Holographic Media for Vocabulary Learning based HOTS

Suci Ramadhanti Febriani
Universitas Islam Negeri Maulana Malik Ibrahim
Jalan Gajayana 50 Malang, Indonesia 65145
Suciramadhantifebriani11@gmail.com

Uhame Binti Harun
Universitas Islam Negeri Maulana Malik Ibrahim
Jalan Gajayana 50 Malang, Indonesia 65145
uhamebintiharun96@gmail.com

Hafizatul Hasanah
Universitas Islam Negeri Maulana Malik Ibrahim
Jalan Gajayana 50 Malang, Indonesia 65145
hafizatulhasanah06@gmail.com

Abstract- **The use of the latest technology in the learning process is one of the demands for teachers in the 21st century. Not only that, the critical thinking process known as HOTS (Higher Order Thinking Skills) also began to be developed. This study aims to design vocabulary learning using a holograpic media based-HOTS. The research method used in this study is the research method for developing the ADDIE model. The ADDIE steps are Analysis, Design, Development, Implementation, Evaluation. Sources of data are taken from observations as a concrete form to determine the problems of vocabulary learning in elementary schools, and are supported by several written sources such as; books, journals, articles relating to discussion. The results of this study indicate that the stages of the vocabulary learning process use hologram media based- HOTS in the following ways; The teacher prepares the hologram media according to the material specified, the teacher gives a project to the students to design a simple dialogue using new vocabulary that has been presented and evaluates the form of student activities with group discussions.**

Keywords— Hologram; HOTS; Vocabulary

I. INTRODUCTION

One of innovation in language learning is the use of the latest technology. It aims to facilitate the delivery of teaching materials tailored to the needs of students. The need for technology integration in the field of education is very important [1]. Using e-learning is one of product of real innovation to develop interesting language learning [2].

Along with the development of technology, information and communication media is growing rapidly which aims to facilitate someone in everything [3], especially in learning foreign languages to learn new vocabulary.

At the elementary school level, vocabulary is still the main reference in language learning. As is known that the most important element of language is the vocabulary which later forms a discourse. However, the problems are still found in languange learning [4].

Vocabulary learning is still focused traditionally and manually, both in terms of material, media and learning methods.[1] There needs to be an increase in the quality of learning that changes students' perceptions in learning languages, because not a few argue that language learning is very monotonous.

Based on this, holographic media can be used as based HOTS for vocabulary recognition tools. This media is a tool for visualizing an object or vocabulary that students will learn. This technology projects light into a field that forms a light bias with a 3-dimensional shape [5].

The introduction of the environment through the media will shape students' open and critical thinking processes, giving rise to various questions and enthusiasm of students in learning [6].

Hologram itself comes from the Ancient Greek "holos" which means whole or whole and "gram" which means information or recording [7]. Holograms are often described as three-dimensional images that contain information about the size, shape and brightness and contrast of the recorded object. This information can be stored in very microscopic sizes and complex patterns of interference. Simply put, a hologram can be made using several simple tools such as using plastic bottles. The hologram provides what is called "parallax" which allows the observer to see the shadow of the object with a different perspective as if the original object was there. With these activities, students can observe the objects shown, they can identify vocabulary meanings and design simple sentences according to the structure of the sentence being learned. This activity encourages students to think critically starting from interpreting new vocabulary and ending by using vocabulary in a good and correct language order.

One of the purposes of this study is for learning to have meaning and fun for students in the presence of interesting and unique media. This is in line with previous research which said that holograms can motivate students so that learning has meaning [8].

[1] Observation at Al-Kautsar Elementary School Malang, on 3 Mei 2019 at 10.00.

In addition, students can practice critical thinking about the intended vocabulary and produce and create words into sentences that can be produced through this holographic teaching aid. Based on the level of critical thinking students according to Bloom's Taxonomy is that students are able to design learning outcomes that have been taught, so students are required to have very high creativity. Furthermore, students can identify the vocabulary objectives provided by the teacher and apply it through their own designs and creations, such as making short discourses and essays, or actively speaking using the foreign language learned.

In addition, students can practice critical thinking about the vocabulary intended through this hologram teaching aid. Based on the level of thinking students according to Bloom's Taxonomy are students able to design learning outcomes that have been taught, so students are required to have very high creativity. Furthermore, students can identify the purpose of the vocabulary given by the teacher and apply it through their own designs and creations, such as making discourses and short essays, or actively speaking using foreign languages learned.

