



Development of Educational Game "Arabic Muslim Adventure" Based on Construct 2 Application to Improve Vocabulary Mastery

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Abstract

In the digital era, teachers must innovate to create interactive learning media that can increase student interest in learning. Learning that is only focused on textbooks is monotonous. This study aims to develop an educational game media, Arabic Muslim Adventure (AMA), on vocabulary learning, test the feasibility, and determine the student's response to the AMA game. This research method is Research and Development (RnD), which refers to the 4D model. The results stated that the feasibility of the AMA game included very feasible criteria with a percentage of media experts at 97.64%, material experts at 97.14%, and learner responses with 24 respondents at 89% with a very feasible category. It can be concluded that the educational game "Arabic Muslim Adventure" is feasible and gets a good response from users, which can be applied to vocabulary learning.

Keywords: Development, Educational Game, Vocabulary, Construct 2

INTRODUCTION

A person's first step to mastering a language starts with learning vocabulary (Siregar et al., 2023). Because learning a language is related to vocabulary (Azizah, 2020). The more a person masters the vocabulary, the easier it is for him to understand the content of the message, either orally or in writing. (Kasnun et al., 2019). Therefore, whoever wants to be proficient in languages, including Arabic, must master vocabulary.

Arabic language learning from elementary to senior high school always begins with vocabulary learning (Jihad & Suaeb, 2017). This indicates that vocabulary learning is important in language learning, including Arabic. In essence, vocabulary learning is not just ordering students to memorize it or enabling students to translate vocabulary forms and find their equivalents. Still, more than that, there are several indicators of achievement so that students can master vocabulary, including translating vocabulary well, pronouncing it, and using it in good and correct sentences (Miftah, 2023).

However, in reality, there are problems in vocabulary learning. Among them, teaching tended to be monotonous with the lecture method and centered on textbooks, without using varied media and techniques (Ni'mah, 2020). In addition, problems related to students' interest and motivation in memorizing vocabulary. According to (Karyani et al., 2019; Sholihah et al., 2023) memorizing vocabulary still needs to be improved for students. Mastering vocabulary also needs to improve in developing Arabic language material to the next level.

The case of students in grade VIII learning difficulties at MTSN 1 Tangerang on vocabulary in Arabic language subjects. From the results of interviews with Arabic teachers, there are at least several problems related to vocabulary, including (1) Vocabulary learning still uses conventional teaching media, namely textbooks and blackboards. Learning is only fixated on the textbook. Because the Arabic textbooks are not lettered, the teacher asks the students to write the bare vocabulary in their respective notebooks first. After finishing, the teacher writes the vocabulary on the blackboard along with the harakat. Then, the teacher pronounces the vocabulary repeatedly, followed by the students. (2) Some are sleepy, not enthusiastic during learning, and even fall asleep. Because the learning system is not accompanied by interactive quizzes or games that attract students' attention, (3) Not all of them come from students who can already speak basic Arabic or have graduated from MI, (4) The teacher does not give students special targets and obligations to memorize the new vocabulary. So that many of them forget and do not want to learn after the lesson.

Meanwhile, student interviews said that they often forget the vocabulary every time they move to the next material, and at every meeting, there is no review of the material. Students memorize only when there is an exam. Only some of them like Arabic lessons because learning Arabic is difficult and boring. Teachers have only used concrete teaching media for the use of media at MTSN 1 Tangerang. For the use of digital media, teachers have yet to apply it in learning. Teachers more often use textbooks and blackboards.

The success of learning will certainly be connected to the strategy of an educator (Mufidah & Rohima, 2020). The solution to overcome this problem, according to Nurrul Khasnah (Mufidah & Jannah, 2022), is to choose learning media that helps smooth the learning process, is fun, and arouses student learning motivation. The more interesting the learning media used, the higher the student's interest in learning (Ayu et al., 2022).

Based on the description above, there is a need for Arabic learning media that is interesting, interactive, and colorful as an innovation in learning so that it is exciting and varied. Among various digital media, we found an educational game designed using the Construct 2 application. The game was named "Arabic Muslim Adventure". This game is an adventure for muslim children in learning Arabic. This game tells the story of a child on an adventure looking for a way out to get to the finish point. However, before that, he had to pass several challenges, including playing Arabic language games related to vocabulary.

