DEVELOPING MULTIMEDIA APPLICATION OF ARABIC INTERACTIVE LEARNING IN GRADE VII AT MTS. WAHDAH ISLAMIYAH GORONTALO

Putri Sarnianty Achmad[1], Iskandar Ikbal[2]

1,2 Informatics Engineering – Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung
E-mail: nsania2@gmail.com[1], iskandar.ikbal@email.unikom.ac.id[2]

ABSTRACT

The Arabic language is one of the subjects that need to be passed by the students at Madrasah Tsanawiyah Wahdah Islamiyah junior high school located in the regency of Bone Bolango, Gorontalo. Based on the questionnaire from 33% respondents of 54 students total populations shows that 89% of the student find it difficult to express words in the Arabic sentences. It also reveals that the learning of Arabic is emphasized mostly on writing and memorizing. The aim of developing a multimedia application for Arabic interactive learning is to assist students in improving their vocabulary mastery through the practice of expressing ideas in a simple sentence. In addition, the application system may trigger the improvement of students' learning interest through the interactive multimedia technology that is built by making use of the Augmented Reality. The development of this multimedia application utilizes the method of Multimedia Development Life Cycle (MDLC) based on Luther-Sutopo that consists of concept development, design, material collection, assembly, testing, and distribution. The learning method uses Computer Assisted Instruction (CAI) through tutorial, simulation, drill and practice models. The application system has also been prepared for teachers to be able to update learning materials and exercises in which students can do the quiz. The system is tested by using Black Box and User Acceptance Test. The test result shows that the system is able to provide the Arabic learning need for students with the percentage of 83% out of 100% expected outcome. This means that the user acceptability is in the 'strongly agree' category. Thus, it can be concluded that the multimedia system is able to fulfill the Arabic learning need.

Keywords: Multimedia, Interactive learning, vocabulary, Augmented Reality, Arabic.

INTRODUCTION

Arabic Language Learning is a core subject that must be studied by a religious education institution at the level of junior high school which is known as the Madrasah Tsanawiyah Wahdah Islamiyah located in Bone Bolango District, Gorontalo. Arabic is the key to the development and study of Islamic sciences, such as Al-Qur'an interpretation, Al-Hadith; and Fiqh Science, and so on.

Speaking of learning Arabic, vocabulary mastery and grammar can support the ability to express ideas in sentences in communication. This is in accordance with what has been stated by Gharawi and Bidin (2016) that vocabulary is an essential component in language learning [1]. In another context, Firmansyah (2015) argues that in learning Arabic, enriching Arabic vocabulary is important to support Arabic language skills [2]. Therefore, in learning Arabic, ideally, it is necessary to get the assistance of electronic media known as CAI (Computer Assisted Instruction) and CBL (Computer Based Learning) so that learning becomes more interesting and students could easily understand the subject matter and master it. So, the media needs to be accompanied by text, images, audio - animated videos. This is reinforced by the research of Mubarak and Sudarmana (2016), that multimedia learning Arabic will help students understand the material and help the teacher in delivering the material [3]. Santos (2016) in his study confirmed that applications with AR media could reduce the delay in acceptance of cognition (cognitive load) so that AR can generate maximum attention and satisfaction in learning. [4]

The pre-survey results of this study showed that students of grade VII Mts. Wahdah Islamiyah has a relatively low absorptive capacity, especially the mastery of Arabic vocabulary which is not adequate as expected in the curriculum target; including interest and motivation to learn. This was triggered by the absence of interactive learning media. It has also been identified that the difficulties faced by students are expressing ideas in a sentence and conversation. This is supported by empirical data, that there are 78% of respondents difficult to understand the Arabic context. On the other hand, information was also revealed that 89% of students tended to experience

difficulties in expressing words in Arabic sentences. In addressing this problem, this study builds an innovative design of an interactive learning system of the Arabic language. This effort is a problem solving faced by students that is to improve vocabulary mastery and students' interest in learning Arabic through the touch of interactive multimedia technology with the help of computers equipped with Augmented Reality (AR) as a medium to generate interest and motivation to learn while overcoming learning saturation. It is believed that with the increasing interest and motivation of student learning, this can encourage Arabic vocabulary mastery and stimulate curiosity and potentially trigger the formation of students' self-awareness in learning Arabic, which in turn can form initiatives of student self-study.

