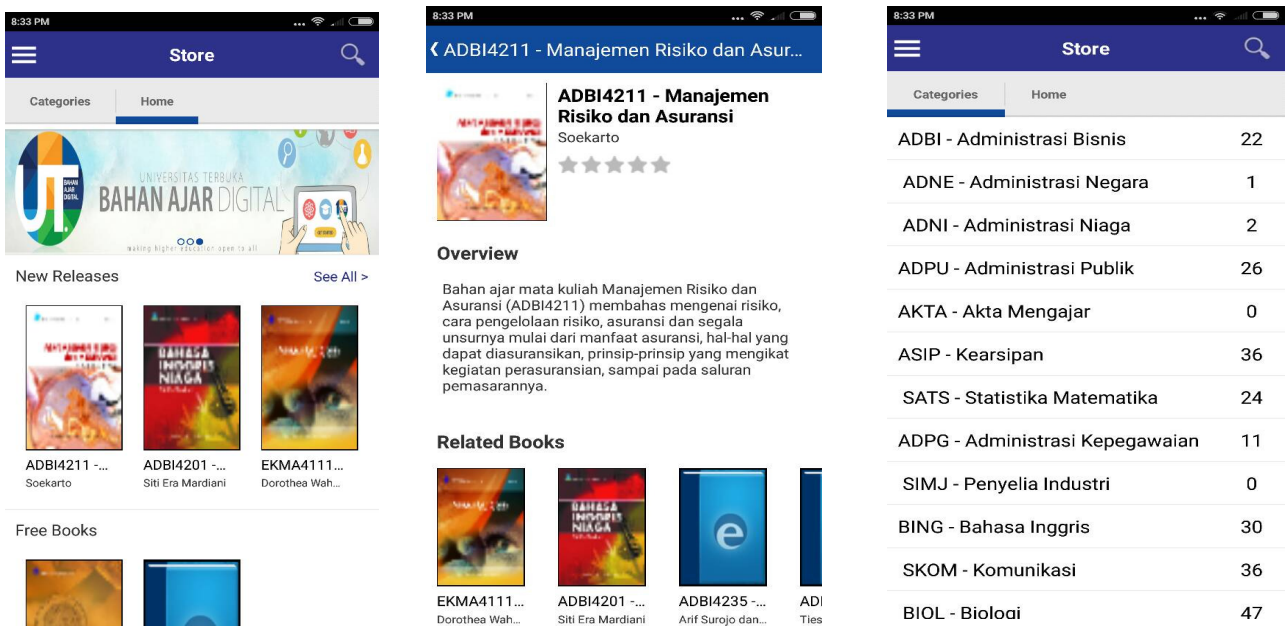

Figure 4. Information about books and its description (*source : play.google.com*)

No	Validator	Comments
1	Expert	The app have a detail instructions and manuals, available in bilingual languages, easy to log in and tap for students.
2	Professional	It should have bookmark, user-oriented and easily to find books with keywords

Table 1. Comments and Suggestions from Experts

No	Topics	Comments
1	Loading	The app works fine, but for books in thei my library, will it be updated several time and sometime takes time too long.
2	Download	For downloading should use "Loading progress%" in order to see the progress of its download.
3	Screen	The screen is really small when it opens the book. Though the screen 5.5 "should be enough.
4	Brightness	App is good, please give some option for setting brightness when opening file. Brightness is so bright that it makes eyes sore. thanks. Good job
5	Loading	Good, Free .. Just want to ask how to move books from cloud to local? It is took time in every page loading.
6	Download	This app always closes itself when the book is already downloaded
7	App	Thats so good and so help for me to learn
8	Log in	I have installed and successfully login / sign-in. Unfortunately when will open, sometimes it did not give any respond and application get closed.
9	App	Good & easy at login, but when all modules are downloaded, suddenly the application did not respond.

Table 2. Comments and Suggestions from Students

Features in the Applications of Digital Learning Materials
The reader application contained in Digital Learning Materials is equipped with bookmark, note, and highlight feature (Highlight feature only works on book format). These features are expected to assist students in reading and understanding the contents of printed materials. The features in the application of digital teaching materials will be added so that the use of this application more and can be used massively (Razak et al., 2019).

