



Developing Educational App to Boost Students' Basic English Skills: A Research & Development

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ABSTRACT

The aim of this research was to identify what media students needed and how to develop it, as well as to determine whether the media was effective in overcoming student problems. This research utilized a research and development design. The population of the research comprised all first-grade students of SMAN 4 Lhokseumawe, which included two classes. In this research, two classes were chosen as samples using simple random sampling. The sample was divided into two groups. The experimental group X.1 consisted of 30 students who were taught using the direct instruction method, while the control group X.2 consisted of 30 students who were taught normally. The data collection techniques used were questionnaires and tests, which included pre-tests and post-tests. The researcher administered questionnaires before conducting the pre-test. Then, the researcher gave the pre-test before providing treatment and the post-test after the treatment. The data were analyzed using the t-test formula. The researcher found that the scores of the t-test were 1.77, 2.21, 1.69, and 2.1, while the score of the t-table at the significance level of 0.05 and $df = 58$ was 1.67. This indicated that the t-test was higher than the t-table. Thus, based on the criteria, the alternative hypothesis (H_a) of this research was accepted, and the null hypothesis (H_o) was rejected. This indicated that using the educational application was effective in enhancing the basic English skills of first-grade students at SMAN 4 Lhokseumawe.

INTRODUCTION

In the learning process, Ilham et al., (2024) states that instructional media can be utilized as a substitute learning resource. Muhson (2010) states that well-designed educational materials will significantly aid students to understand and assimilate content. Utari et al. (2014) explain that engaging educational materials can also draw students' attention to the information presented by teachers, making it easier for them to understand. Ramansyah (2014) states that students will benefit from the use of multimedia in the classroom

as it makes the instructional materials more accessible and visually clear. Garrison (2011) states that the technological foundation of e-learning is the internet and associated communication technologies.

In recent years, digital technology has increasingly been integrated into education to improve the overall teaching and learning experience. Singh (2021) explains that the integration of digital technology in education aims to enhance the teaching and learning experience, making it more engaging for both teachers and students. Mobile technology now plays a significant role in various areas of daily life, including entertainment, social networking, e-commerce, and education, as noted by Persson and Nouri (2018). Inggita et al. (2019) highlight that the development of compact information technologies like smartphones and tablets has contributed to the growing popularity of mobile learning in educational settings. Lai et al. (2018) emphasize that learners' understanding and effective use of the capabilities offered by technological resources are crucial factors influencing their actual learning experiences.

The researcher aims to address these challenges by developing a learning application using the Dart programming language and the Flutter framework, which enables the creation of rich, responsive user interfaces across multiple platforms efficiently. Clark & Mayer (2023) offer practical guidelines for e-learning designers and developers, covering topics such as multimedia use, interactive learning environments, online assessments, and program evaluation. English skills comprise both receptive skills, like listening and reading, and productive skills, such as speaking and writing, all of which Harmer (2002) emphasizes should be developed simultaneously to achieve effective communication. E-learning materials are typically delivered through three main methods: synchronous learning, asynchronous learning, and self-directed learning, each differing in timing and interaction levels between teachers and students, as Henderson (2003) explains. Overall, e-learning integrates electronic devices and communication technologies to facilitate flexible and accessible learning experiences.

Previous research on learning media using e-learning has focused on developing targeted applications to address specific language learning challenges. Pamilu (2022) developed a web-based application aimed at helping tenth-grade students improve their understanding of grammar, resulting in significant gains in grammatical comprehension. Similarly, Rahmat (2015) created an Android application dedicated to teaching all twelve English tenses, utilizing Java programming to enhance mobile language learning through innovative technology. Bestari (2014) developed educational software using Delphi 7 for teaching tenses at SMKN 2 Lhokseumawe, focusing on four tenses and demonstrating effectiveness through student approval and positive assessment results. Thus, These studies collectively demonstrate that focused, technology-based learning applications can effectively enhance students' mastery of specific English language skills (Ilham et al., 2023; Dhivya et al., Fadhillah et al., 2024; Azmy & Rahman, 2024; Ali, 2024; Fentari, 2025; Hasumi, & Chiu, 2024; Palandi, Pudyastuti & Molewe, 2024).

METHODS

Development research plays a critical role in creating purposeful and practical solutions within educational and design contexts. Akker (1999) states development research involves a systematic process that includes analysis, design, evaluation, and revision, which are iteratively conducted until an optimal balance between theoretical ideals and practical implementation is achieved. The subjects of the study were divided into two groups: one as an experimental group that received a therapy utilizing an Educational Mobile Application and the other as a control group that received a traditional technique. The design may be found in the table 1 below.

