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Development of Interactive Multimedia in Learning English Using Game-Based Applications to Enhance Listening Skills for 12th Grade Students at SMKN 3 Bangkalan

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Abstract

The purpose of this research is to develop an engaging English-language educational game that aligns with the news item text material to improve the listening skills of SMKN 3 Bangkalan students. The research method employed is research and development (R&D) using the MDLC model, which involves six stages: concept, design, material collection, assembly, testing, and distribution. Data collection techniques included surveys and interviews. The validation results obtained from experts are as follows: 1) The English language educational game for listening competence is suitable; 2) The material validation expert's percentage is 88.88%, categorized as "highly appropriate"; 3) The language validation expert's percentage is 81.82%, categorized as "appropriate"; 4) The media validation expert's percentage is 84.21%, deemed "highly appropriate"; 5) The small-group user testing resulted in a percentage of 81.84%, categorized as "appropriate"; 6) The large-group user testing yielded a percentage of 76.84%, categorized as "appropriate." Based on the test results, it can be concluded that the English language educational game for listening competence is suitable for enhancing the listening skills of SMKN 3 Bangkalan students.

Keywords: English, educational, game, listening, MDLC.
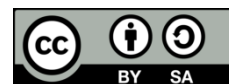
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I. Introduction

English plays a crucial role in various aspects of life in this era of globalization. Its application in technology, art, politics, culture, science, and even international relations underscores this significance. Whether listening to music, watching television, playing games online or offline, seeking reference books for information, or even communicating with strangers, many people require the English language. As seen in programs like the ASEAN Economic Community (MEA), students are required to master English as a prerequisite. Besides the increasing demands of the times, English is recognized as the world's "lingua franca" [1].

The Central Statistics Agency (BPS) shows that as of February 2022, the Open Unemployment Rate (TPT) for graduates of Vocational High Schools (SMK) in 2022 reached 9.42%. The researcher also conducted interviews with a guidance counselor, Mrs. Nanik, regarding the absorption of SMKN 3 Bangkalan graduates in the workforce. Based on the data analysis and interviews, out of the three batches from 2018 to 2021, 45.01% of students have not been absorbed into the workforce. Mrs. Nanik stated that by having students take an English language test, their chances of getting employed could be improved.

The role of the English language for vocational school (SMK) students is to expand their horizons and opportunities for employment and enable them to compete with foreign workers. This is because SMK graduates are often associated with entering the workforce immediately after completing their studies, making their English language skills even more critical at this level. This aligns with the statement by Ubaedillah [2] that in today's world, competition for employment is becoming increasingly fierce. Prospective employees are expected not only to meet the standards of competence in their desired field but also to communicate using a universally recognized language, especially English. Particularly for foreign companies, individuals who can communicate in a foreign language have a better chance of securing their desired job. When determining requirements for hiring new employees, this impacts the company's selection process, with the ability to communicate in English being one of the admission criteria. Therefore, it is crucial for schools to provide English-language communication training so that graduates can compete for good jobs in the future. One such SMK facing these challenges is SMK 3 Bangkalan.

English language proficiency is a crucial prerequisite for SMK graduates in their job search. SMK students are expected to master the four language skills: listening, writing, speaking, and reading, with an emphasis on communication skills. SMK students are expected to have more communicative English language skills to prepare them for the workforce. Vocational school students often tend to be passive when it comes to English communication, as they are often worried about not knowing vocabulary, afraid of making mistakes, and skeptical of what others say. This can be detrimental to SMK students since English language proficiency is one of the criteria for evaluating an individual's quality when applying for a job. Job applicants with active English language skills will have a higher market value [3].

Communication flows more smoothly when the listener can respond to what the speaker is conveying. Differences in pronunciation and grammar can lead to misunderstandings between the speaker and the listener [4].

Listening involves several criteria or elements to achieve it effectively, with five key components: hearing, attending, understanding, responding, and remembering. In simple terms, active engagement is required in the communication process because successful communication relies on the recipient's ability to comprehend what the speaker is conveying [5].

The role of the English language in the context of the workplace is significant. Proficiency in English is a valuable asset for employees. In fact, good English language skills are often a mandatory requirement for job applicants in several job offers. Proficiency in English also benefits local company employees who aim to expand their businesses into international markets. Consequently, it's no surprise that many employees opt to take English language training courses [6].

Besides the challenges posed by students, the lack of appropriate learning materials and resources tailored to harness students' abilities leads to passivity in the classroom. Furthermore, teachers often employ lecture-style teaching models and teacher-centered learning activities. English is highly important, and the support of suitable learning media is essential to mitigating unemployment rates.

Based on the factual data, there is a need for facilities or resources to help hone English language skills. English is no longer just a common language; it has become a norm, especially in this era of globalization. In today's globalized world, being able to speak English effectively and fluently is a requirement for everyone. This is because English is used in nearly every aspect of life. English is not only required in schools but is also used in working with businesses worldwide in international transactions. There are numerous job opportunities for individuals proficient in English, and they may even secure high-paying positions in various businesses or organizations [7].

Given this context, more in-depth interviews were conducted with English teachers at SMKN 3 Bangkalan, specifically with Mrs. Indah. From these interviews, it was revealed that the current learning media used by teachers consist of books and speakers. However, these learning materials are still insufficient to help improve the listening skills of students. Furthermore, students often struggle to focus and have difficulty hearing clearly during listening activities.