6. Usability of Application

The definition of usability according to International Standard Organization (ISO) in 9241 about usability standard (*International Organization for Standardization*, 2018) is the product that can be used by a particular user to achieve a target with effective-ness, efficiency and satisfaction of use in a particular context. The usage context consists of users, tasks, equipment (hardware, software and materials). Based on these definitions usability is measured by component:

a. Easiness is defined as how fast the users are proficient in using the system as well as the ease of use of running a function as well as what the user wants they can get. Digital Books in UT is really easy and students can access it from their smartphone, it is designed for students to learn and comprehend materials by students autonomously.
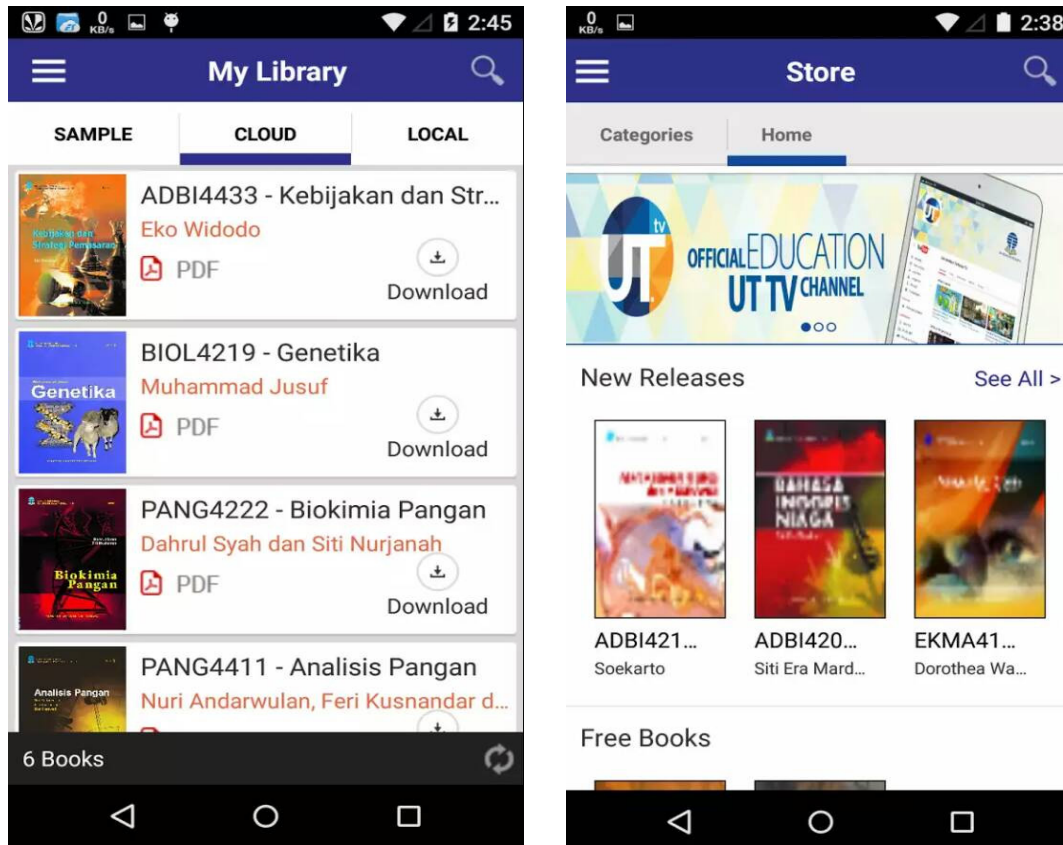
Figure 5. Books and its features (source : play.google.com)

b. Efficiency is defined as the resources spent to achieve accuracy and completeness of objectives. This Digital Books in android will avoid several unusable budget and time, it is really efficient for students to find their needs by using their smartphone.

c. Importance is defined how the user's ability to retain knowledge after a certain period of time, the ability to remember obtained from the laying of the menu is always fixed. The application will update several periods if there is some suggestions and input for better ways and fix some errors.

d. Errors are defined by how many mistakes the user makes, the user-generated error encompasses what nonconformity the user thinks with what the system. This application also provides some input, comments, and testimonials for students to give some feedback if they find any error, so the developer will fix the errors as soon as possible.

e. Satisfaction is defined as the freedom from discomfort, and a positive attitude toward the use of a subjective product or measure as the user feels about the use of the system. Most students satisfied with this application and it still developing to be better in the future. Some of our students also gave ratings 3.8 out of 5.0 in July 2017. (Universitas Terbuka, 2017)

7. Conclusions

Various applications developed by universities such as Open Universities in Indonesia, which started to be developed, from easy access, facilities and user needs oriented to tutorials, registration and examination.