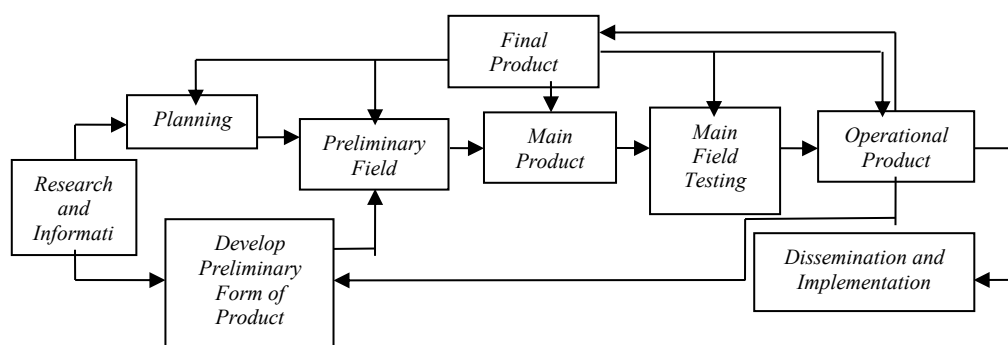
Table 1. Research Design

No	Group	Pre-Test	Treatment	Post-Test
1	X.1	O ₁	Experiment	O ₂
2	X.2	O ₃	Control	O ₄

The research of this article was carried out in a senior high school in Lhokseumawe, Aceh, Indonesia. The researcher chose this place because the writer has informed many students and especially students of SMAN 4 Lhokseumawe in class X at this school have not been able to comprehend the four basic English language abilities, this school offers English lessons and the writer has access to the school. In writing of this article the researcher use a research and development method, the reason why the writer chose this method is because of its nature is to create solutions in the form of media to solve problems experienced by students. Borg and Gall (1983) describe research and development is the process of creating and validating educational products and they include examining research results, field testing it in the location where it will eventually be utilized, and updating it to remedy any flaws discovered during the field-testing stage. In this study the authors conducted observations in order to support questionnaire and test as techniques to collect data.

Based on Sugiyono models there are ten steps that should be followed in R&D, nevertheless researcher adapted the development model, thus researcher only take seven steps for this case, see the figure below.

Figure 1. E-Learning Development Model



To evaluate the practicality of an educational application, appropriate data collection instruments are essential. Syahrums (2014) states the questionnaire used in data collection consisted of a questionnaire for teachers and students to measure the practicality of educational application developed, which is questionnaire is a fact collection method via written questions to attain information or records from records sources or respondents. The concurrent embedded design is used to answer questions that require different types of data, as explained by Malik and Hamied (2014). Ponto (2015) stated the questionnaire is one of the most widely used methods for collecting data, especially to gather students' attitudes and perceptions about smartphone ELLA. Cheung (2021) highlights a strong connection between quantitative analysis and the use of structured questionnaires.

Questionnaires were given to find out what media the students need to learn 4 English basic skills. A test was a series of questions or activities, as well as other instruments, intended to assess the skills, intelligence, knowledge, abilities and talents of a person or group. In this study, the researcher used a pre-test to see students' abilities before receiving treatment using media developed by the researcher and a post-test to see the level of improvement obtained by students after receiving treatment using the media developed. However a test is considered valid if it can measure exactly what it is intended to measure by Arthur Hughes (1989).

RESULTS AND DISCUSSIONS

The results of this study highlighted significant differences at students' scores on four basic English skills were higher after being treated with the Indonesian English application compared to before being given treatment by researcher, this means that the application of Indonesian English had a greater influence on student improvement basic. Apart from that, researcher as developer also play a role in this, making it easier for teachers to educate and analyze student skills. These findings are discussed students need media, process of developing, and the effectiveness of media.

