HISTOGRAM (History In Hologram): Fun Learning Media to Learn Ancient Relics of Indonesia

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ABSTRACT
Archaeological objects are historical relics that have important values for human life. But not every student can see and feel the atmosphere of ancient objects, because they have long been extinct or maintained their existence. The introduction of ancient objects through the media in the form of images contained in books, two-dimensional drawings and other teaching aids, this is considered ineffective because two-dimensional picture can only be seen on one side only, but by using 3D Hologram technology it is expected that in learning it can make historical lessons about ancient objects can be more interesting and enjoyable as well as helping in introducing efforts to conserve ancient objects. The results of this research are expected to be able to provide 3D Hologram technology by utilizing the principles of holographic work that is able to provide convenience for student by their own gadget.

INTRODUCTION
Indonesia is known as a nation that has a long history, including ancient relics important to a civilization and this shows how the glorious Indonesia in the past. With this media, collective memory as a good and bad experience of the nation in the past can be brought back. That is very important for the young generation and our education. But, the fact is that there are many ancient relics in Indonesia which have worsened their condition and even many of their assets have been lost. After searching, it turns out that many young people do not know the history of their own country, including the existence of ancient relics that bear witness to the nation's history. The existence of books on ancient relics in the library is actually quite complete and adequate, but the interest of the younger generation, especially children to read the book is still felt lacking. Especially in today's world children prefer to visit internet cafes to browse the internet or play computer games than to visit the library.

According to Ifta (2016) in this Globalization Era, the development of information technology science and the world of visual communication design in recent years experienced
very rapid progress because of the discovery of new technologies in digital media both in the
world of hardware and software (Bakas & Mikropoulos, 2003). Advances in information
technology and visual communication design have become an inseparable part of people's lives
which has given birth to new meanings which in turn are able to create a technology that can
connect interacting real world and virtual world directly. This meaning can try to participate in
the development of technology that is developing and developing recently, especially in the
development of HISTOGRAM (History in Hologram) media, so as to produce a memorable
visual experience.

However, the development of several years, the world of visual communication design
also began to develop towards an alternative 3D virtual reality technology called "Holography" a
technique that allows light from scattered objects to be recorded and then reconstructed so that
objects as if they were in the same position with recorded media. According to Ahmed (2010)
holograms are three-dimensional notes of the positive frequency of laser light waves that have
the advantage of being able to store information, which contains three dimensional (3D) objects.
(Mayer, 2005)add the technological revolution has contributed to changes in many areas of life.
In education, for example, the famous inventor, Thomas Edison, predicted that textbooks would
be replaced by motion pictures. Similar predictions were made with the emergence of the
phonograph, radio broadcasting, tape players, TV and video. Despite these attempts were
importance in the field of education, many experts argued that these technologies considered as
the mass form of one-way information transfer. For example, public broadcasting prevents
individual learning, because it does not reflect individual needs. The sequential presentations,
such as tapes and videos, do not allow for working with the piece of information actually
needed. Therefore these means can only play a role of supplementary specialised material.

Not only objects that are usually found in photographs or pictures in general. That is
because the working principle of a hologram is not as simple as a photographic lens
(Ramachandiran, Chong, & Subramanian, 2019). Holograms use the principles of diffraction and
interference, which are part of the wave phenomenon. From the beginning, the researchers
wanted to design a HISTOGRAM (History in Hologram) product model that was first triggered
by the discovery of a writing about the phenomenal Pepper's Ghost illusion technique. The
researchers' curiosity then developed in the search for work systems and what materials were
used to design this technique simply and could be applied easily for its application in 3D
Holograms.

At present day to know about ancient relics can only be learned through ancient objects
catalog books, encyclopedias, and history books that exist, where there are only two-dimensional
images that can only be seen one side only on the objects of ancient relics found in several
places all over the world But with the existence of holographic technology that can change the
way we see in the form of 3D animation based on ancient relics. Through the working principle
of 3D Holographic Reflection, the inverted pyramid can provide many alternative opportunities
in the world of visual communication entertainment to be developed as an interactive media in
the introduction of fun ancient objects. The interactive media referred to as a visual aid evokes a
sense of interest in students to focus on recognition and stimulate the active role of students in
finding, constructing their own knowledge in the process of recognizing shapes, patterns, reliefs
and values contained in prehistoric objects so that students become more easy to understand by
how it looks. Seeing the above phenomenon is the background of the need for research on the
use of computer game applications as a means of education and teaching of historic buildings for children.