Applications and facilities developed are very helpful for students in completing their academic tasks. Quality Evaluation in this android-based materials application runs well with users reaching over 10,000 for just 4 months since launch in January 2017. (Universitas Terbuka, 2017)

Figure 6. Review rating from more than 300 users (3.8 out of 5.0) in July 2017 (source : play.google.com)

Application of Android-based Digital Teaching Materials is able to facilitate students at the Universitas Terbuka in understanding the material for learning, this is can be seen by the number of downloads both on the device and the application (Chau & Jung, 2018).

Mobile devices that can be used to access BA Digital UT are mobile devices with Android operating system, it is expected that in the future Apple iOS users can use the Service of Digital Teaching Facilities at the Universitas Terbuka.

References

[1] *Android*. (2018). Retrieved from www.android.com.about/

[2] Chau, N.-T., Jung, S. (2018). Dynamic analysis with Android container: Challenges and opportunities. *Digital Investigation*, *27*, 38–46. https://doi.org/10.1016/j.diin.2018.09.007

[3] *International Organization for Standardization*. (2018). Retrieved from https://www.iso.org

[4] Jiang, Y., Katsamakas, E. (2010). Impact of e-book technology: Ownership and market asymmetries in digital transformation. *Electronic Commerce Research and Applications*, 9 (5) 386–399. https://doi.org/10.1016/j.elerap.2010.06.003.

[5] Korat, O., Graister, T., Altman, C. (2019). Contribution of reading an e-book with a dictionary to word learning: Comparison between kindergarteners with and without SLI. *Journal of Communication Disorders*, 79, 90–102. https://doi.org/10.1016/j.jcomdis.2019.03.004

[6] Lestari, I. (2013). *Disertasi. Universitas Negeri. Malang. Pengembangan Bahan Ajar Berbasis Kompetensi*.

[7] Li, L., Riom, T., Bissyandé, T. F., Wang, H., Klein, J., Traon, Y. L. (2019). Revisiting the Impact of Common Libraries for Android-related Investigations. *Journal of Systems and Software*. https://doi.org/10.1016/j.jss.2019.04.065

[8] List, A. (2019). Defining digital literacy development: An examination of pre-service teachers' beliefs. *Computers & Education*. https://doi.org/10.1016/j.compedu.2019.03.009

[9] Mulyasa. (2006). *Menjadi Guru Profesional Menciptakan Pembelajaran*.

[10] Park, J. H., Kim, H.-Y., Lim, S.-B. (2019). Development of an electronic book accessibility standard for physically challenged individuals and deduction of a production guideline. *Computer Standards & Interfaces*, 64, 78–84. https://doi.org/10.1016/j.csi.2018.12.004

[11] Razak, M. F. A., Anuar, N. B., Salleh, R., Firdaus, A., Faiz, M., Alamri, H. S. (2019). "Less Give More": Evaluate and zoning Android applications. *Measurement*, 133, 396–411. https://doi.org/10.1016/j.measurement.2018.10.034

[12] Riady, Y. (2014). Assisted Learning Through Facebook: A Case Study Of Universitas Terbuka's Students Group Communities In Jakarta, Taiwan And Hong Kong. *Turkish Online Journal of Distance Education*, *15*(2). https://doi.org/10.17718/tojde.71656

[13] Riyana, R. S. (2007). *Media Pembelajaran*. Bandung: CV.

[14] Safaat, N. (2013). *Aplikasi berbasis Android*. Bandung: Informatika.

[15] Universitas Terbuka, U. (2017). *Lampiran sosialiasi Bahan Ajar Digital*. Retrieved from www.ut.ac.id.

[16] Wilson-Higgins, S. (2018). 2 - Digital print and book manufacturing on-demand. In S. Wilson-Higgins (Ed.), *The Impact of Print-On-Demand on Academic Books* (p. 19–32). https://doi.org/10.1016/B978-0-08-102011-1.00002-X.

[17] Zhang, C., Li, L. (2006). Digital teaching reference book service: A case study on knowledge-object-based microstructure of digital resources. *The International Information & Library Review*, 38 (3) 110–116. https://doi.org/10.1016/j.iilr.2006.06.002.