The researcher also distributed a questionnaire to 25 12th-grade students at SMKN 3 Bangkalan to gain further insights. This questionnaire revealed several challenges to the continuity of learning. Through

observations and a questionnaire using Google Forms, the results showed that 48% of students faced difficulties with the learning medium, while 32% encountered difficulties with English word pronunciation. Most difficulties related to the learning medium included issues with maintaining focus, unclear speakers, and difficulty understanding what was being heard. The percentage results from the questionnaire can be seen in Figure 1 below:
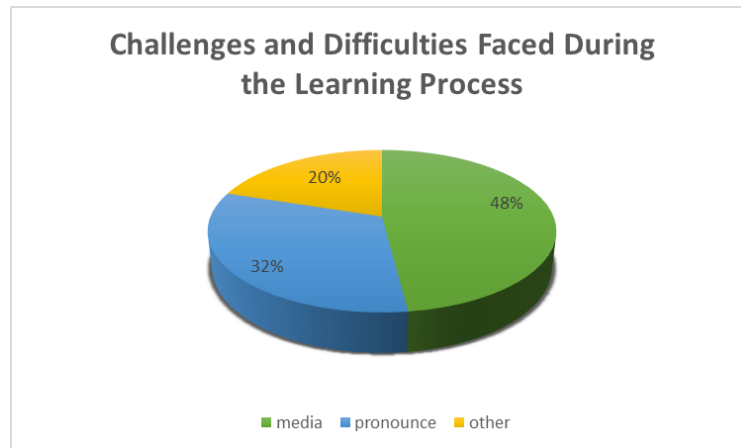

Fig. 1.   Percentage Diagram of Student Challenges

This is due to the inadequacy of learning resources and the lack of supportive laboratories for students. Moreover, as many as 88% of student respondents express their interest in and the need for the development of educational game-based learning media. Even among the 20% of students who do not face difficulties, they still acknowledge the need for the development of educational game-based learning media to make the teaching and learning process more engaging.

At the vocational school level, the English language subject aims to equip students with the ability to communicate effectively both orally and in writing at an intermediate level, with mastery of English language skills, in support of the competence of the program's field.

There are several practical benefits of using learning media in the teaching and learning process, as follows [8]:

1. Learning media can aid and expedite the learning process and outcomes by making the delivery of messages and information clearer.

2. Student motivation can be enhanced through learning media by directing their attention. It allows students to learn according to their abilities and interests, facilitating more direct interaction between students and their environment.

The interest of students in using Android as a learning medium, combined with their familiarity with Android smartphones, underscores the need for Android-based learning media in this subject. Teachers have yet to fully harness technology as a learning medium, even though students are already familiar with it [9].

The students' demand for Android-based learning media is evident from the percentage results in Figure 2 below:
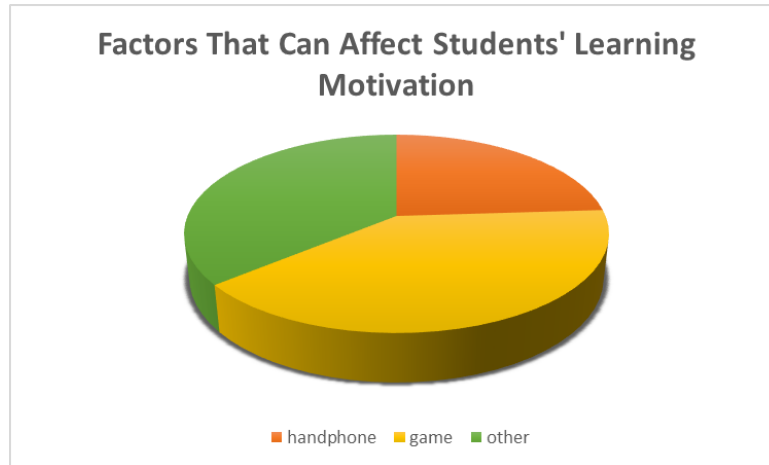
Fig. 2.   Percentage Diagram of the Influence on Students' Learning Motivation

With various learning media, teachers can use them as tools to impart knowledge to students. Learning media are valuable learning resources that can help teachers enrich students' understanding. The use of learning media by teachers makes it easier for students to comprehend the learning materials and fosters their interest in learning new things [10]. Learning with smartphones as a medium offers the convenience of access from anywhere and at any time. In the learning process, it is crucial to have learning media that can engage students' interest. Essentially, in the learning process, various engaging learning tools are needed, and one such tool is educational games.

Educational games are currently a technology that can be utilized as a learning medium. The development of educational games is quite fascinating. When compared to conventional educational methods, educational games offer several advantages. The availability of animation, which has the potential to enhance memory and help students retain information for a longer duration than conventional teaching methods, is one of the significant advantages [11].

II.   RESEARCH METHOD

The research model used by the researcher is research and development (R&D). Research and development is a systematic method for designing and developing educational programs and learning products that meet internal criteria [12].