Hopefully, this research can contribute as an innovation and novelty in Arabic language learning so that students can easily master vocabulary. As said (Hestiyani, 2020), students at the Tsanawiyah and Aliyah levels like to learn new things, including learning languages by doing something or learning by doing. This is based on previous research on the application of Construct 2-based educational games in vocabulary learning; the results are as stated by (Amalia & Rahmawati, 2023) that the game application makes students less bored, enjoy, and more interested in finding out vocabulary that they do not know quickly.

THEORETICAL STUDIES

As technology advances, Arabic vocabulary learning has been innovated. This is evident from the research that examines technology-based Arabic learning media. Now, students can easily access learning materials anywhere. Learning media is expected to increase student motivation in learning, increase understanding, and present material more interestingly and interactively (Alfian, 2020).

In addition, digital games have become inseparable from the lives of teenagers today. Especially in adolescence, according to Erizal (Firmansyah & Fauziyah, 2023), the largest age group dominates online gaming due to their strong motivation to win the game. Games developed into educational games have the potential to provide interesting and sustainable learning experiences for students (Azizah & Batubara, 2021). That is because students tend to like interactive and fun games. Learning with media in animated images is easier to understand than reading repeatedly (Azizah & Irsyadi, 2020).

Learning does not always require games, but learning that is supported by using educational games appropriately can increase student interest and learning variety. Educational games are not for learning but to support the learning objectives (Rohmah, 2020).

The utilization of educational games can be an alternative to vocabulary learning. This is because children today prefer to play games rather than play with their peers (Syukron et al., 2022). Therefore, Arabic teachers can incorporate Arabic material into an educational game they can play anytime and anywhere. It is time for today's students to keep up with technological developments, and educators should utilize the available means to create interesting learning media.

One of the media that can be used in learning Arabic vocabulary is an educational game based on the Construct 2 application. Construct 2 application as an interactive game development software that is easy to use without having to have a special scientific background related to application programming that is so complex. Its user-friendly interface allows educators to design interactive digital applications as an innovation in learning (Putriani & Waryanto, 2017).

Arabic Muslim Adventure (AMA), an educational game based on the Construct 2 application, can be an alternative for students to learn Arabic vocabulary. The author created the name of this game, which means that the word Arabic indicates that this game is an Arabic game, and Muslim Adventure implies that this game has an adventure theme. The design of this game begins with conducting a needs analysis first to find out the material content that will be included in the game. In this educational game design, there is a storyboard to make it easier for the author to create the game's flow.

This AMA game is supported by audio, which, when clicked, will emit the sound of the vocabulary displayed, such as the word مدرس. If the user clicks the sound button, then this game will issue the pronunciation of the language and a meaning button if needed. In addition, this game contains five games as evaluation material for students after learning the material. The games have an adventure theme: puzzles, guess sounds, quizzes, adventure, and fill the text.

RESEARCH METHODS

The research and development method is used in this research. The product produced from this research is an educational game of Arabic vocabulary based on the Construct 2 application on the material of Profession (مهنة). The R&D model used by the author is 4D and was developed by Thiagarajan. The 4D stages consist of Define, Design, Development, and Disseminate (Mawardi et al., 2022).

The stages of the above procedure can be depicted in the following chart.