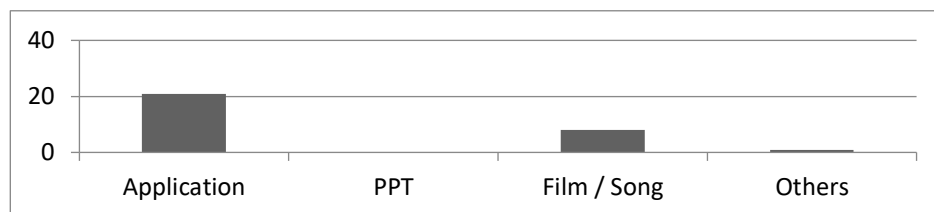
Students Need Media to Improving the Basics of English Skills

Media integrated with technology has become widely adopted in educational contexts, with many educators recognizing the potential of mobile applications in second language learning, as noted by Godwin-Jones (2011). Research by Rosell-Aguilar (2017) shows positive outcomes in language development and learner engagement, especially through increased practice opportunities, while Zhang and Zou (2022) highlight that mobile apps are the primary method for mobile language learning. According to Szeto et al. (2016), tailoring the integration of information and technology to students' needs can enhance their interest in English. Learning media encompasses various methods and technologies designed to deliver information,

support comprehension, and enrich the learning experience; these are generally divided into print media, such as textbooks and handouts, and non-print media, including audiovisual aids and interactive technologies, as categorized by Gerlach and Ely (1980). Reiser and Gagne (1983) classify instructional media into audio, print, still visual, motion visual, and real objects, offering a comprehensive framework for media use in education.

According to the results of the questionnaire data, students selected to utilize the application that the researcher would produce after the researcher told them about the media that the researcher would develop. However, some students prefer Film/Song media to aid their English study. The data is depicted in the Image below:

Figure 2. Questionnaire Result



Process of Developing English Learning Media

After gathered information from students, researcher decided to make application from Dart. Dart is language program from Google Inc to create an application or website. The researcher made several steps to develop the product. First, the researcher created a design for the application and also the material that would be displayed in the application. Second, the researcher conducted an application test in the experimental class to measure the effectiveness and feasibility of the application.

Third, testers validated the media with IT experts to provide advice on further developments. Fourth, the researcher made revisions in terms of design and materials based on criticism and suggestions from experts. Fifth, researcher tested the media again after following previous suggestions and criticism from IT experts. Sixth, after passing trial use on students in the experimental class, examiners only need to make final revisions before the final production stage. Seventh, at this stage the researcher has finished conducting field testing and revisions, and can be fully used by students.

The Effectiveness of Educational Application to Improve Students' Basic English Skills

Addressing persistent issues in the education sector demands strategic and sustainable efforts. Tsai (2019) highlights the significant impact of digital learning applications on student achievement in elementary schools, a finding further supported by Arafik (2021), who notes improvements in student performance when such applications are used. Moreover, Andreani (2019) and Wang (2021) emphasize that the use of digital

tools enhances students' motor skills and fosters greater engagement and creativity during learning activities. Chisunum & Nwadiokwu (2024) explains that these applications facilitate the achievement of curriculum goals by simplifying the presentation of instructional materials, thereby improving learning satisfaction for both students and educators, as also noted by Isti'anah (2023). This increased satisfaction contributes to a more innovative and creative teaching approach among educators.

Recognizing the growing role of technology in education, Lara Nieto-Márquez et al. (2020) emphasizes that digital technology, which is now indispensable in education, has a profound influence. He predicts that digital learning tools such as E-books, educational games, and various platforms will become increasingly integral to the future of education. Khan (2019) emphasizes that effectively addressing these obstacles necessitates significant investment in both teacher professional development and the improvement of educational infrastructure. The media expert has evaluated the lesson's design and determined that it is a suitable stage for learning variety. From a material context, the presentation and the composition of the material have been evaluated and examined by material experts, making the development of the product design possible.

The experimental group's learning achievement data analysis using the T-test showed significant enhancements in learning achievement during the pre-test to the post-test. However, based on the data gathered by the researcher, the average score, variance, standard deviation, L_0 and t-test from the students' pre-test and post-test for both groups are as follows.

Table 2. Speaking Test Results

	Experiment Class		Control Class	
	Pre-test	Post-test	Pre-test	Post-test
Means Score	49.8	66.5	46.1	53.7
Variance	648.34	959.65	644.41	769.31
Standard Deviation	25.46	30.97	25.38	27.73
L_0	0.124		0.101	
T_{test}	1.77			

The goal of the normality test was to determine if the data was normal or not. The Lilliefors test with the criteria $L_0 < L_{table}$ was employed for this study's normality test. The test results revealed that the L_0 for the experimental group $L_0 < L_{table}$ is $0.1243 < 0.161$. The L_0 for the control group $L_0 < L_{table}$ is thus $0.101 < 0.161$. As a result, it was demonstrated that the data was normal. Furthermore, after determining homogeneity and normality, the t-test is determined. Because the data in this study was normally distributed, the researcher employed the t-test formula, this study's t-test score was 1.77.