Thus, this study aims to design an interactive learning multimedia system entitled DEVELOPING MULTIMEDIA APPLICATION OF ARABIC INTERACTIVE LEARNING IN GRADE VII (A Case Study at Islamic Junior High School of Madrasah Tsanawiyah Wahdah Islamiyah Gorontalo)

1. CONTENT OF STUDY

2.1 Literature review

A. Multimedia

Vaughan (2013) defines that multimedia is a digital combination that is manipulated by several elements such as text, photos, graphic art, audio, animation and video [5]. In line with what has been stated by Dewi, Isnanto and Martono (2015) which states that multimedia is a combination of several elements: images, art, text, sound, animation, and video delivered through computers that are digitally manipulated and can be controlled interactively [6]. Multimedia components are shown in Figure 1 below

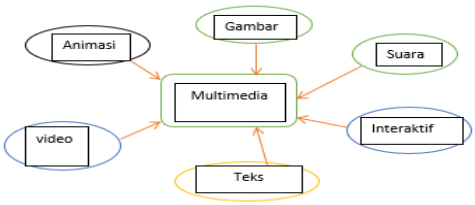


Figure 1. Interactive Multimedia

The figure can be described as in the following:

(a) Image *(Gambar)*

Images are an important element in multimedia development. Images can summarize and present complex and interesting data. The image consists of two types, namely bitmap and vector [5].

(b) Audio *(suara)*

Voice is usually in the form of music, sound from recorded voice and other sound effects that can be combined with images, making it more attractive and giving a deep impression that is used in multimedia such as MP3

(c) Interactive

(d) Interactive is the role of media that can deliver a good connection designed via the internet or LAN (Local Area Network) or a design that makes participants interact with learning practice tasks; this is usually set up in computer-based instruction(CBI).

(e) Text

Text is the earliest and simplest element in multimedia, usually referring to words, sentences, discourse or everything that is written and displayed.

(f) Video

Videos are part of sequential images called frames per second (FPS). The images are projected on a screen or screen which is added with text and animation objects.

(g) Animation

Animation aims to make the image look moving or alive [5]. Therefore, animation consists of several components of images arranged sequentially and alternately. Animation looks more interesting and communicative in conveying a goal.

B. Learning media

Computer-Assisted Instruction (CAI) is a computer-assisted learning method. CAI also works to help teachers in the learning processes such as multimedia, presentation tools, and props in learning [7]. The model of CAI learning method is the tutorial model, simulation model, drill and practice model and games

2.2 Research methodology

This research uses applied descriptive methodology and development (Masyhuri and Zainuddin, 2011: 53) [8]; namely, research describing multimedia development with the use of the Multimedia Development Life Cycle (MDLC) technique and its application in learning Arabic. Thus the steps of this research can be described in Figure 2.

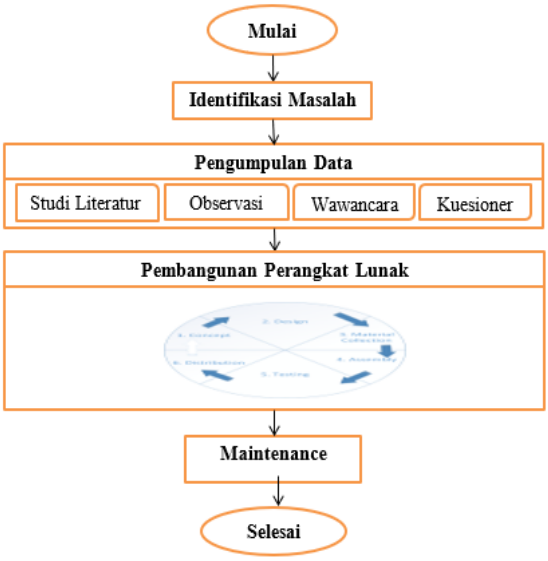


Figure 2. Research methodology flow

1) Problem identification

This research is based on an initial survey conducted by researchers through focus discussions with Arabic language teachers and the MTs principal of Wahdah Islamiyah Gorontalo, where it was informed that students' vocabulary mastery ability was influenced by diverse student input factors (some input from schools that did not teach Arabic before) so that some students had very limited vocabulary mastery.