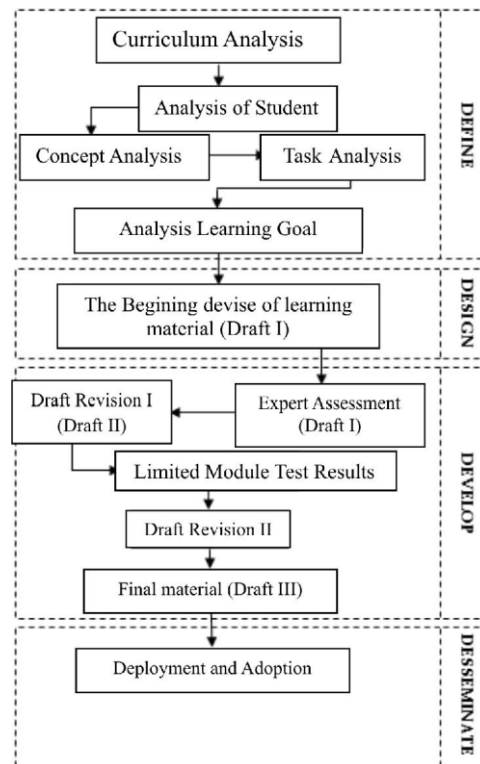


Figure 1. 4D Model Chart

Modification Model (Thiagarajan, 1974) by (Widiyanti & Kurniawan, 2021)

Define, in the form of a stage of reviewing or observing related subjects to be studied by analyzing needs. Design is the stage of designing or designing an educational game. Development is the stage of testing and improving the initial media design made by material expert validators and media experts. Disseminate the stage of disseminating or applying media in an institution (Peranti et al., 2019).

The instruments used in this research were, first, semi-structured interviews. Questions were asked using an interview guideline, but the researcher added some questions outside the guideline. The interview was aimed at related parties to explore sources of information about vocabulary learning at MTSN 1 Tangerang. The interviewees were Arabic teachers and students of class VIII.

Second, the questionnaire sheet. Questionnaires determine the feasibility of educational game media at the product testing stage and student responses after the product test. The questionnaire is divided into three, namely: (1) material questionnaire for material experts, (2) media questionnaire for media experts, (3) student questionnaire for student response to the application. The questionnaire

assessment uses a Likert scale with criteria, namely score 1 (Strongly Disagree), score 2 (Disagree), score 3 (Fair), score 4 (Agree), and score 5 (Strongly Agree).

The feasibility of the material is reviewed from four aspects, namely: (1) material presentation aspect, (2) material content aspect, (3) quality aspect, and (4) learning aspect. Meanwhile, media feasibility is reviewed from three aspects, namely: (1) software aspects, (2) display aspects, and (3) learning design aspects. (Setyadi, 2015; Dewi, 2020; Zulfikar, 2022; Linda & Syafriansyah, 2023).

The data analysis techniques used in this research are descriptive qualitative and descriptive quantitative techniques. Qualitative analysis was obtained from interview data from Arabic language teachers and students and used for the needs analysis stage in the design of educational game development. The interview data collected was then summarized and presented so that researchers know the overall data during the research process. Finally, the data is summarized so that it can be used as the basis for the development of educational games. The data concerns Arabic vocabulary learning at MTSN 1 Tangerang and its obstacles.

Quantitative data analysis is obtained from questionnaire data by media expert validation, material expert validation, and student response. The study results are used to determine the feasibility of the developed educational game. The stages, namely: (1) Convert the questionnaire value into a score. A Likert scale guides the score with a scale of 1-5. (2) The results of the scores for validation of material experts, media experts, and student responses will then be calculated using the following formula:

$$Percentage = \frac{\Sigma \text{Result of data collection score}}{\text{Criterion scores}} \times 100\%$$

(Saski & Tri, 2021)

(3) The percentage results obtained from the above formula are determined and analyzed using an assessment reference scale. The measurement results were compared with the pass limit criteria in Table 3 below.

Table 1. The Scale of Eligibility Criteria

Percentage	Criteria
0% - 20%	Not Feasible
21% - 40%	Less Feasible
41% - 60%	Decent Enough
61% - 80%	Feasible
81% - 100%	Very Feasible

(Source : Riduwan, 2012)

RESULTS AND DISCUSSION

The steps for developing educational games with the 4D model are as follows:

Define

a. Curriculum Analysis

The curriculum used at MTSN 1 Tangerang is the 2013 curriculum. The design of educational games refers to the 8th-grade MTS level package book published by the Ministry of Religion 2020. There are three themes contained in the even semester, including Chapter 4 (الرياضة), Chapter 5 (المهنة), and Chapter 6 (عيادة المرضى). The material chosen for this study is professional. The material contained in Chapter 5 will be used as reference material in the development of educational games. The preparation of the material is adjusted to the KI, KD, and achievement indicators as follows:

- 1) Core Competency (KI-4): Students can process, serve, and reason in the concrete domain (using, parsing, assembling, modifying, and making) and abstract domain (writing, reading, calculating, drawing, and composing) by what is learned at school and other similar sources in the point of view/theory.
- 2) Basic Competencies (KD 3.9): Understand the social functions, text structures, and linguistic elements (sounds, words, and meanings) of simple narrative texts related to the theme: المهنة involving speech acts of giving and asking for information.
- 3) Indicator:
 - a. Students can pronounce the vocabulary about المهنة
 - b. Students can memorize vocabulary about المهنة
 - c. Students can match vocabulary with pictures
 - d. Students can read and translate qiroah texts related to the material المهنة
 - e. Students can complete Arabic sentences about المهنة

According to Murtadho (2008), for MTS grade VIII, the number of vocabulary words that need to be mastered in each chapter is at least 25 vocabulary words. Then, referring to the Arabic language book published by the Ministry of Religion 2020, for the Profession Chapter, the total vocabulary is 20 vocabulary. Therefore, the design of vocabulary material in the Arabic Muslim Adventure educational game will be designed with 30 vocabulary words with a learning allocation of 3×40 minutes. Vocabulary material is accompanied by examples of its use in simple sentences and texts with the theme المهنة.

b. Needs Analysis

Based on the results of interviews with Arabic language teachers at MTSN 1 Tangerang, aspects related to learning implementation are known, including (1) The vocabulary learning strategy still uses the drill method (the teacher says the vocabulary, and the students are asked to repeat it). The use of less varied methods makes learning tend to be boring (Azam, 2023). (2) Students have difficulty reading the vocabulary contained in the Arabic textbook because it is unpunctuated. So, the teacher writes it on the board first, and then the students write it down. (3) Regarding students' learning motivation, some students sometimes fall asleep, chat, and eat in class. In this case, the teacher should provide the right stimulus to minimize this, such as using various learning methods through media (Fatmawati & Anjarsari, 2021). (4) Low student interest in mastering vocabulary because there is no specific obligation or target given by the teacher to master each chapter's vocabulary; the teacher frees students to memorize it themselves.

Interviews related to aspects of the use of learning media, including (1) Vocabulary learning media that teachers often use are still concrete media, such as

wall clocks for chapter (الساعة) and picture media. Meanwhile, in the current era, teachers who understand technology are needed for a generation closely related to the advancement of gadgets (Dipani, 2023). (2) Teachers more often use printed books for vocabulary learning. (3) Projector facilities in each class are not yet available, so teachers rarely use it as an alternative to digital learning because it is impractical and time-consuming to prepare. (4) Teachers have made innovations in the form of module books that contain a summary of material from package books and LKS. The arrangement is more systematic, between vocabulary and translation underneath, which makes it easier for teachers to learn, and students enjoy it more. (5) There is no development of learning media that utilizes technology. Learning still uses concrete media, which is monotonous and less interactive in involving students. This indicates that teachers must continue to innovate and explore technology as a tool in the learning process (Maulani et al., 2022; Saleh et al., 2022).

Therefore, interactive media is needed to attract students to master vocabulary, one of which is an educational game based on the Construct 2 application. This game media presents Arabic vocabulary material with an attractive and interactive display that can be learned and played by students at any time so that it can overcome boredom during learning (Purwaningtyas et al., 2023). The content of vocabulary material in the game is arranged systematically, consisting of pictures, pronunciation, vocabulary, and translation.

c. Learner Analysis

Based on the results of interviews with students related to learning aspects, it is known that (1) Few students have a high interest in learning Arabic. The reason is that learning Arabic seems difficult and boring. (2) It is difficult to read vocabulary that has no harakat. In addition, from their statements, many vocabulary words are forgotten when moving to the next chapter because there is no desire to repeat what they have learned. They want to memorize only when there is an exam. This kind of learning pattern is due to the low motivation of students to master vocabulary. Conversely, students with high learning motivation show good learning habits through a desire to explore the subject matter (Sariati et al., 2020). (3) The vocabulary learning method the teacher practices is still the lecture method with repetition. This makes learning monotonous (Auliannisa et al., 2023). (4) The learning media used is picture media, where the teacher assigns students to find pictures that match the vocabulary and then attach them to the cardboard. Their response was happy when learning vocabulary with pictures. The intermediary of pictures makes vocabulary easier to remember (Primaningtyas, 2018).