The general objective of this research is to increase the knowledge of ancient relics in Indonesia to the younger generation. While the specific purpose of this research is to examine free 3D modeling applications that can be used to create 3D ancient relics models for a 3D game application that can be used as a history learning media for children. Learning of ancient relics always has a bad perception, children's interest in ancient relics is always low. Even history is considered as one of the boring things. The tendency that arises is that history has no benefits or uses. By utilizing the game as learning ancient relics will certainly attract young people to learn it. Games are an inseparable part and have a role in shaping a cultural attitude in society, especially young people, because the content of stories in a game affects the perception and knowledge of what themes are contained in a game. The theme of history and culture of Indonesia is very important because by including these themes will create a sense of nationalism and love of the history and culture of the Indonesian people. Many ancient relics in Indonesia, but not many young people who feel close and know for sure the ancient relics. That requires a media that is very close to young people and has a very large communication influence. Game media is considered the closest media to young children and the content / messages that can be included in a game is huge and unlimited. This media is a media that can provide information to the younger generation about the history, national culture, and of course it can also be used as an alternative form of learning of ancient relics in Indonesia.

METHODOLOGY

In this study, researchers used a type of Research and Development (RnD). Research and Development (RnD) is a research strategy or method that is quite effective in improving practice (Sukmadinata, 2006). Research and Development (RnD) or Research and Development is a process or steps to develop a new product or improve existing and products. Then the research design used in this RnD research method, researchers used a survey design. Development method means deepening and expanding existing knowledge (Sugiyono, 2009). In addition, Sugiyono (2009) states that in general RnD research is longitudinal (several stages). There are several development procedures proposed by several experts. One of them is the development research procedure proposed by Sugiyono (2012) in developing this HISTOGRAM, researchers used the ADDIE (Analysis, Design, Develop, Implement, Evaluate) model and already had a prototype or simple design that could still be improved.

The trial of the use and application of History in Hologram (HISTOGRAM) learning media was carried out in class X IPS students of SMA Negeri 1 Bandar Lampung, Bandar Lampung City in July 2020 at the school year 2020/2021. The place that will be used as a research site is SMA Negeri 1 Bandar Lampung. This school has three history educators. Each of these educators taught in classes X, XI, and XII using the 2013 Curriculum. The type of research used in this study was a descriptive study using a qualitative approach. Descriptive method is used to study character education through history learning in SMA Negeri 1 Bandar Lampung. Descriptive research is generally carried out with the main objective, namely to systematically describe the facts and characteristics of the object or subject being studied appropriately. Qualitative approach is research experienced by research subjects such as behavior, perception, motivation, actions and so forth holistically and in a descriptive way in the form of words and language in a special natural context and by utilizing various natural methods (Moleong, 2009).
RESULT AND DISCUSSION

This research used a model ADDIE development. ADDIE model (Analysis, Design, Develop, Implement, Evaluate). According to Aldoobie (2015) ADDIE model is one of the most common models used in the instructional design field a guide to producing an effective design. This model is an approach that helps instructional designers, any content’s developer, or even teachers to create an efficient, effective teaching design by applying the processes of the ADDIE model on any instructional product.

At this stage an analysis is carried out needs or needs assessment. As for analysis conducted at this stage among others: (a) Conduct interviews with teachers mentor related problems learning experienced by students in social studies class 2, (b) Determine the learning objectives will be achieved in learning competency, (c) Determine the target to be addressed namely students in social studies class 2, (d) Identify the resources of money there to be able to support learning goals by using 3D video media hologram, (e) Make a product management plan.

At this stage what is done is design the media to be used for the learning process. With processing the initial information that has been obtained through interviews then at At this stage there are a number of steps: (a) The design is done based on historic building material and determine experts, the media and learning design, (b) This stage is to mention objectives the performance of material experts and media experts that experts as validators, (c) Generate a testing strategy.

Development: (a) Generate material subject matter the ancient relic are packed in the form of a 3D Hologram video, (b) Developing accompanying materials for students. Accompanying ingredients used as a guide use of 3D holographic video media, (c) Developing accompanying materials for teachers. Accompanying materials are used as a guide for teachers inside using 3D Hologram video media, (d) Validate the material to the experts material, Mr. Henry Susanto, M.Hum, (e) Conduct media validation on experts the media, Mr. Sumargono, M.Pd.

At the implementation stage this is done by media experts and material experts. This matter due to limited ability to deaf children in conducting trials so the experts are doing it material namely Mr. Henry Susanto, M.Hum. and While the media expert is Mr. Sumargono M.Pd. Implementations consist of five steps which are orientation and choosing topics, literature review, searching and designing videos, making a reflector and readjusting hologram assembly and sharing. Each workshop provides participants to share their knowledge, skills and experience and to do their tasks collaboratively. During workshops researchers guide participants in different ways such as the define order of tasks, lead to participants determining knowledge and scientific knowledge and motivating them to difficult problem. The workshops support participants individual and group skills such as interest, sharing knowledge and collaboration. The primary aim of workshops are not produce the artifacts, they aim to create an collaborative and inspirational learning environment which constitutes peer learning.
Figure 1. Skills, Workshop Content and Participant Tasks During the Implementation

Evaluation: (a) Determine evaluation criteria. Criteria evaluation seen by comparing pre-test and post-test results were tested to deaf students before and after using video media 3D hologram So it will be known the difference, (b) Choosing an evaluation tool viz data calculation from the test instrument which has been made, (c) Evaluating.