2) The technique of data collection

After identifying the problem, a further study is carried out through several the data collection techniques.

1. Literature study
   Data collection was done by collecting textbooks or literature, journals, and other reading material, and utilizing internet media related to the topic of this study.
2. Observations
   The observation method is that the researcher directly observes the learning process in the classroom, the learning material, and textbooks used, including the curriculum and syllabus of the lesson to obtain information about school facilities and infrastructure.
3. Interviews
   This interview technique was carried out in order to gather information about learning conditions, both related to the problems at hand, such as data that has been obtained, including limited learning interest, limited level of vocabulary mastery, limitations in expressing ideas and thoughts in sentences, as well as relating to processes learning that is being carried out.
4. Questionnaires
   This method was carried out to determine the needs of students and teachers in interactive multimedia applications in addition to testing the system whether the system helps teachers in enhancing conducive learning interactions, which in turn triggers an increase in students' interest in learning Arabic, and vocabulary mastery and the ability to make sentences supported by the utilization of Augmented Reality.

3) Software Development Method

The method used in constructing the Arabic interactive multimedia application employed the Luther Sutopo version of Multimedia Development Life Cycle (MDLC) which consists of six stages.

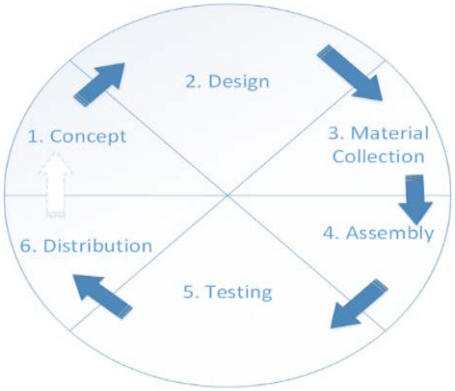


Figure 3. *Multimedia Development Life Cycle* (Binanto,2010)

The six stages are described as in the following:

1. **Concept**
   In the concept stage, the efforts are carried out starting the analysis, formulating ideas into program objectives and determining program user audience.
2. **Design**
   This stage is to develop or design based on the concept in the previous stage which includes the specification of program architecture, style, display of material requirements for the program.
3. **Material Collection**
   Material collection is the stage of collecting materials needed in the construction of the program. The material is in the form of 2D images, 3D objects, animation, video, audio, and others.
4. **Assembly**
   This stage is carried out to combine all objects or multimedia materials at the stage of collection material based on the design stage, such as storyboards, flow charts and or navigation structures [9].
5. **Testing**
   The testing phase aims to analyze errors or improve the system. The first stage in testing is called the Black Box testing phase, which is a test carried out on the system by the developer. After successfully going through black box testing, it then proceeds with testing

the user acceptance test which involves the end user (application user test) application built.

6. **Distribution**
   At this stage, the application is stored in a storage medium (Binanto, 2010) [9]. Distribution is the stage where the application is ready to be distributed.

2.3 Results and discussions

A. System analysis

System Analysis is the first stage in building or developing a system that will significantly affect the success of the next stage [10].