HOTS (*Higher Order Thinking Skill*) is one of the achievements needed in the 21st century [9]. The Ministry of Education and Culture also revised the 2013 curriculum by including HOTS in its latest revision. Because critical thinking is a demand and there needs to be training developed by the teacher early on, such as developing ideas, making decisions and classifying aspects and elements learned.

Table 1. Bloom's taxonomy level

Num	Categories	Activity
1.	LOTS (Low Order Thinking Skills)	Understanding (Explaning) (Inferring) (Summarizing) (Classifying) (Examplifying) Remember (Recognizing) (Recalling)
2.	MOTS (Middle Order Thingking Skills)	Analyze (Attributing) (Organizing) (Differentiating) Apply (Executing) (Implementing)
3.	HOTS (Higher Order Thinking Skills)	Evaluate (Critiquing) (Checking) Create (Producing) (Planning) (Generating)

Anderson and Krathwohl revealed the definition of HOTS in learning to make learning to remember and learn to transfer. Learning to remember certainly requires this type of thinking, but currently learning to transfer it Anderson, Krathwohl, and their colleagues consider "meaningful learning." [10]. This approach has informed their construction of the revised Cognitive dimension of Bloom's taxonomy. The Table 1 is Bloom's taxonomy level which shows the level of thinking to determine the cognitive level of students, including HOTS thinking. [11].

Some fundamental elements regarding the stages of critical thinking are remembering, understanding, applying, analyzing, evaluating and creating something new as a form of applying the vocabulary that students already know [12].

Based on the explanation of the background of the problems described above, the main problem is formulated, namely how is the design of vocabulary learning using holograms for vocabulary learning based HOTS? The purpose of this study is to design vocabulary learning using holograms based HOTS. The benefit that can be taken is to provide ideas for teachers to develop learning media in the form of visualization, namely holograms based HOTS.

In the design of holographic media development, it has certain limitations. This application runs using an Android smartphone with a minimum OS. 4.4.2 kitkat, applications can display objects, so they can encourage students to recognize new vocabulary in learning languages.

II. RESEARCH METHODS

The research method used in this study is the research method for developing the ADDIE model. The ADDIE steps are Analysis, Design, Development, Implementation, Evaluation [13].

a. Analysis

This stage is the stage where we find learning objectives, identification of students, learning materials that can use holographic media and other things that are deemed necessary. At this stage collecting materials are also carried out which are stages of collecting materials in accordance with the needs of the animation being worked on. Collecting files or text on clip art images, photos, animations, videos, audio and related to this 3D Hologram.

b. Design

At this stage the researcher conducts a material design plan that can be taught using holographic media, appearance, material and material requirements for making in 3D Hologram animation. This stage describes the description of each material, including all multimedia objects, links and editing videos that will be displayed using the hologram media.

c. Development

This stage contains the realization of product design activities. In the design phase, concepts have been designed and compiled. And at this stage of development, the conceptual framework is realized to become a product that is ready to be implemented.

d. Implementation

At this stage designs and methods have been implemented that have been developed in real situations, namely in the classroom. During implementation, the design of the hologram media was developed and applied to the actual conditions. The material was conveyed using holographic media and then carried out an initial evaluation to provide feedback on the application of this holographic learning media.

e. Evaluation

Evaluation was carried out in two forms, namely formative and summative evaluation. Formative evaluation is carried out at the end of each face, while summative evaluation is carried out after the activity ends as a whole. This is done to find out the final results of learning, and to find out whether the learning objectives that have been designed using holographic media have been achieved or not.

Sources of data come from field observations and scientific written sources, such as; books, journals related to the topic of discussion. The data analysis technique uses data triangulation.

III. RESULTS AND DISCUSSIONS

A. Hologram Design

The application of 3D Hologram in this study is an innovation in the field of visualization to display the form of vocabulary learning material by displaying images of the vocabulary learned. Learning using this hologram media aims to make it easier for students to memorize memorized vocabulary by displaying 3D images of the vocabulary.

This first stage is the stage where we find the learning objectives; vocabulary learning goals desired by the instructor using holographic media. Then identified students who will learn to use this holographic media by compiling learning materials that will be taught using holographic media.

At this stage collecting materials are also carried out which are stages of collecting materials in accordance with the needs of the animation being worked on. Collecting files or text images of clip art, photos, animation, video, audio and related to 3D Holograms, such as vocabulary learning about families, then collected all images or videos related to the family. After that, the design of the holographic media glass is in the figure 1.

Furthermore, after obtaining a sketch or description of the material to be taught using hologram media, it was developed by displaying it in the form of four sides, namely right, left, up and down. The four sides are arranged so that to be able to visualize the animation of the material.