The initial design of the History in Hologram (HISTOGRAM) learning media begins with the process of comparing History in Hologram (HISTOGRAM) with other Holograms to determine the strengths, advantages and disadvantages of History in Hologram (HISTOGRAM) learning media, then after that the media design and manufacturing process is carried out. History in Hologram (HISTOGRAM) learning is done by modifying and updating the media and inserting the History of Learning content into the History in Hologram (HISTOGRAM) media, then finishing and applying it to learning in educational institutions.

Learning is a process in exploring a series of knowledge. To achieve the objectives of effective and efficient learning, of course, requires learning media that are creative and interactive. That is none other than because there are aspects that must be considered both in terms of education, social, and economics. That is none other than because at this time the world was shaken by the existence of which caused all aspects of life to be affected and not separated from the world of education. In response to this, it is necessary to have innovative action by creating learning media in the form of History in Hologram (HISTOGRAM) as a medium of learning in the conservation of ancient objects. According to Aziz (2016), a hologram is a technique for recording the light of objects that are scattered and then constructed so that the object seems to be in a position relatively similar to the recorded recording media. In addition, holograms are able to store information in the form of 3D (three-dimensional) objects.

Initially, to obtain information about ancient objects students are required to jump directly into spaciousness. However, covid-19 is currently not possible to do so so that learning activities
are carried out remotely while still paying attention to the quality of learning through the History in Hologram (HISTOGRAM) media. This learning media is designed with a barcode that aims to make it easier for students to freely access material related to ancient objects. In addition, the barcode also functions as a voluntary donation medium for ancient officers affected by Covid-19. Thus, the concept of the design of the History in Hologram (HISTOGRAM) Hologram is very useful both in terms of education and economics.

The approach used in the History in Hologram (HISTOGRAM) media is scientific. This approach allows all students to have critical thinking skills towards the material being studied (Ghuloum, 2010). These skills consist of observation, questions, data collection, association, and communication. In its implementation, teachers are needed but the teacher's assistance decreases with increasing maturity of students (Bermawi, 2016). In addition, the presence of the History in Hologram (HISTOGRAM) media provides an opportunity for all students to learn independently by observing and communicating about ancient material materials. Because according to Sintari (2017) the media are all things that can be used to channel messages from the sender (teacher) to the recipient (learners) so as to stimulate the thoughts, feelings, concerns and interests of students so that when the learning process takes place (Hoon, Shukaila, & Shaharuuddin, 2019).

Implicitly these skills can be explained as follows: (1) Observing. At this stage students are required to see and observe ancient objects such as temples, statues, and others through the History in Hologram (HISTOGRAM) media, (2) Ask. Then after students are given the opportunity to ask questions related to these ancient objects, (3) Collecting Data. Furthermore, the questions posed will be analyzed by the teacher and all students from various relevant science sources, (4) Associate. This stage is the step where the analysis is collected into data, (5) Communicating. Finally, students are required to explain again by communicating in the form of media images or the other.

The results of the History in Hologram (HISTOGRAM) media assessment based on the results of the media expert's evaluation of the appearance and narrative quality obtained 84.3% which were included in the excellent criteria, while for the color aspect 79.0% and the votes received 77.7% which were included in the criteria well.

![Results of Historical Funtastic (HISTOGRAM) Holographic Media Assessment](source: author)

Figure 2. Results of Historical Funtastic (HISTOGRAM) Holographic Media Assessment

The quality of the display gets a percentage value of 83.3% which is included in the criteria very well. As for the assessment of aspects of the display quality includes the ratio of the 3D display and the clarity of the material display in it. Media experts assess that the 3D display ratio that researchers use is very good and attractive in appearance. Color aspect in obtaining a percentage value of 83.3%. The evaluation criteria in the narrative aspect include the use of language and voice intonation used in the learning media of the History in Hologram (HISTOGRAM)
Hologram, this is in accordance with the opinion in Sungkono’s research (2012) which explains that the criteria for the narrative aspect that must be achieved is the sound volume good, good tone of voice, style of language, clarity of speech, and tempo of speech.

The color aspect obtained a value of 79.0% which is included in the criteria either. Criteria in the assessment of color aspects include the use and harmony of color contrast in the media as well as the attractiveness of the use of color in the History in Hologram (HISTOGRAM) media, which according to media experts based on their assessment results this media has a good and attractive color usage.

