

The Optimization of the MIT Apps Inventor in Entrepreneurship Learning for Students with Disabilities

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ABSTRACT

The research's background laid down by the enhancement of the disabled persons' entrepreneurial ability is less than optimal. The enhancement can be started from the school's learning process by utilizing media that supported entrepreneurship learning. MIT App Inventor is an application that can be utilized freely. It helps to develop learning media. The purpose of this study is to find appropriate learning media for students with disabilities and thus make it easier to develop entrepreneurial activities. The research uses an R&D method. The research's subject is disabled students that include blind students, deaf students, and students with moderate mental retardation. The research's result shows that the MIT App Inventor can optimize entrepreneurship learning. The application develops multimedia elements by adding video, text, voice, and image. Based on the validation and practical test, the media is feasible for being tested on a wide scale

Keywords: MIT App Inventor, Learning Media, Entrepreneurship Learning, Disability Students

1. INTRODUCTION

The collaboration between entrepreneurship education and technology development happens to be one of the agendas to improve economic matters. This agenda lays down to build young entrepreneurs in Indonesia. The entrepreneurial benefits in society not only become a media to make improvements and changes in persons' life quality in a community but also plays a significant role to manifest personal quality in a society and a nation [1]. The development of knowledge and technology widely influences human life.

The mushroom growth of information and technology in a globalization era has affected many sectors starting from the social environment, economy, technology, education, and politics. The education sector has to always adapt the entrepreneurship aspect to the global technological development to improve the education's quality. In particular, this goes to the utilization of technology in the education learning process [2]. Communication and information technology (ICT), as a part of knowledge and technology, is generally described

as all of the technologies related to retrieval, collection, processing, keeping, deployment, and presentation of information [3].

Therefore, the education sector is greatly benefited by the advancement of ICT. The huge benefits are obtained starting the high-quality materials served for learning exploration such as literature, journal, books, to build up scientific forums and discuss with many experts worldwide. All of these become easy to do without any restriction as everyone can experience them independently.



Figure 1 Sustainable Development Goals adopted by the 2030

The graduates who have collaborative and interdisciplinary skills are highly required to enter various challenges developed in the world [4]. Image 1 shows the latest goals of the Sustainable Development Goals (SDGs) that include 17 topics in total. As a world action that has been agreed upon by world leaders including Indonesia, the agendas have aims to end poverty, social-gap, and protect the environment. One of the agendas discusses education quality. SDGs contain 17 topics and 169 targets to fulfill in 2030.

Even though, among these topics, none of them specifically talks about information and communication technology (ICT) and only a few of the targets mention ICT and relevant technology, the SDGs 2030 plan still claims that substantially, ICT can help to accelerate human development progress and highly possible to bridge the technology gap [5].

Collecting information is easy to get anywhere and anytime due to technological advancement. But unfortunately, not everyone can get this access. People who have disabilities still experience difficulties getting information and use technology. It's different with the general public the disabled people as a group of the community are no less important than to receive education in school.

Disable people are a group of the community that is considered as minorities. People with disabilities are persons who grow and develop with diverge behaviors physically, mentally, intellectually, socially, and emotionally, and that require particular treatments [6]. The barrier and aberration development that disable people have frequently known as deaf people, blind people, speech-impaired people, autism, physically disabled people, mentally disabled people, and moderate mental retardation people.

The large gap of having no job opportunities in a disabled community happens because of various factors. Among the problems experienced by them, the difficult access to get job opportunities is one example. Besides, the society stereotype labels them as people who are unskilled, powerless, and pitiful. This condition conduces few job opportunities. Moreover, a lot of companies show ignorance and do not accept people with a physical disability to enter job applications because they are considered incapable. Also, there is no supportive access facility for disabled people. Thus, it's important to create a study that can improve disabled students' skills. One of those is doing entrepreneurship education development with proper media.

Along with learning technology development, media has an important role. A learning media can be used to conveys a message from sender to recipient to stimulate the mind, feeling, attention, and interest to students to learn more [7]. By using media, the students can feel motivated to learn and encouraged to writing, speaking,

and being inspired. Therefore, it helps the learning and teaching process become more efficient and effective. Also, it builds up a good relationship between teachers and students.

Besides, it can help to overcome boredom when studying in the class. More appealing the teachers create learning material the students can get more motivated to learn. Even so, teachers have yet developed innovation yet in teaching materials practice, or do they have it. The school must understand the principles and guidelines to apply the technology in a class successfully [8]. The teaching enhancement needs improvement to utilize the technology for studying efficiently in a class [9].

Smartphones are devices that are widely used by the public. They bring it everywhere they go. This condition opens a big opportunity to develop a learning media based on mobile learning. Mobile learning is one of the learning media development alternatives [10]. The research focuses on learning media based on an android mobile more. The development of learning media based on android mobile has occurred a lot. E-learning and other general mobile learning have search features that are compatible with people's wishes. Thus, information can be found and collected quickly [11].

