Yogyakarta Vredeburg Fort Museum Based to Conduct the Designation of Learning Video of Social Science

Dhiniaty Gularso[1(✉)], Muhammad Fairuzabadi[2], and Muhammad Iqbal Birsyada[2]

[1] Faculty of Teacher Training and Educational Sciences, Universitas PGRI Yogyakarta, Yogyakarta, Indonesia
dhiniaty@upy.ac.id

[2] Faculty of Science and Technology, Universitas PGRI Yogyakarta, Yogyakarta, Indonesia

Abstract. A museum is a building or building that is used as a place to exhibit objects that deserve public attention, such as historical relics, arts and sciences. The museum has educational and artistic value so that it can be used as a source of student learning at all levels of education in Indonesia. One of the learning resources that can be developed based on the information in the museum is learning videos. Especially during the current Covid-19 pandemic, students and teachers have difficulty making direct visits to museums, especially for the ones who are geographically far from the museum location. The learning video that will be developed in this research is a Social Science one by taking subjects in elementary, middle and high school. The museum that will be the object of research is the Fort Vredeburg Museum, located in Yogyakarta, Indonesia. The design of learning videos employs the multimedia development life cycle/MDLC method in content development with six cyclical steps, namely drafting concepts, designing, collecting materials, assembling, testing and distributing the learning videos. This research is still at the design stage of social studies learning videos with the Vredeburg Fort museum as the basis for thinking. The next step of this research is a social studies learning video based on the Vredeburg Fort Museum, where validity tests, reliability tests, effectiveness tests and usability tests are carried out.

Keywords: Learning Video · Social Sciences · Vredeburg Fort Museum · Learning Resources

1 Introduction

Education can be obtained by humans at anytime, with anyone and anywhere, including in museums. According to the results of the 22nd general meeting of the International Council of Museums (ICOM) in Vienna Austria on August 24, 2007, the museum is a permanent non-profit organization that serves the community and its development, open to the public, which collects, preserves, researches, communicates, and exhibits tangible and intangible cultural heritage of humans and their environment for educational purposes. A museum is a building that is used as a place to exhibit objects that

deserve public attention and consideration, such as historical relics, arts and sciences. Various fields of science can be displayed in a museum such as the field of science at the Gwacheon National Science Museum (GNSM) South Korea [1], the field of archeology at the Egyptian museum which displays ancient artifacts [2], geological science displayed at the Geology Museum in Bandung Indonesia [3], military fields, especially aerospace displayed at the Yogyakarta Indonesian Aerospace Museum [4], even culinary arts displayed at the Hangzhou Cuisine Museum in China [5], traditional Jacquard woven fabric art at the Turkish Museum [6], even the science on children at the Egyptian Children's Museum [7].

According to John Dewey, an expert in educational psychology, museum possesses high educational value, therefore he recommends asking students, especially those at the Chicago Laboratory School, to visit museums to enhance the students' experiences. According to Dewey, museums hold a central role in a student's experience. This statement was put forward because John Dewey really likes to visit museums [8]. It is a place of learning where humans gain education, therefore museums can be used as a source of learning. In the museum, adolescent students explore and discuss scientific facts on gender, sexist, racist, imperial science that occurred in primitive Africa to Europe [9]. The museum can also provide education about the values of multiculturalism to students including the values of harmony, tolerance and harmonization between ethnicities and religions that have been cared since the time of the Sultanate of Banten, as it has been conducted by the Sorosowan Banten Indonesia Museum [10].

In addition to educational value, museums also have the entertainment values. They can also be used as a place to reduce stress in the workplace [11]. During the COVID-19 pandemic, trauma also develops from workplace problems related to personal health safety and work security. This means that museums can be used as a new source of learning for workers to reduce stress levels.

Museum-based student learning resources are at the moment being developed in Indonesia. The goal is to bring students closer to the museum because the museum has a high educational value. In Indonesia, the "Love the Museum Movement" has been developed since Oktober 12th, 2018. Besides, when students visit museums, it means that learning is not limited to the classroom, but learning can also be conducted outside by directly observing cultural heritage objects in the museum. Learning outside the classroom is more fun and meaningful for elementary students [12]. Students can also learn directly from museum guides who have expertise in the objects or cultural heritage being displayed. However, outside learning Classes are still very rarely [13]. In fact, museums are very rich in material and information that can be directly captured by the students' cognitive and affective from various levels, elementary, middle school, high school, to university. Museums can be used as learning resources for various activities in the school curriculum such as extracurricular, intra curricular and learning outside the classroom like Theories on archaeology, make a living and excavation and how to take care of archaeological objects [3], Elementary school students Creative Thinking in Proposing Math problems [15], Understanding the concept of space (location, distribution, potential, climate, and shape of the earth, geology, flora and fauna) and the interaction between spaces in Indonesia and their influence on human life in economic, social, cultural and educational aspects [16], History learning of Tenth Graders of social

science [17], Raise students' history awareness [18]. Activities to integrate artifacts into the curriculum can develop students' self-confidence when they are studying history [14].

There are 435 museums spread across 33 provinces and there is 1 province that does not yet have a museum, it is the province of West Papua. The province with the highest number of museums is East Java with 64 museums, then Central Java with 62 museums, and DKI Jakarta with 61 museums [19]. Indonesia is a large and wide archipelagic country consisting of 16,056 islands with 99,039 km2 the length of the coastline and a total area of 2.7,812 km2 [20], it is divided into 24 provinces. Based on data from the Indonesian Central Statistics Agency, the total population of Indonesia is 269,603,400 people. Nearly 40% of Indonesia's population is of school age. The very broad covered area and quite difficult to reach, making access students to learning resources is constrained, especially related to the existence of museums. All museums in Indonesia are located in urban areas, while schools in Indonesia are located both in urban and rural areas. Long distances are also an obstacle for students to access museums as learning resources [21], so that innovation is urgently needed in accessing museums, through making museum-based learning videos. For this reason this research would be conducted. This museum-based learning video is designed to meet students' needs for Social Science competencies in schools.