Based on the results of the material expert assessment, the researcher gets the result that the aspects of the suitability of the material with KI and KD, the clarity of the material, the order of the material, the communicative, the suitability of the evaluation questions, the harmony of the teaching material, obtain a percentage value of 100% which is included in the criteria very well. Aspects of learning objectives, as well as the relationship of the material, obtained a percentage value of 94.3% which entered into very good criteria.

**Figure 3.** Flowchart Mechanism History in Hologram

1. First it must be prepared either smartphone or tablet.
2. After that in the device there must be a 2D video arranged into 4 parts.
3. Provide pyramid made of plastic tapes, glass or resin (choose one).
4. Play 2D Video With the Pyramid Above It, enjoy the effects arise in 3D.
5. Students observe the shapes that arise, then comment on what they get
CONCLUSION

Based on the problem above, it was explained that IPS teachers in SMA N 1 Bandar Lampung were more likely to use textbooks and blackboards for student learning. The existence of textbooks as a learning aid media apparently also does not function optimally because students will only read textbooks provided if instructed by the teacher to read or work on the problems in them. The use of textbooks that are dominated by subject matter in the form of text is still more widely used by teachers in the learning process. In the history learning process, teachers tend to only use conventional one-way methods that rely entirely on the teacher to deliver the material so that boredom and boredom often descend most students, the achievement of student learning outcomes becomes less optimal and students also look passive in following the lessons and many students who view history lessons as second-class lessons after being inexact. Concerns about the lack of knowledge and awareness of students in recognizing cultural heritage objects or historical relics laden with noble philosophies ultimately reduce students’ learning experiences that should be fun.

Current technological advancements and sophistication which are entering the phase of the industrial revolution 4.0 have made many technologies updated, one of which is 3D hologram, or often known as cool as augmented reality because it presents an attractive 3D display through the pyramid of projectors as a reflection of its light. We integrate technological elements and historical learning, especially on buildings, objects and historical relics with the ultimate hope
that students will be able to conserve these objects, at least knowing the real shapes in 3D through this augmented reality. This is certainly in line with Pancasila and the 1945 Constitution which states that education is an effort to educate the nation's children in order to realize the quality of human resources in order to be able to compete and collaborate at the global level.

Drawing conclusions through the pre-test and post-test tests found that there is a change in value from before the use of HISTOGRAM with after the use of HISTOGRAM increased rapidly, this shows the success of HISTOGRAM able to be an indicator of students' interest in studying Social Studies history subjects and thus their efforts to conserve can grow slowly. The results of the History in Hologram (HISTOGRAM) media assessment based on the results of the media expert's evaluation of the appearance and narrative quality obtained 84.3% which were included in the excellent criteria, while for the color aspect 79.0% and the votes received 77.7% which were included in the criteria well. The quality of the display gets a percentage value of 83.3% which is included in the criteria very well. As for the assessment of aspects of the display quality includes the ratio of the 3D display and the clarity of the material display in it. Media experts assess that the 3D display ratio that researchers use is very good and attractive in appearance. Narrative aspect in obtaining a percentage value of 83.3%. The evaluation criteria in the narrative aspect include the use of language and voice intonation used in the learning media of the History in Hologram (HISTOGRAM), this is in accordance with the opinion in Sungkono's research (2012) which explains that the criteria for the narrative aspect that must be achieved is the sound volume good, good tone of voice, style of language, clarity of speech, and tempo of speech.

The color aspect obtained a value of 79.0% which is included in the criteria either. Criteria in the assessment of color aspects include the use and harmony of color contrast in the media as well as the attractiveness of the use of color in the History in Hologram (HISTOGRAM) media, which according to media experts based on their assessment results this media has a good and attractive color usage. The sound aspect obtains a percentage of 77.7% which is included in the criteria both, according to media experts the use of sound in the learning media is good and clear for students to understand in their use.

This media is applicative and futuristic because besides it can really be applied in history lessons it can also be used in many other subjects that require 3D visuals though. The teacher can modify pictures or videos according to the topic of the lesson, this media can also be an alternative learning because it can increase students enthusiasm with seeing an object. Critical and solutive ideas will arise during the process of observing existing holograms, and this can stimulate students to think logically and empathize.

Teachers replaced by holograms. It sounds like something from a science fiction movie or TV show. The reality is the technology has recently been created to bring live holograms from one location and beam them into any location in the world. This phenomenon led the researcher to investigate whether HISTOGRAM will be an effective tool for the teachers in the future. Furthermore, the researchers wished explore the main barriers that might prevent HISTOGRAM being integrated into a ancient relics learning.

REFERENCES


