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Developing android-based literature theory learning media using the MIT App inventor application

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ABSTRACT

This study aims to develop an Android-based literary theory learning media using the inventor application in the independent learning era - independent campus. This study used the Research and Development (R & D) that refers to the model of the research and development of 4D (four-D), which is definition, design, development, and dissemination. The Android-based learning media developed was tested on students in the odd semester taking the course of Theory of Literature at the Department of Indonesian Education, Faculty of Teacher Training and Education, University of Bengkulu. Based on the results obtained from the questionnaires that were distributed in this study, which were from the results of material validation, data related to the learning media used in this study were declared suitable for use without revision. In terms of media appearance and display (text on the media, color combination on the media, images on the media, navigation board layout), the result in general was "strongly agree". In terms of usage (instructions for use and user interface), the result in general was "agree". Based on the results of questionnaire distribution to thirty students, the following results were obtained. Twenty-three students stated "strongly agree" and seven students stated "agree" to the learning indicators. Regarding the material indicator, twelve students stated "agree", eighteen students stated "strongly agree". Meanwhile, regarding the learning media display indicator, all students stated that they strongly agreed. With the usage indicators, twenty-one students agreed and nine students strongly agreed. The test in the form of giving questions to students aimed to discover the extent to which students understood the material after the Android-based learning media created using the MIT App Inventor application was tested. The data obtained revealed that 39% of students got an A, 51% of students got a B and 10% of students got a C.

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Implementation of learning in a pandemic era is not directly influenced by how the government, particularly the Ministry of Education and Culture, set policy regarding Independent Campus and Independent Learning in college. The concept of independent learning aims to provide flexibility for students to study outside the campus. This means that students are given the freedom to explore the knowledge they need. The application of this concept must be accompanied by sufficient technological readiness so that the independence of students in exploring knowledge can be realized. One of this technological readiness is to provide learning media that can be accessed anywhere and anytime by students.

Learning media provides not only a means to improve the quality of learning but also one that will be beneficial if the media are close to the learners. Students in the current era are Generation Z (Gen Z) students who grew up in the era of the rapidly growing digital world, so this generation is technology literate. The proximity of students to technological products such as gadgets requires educators to see opportunities in the provision of education, for example, by developing Android-based learning media using the MIT App Inventor application.

The MIT App Inventor application is a tool for creating Android-based apps, which were initially developed by Google. Still, now its management has been taken over by the Massachusetts Institute of Technology (MIT), which is a prestigious university in the world engaged in technology. The advantage of the MIT App Inventor application, compared to other application makers, is the minimal coding process in its development. This application has provided blocks of program code so our task is to arrange them by dragging or dropping the desired object (Syaputrizal, Nelsi, Jannah, & Raudhatul, 2019:805).

Android -based learning media using the MIT App Inventor application is made in the form of software, because besides being easily accessible, this media also has a simple operating system so that it can support the process of independent campus learning activities anytime and anywhere by anyone especially student. Android-based learning media using the MIT App Inventor application not only makes space and time effective but also helps the learning process to be more interesting and meaningful for students.

Literary theory is one of the courses in the Indonesian Language Education Study Program. This course expects students to understand literary theory. However, since the outbreak of COVID-19, face-to-face learning activity turned into distance learning, also known as online

learning. The achievement target in the literary theory course will later become the basis for other courses, therefore the foundation of this course must be strong. This means that students must understand literary theory and simply be able to apply it in literary works as that when students are introduced to courses that analyze literature, students are able to explain the contents of literary works such as novels, short stories or poetry (Artika, 2015:25).

Seeing the importance of this literary theory course, an innovation in learning is needed so that students are interested in exploring the materials in this course. The innovation is to provide attractive interactive media for students as a learning tool that is relevant to the material that students are learning (Dirga, 2016:105). By presenting Android-based literary theory learning media using the MIT App Inventor the learning process not only becomes interesting but also becomes meaningful for students.

Enayati and Abbas (page 96: 2020) in the International Journal of Language Education stated that media helps the learning process as a communication process to take place optimally. With this communication, it is hoped that the learning process will take place more effectively, efficiently, and fun for students. Briggs in Rusman (2008) states that learning media is the physical means of conveying instructional content, books, films, videotapes, etc.

Furthermore, Briggs also stated that the media is a tool to provide incentives for students so that the learning process occurs. This statement is in line with the opinion of Kustandi (2011) which states that learning media are intermediaries or messengers from the sender to the recipient of the message. In more particular, the notion of media in the process of learning teaching tends to be interpreted as graphic, photographic, or electronic tools to capture, process, and reconstitute the information visually or verbally.