The stages of system analysis development consist of the following stages:

a. Problem analysis
b. Previous studies analysis
c. On-going system analysis
d. Proposes system analysis
e. Material needs analysis
f. Coding analysis
g. Non-functional needs analysis
h. Functional needs analysis

B. On-going system analysis

The system that is currently running at MTs. Wahdah Islamiyah Gorontalo has not used an interactive multimedia system. The learning process is carried out manually, namely writing on the blackboard, conveying it orally, and demonstrating directly by the teacher to provide examples of vocabulary use and conversation models. The process of learning steps implemented is as follows:

1) Teacher delivers the learning materials with topics that will be learned.
2) Teacher writes down the topics on the board and then explains the aims and expected outcomes as well as the design and mechanism to be done.
3) The teacher then explains the concepts and learning materials

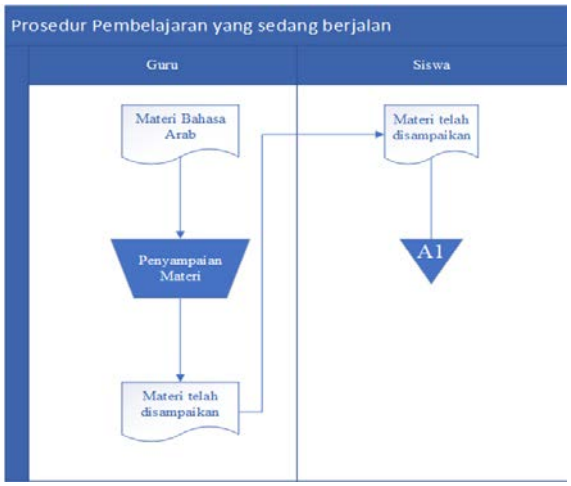


Figure 4. Learning material delivery procedures

Remarks :
A1 : Delivered learning material.

The flow of practice delivery is as follows.

1) The teacher prepares Arabic language practices, such as writing, reading, listening and speaking practices
2) While students work on the practices given, the teacher monitors, guides, and directs students to work on Arabic-based practices
3) The teacher examines the results of student training and provides feedback to improve learning outcomes.

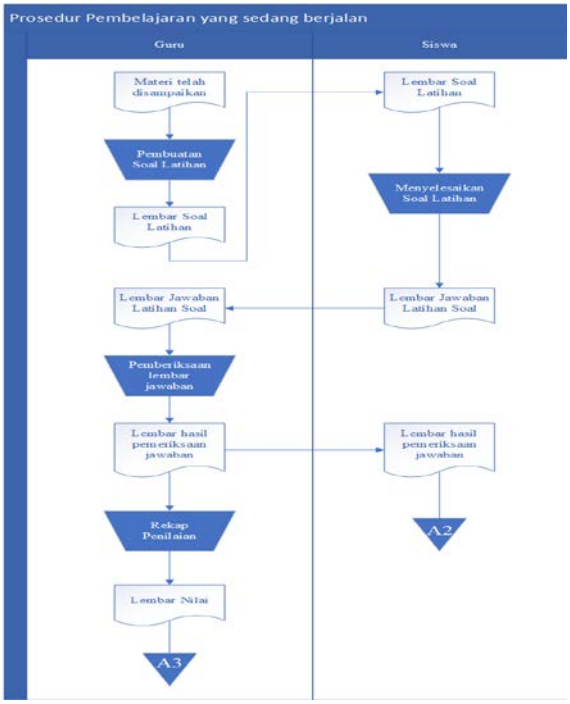


Figure 5. Practice delivery procedures

Remarks :
A2 : Checklist for answers archive
A3 : Scoring sheet archive.

C. Proposed system analysis

Components built into this system are based on the Arabic Language Grade VII 2013 curriculum package by the Ministry of Religious Affairs. The steps for learning computer assistance (Computer Assisted Instruction, CAI) consist of Tutorial, Simulation, Drill, and Practice

1) Tutorial

The tutorial model in Arabic interactive multimedia application is used for the delivery of materials in Arabic in grade VII. The flow of the material is as follows:

1. The teacher will deliver the material through the system to be built, by selecting the material to be delivered
2. The system will then display material in the form of text, audio and also animated / video images