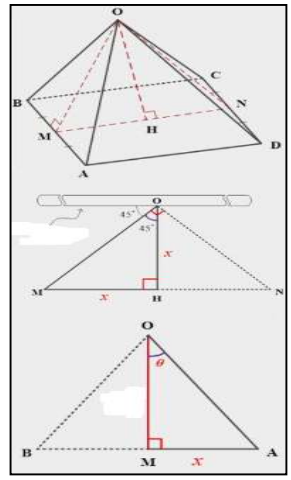

Figure 1. Design of the holographic media glass

In the next stage the pyramid is made as a reflection of the hologram. In its application two pyramids are made with two sizes, one size for a 5 inch smartphone screen and another measure for a 15 inch LCD monitor. For the size of the smartphone, the pyramid is made with a composition measuring 3.5 cm high and 6 cm wide using transparent plastic mica material. Whereas the second pyramid is made with a composition measuring 15 cm high and 20 cm wide using glass.

The results of the design of the pyramid can be set on media that is tailored to the needs. For example, for simple and mobile needs, you can use a design with a 5-inch smartphone size, but if for larger needs, you can use a pyramid with a 15-inch LCD size.

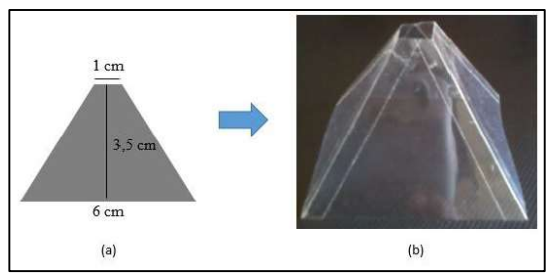

Figure 2. The shapes of design pyramid

B. Vocabulary Learning using hologram Media based HOTS for vocabulary learning

The steps that can be taken by the teacher in implementing the holographic media for vocabulary learning based HOTS are as follows:

a. The teacher prepares learning materials, learning media, and predetermined learning plans

b. The teacher presents learning material that has been prepared by first giving apperception to students about the material to be learned in the classroom.
c. The teacher asks students to try to practice together the material being studied. If there are students who are considered to need emphasis, then the teacher should give special attention.
d. The teacher divides students into groups and students choose the group leader. The group leader should be students whose skills and understanding are better so they can help their friends in the learning process.
e. The teacher gives assignments to students to be able to practice learning material by identifying the vocabulary learned. Vocabulary that has been shown using a hologram.
f. Students respond and interpret new vocabulary in groups.
g. Students are given the task to carry out simple dialogues related to learning material and record it in video format.
h. The teacher asks students to submit the recording assignment or can also ask students to display it in front of the class at the next meeting.
i. At the next meeting, the teacher and students discuss the assignment given by giving students the opportunity to criticize the assignment of their friends first.

Here are some steps that can be taken in using hologram media based HOST. This media can be further developed in accordance with the conditions of the students.

The steps above encourage students to think critically with the stage that students begin to observe the media used by the teacher, then students analyze the objects referred to in teaching aids, indirectly they can identify the meaning of vocabulary through holograms. Then the teacher gives a project to each group to apply the vocabulary taught through drama and into video.

This encourages students to think critically how to develop the ideas they have together and are packaged in the form of a short drama in a simple way. This process requires high creativity and thought processes to do projects that are in accordance with the theme. HOTS analysis through vocabulary learning that students will develop through holographic media is explained in Table 2.

From the results of the classification analysis of the learning process above, it is known that vocabulary learning through Holograms has an impact on the activities of students' high-level thinking processes carried out on an ongoing basis. With the demands of creating and creating work, this learning is called HOTS, according to HOTS classification (design, creation and analysis) [14].

This shows that the findings regarding learning media that are modified and adjusted to the principles of HOTS-based vocabulary learning are very helpful for teachers in designing and applying holograms that will be used in initiating students' critical thinking processes.

Table 2. HOTS Analysis

Num	Aspect	Discussion
1.	Listening	Through the staging of the drama, students are able to analyze the language production presented by other groups, so that each group can proofread words that are not in accordance with their speech.
2.	Speaking	Students produce words as a result of a consensus of drama texts created together.
3.	Reading	The process of language production through the stage of reading texts created by students will practice the process of critical thinking, because it examines each vocabulary meaning contained in the drama text.
4.	Writing	In creating drama, students are required to be able to write text that will be displayed by students. this requires students to think critically in analyzing and creating words and their composition into perfect sentences.

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