From the results of these interviews, using this educational game can be an alternative for students to understand learning materials. This is due to students' interest in media that displays text, images, sound, and animation (Hanifah et al., 2024). The average age of students in class VIII MTs is around 14-15 years old, and at that age, their motor skills have developed, and they can use digital learning media. In addition, the development of increasingly advanced technology can be utilized to create Android-based learning media that can be played anytime without bringing printed books. Because, in this day and age, almost all teenagers already have gadgets. Students' motives for owning gadgets are due to their need for available applications, one of which is to support their learning activities (Purwantiwi et al., 2023).

Design

At this stage, researchers will design educational games that are developed according to curriculum analysis, needs analysis, and students.

a. Selection of Educational Games

From the results of the interviews that have been conducted, there is a need for interactive learning media; one example is the creation of educational games for vocabulary learning. As the name implies, this game has an adventure theme. The adventure theme is taken because, based on research (Suryanto, 2015), the most popular game category is adventure-themed games. This is because adventure games contain games of wits, tactics, and interesting graphic elements.


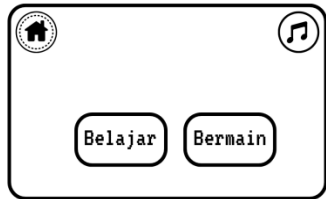
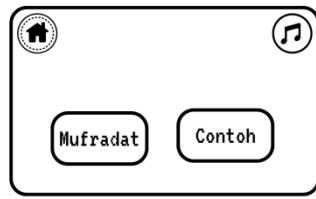
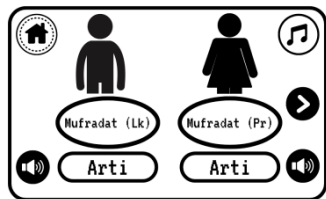
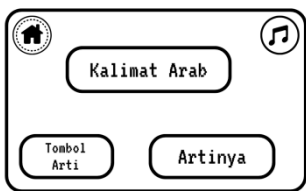
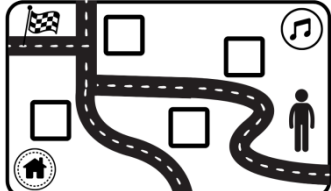
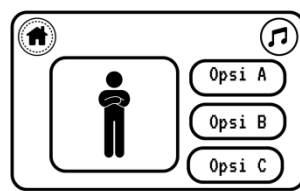
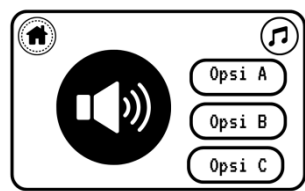
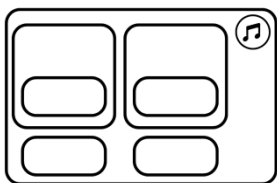
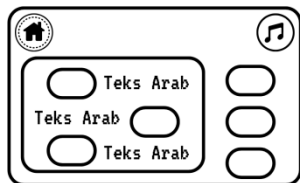
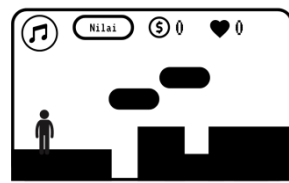

b. Developing a Storyline

The storyline will describe the overall storyline contained in the game (Ricardo et al., 2022). This game is an adventure-themed game designed to learn vocabulary. The title of this game is "Arabic Muslim Adventure". The character in this game is a child who must complete his mission to find a way out. But before that, the child must complete five-game challenges containing several questions related to vocabulary material. Each correct answer will receive a score. The player must also read every clue that appears at the beginning of the game.

c. Developing a Storyboard

A storyboard is a visualization of the game that will be created as an initial description of the application design (Kautsar & Sanjaya, 2021). Researchers assemble the storyboard as an overview of the game flow to be created, as in Table 2.