The conclusion on learning media was proposed by Hansson, et al. (pages 1-17: 2020) in the International Journal of Science Education, stating that with the presence of learning media, the teacher is no longer as the only source of learning, but as a facilitator. Even at present, this media has been believed to have a position as a source of learning of the whole environment around students.

Hannon (2000) described the four functions of theory in life as follows:

a. Theory becomes the main source of researchers to find answers to questions.

b. Theory can change work patterns into better work patterns.

c. Theory can explain and mature thinking. Procedures and identification are carried out in order to find answers.

d. Theory can explain to the public about the problems that occur.

Emzir (2015) at least explained various kinds of literary theories:

a. In structural literary theory, literature is seen as a work that has elements that are interrelated with one another. The inner structure in the form of building elements and the outer structure in the form of social, economic, and cultural life can be linked to the existence between the author of the work and the literary work (Emzir and Rohman, 2015: 38-39).

b. Signs in literary works can be understood as meaning if researchers make interpretations of existing meanings. This semiotic literary theory also understands literary works as linguistic works that have relevance to the meaning that exists in society.

c. Deconstruction experts view literary works as something new and do not see them as symbols but as literary works that renew the concept of the structure of literary works. Every word has a new meaning with a critical thinking model. Deconstruction focuses on reference texts and tries to find element of the work of literature.

d. Post-colonialism and post-modernism emerged after an era had passed and signaled a new era. Post-colonialism signifies the existence of the latest condition of the colony from the past which is seen from the product of literary works. Edward Said in his 1978 book Orientalism called Europeans spreading stereotypes of non- Europeans unwise, immoral, wild, and irresponsible. According to Said, the Europeans are only viewed by one frame without seeing another way of thinking (Emzir and Rohman, 2015: 87-88). Meanwhile, post-modernism signifies the rebellion of the product of modernity. One of the products of modernity regarding gender is producing works that promote equality.

There are several important reasons why this research needs to be carried out. Following are several reasons, including:

• Digital media can provide access to broader and more varied learning. Digital media allows people to learn from a variety of sources, including video, audio, e-books, and

websites. This can help people to find learning materials that suit their interests and needs.

• Digital media can make learning more interactive and interesting. Digital media can use various interactive features, such as videos, animations, and simulations, to make learning more interesting and engage students. This can help students to better understand the learning material.

• Digital media can make learning more flexible and affordable. Digital media can be accessed from anywhere and at any time, so people can study according to their schedule. This can also reduce learning costs, because people do not need to buy books or other learning materials.

METHOD

The method used in this research was research & development (R&D). This method aims to find, formulate, improve, develop, and test the effectiveness and significance of products, models, methods, strategies, or services (Putra, 2011). This research refers to the 4D (four-D) research and development model. According to Thiagarajan (1974), the 4D research and development model consists of 4 stages: definition, design, development, and dissemination.

Borg and Gall development design is one of the most popular research and development (R&D) models. This model consists of 10 stages, namely:

1. Needs analysis

This stage aims to identify the needs that need to be met by the product to be developed. These needs can come from various sources, such as research results, expert opinions, and user input.

2. Planning

This stage aims to create a product development plan. The plan should include product goals, user targets, learning materials, learning methods, and evaluation.

3. Initial product development

This stage aims to develop the initial product based on the plans that have been made. The initial product can be a prototype, model, or draft.

4. Initial trial

This stage aims to get feedback from users about the initial product. This feedback can be used to improve the initial product.

5. Initial product revision

This stage aims to improve the initial product based on feedback from users.

6. Limited trial

This stage aims to test the initial product by involving a small group of users. The goal is to see whether the initial product can be used well and meets user needs.

7. Limited product revisions

This stage aims to improve the initial product based on the results of limited trials.

8. Field trials

This stage aims to test the initial product by involving a large group of users. The goal is to see whether the initial product can be used well and meets user needs on a wider scale.

9. Revision of field products

This stage aims to improve the initial product based on the results of field trials.

10. Dissemination and implementation

This stage aims to disseminate the products that have been developed and apply them in the field.

The Borg and Gall development design has several advantages, namely:

1. The products developed can meet user needs well.
2. The products developed have been tested extensively, so their quality can be ensured.
3. This model can be applied to develop various types of products, such as learning materials, learning media, and training programs.

The population of this research was all students of the Indonesian Language Education Study Program, Faculty of Teacher Training and Education, University of Bengkulu, in the academic year 2021/2022. Meanwhile, the samples in this research were first-semester students who took the course Literary Theory at the Indonesian Language Education Study Program, Faculty of Teacher Training and Education, University of Bengkulu. The research was conducted from May to November 2021.