The development of educational game media can be accomplished using the Multimedia Development Life Cycle (MDLC) method, as depicted in Figure 3, which consists of six stages, namely: concept, design, material collection, assembly, testing, and distribution.
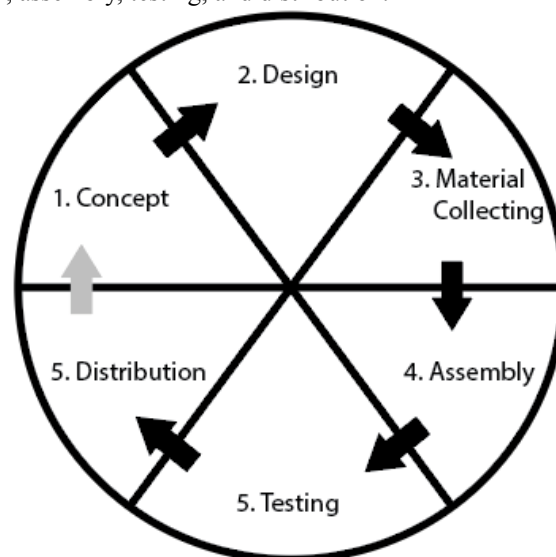
Fig. 3.   Luther-Sutopo Version of the MDLC Phases

Using the term "authoring" to define the development of multimedia software, Luther defines the stages of multimedia software development in 6 steps, where each step does not have to be sequential but can run in parallel with the planning stages (conception and design) that should be initiated first, as outlined by Luther in Binanto [13].

This method represents the development of a tool that can be used not only for creating and developing new products but also for validating the products produced. The development carried out in this research employs one of the methods, namely the Multimedia Development Life Cycle (MDLC)[14]. The following are the steps in the development activities of the MDLC model:

TABLE I.   STEPS IN DEVELOPING THE MDLC MODEL

Model Steps	Development Activities
Concept	The media goals and the type of multimedia application to be designed are clearly determined.
Design	Define the necessary steps in the multimedia project. Storyboards and flowcharts are created in this phase.
Material Collecting	In this phase, all available data files, audio, video, and images are collected. The information gathered in this stage is used in the production phase of developing the educational game, which defines all the scenes of the multimedia application.
Assembly	The entire project was created and programmed to develop the educational game application.
Testing	The application is run and tested during the testing phase to ensure that the multimedia development proceeds according to plan.

Here is the procedure for the research and development stages of the English educational game, adapted using the MDLC model [13]:
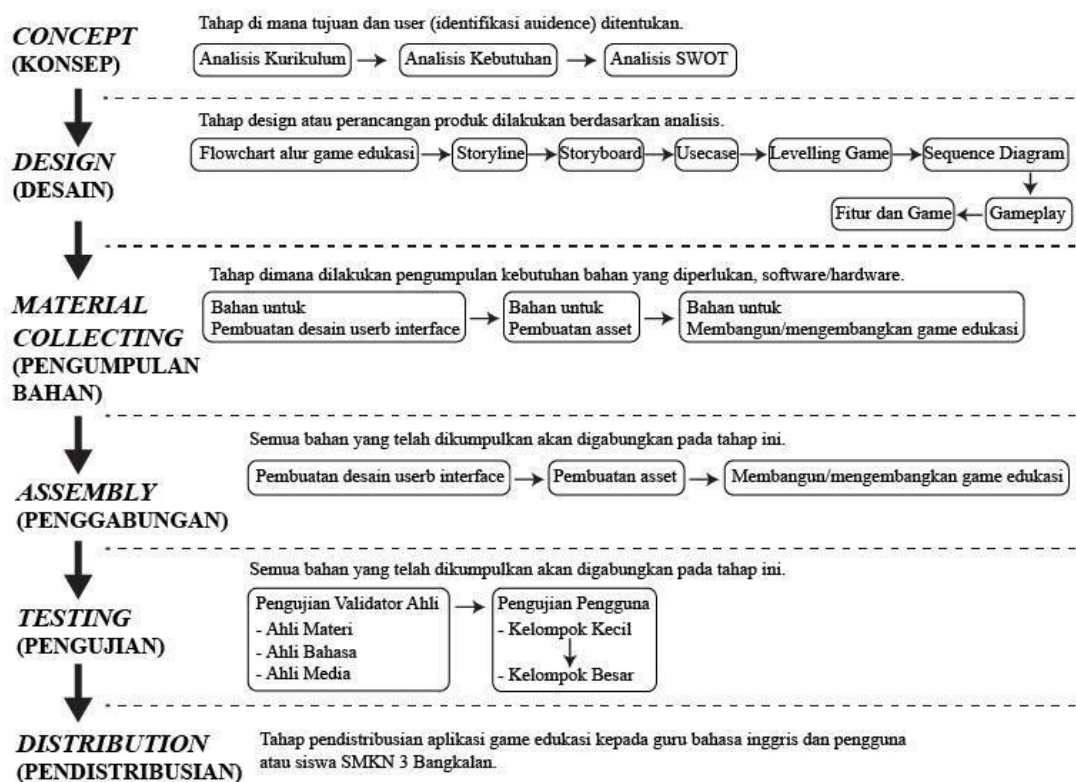
Fig. 4.   Research Procedure

1. Subjects of Testing

Experts and the target audience who evaluate the newly developed educational media are the subjects of testing in this research and development study. The subjects include subject matter experts, language experts, and instructional media experts, as well as test subjects who act as users and evaluate the developed educational media.

2. Data Collection Techniques

In this study, interviews, questionnaires, and documentation are used as data collection methods.

a. Interviews

Interviews are one of the evaluation tools where researchers pose questions to respondents and engage in discussions to gather the necessary data. To gain a better understanding of the potential and issues within the twelfth-grade classroom, this study involves interviews with English teachers and guidance counselors.

b. Questionnaires

Questionnaires are used to record and collect information or data by having students respond to a set of questions based on user requests. Program indicators related to program content, learning materials, appearance, and technical quality are measured using questionnaire methods.

c. Documentation

Documentation involves recording past events. This documentation includes visual evidence during the interview process, the students' engagement with or use of the educational game media, and the students' written responses during questionnaire completion.