Table 2. Arabic Muslim Adventure Game Storyboard

			
Home Page	Menu Page	Learning Menu	Mufradat material
			
Sentence Material	Game Map	Quiz Game	Voice Guessing Game
			
Puzzle Game	Fill The Text Game	Adventure Games	Play Instructions

d. Designing Educational Games

After compiling the storyboard as a sketch of the initial design, the next step is to design the educational game. Designing is an important part of making educational games because the interface is the first thing the player sees when the game is run (Romadhon & Diartono, 2019). The application initially appears on a main menu page consisting of four button features, namely the sound on/off button, profile button, info button, and play button. There are two menu options: the play menu and the learning menu. In the learning menu, there are two choices of material that can be learned, namely vocabulary material related to the theme مهنة (profession) and examples of its use in simple sentences. The mufradat menu contains 30 vocabulary words on the theme of Profession. The material comes with illustrations & translations. Players can click the green sound button and listen to it repeatedly to learn how to pronounce the vocabulary. Then, use the back and next buttons to switch language. The game menu is designed like a map. This game menu is a form of evaluation of the extent of student understanding of the material that has been learned. It consists of five games: puzzle, adventure, guess the sound, quiz, and fill the text.

Development

The development of vocabulary educational games in this study is as follows: First, the validation test by two experts to determine the feasibility of the vocabulary educational game learning media developed. The feasibility of material content from 1 material expert (PBA UPI lecturer) and media feasibility from 1 media expert (web app developer).

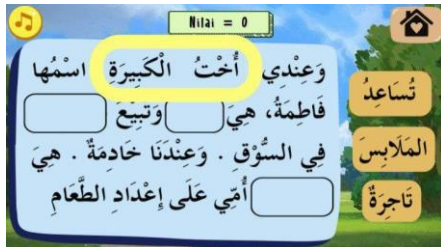
Material experts provide input from the aspect of material presentation, namely: (1) There are no learning indicators, (2) Vocabulary material needs to be differentiated according to gender and image, as well as a separate translation if needed, (3) Need to add instructions for using the game and a clear introduction page, (4) Need to be added to vocabulary material, (5) Correct Arabic sentences that are wrong or less precise, such as changing التَّاجِرُ يَبِيعُ الحَضْرَوَاتِ فِي السُّوقِ to أُخْتُ كَبِيرَةٌ and أُخْتُ كَبِيرَةٌ becomes أُخْتُ كَبِيرَةٌ (6) Replacement of *qawā'id* material with Arabic example sentences. The results of the revision are as follows:

Table 3. Material Expert Revision

Before Revision	After Revision	Description
		Addition of learning indicators, KI & KD.
		Addition of gender-appropriate vocabulary & separate translation.



Addition of play instructions



Correcting incorrect Arabic sentences.



Addition of preliminary layout



Replacing the *qawā'id* material menu with example sentences



Media experts provide input from the aspect of media presentation, namely: (1) The loading page is too long, (2) The application icon is better to have its characteristics, (3) Button settings that direct players to the initial menu, (4) The background quiz game needs to be changed to make it more contrasting with the questions, (5) It can support all types of android, (6) Need to add instructions for using the game. The results of the revision are as follows.

Table 4. Media Expert Revision

Before Revision	After Revision	Description
		App Icon Change



Quiz game
background
replacement



Adding commands to
the adventure game

The validation results by material experts are presented as a diagram, as in Figure 2 below.

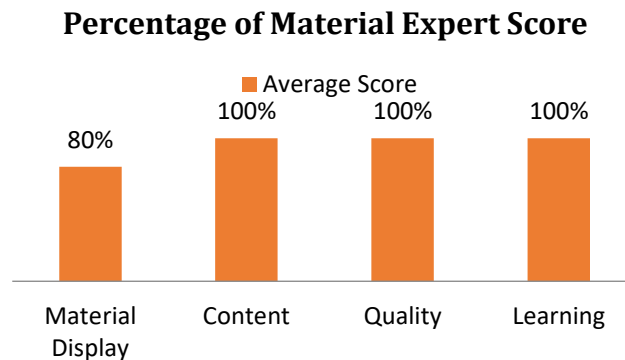


Figure 2. Percentage Diagram of Material Expert Score

The Figure 2 above shows that the material content in the Arabic Muslim Adventure educational game is included in the very feasible criteria. Next, the score of all aspects contained in the material expert questionnaire obtained a total answer of 68 points out of 70 total points that can be obtained. Furthermore, the calculation was carried out, and the following results were obtained:

$$P = \frac{\sum \text{Result of data collection score}}{\text{Criterion scores}} \times 100\%$$

$$= \frac{68}{70} \times 100\% = 97.14\%$$

The percentage results show that educational games, from the material aspect, are very suitable for use.