During a pandemic, online learning is still ongoing. Based on an online learning evaluation during 2020, some of the research state that online learning gives both positive and negative impacts. Many students find it difficult to master the learning material served online [12]. The teaching materials are often presented in a reading form that's hard to be understood fully by the students. From those researches, proper learning media is highly needed.

As an educator, a person must have innovation to support the learning process to students, especially disabled students. Few researchers have tried to develop a learning application by using MIT App Inventor. Some of those who have already developed the app for more than just a learning process mentioned in the following; Mikolajczyk, Mihci and Al-Omary [13], [14], [15]. The MIT App Inventor design introduces mobile app development for education. It's an online platform that can be used and applied freely and easily for everyone [16]. Based on these backgrounds, the writer develops learning media using MIT App Inventor for entrepreneurship learning.

2. METHOD

This research develops an android-based multimedia application product for disabled students. The production process of making a multimedia application product uses the MIT App Inventor platform that can be accessed online. The model development uses Lee & Owens's model [5]. This model is chosen because it's compatible with the development's goal to produce a multimedia

product. Besides, this model has detailed and completed stages, starting from the analysis and assessment stage, design stage, development stage, implementation stage, and evaluation stage. The steps of developing a Lee & Owens model product can be seen through the images below.

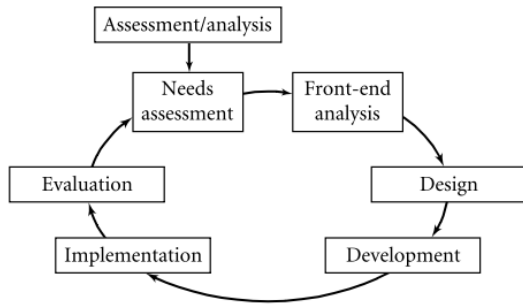


Figure 2 Lee & Owens model development diagram[5]

The android multimedia research and development procedures are explained in the following; 1) the assessment/analysis that consists of needs analysis and front-end analysis, 2) the design analysis, 3) the development analysis, 4) the implementation analysis, and 5) the evaluation analysis. The trial design has been carried out to determine the validity, practicality, and android multimedia product appealing. The validation is carried by a material expert, media expert, and linguist. Also, it's tested on teachers and disabled students.

The research instruments are the initial data collection instrument (the needs analysis) and a field trial instrument. The data collection instrument consists of the

test sheet and the questionnaires (validation and response). To get a valid scoring scale, a Likert scale is used. It has four alternative indicators. The indicators are Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD).

The media experts assessed several aspects in the validation questionnaires. Those aspects are the visual aspect, audio aspect, typography aspect, programming synchronization aspect, and practical aspect. The multimedia visual aspect consists of color selection, background, image selection, visual image accuracy, and font selection. The multimedia audio aspect includes voting, background music, sound effect, and voice pronunciation clarity. The typography aspect contains font/text suitability, font/text color, font/text size, and font/text style. The programming synchronization aspect consists of the sophisticated use of multimedia learning. Lastly, the practical aspect contains the utilization, the convenience of operating buttons, and the smooth open access.

Furthermore, the linguist validation questionnaire assessment aspect includes the accuracy of using the term, the accuracy of using sentences/grammar, the accuracy of composing sentences, and the correct conceptual words/sentence making. The material expert assessed the validation questionnaires that consisted of the material suitability with the applicable curriculum, the material/concept accuracy, the source material accuracy, the advanced material/concept accuracy, the proximity of the suitable material with the students' life. The validation criteria used in the research validity are presented in the following table.

Table 1 Achievement Level and Eligibility Quality

No	Achievement Level	Qualification	Explanation
1	81-100%	Very Good	Very Decent, no revision
2	61-80%	Good	Decent, no revision
3	41-60%	Quite Good	Quite Decent, needs revision
4	21-40%	Deficient	Not Decent, needs revision
5	< 20%	Strongly Deficient	Strongly Not Decent, needs revision

Source: [17]

Table 2 shows the learning media practicality criteria. It is used on a large-scale trial is tested in SLB YPAC that implemented by teachers' help later. The criteria are

created based on questionnaires that have been made through Google link form. The link is shared with the teachers and the students to utilize the learning media.

Table 2 The Practical Criteria

Scale	Criteria
$0 \leq P < 1,5$	Impractical
$1,5 \leq P < 3$	Quite Practical
$3 \leq P < 4,5$	Practical
$4,5 \leq P \leq 5$	Very Practical

Based on the assessment result from the expert validator, the data analysis technique uses qualitative descriptive analysis and quantitative descriptive analysis. It consists of product validity data analysis, product practicality data analysis, and product attractiveness data analysis. Lastly, each of the validators analyses the qualitative data. It's settled up based on the response, suggestion, and advice.