The data in this study were collected using questionnaires and test techniques. Three types of questionnaires were distributed in this study: material expert questionnaire, media expert validation questionnaire, and student response questionnaire. The questionnaires were distributed to determine the feasibility of the learning media that the researchers had developed. The technical test in the form of giving students questions aimed to determine the extent to which students understood the material after the Android-based learning media was tested.

The instruments used were objective questions and essays and questionnaires that the researchers distributed. The following is a framework of the instrument. In the assessment questionnaire for students, the components assessed were learning, material, display of learning media, and

their use. As in the assessment questionnaire for expert, the component materials assessed were in the form of learning (learning objectives, material delivery, and evaluation) and material (relevance and material selection). Next was the assessment questionnaire for media experts. The assessed components were the display and appearance of learning media and their use. Ten multiple-choice test questions were given to students to measure student understanding.

The data analysis technique used in this study was questionnaire data from material experts and media experts and questionnaire responses from students, which were scaled with a five-point scale, where the highest score was 5 (strongly agree). The lowest score was 1 (disagree). To calculate the average total score of each questionnaire, the formula was: $X = \Sigma X/N$. The score obtained was then converted according to the reference table below:

Table 1. Conversion Score on a Five-Point Scale (Source: Suartama, 2010)

Grade Interval	Category
X > Xi + 1.8 Sbi	Strongly Agree
Xi + 0.6SBi < **X** ≤ Xi + 1.8Sbi	Agree
Xi - 0.6SBi < **X** ≤ Xi + 0.6Sbi	Neutral
Xi – 1.8SBi < X ≤ Xi - 0.6Sbi	Disagree
X ≤ Xi – 1.8Sbi	Strongly Disagree

Meanwhile, from the test questions given to students, the scores obtained aere entered into the assessment category table so that a percentage of the number of students with certain assessment categories was generated. The following is the formula that was used in data processing.

$$X = \frac{€X}{€Xmaks} \text{ x } 100\%$$

Annotation:
X = the searched value in percent
€X = Total student scores
€Xmax = Total score

Table 2. Rating Category Table

No	Percentage	Category
1	80% - 100%	Very active (A)
2	70% - 79%	Active (B)
3	60% - 69%	Moderately Active (C)
4	45% - 59%	Less Active (D)

(Modified from source: Nurgiyantoro, 1988:363)

Indicators of research success are as follows:

1. The indicator of success in this study is if the results obtained show 30% of students get an A (very good), 50% of students get a B (good), 20% of students get a C (enough), and 0% of students get a D (poor).
2. The assessment performed on the material expert questionnaire, media expert validation questionnaire, and student response questionnaire obtains good results. It is included in the appropriate category if the average score interval is 3.

Based on the results obtained from the questionnaires distributed in this study or the results of material validation, data related to the learning media used in this study were declared suitable for use without revision. The validator agreed with the assessment of learning indicators (objectives, presentation and evaluation), and the validator responded with solid agreement to the material validator indicators (relevance and material selection). Based on the results of the validation of the learning media, the validator stated that it was feasible to use it without revision. The assessment results can be elaborated as follows. In terms of media appearance and display (text on the media, color combination on the media, images on the media, navigation board layout), the result in general was "strongly agree". In terms of usage (instructions for use and user interface), the result in general was "agree". Based on the results of questionnaire distribution to thirty students, the following results were obtained. Twenty-three students stated "strongly agree" and seven students stated "agree" to the learning indicators. Regarding the material indicator, twelve students stated "agree", eighteen students stated "strongly agree". Meanwhile, regarding the learning media display indicator, all students stated that thy strongly agreed.

Table 3. Score Interval

Score Interval	Category
$\mathbf{X > \bar{X}_i + 1,8sb_i}$	Very high
$\mathbf{\bar{X}_i + 0,6sb_i < X \leq \bar{X}_i + 1,8sb_i}$	High
$\mathbf{\bar{X}_i - 0,6sb_i < X \leq \bar{X}_i + 0,6sb_i}$	Fair
$\mathbf{\bar{X}_i - 1,8sb_i < X \leq \bar{X}_i - 0,6sb_i}$	Low
$\mathbf{X \leq \bar{X}_i - 1,8sb_i}$	Very low

Data from student perceptions were analyzed using a five-scale conversion referring to the following calculations (Widoyoko, 2009).