Then, the results of validation by media experts are presented in a diagram, as shown in Figure 3 below.

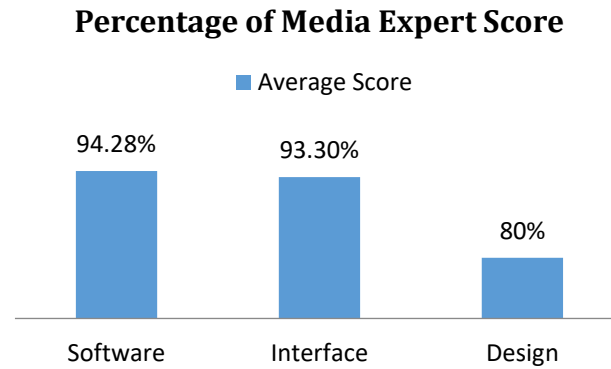


Figure 3. Media Expert Score Percentage Diagram

The Figure 3 above shows that the feasibility of media in the Arabic Muslim Adventure educational game is included in the very feasible criteria. Next, the score of all aspects of the media expert questionnaire obtained a total answer of 83 points out of 85 total points. Furthermore, the calculation is carried out as follows:

$$P = \frac{\sum \text{Result of data collection score}}{\text{Criterion scores}} \times 100\%$$

$$= \frac{83}{85} \times 100\% = 97.64\%$$

The percentage results show that educational games, from the aspect of media preparation, are very feasible.

Dissemination

After this educational game was validated and revised, it was distributed to class VIII students at MTSN 1 Tangerang. The distribution of this educational game aims to determine student responses to the vocabulary learning media developed. Students were asked to download the application on their respective cell phones. After testing 24 students, students were asked to complete a response questionnaire, as shown in Table 5 below.

Table 5. Student Response Questionnaire Results

No.	Indicator	Percentage	Feasibility
1.	The AMA app looks very attractive	93%	Very Feasible
2.	The colors on the AMA app are attractive and exciting.	92%	Very Feasible
3.	The AMA app interface is easy to understand and easy to play.	93%	Very Feasible
4.	With the AMA app, learning vocabulary becomes easier and more fun.	93%	Very Feasible
5.	The AMA app has made me more interested in learning vocabulary.	83%	Very Feasible
6.	With the AMA app, my vocabulary has increased and is easier to remember.	88%	Very Feasible

7.	AMA application is useful as an innovation in learning mufradat.	90%	Very Feasible
8.	The icons and buttons in the AMA app are easy to understand.	88%	Very Feasible
9.	This AMA app is fun to play in your spare time.	85%	Very Feasible
10.	The AMA app is easy to operate.	88%	Very Feasible
	Average Percentage	89%	Very Feasible

(Modified : Rafiqin & Saputra, 2017)

The results obtained from the overall average student response questionnaire received a score of 89%, categorized as "Very Feasible." This shows that the AMA game gets a good response from students. This means that it can be an innovation in vocabulary learning. This is because the game display is interactive, interesting, and easy to run on all types of android.

CONCLUSIONS

Educational game media is needed in vocabulary learning to increase students' motivation and interest. The developed application has met the eligibility standards based on the validation test. The results of material expert validation obtained a percentage of 97.14%, while the results of media expert validation amounted to 97.64%. This is supported by student responses, which totaled 89%. This shows that the game developed is valid and feasible to use as a vocabulary learning media. The development of Arabic vocabulary educational games is inseparable from development suggestions. Suggestions for further development are that it can be accessed on IOS and Play Store to make it easier for all people to download the game.

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