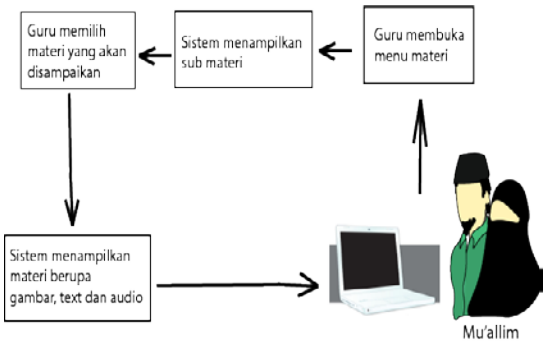


Figure 6 Material delivery by the teacher

2) Simulation

The simulation model in this system is used to give users an idea of how to quickly understand the material they are learning. In this practice, it is hoped that students will be able to understand the position of a word and easy to memorize vocabulary in Arabic and also create good cooperation between students

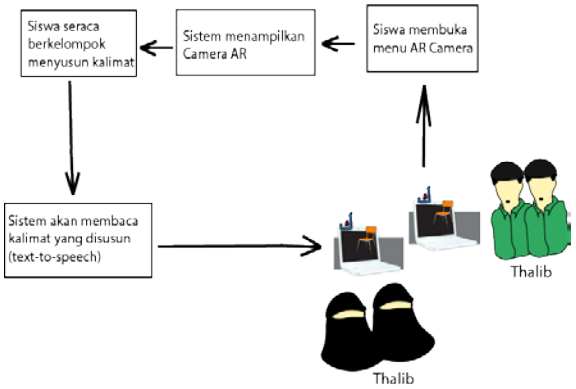


Figure 7. Practice with Augmented Reality flow

3) Drill and Practice

This model is used to train and test students' abilities in understanding material that has been delivered by giving practice questions.

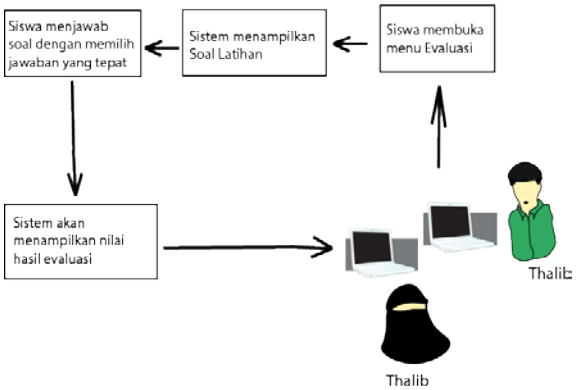


Figure 8. Evaluation drill flow

D. Systems architecture

The systems architecture is used to describe the workflow of the system in the development of interactive multimedia applications in Arabic which

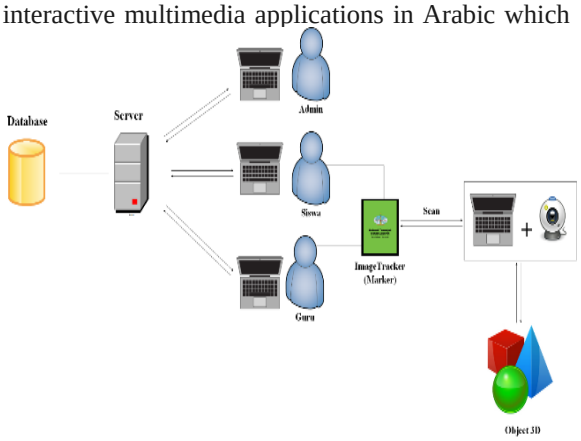


Figure 9. Systems architecture

Explanation of the system architecture can be explained as follows:

a) All users are required to login first. Then the login data will be validated by the database. If the data is valid, the user will go to the main menu
b) To add users to the system can be done by the user with the help of the admin. User data added will be saved in the database.
c) Data from the menu of material that will be used by the teacher and student users is taken from the database. The material on this system can be updated by the admin user; the updated material will be stored in the database.
d) On the 'let's practice' menu, only students can manage it, which results in the score of the exercise being saved in the database.
e) Exercises can be added by the teacher's user in which the added data will be saved to the database.
f) Augmented reality in this system is only found on student and teacher users. The augmented reality as a simulation exercise composes simple sentences.
g) Augmented reality uses the marker tracking method, where the markers that have been provided are directed to a laptop equipped with a webcam.
h) The tracking object will be checked in the vuforia database. If the marker is registered in a database that has been stored in the Vuforia database, the system will display 3D objects.