3. Data Analysis Techniques

The data analysis employed in this research and development study includes both quantitative and qualitative data analysis techniques obtained after testing by one media expert, one subject matter expert, and one language expert. Qualitative data is derived from suggestions, feedback, and corrections provided by validation experts related to the quality of the educational game and its content. Subsequently, the product testing results are used to modify the product before conducting user trials (with students). The

validation of product testing is conducted using the Likert scale and Guttman scale concepts, as depicted in the table below [12]:

TABLE II.   LINKERT SCALE

No	Answear	Value
1	Excellent	5
2	Good	4
3	Average	3
4	Poor	2
5	Very Poor	1

TABLE III.   GUTTMAN SCALE

No	Answear	Value
1	Yes	1
2	No	0

After obtaining the results from the testing, the next step is to calculate the total scores for each aspect from all respondents, including media experts, subject matter experts, and users. The suitability of the media will be determined after obtaining the qualitative results by establishing a suitability range based on the total scores [15].

TABLE IV.   LINKERT SCALE RANGE

Score Range	Category
$\overline{x}i + 1.80$ SBi $<X$	Excellent
$\overline{x}i + 0.60$ SBi $<X \leq \overline{x}i + 1.80$ Sbi	Good
$\overline{x}i - 0.60$ SBi $<X \leq \overline{x}i + 0.60$ Sbi	Average
$\overline{x}i - 1.80$ SBi $<X \leq \overline{x}i - 0.60$ Sbi	Poor
$X \leq \overline{x}i - 1.80$ Sbi	Very Poor

Explanation:
X   = Total Score
$\overline{x}i$ = (1/2) x (Ideal Highest Score + Ideal Lowest Score)
SBi   = (1/3) x (1/2) x (Ideal Highest Score - Ideal Lowest Score)
Ideal Highest Score   = ∑ item criteria x highest score
Ideal Lowest Score   = ∑ item criteria x lowest score

The calculation of the Guttman scale, as taken from Trisanti [16], is used to determine the percentage of media criteria. Below is the formula for the Guttman scale:

$$K = \frac{F}{N \; x \; I \; x \; R} \; X \; 100\%$$

Explanation:
K = Media Feasibility
F = Number of Respondent Answers
N = Highest Score
I = Number of Items
R = Number of Respondents

Each indicator is then described and summarized by converting quantitative percentage data into qualitative data in accordance with the conversion reference in the table below [16]:

TABLE V.   VALUE CONVERSION

No	Percentage Interval	Value
1	0 – 20%	Very Poor
2	20% – 40%	Poor
3	41% – 60%	Average
4	61% – 80%	Good
5	81% – 100%	Excellent

III.   RESULTS AND DISCUSSION

The research and development have resulted in an English language educational game designed to enhance the listening skills of 12th-grade students. The application creation process involved multiple improvements and refinements to achieve a final product that is valid and suitable for student use. The MDLC (Multimedia Development Life Cycle) model comprises 6 development stages: concept, design, material collecting, assembly, testing, and distribution. Here's an explanation of each stage undertaken in the development of the educational game:

1. Concept
    This stage determines the target of the game and the type of multimedia application to be designed. It begins with curriculum analysis, needs analysis, and SWOT analysis.
2. Design
    The design of the educational game or product is based on the analysis conducted in the concept stage. The game is visualized using flowcharts, storyboards, use cases, and sequence diagrams.
3. Material collecting
    This stage involves gathering materials in preparation for the assembly phase. This includes software, game assets, videos, audio dubbing, sound effects, and more.
4. Assembly
    In this stage, the results of developing the educational game are elaborated upon after going through the material collection process. Below is a brief description of the English language educational game:
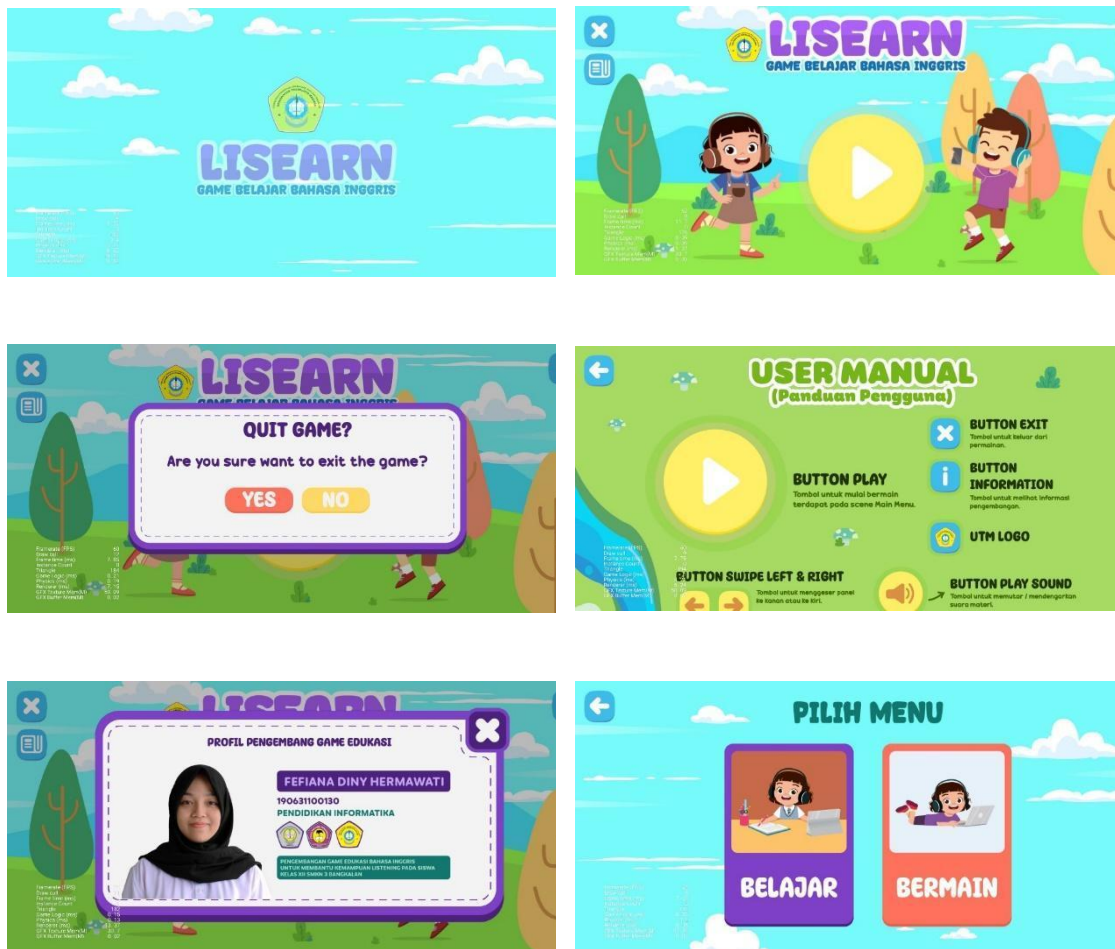
Fig. 5.   The Initial User Interface of the Educational Game
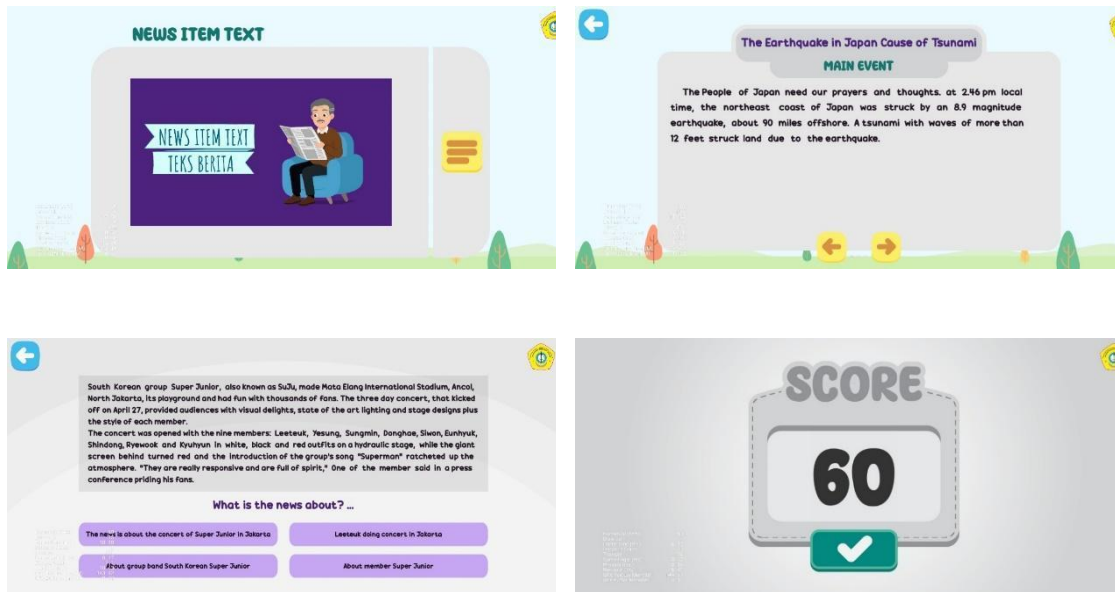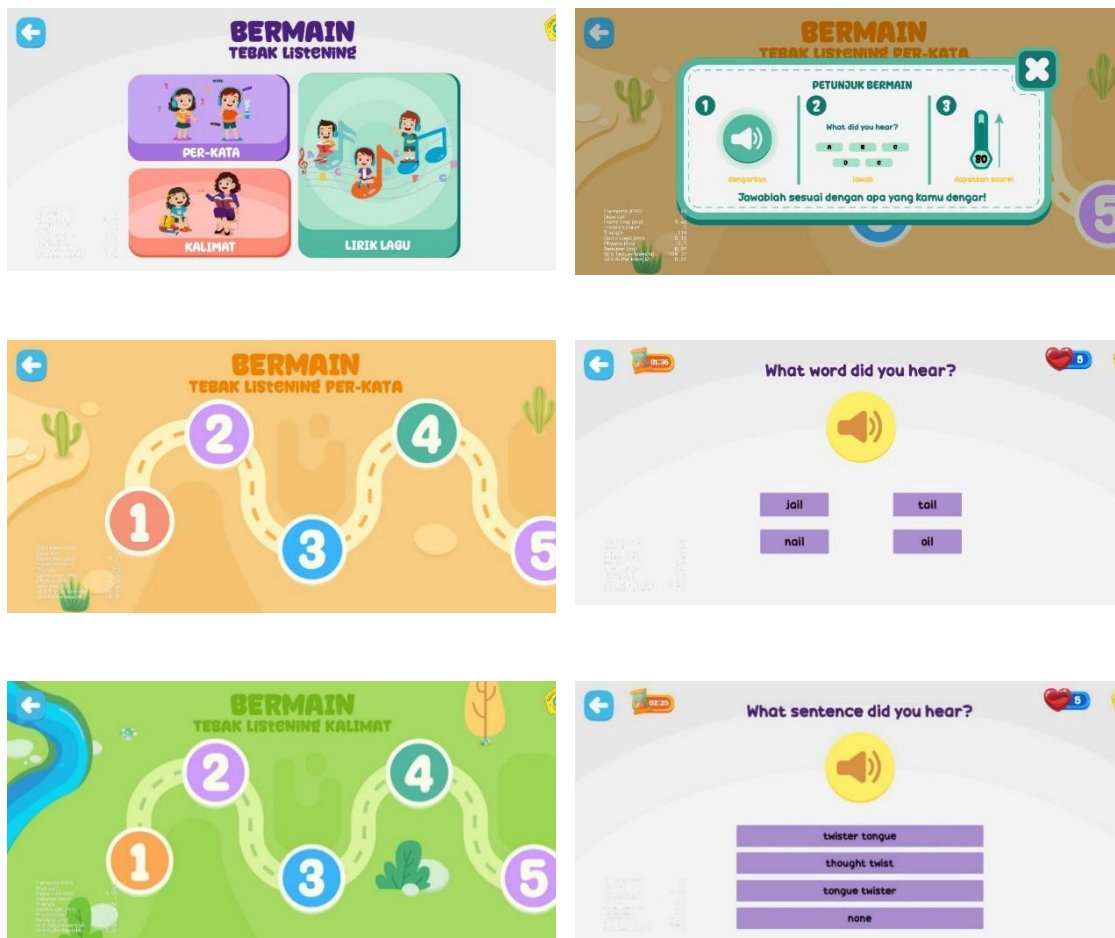
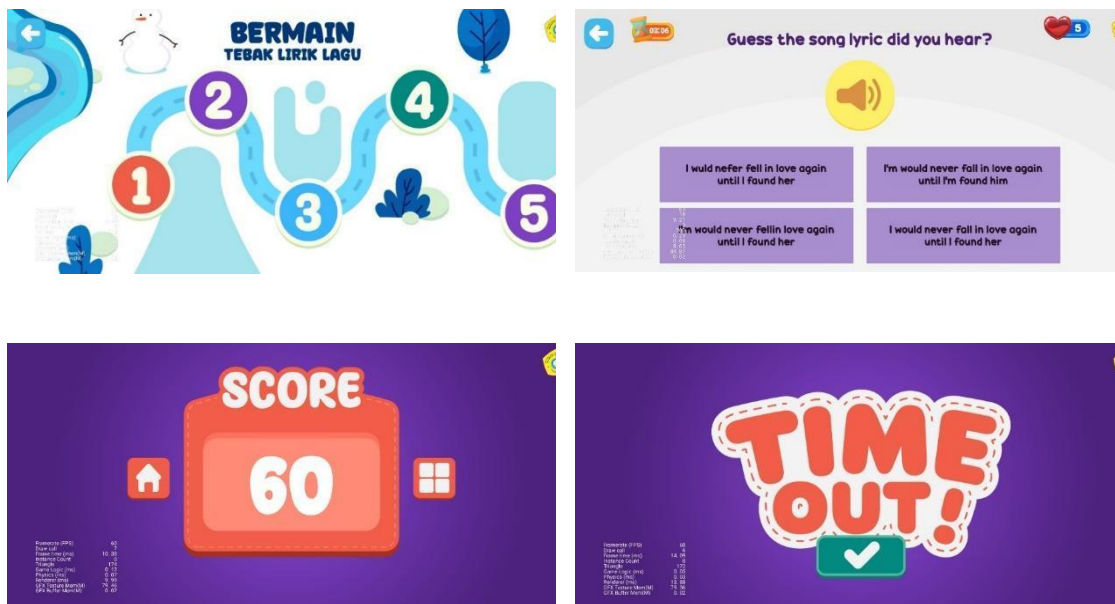Fig. 6.   Learning Menu