Table 3. Listening Test Result

	Experiment Class		Control Class	
	Pre-test	Post-test	Pre-test	Post-test
Means Score	54.1	69	51.4	52.4
Variance	540.03	621.31	523.37	531.65
Standard Deviation	23.23	24.92	22.87	23.05
L₀	0.158		0.158	
T_{test}			2.21	

The goal of the normality test was to determine if the data was normal or not. The Lilliefors test with the criteria $L_0 < L_{table}$ was employed for this study's normality test. The test results revealed that the L_0 for the experimental group $L_0 < L_{table}$ is $0.158 < 0.161$. The L_0 for the control group $L_0 < L_{table}$ is thus $0.158 < 0.161$. As a result, it was demonstrated that the data was normal. Furthermore, after determining homogeneity and normality, the t-test is determined. Because the data in this study was normally distributed, the researcher employed the t-test formula, this study's t-test score was 2.21.

Table 4. Reading Test Result

	Experiment Class		Control Class	
	Pre-test	Post-test	Pre-test	Post-test
Means Score	56.1	70.1	56.8	52.4
Variance	424.24	1183	423.86	879.31
Standard Deviation	20.59	34.39	20.58	29.65
L₀	0.089		0.147	
T_{test}			1.69	

The goal of the normality test was to determine if the data was normal or not. The Lilliefors test with the criteria $L_0 < L_{table}$ was employed for this study's normality test. The test results revealed that the L_0 for the experimental group $L_0 < L_{table}$ is $0.089 < 0.161$. The L_0 for the control group $L_0 < L_{table}$ is thus $0.147 < 0.161$. As a result, it was demonstrated that the data was normal. Furthermore, after determining homogeneity and normality, the t-test is determined. Because the data in this study was normally distributed, the researcher employed the t-test formula, this study's t-test score was 1.69.

The goal of the normality test was to determine if the data was normal or not. The Lilliefors test with the criteria $L_0 < L_{table}$ was employed for this study's normality test. The test results revealed that the L_0 for the experimental group $L_0 < L_{table}$ is $0.152 < 0.161$. The L_0 for the control group $L_0 < L_{table}$ is thus $0.133 < 0.161$.



As a result, it was demonstrated that the data was normal. Furthermore, after determining homogeneity and normality, the t-test is determined. Because the data in this study was normally distributed, the researcher employed the t-test formula, this study's t-test score was 2.1.

Table 5. Writing Test Result

	Experiment Class		Control Class	
	Pre-test	Post-test	Pre-test	Post-test
Means Score	51.5	71.3	52.8	59.5
Variance	677.17	1182	697.65	935.4
Standard Deviation	26.02	34.38	26.41	30.58
L₀	0.152		0.133	
T_{test}	2.1			

CONCLUSION

Based on the result of research, the researcher concluded some important points related to the research problem. To strengthen their English abilities, students require Android-based learning material. As we all know, there are four language skills: speaking, listening, reading, and writing. As a consequence, academics have proposed developing Android-based media on the findings of student questionnaires, namely: 1) Students have trouble learning English; some abilities that students believe are difficult and require assistance from supplementary media; 2) Encourage instructors to contribute to the usage of apps in the classroom. When researcher discovered this issue, they quickly defined what needs should be included in the program. In this development, the researcher used three types of software: Android Studio, Visual Studio Code, and Flutter as the framework.

Researcher used the Dart programming language which is known to be open source in its creation. After the application is built in the initial stages, researcher evaluate it with IT specialists to provide recommendations and criticism so that the application can be improved. The researcher then follows the validator instructions and proceeds to validate the application once it has been provided comments and criticism. The Indonesian English application is then evaluated to determine its efficacy. In this scenario, the researcher selected one experimental class to utilize the Indonesian English application and one control class to compare to the experimental class. Before testing the application, the researcher conducted a pre-test in both classes to assess students' existing abilities and as a basis for the post-test. After the pre-test, the experimental class used the Indonesian English application as treatment, while the control class only learned through lecture tactics and literature. After the treatment phase ended, the researcher conducted a post-test

to assess student progress in the two courses. Based on the findings of the students' post-test, where t-score $>$ t-table, namely: 1.77, 2.21, 1.69, 2.1 $>$ 1.67, it is possible to conclude that the Indonesian English application is successful in increasing students' basic English abilities, particularly in class X.

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