E. Non-functional needs analysis

Non-functional needs analysis is the analysis needed to determine the system requirements specification to be built.

1) User analysis

As for the analysis of users who will run this interactive Arabic multimedia can be seen in Table 1 below.

Table 1. User analysis

User	Education	Responsibility	Ability
Teacher	S1	Giving material, practice, and evaluation	Able to master the basic computer base
Student	SMP/ MTs	Listening to the material, interact with the system, practice.	Able to master the basic computer base
Admin	S1	Updating materials and adding users	Able to master the basic computer base

F. Functional needs analysis

Analysis of functional needs is needed to describe the system functionality that will be built in the Arabic interactive multimedia application. The Functional Needs Analysis uses Object Oriented Programming (OOP) modeling.

1) Use Case Diagram

Use case diagram is a visual picture that represents the workings of a function or process [11]. Use Case describes what the system or subsystem can do. Use Case Diagram on Arabic Language Learning Interactive Multimedia Application can be seen in **Figure 10**.

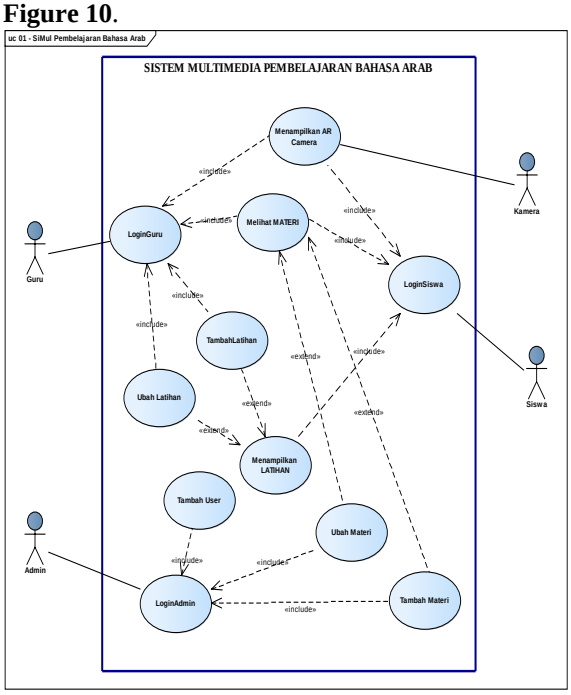


Figure 10. Use Case Diagram

G. System design

1) Class Diagram

Class Diagram shows the system consists of object classes. Class Diagrams function to describe how the relationships between classes of objects involved in the use case.

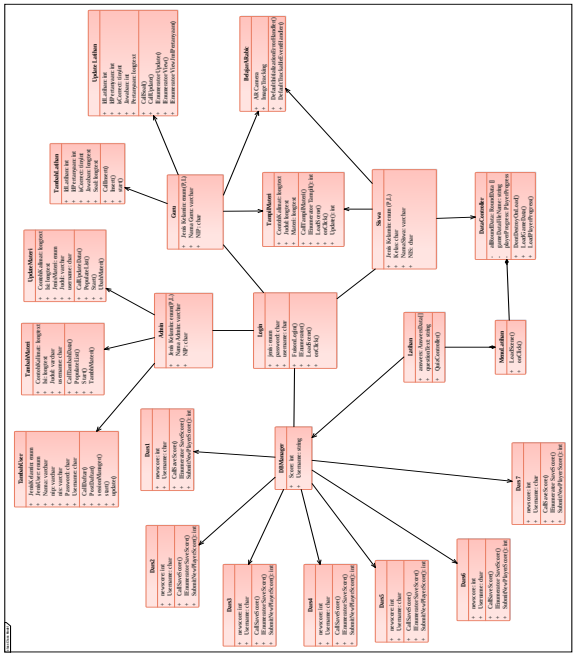


Figure 11. Class Diagram

H. System implementation

Implementation is the implementation stage of the design results based on the results of the analysis into a class in the programming language, interface display, and the application of environment.