Fig. 7.   Game Menu

5. Testing
    Testing is the stage of assessing the feasibility of the educational game. It is conducted by several validators, including subject matter experts, language experts, and media experts, each with predefined qualifications.
a. Expert Content Validation
    The content is evaluated by subject matter experts who are English teachers. Here are the results of the content validation analysis for the game:
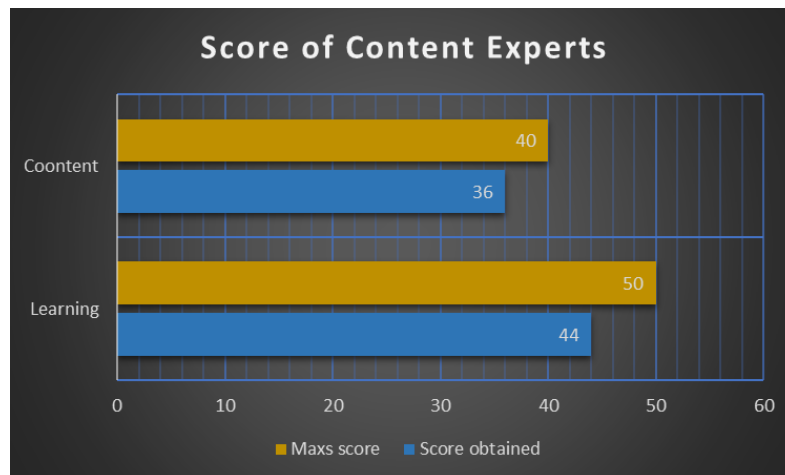