DISCUSSION

Based on student responses regarding the learning implementation process, an average of 2.56 was obtained, so further development is needed. This is based on a learning process that is not very effective, learning objectives that are not in accordance with the teaching materials, unbalanced suitability of material and time, language that is not a little difficult to understand, monotonous teaching models or techniques, inappropriate learning methods and models, incomplete task completion, one-way learning conclusions, ineffective learning media or teaching aids, student activities that still adhere to conventional styles or not digital-based, explanation of material that is still difficult for students to understand, evaluation implementation is less effective. so further treatment is necessary, Wulandari, et al (p 577: 2019) in an article titled Development of *Mobile Learning*

Based Android On Currency Lesson Engineering Tool Software At SMK Sultan Trenggono city of Semarang said that the development of Anroid technology has brought significant impact in the world of education. As stated by Maftakun (2020) in his thesis entitled Development of Android-based Crossword Learning Media for Indonesian Language Subject in 2020, the benefits for students who participate in the use of Android technology include: a) Ease for students in accessing information, b) Design of learning materials presented interactively and attractively, and more conceptual delivery, c) Educational materials that can be accessed through distance learning if there are time and opportunity constraints.

One of the innovative learning media is Android-based learning media using the MIT App Inventor application. Mulyadi (2013) said that the MIT App Inventor is an app used to create Android-based apps that are based in visual block programming so that the user can create an application without coding.

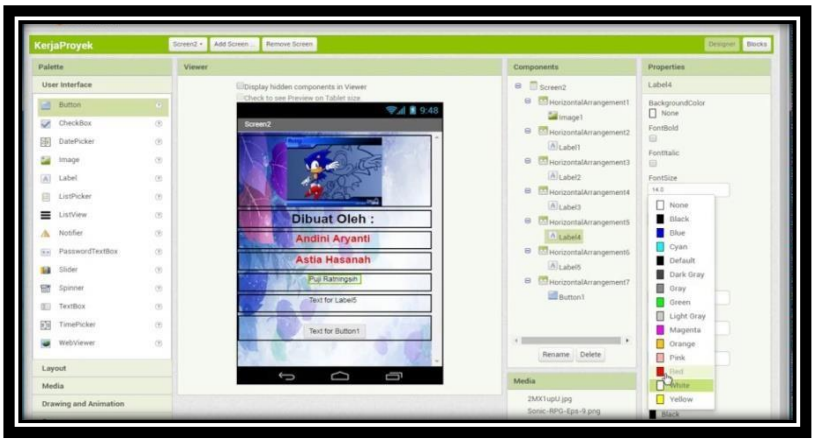

Figure 1. Design View on the MIT App Inventor Application

The advantage of The MIT App Inventor compared to other application makers is the minimal coding process in its manufacture. The application has provided blocks of program code so our task is to arrange them by dragging or dropping the desired object. The steps in creating a project using the MIT App Inventor are as follows.

a. Install the MIT App Inventor on your Android phone.
b. Register and log in to https://appinventor.mit.edu/ using your Gmail a ccount.
c. Select the new project start menu, give it a title, and press OK.
d. Furthermore, the panel component of tools can be dragged or dropped into the middle of the line with the concept you want.

CONCLUSION

The questionnaire data from material experts and media experts showed a result of 3.86, which indicated that the learning media created using the MIT App Inventor application had been used. Still, something needed to be revised because the media cannot be used on computer devices but only on smartphone devices. The material offered in the media should be more attractive in terms of appearance, and a mind map can be added to make it look more futuristic. The media was very user-friendly in the sense that it can be accessed at any time and does not require an internet network. The most important thing is that it can be installed on a smartphone. During the study of literary theory, the data obtained from four trials conducted by researchers and partners showed that 39% of students got an A grade, 51% of students got a B grade and 10% of students got a C grade. In terms of students' answers, they really referred to the literary theories expressed by expert.

Research findings show that students master the material as an effort to face technological developments in the era of industrial revolution 4.0. This has some implications as follows;

1. Change of study space. Learning usually takes place in conventional rooms or what is usually called classrooms, but with the existence of this research product, classrooms are wider and more unlimited than conventional rooms; in other words, students can study anywhere.
2. Changes in study time. The learning process usually has a systemized time in the form of a schedule. In contrast, with this digital application the learning time becomes more flexible even though it is regulated in the application program.

3. Learning resources that are limited in conventional learning can be presented widely and completely with digital applications in this learning.
4. Learning evaluation, which is only limited to written questions and exercises, becomes more varied with this digital application, namely that student learning evaluation tasks have a more varied form, for example, making videos of speaking activities and providing comments or corrections directly from the text provided.
5. Students' creativity increases with the use of this digital application; for example, when they discuss synchronously, they can do it in writing or orally.

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