3. RESULT AND DISCUSSION

The first stage discusses the needs analysis. Based on the needs analysis result, the collected data from in-depth interviews with the teachers who stay in a research location informs that they have yet optimized the technology used for school's learning. It is important to apply technology for online use during the Covid-19 pandemic as it provides convenience to the students, especially disabled students. The research product is an MIT App Inventor that's used for developed learning media. Before it sets into production, a media design needs to be made.

The purpose of the design is to simplify the media interface and the content layout setting. It helps to set the compatibility between the production and the preliminary design draft. Based on the interview, the content media explores the entrepreneurship theme for senior high school students. The students are disabled students who are blind, deaf and having moderate mental retardation. This theme discusses farming, raising live stocks, and making crafts.

The second stage of the research is the design stage. It makes an interface design. Also, the material determination is done during this stage through interviewing the teachers by using a WhatsApp platform. This step helps to arrange the compatibility in the app easily. Smartphone device has limited screen display size. To overcome this problem, the application display is designed specifically to adjust the smartphone display size. The icons and the size of the buttons are designed particularly to be tangible easily with fingers, as seen in Image 3.



Figure 3 The Icon Designs on Media Product

The next step is learning media product development. The development starts by making a product firstly by adding the designed components in MIT App Inventor by the initial design. After that, the application layout is set up. Then, adds up learning video completed with Sign language for deaf students and text material audio for blind students on the screen by adapting the previously made components.

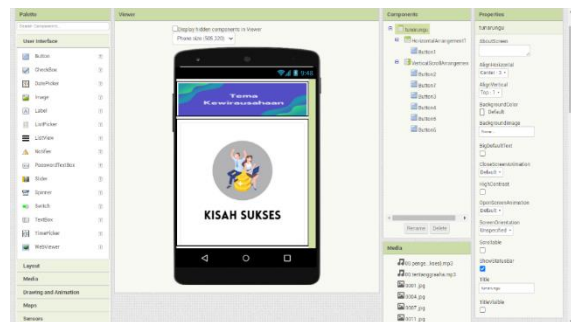


Figure 4 Making Product by Using MIT App Inventor

The next step after doing the product development stage is the validation test. Some of the experts validate the developed product before testing it. The material expert and the media experts hold the validation process. Graaha Usaha is the title product of the learning media product. The following table 2 is the learning media assessment result that is made by using MIT App Inventor. The Graaha Usaha result is described in Table 3 below.

Table 3 The Result of the Graaha Usaha Media Made by the Validators

Validator 1	Validator 2
The successful story part is arranged at the bottom.	Adding more practical questions
Each of the theme application samples can be more varied	Use some references to develop the materials
	It has no instruction guidelines yet

Table 4 is the validation result of Graaha Usaha as a learning media product. The test validation aspects consist of visual communication (interface), the usefulness (easy to use/operate), a complete presentation (the instruction guidelines), the language presentation (grammatical use), the design/layout (buttons options in the media, multimedia elements). After the validation test

and completing the media are completed under the validators' suggestion, the next thing to do is implementing the media on a wide scale. The media is firstly tested on teachers and students in SLB YPAC Malang. The test result made on a wide scale is shown in Table 5.

Table 4 The Validation Result

No.	Aspect	Score	Information
1	Visual communication/interface	95	Very Good
2	Usefulness	90	Very good
3	Complete presentation	80	good
4	Language presentation	83	Very good
5	Design/Layout	90	Very good
Average Score Percentage		87,6	Very good

Table 5 The Result of the Wide Scale Test

Respondent	Total score	Eligibility Score	Criteria
1	30	5,0	Very Practical
2	29	4,8	Very Practical
3	30	5,0	Very Practical
4	25	4,2	Practical
5	25	4,2	Practical
6	29	4,8	Very Practical
7	27	4,5	Very Practical
8	28	4,7	Very Practical
9	29	4,8	Very Practical
10	26	4,3	Practical

Based on Table 5, Graaha Usaha, as a mobile learning media, is developed through validation and practical test. This media is valid and practical to use on a wide scale. It's applied in entrepreneurship learning to students in SLB YPAC Malang. This research tunes in with the development research is done by Muttu et al, Anggraenii et al, and Syaputrizal and Jannah [18], [19], [20].

4. CONCLUSION

This research produces learning media entitled Graaha Usaha. The development process uses MIT App Inventor. This learning media contains materials for high senior disabled students especially blind students, deaf students, the students with moderate mental retardation. The developed material focuses on entrepreneurship learning aspects such as adding successful stories from

persons with disabilities, entering entrepreneurship themes such as farming, raising live stocks, food processing, making crafts, and product marketing plan. Based on the validation and practical test, Graaha Usaha is valid and practical to use for entrepreneurship learning media.

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