Fig. 8.   Expert Content Validation Analysis Diagram

The results indicate that the content test of the game yielded a total assessment score (X) of 80, which falls within the range of $75.6 < 80$. When calculated as a percentage, this score amounts to 88.88%. This score suggests that the game qualifies as a highly suitable product. This result strongly supports the effectiveness and quality of the content in the game that was tested.

b. Media Expert Evaluation

The media were evaluated by a media expert, a computer science educator with a background in IT and expertise in educational media and design. Here are the results of the media evaluation for the game:
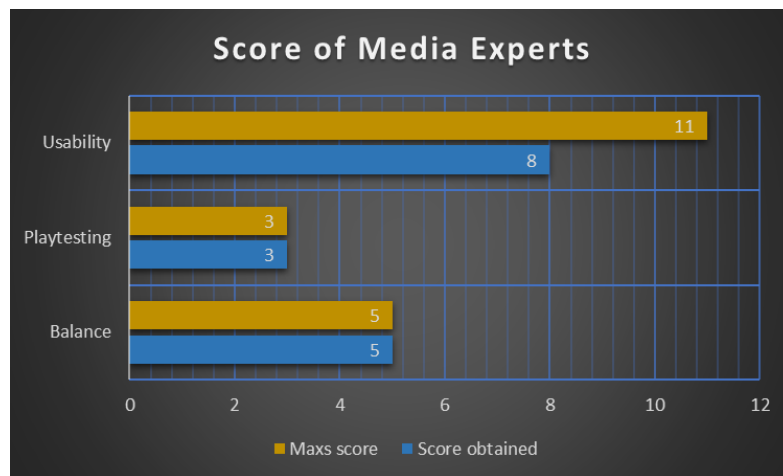

Fig. 9.   Expert Media Validation Analysis Diagram

Based on the scores obtained from the media expert, the Guttman scale is then calculated. The analysis shows that the media test of the game resulted in a percentage score of 84.21%. This score indicates that the game qualifies as a "very good" or "very suitable" product. Strong support for the effectiveness and quality of the game's media that was tested is obtained through these results.

c.   Language Expert Testing
The language content of the game was tested by a language expert who is a lecturer in the Indonesian Language and Literature Education Program, possessing knowledge and expertise in linguistics and language use. Here are the analysis results from the language testing of the game:
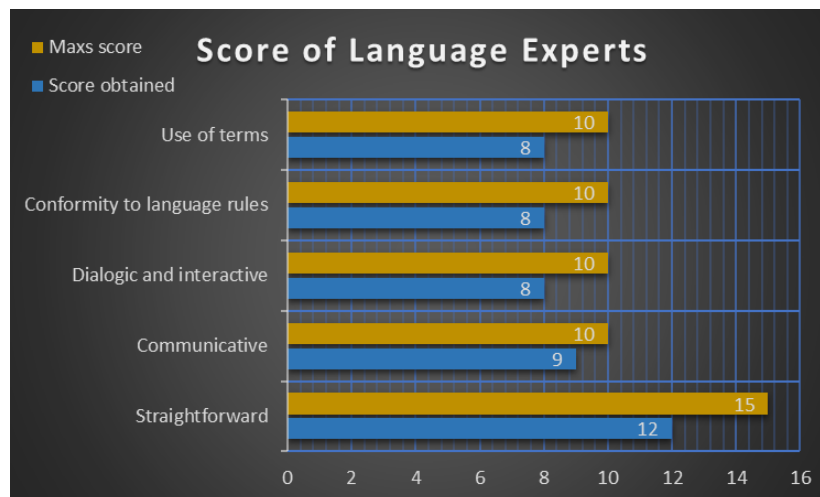

Fig. 10.   Expert Language Validation Analysis Diagram

As observed, the language test in the game yielded a total assessment score (X) of 45, which falls within the range of $37.38 < 45 \leq 46.14$. When calculated as a percentage, this score amounts to 81.82%. This score indicates that the game qualifies as a "passable" product. This result supports the effectiveness and quality of the language content in the game that was tested.

d.   Small Group User Testing

In the small group user testing, the research involved testing the English language educational game with 8 students from 12th grade at SMKN 3 Bangkalan. The following are the evaluation results obtained through questionnaires given to the students. The testing included three indicators: Balance Testing, Playtesting, and Usability Testing:
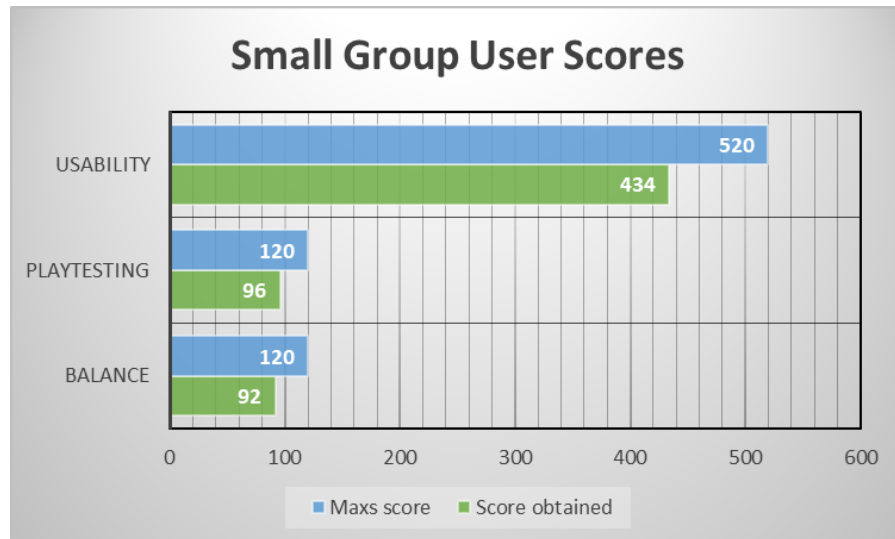

Fig. 11.   Small Group User Testing Analysis Diagram

The small group of users, after going through the testing process and analysis, achieved the following results: In the balance testing indicator, a percentage score of 76.6% was obtained, the playtesting indicator received a percentage score of 80%, and the usability testing indicator received a percentage score of 83.46%.