1) System Environment Implementation

Multimedia Hardware Implementation of Arabic interactive learning can be implemented in the following hardware environment:

1. Windows
   - Windows 10 64-Bit

Implementation of the Arabic Interactive Learning Multimedia Software is implemented in the following software environments:

1. APPX Windows 10
2. Database Server

I. System testing

Tests are carried out to see the quality or to analyze errors in the seventh-grade interactive learning multimedia systems. The testing is done by testing the system with black boxes and User Acceptance Test system.

1) Black Box test

Black box testing procedures include each page, namely:

1. Login test
2. Adding materials test
3. Changing material test
4. Adding user test

5. Adding practice test
6. Changing practice/drills test

These are all done in step by step from the login to the changing practice or drills.

- Case and test results

As for the cases and test results that have been carried out based on the testing procedure using black box testing is as follows:

Table 2 Login procedure testing

Testing procedure	Expected output	Obtained results	Conclusion
Check Username and Password are incorrect	*Your username/password is incorrect or has not been filled*	*Your username/ password is incorrect or has not been filled*	consistent
Check Username and Password are not filled	*Your username/password is incorrect or has not been filled*	*Your username/ password is incorrect or has not been filled*	Consistent
Check Username and Password are correct	*Display continues to main menu (Admin / Teacher / Student)*	*Shows a main menu (Admin / Teacher / Student)*	Consistent

- Black box testing conclusion

Based on the results of testing with the black box method, it can be concluded that functionally the interactive multimedia applications of Arabic in grade VII have been running well and as expected. However, it does not rule out the possibility of errors in the application system when running in the real environment.

2) User Acceptance Test

This is to test the acceptance of the system development of the Arabic interactive multimedia application, then the User Acceptance Testing was conducted using the Likert Scale to measure the social phenomenon, opinion, attitude of an event.

In the context of this test, two groups of respondents consisting of 40 students and five teachers were taken. Thus the instrument of the user acceptance test consists of six Questionnaires followed by 3 Likert scale options, namely:

- Disagree (TS) with score value1 (0%-32%)
- Agree (S) with score value 2 (33%-66%)
- Strongly agree (SS) with score value 3 (67%-100%)

Based on this option, the frequency of the option selection can be calculated and analyzed using a Likert scale to determine the level of acceptance of the system. The Likert scale formula (1) is as follows:

$$Y = \frac{(Jumlah\ S\ \times B)}{(B_m \times Jumlah\ Resp.)} \quad (1)$$

Remarks:

Y : System acceptance level.
S : Score
B : Option score
B_m : Maxima score
$Jumlah\ Resp.$: Number of respondents

The development of user acceptance testing instrument is built in 6 dimensions of questions / statements.

Table 3. Questions/statements dimension

No.	Question	Answer		
		TS	S	SS
1	The Grade VII Arabic Interactive Learning Multimedia System can be operated easily and effectively	0	21	24
2	Is multimedia interactive learning facilitating learning Arabic?	1	22	22
3	Is the interactive multimedia system built can help in meeting the needs of learning Arabic?	1	20	24
4	Is the application system running well?	3	20	22
5	Is the created multimedia system able to support students' interest in learning Arabic?	2	19	24
6	Augmented Reality on Interactive Learning Multimedia Systems Grade VII Arabic is interesting and easy in composing sentences	1	16	28

The percentage result of questions No.3 can be seen in **Figure 12** and **Figure 13**

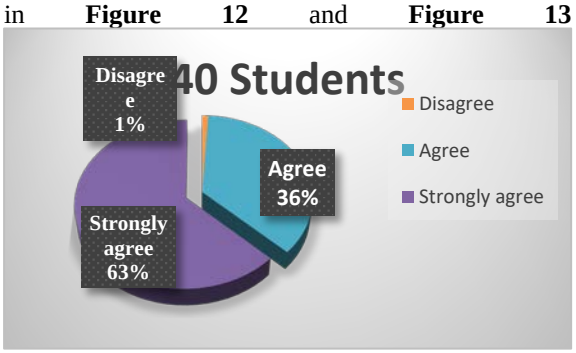


Figure 12. Percentage of student response

The percentage calculation for student response:

$$Y = \frac{100}{120} \times 100\% = 83\%$$

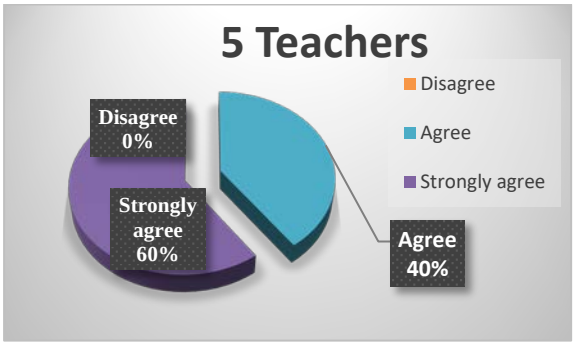


Figure 13. Percentage of teacher response

Percentage calculation for teacher response:

$$Y = \frac{13}{15} \times 100\% = 86{,}67\%$$

Based on the results of the percentage of 83% of student respondents and 86.67% of the teacher respondents included in the category strongly agree. It can be concluded that the interactive Arabic multimedia system can meet the learning needs of Arabic.

3. CONCLUSION

The Arabic learning multimedia application system equipped with Augmented Reality (AR) can help students improve Arabic vocabulary mastery and can create learning interactions that can trigger students' interest in learning Arabic through interactive multimedia technology. However, this research still has some drawbacks, so it is advisable for those interested in developing interactive multimedia applications, specifically Arabic for vocabulary, not only focus on the scope of composing sentences, but also to add text-to-speech technology with augmented reality..

REFERENCES

[1] M. A. Gharawi and A. Bidin, "Computer Assisted Language Learning for Learning Arabic as a Second Language in Malaysia : Teacher Perceptions," vol. 6, no. 8, 2016.

[2] A. U. Firmansyah, "Rancang Bangun Aplikasi Media Pembelajaran Bahasa Arab Berbasis Multimedia Dengan Menggunakan Adobe Flash Cs6 Pada Kelas Vii Madrasah Tsanawiyah Islamiyah Hessa Air Genting," *J. Teknol. dan Sist. Inf.*, vol. 2, pp. 15–20, 2015.

[3] A. Mubarok and L. Sudarmana, "APLIKASI MULTIMEDIA PEMBELAJARAN BAHASA ARAB UNTUK MADRASAH TSANAWIYAH KELAS VII," *JUTIM*, vol. 1, no. 1, pp. 25–33, 2016.

[4] M. E. C. Santos, W. Lübke, T. Taketomi, G. Yamamoto, M. M. T. Rodrigo, C. Sandor, and H. Kato, "Augmented reality as multimedia : the case for situated vocabulary learning," *Res. Pract. Technol. Enhanc. Learn.*, 2016.

[5] T. Vaughan, *Multimedia : Making It Work*, vol. 63, no. 2. 2006.

[6] A. R. Dewi, R. R. Isnanto, and K. T. Martono, "Aplikasi Multimedia sebagai Media Pembelajaran Ilmu Pengetahuan Sosial Materi Budaya di Indonesia menggunakan Unity Engine untuk Sekolah Dasar," *J. Teknol. dan Sist. Komput.*, vol. 3, no. 4, pp. 471–480, 2015.

[7] Dr.Rusman, *Model-model Pembelajaraan*. Bandung: Rajawali pers, 2016.

[8] Masyhuri and M. Zainuddin, *Metodologi Penelitian: Pendekatan Praktis dan Aplikatif*, Revisi. Malang: PT. Refika Aditama., 2011.

[9] I. Binanto, *Multimedia Digital Dasar Terori + Pengembangannya*. Yogyakarta: Penerbit Andi, 2010.

[10] J. L. Whitten and Lonnie D. Bentley, *Systems Analysis and Design Methods*, no. 1. New York: McGraw-Hill, 2007.

[11] G. B. Shelly and H. J. Rosenblatt, *Systems Analysis and Design, Ninth Edition*. USA: Course Technology, 2012.