This educational English game excels in the usability indicator, which assesses ease of use, feedback, interface, and usability in learning. The percentage obtained, which is 83.46%, falls into the "suitable" category, indicating that users can easily use this educational game without experiencing difficulties or confusion. This is supported by the research of [17], which indicates that good usability greatly increases the likelihood of frequent visits by users because the application helps them achieve their goals. High usability makes the game appear more user-friendly [18]. This is also in line with Santoso's research[19], which suggests that good usability enables users to learn and use a product to achieve their goals. Similarly, Sukmasetya's research [20] states that a usable user interface allows users to concentrate more on the educational game.

Therefore, it can be concluded that the developed educational game is good and suitable for users to learn and achieve their goals more effectively. An easy-to-use interface also enhances concentration.

e. Large Group User Testing
In the large group user testing, the educational English game was tested with 20 students from class XII at SMKN 3 Bangkalan. The assessment results obtained through questionnaires provided to the students are based on three indicators: Balance Testing, Playtesting, and Usability Testing.
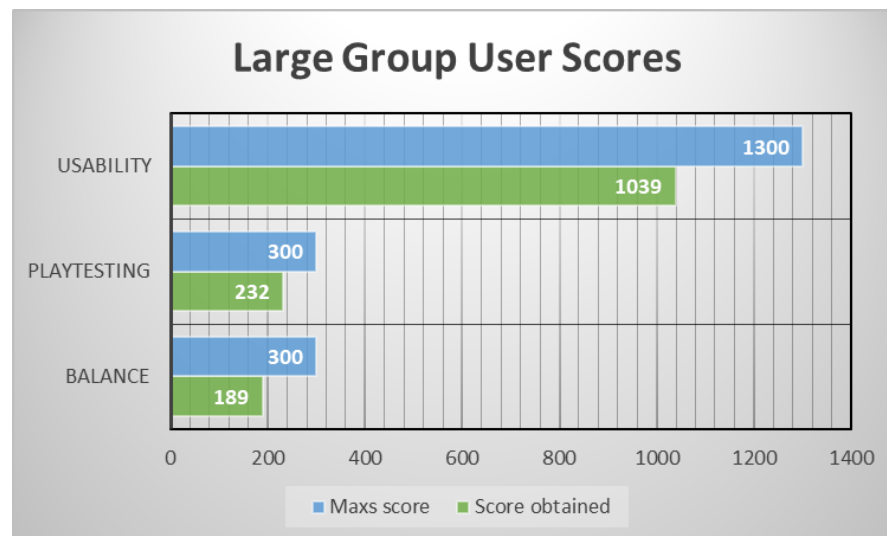
Fig. 12.   Large Group User Testing Analysis Diagram

After going through the testing process and analysis, the results are as follows: In the balance testing indicator, a percentage score of 63% was obtained; in the playtesting indicator, a percentage score of 77.33% was achieved; and in the usability testing indicator, a percentage score of 79.92% was achieved.

The usability indicator obtained the highest score, covering ease of use, feedback, interface, and usability in learning. The percentage of 79.92% falls into the "suitable" category, indicating that users find this educational game easy to use without experiencing difficulties or confusion. High usability makes the game appear more user-friendly [18], which is supported by Hartawan's research [17], which states that good usability has a significant likelihood of frequent visits by users because the application helps them achieve their goals. This is also in line with Santoso's research [19], suggesting that good usability allows users to learn and use a product to achieve their goals. Similarly, Sukmasetya's research [20] states that a usable user interface allows users to concentrate more on the educational game.

In conclusion, the educational game has been well developed, allowing users to learn and achieve their goals more effectively. Furthermore, an easy-to-use interface can enhance user concentration.

6. Distribution

In this stage, the distribution of the educational game to English teachers and students at SMKN 3 Bangkalan has been carried out as planned.

IV.   Conclusion

Instructional media development begins with a preliminary study to identify the issues that will be the focus of the research. Subsequently, the researcher develops an instructional media product using open-source game development software as a solution to the identified issues. This educational English language game focuses on listening skills and contains materials related to news item texts designed for 12th-grade students in vocational schools (SMK). The game can only be used on Android smartphones up to version 13 Tiramisu. Additionally, it is recommended for students to use earphones to enhance their listening experience while playing.

The educational game is designed with a focus on student needs, aligning with the curriculum and competency standards. It utilizes news item text topics to enhance students' listening skills interactively. The game has an attractive interface and is easily accessible on Android smartphones, providing flexibility in learning. This game effectively delivers content and maintains students' interest in learning English.

The educational English language game is deemed effective and suitable as an instructional medium after undergoing several tests with all test subjects. Experts and test results have indicated the suitability of this game for enhancing students' English listening skills. The trial with 12th-grade SMK students received positive feedback, demonstrating that this educational game is effective in enhancing listening skills. The inclusion of news item text materials helps enrich students' understanding.

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