Learning videos are live image recordings or programs to be shown on television or computers that can be used for learning. Learning videos can be the effective learning media at all levels of education, such as at the Early Childhood Education level [22]. & Siahaan, R. (2022), increase learning achievement at the high school level [23], increased 55% students' understanding of learning by [17] and even improve students' critical thinking skills if the learning video is combined with the problem-based learning model [24]. Especially during the current Covid-19 pandemic, learning videos are very much needed considering learning is conducted through non-face-to-face, it is more on mobilephones or computers. The COVID-19 pandemic has brought the whole world to stop. One of the biggest problems is travel restrictions to reduce the spread of the virus. Everyone is forced to stay at home and consequently the visits to art galleries and museums are all prohibited [25]. Likewise in the world of education, students cannot visit museums. Learning videos can be very effective since online learning models, students experience and mastery on technologies are increasing [26]. Based on the effectiveness of learning videos and the central role of museums as a source of information, museum-based videos for social studies learning is very important and urge, especially since the development of education in Indonesia must adapt to 21st century education which requires teachers and students to be adaptive, creative, innovative, and communicative.

2   Method

This research procedure uses the Multimedia Development Life Cycle (MDLC) approach in content development [27]. The MDLC method has 6 stages of development which constitute a cycle (Fig. 1), which are as follows:
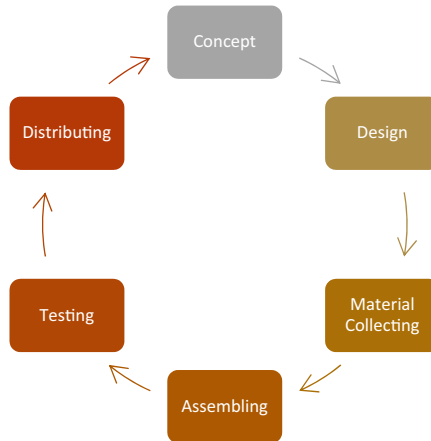
Fig. 1. MDLC Method Cycle

Concept

At the concept stage, several activities are carried out, namely:

a. Determine the objectives and benefits of social studies learning videos that will be made based on the Core Competencies (KI) and Basic Competencies (KD) to be achieved.
b. Determine the subject that will use the learning video (elementary school, junior high, or the high school)
c. Determine the object or part of the museum that supports learning materials.
d. Describe the concept of delivering learning materials in accordance with the objectives of the subject and object that have been determined.

Design

At this stage, several specifications will be made in detail regarding the architecture, style and material needs of learning videos. The specifications to be made are based on the following steps:

a. Material design (narrative). In material design, there are 3 aspects that must be considered, namely (1) the concept and purpose of the design, (2) the depth and width of the concept, and (3) aspects of the quality of learning. In the aspect of content and material, there are 5 indicators, namely (a) the suitability of the material with the Competence Standards, Basic Competencies, and Indicators, accuracy of the material with learning objectives, completeness of the material, coherence of the material, the interest and attention of the students. In the aspect of the depth and width of the concept, there are 2 indicators, namely the suitability of the concept and material, and the limitation of the material according to students' understanding. In

Table 1. Likert Scale

Score	Options
1	Poor
2	Fair
3	Good
4	Very Good
5	Excellent

the aspect of learning quality, there are two indicators, namely the quality of the test and the quality of the learning process.

b. Storyboard design. In the design of social studies learning videos, there are three aspects that will be assessed, namely (1) design aspects, (2) functional aspects and (3) aspects of social studies learning objectives. In the design aspect, there are three indicators, namely (a) the attractiveness of the video, (b) the suitability of the display with the age and grade level of the students and (b) the clarity of the letters and image used. In the aspect of the function of social studies learning videos, the two indicators assessed are (a) whether social studies learning videos can help students in learning activities or not and (b) indicators of clarity of concise material and working on questions. In the specification of the objectives of the social studies learning video, there are two indicators, namely (a) the accuracy of the use of social studies learning videos and (b) the presentation of tasks to increase mastery of the material being taught.

Collecting Material

Material for social studies learning video content include:

a. Photos: location photos, related historical documentation photos.
b. Videos: environment, scenes, sources, and related documentary videos.
c. Audio: narrator, resource person, background sound, related documentary audio.
d. Presentation related to content material.
e. Text spoken by the narrator and resource persons to help the deaf.

Assembling

This stage assembles the collected materials into a multimedia content using video editors and other applications.

Testing

This stage is in the form of testing multimedia content to measure its quality. Hhli validation test and user validation test. The data was obtained using a questionnaire instrument using a Likert scale. The likert scale is used to measure a person's attitudes, opinions, and perceptions about social phenomena (Sugiyono, 2014). The Likert scale used consists of five choices as described in the Table 1.

Table 2. The Eligibility Criteria for Media Product Validation Results

Achievement Level	Qualification	Description
85%-100%	Excellent	No need to revise
75%-84%	Very Good	No need to revise
65%-74%	Good	Need to revise
55%-64%	Fair	Need to revise
0–54%	Poor	Need to revise

Source: [29]

The data analysis technique to determine the percentage of expert validation, language validation, and social studies learning video design validation was carried out using the following formula [28].

$$p = \frac{\sum x}{\sum x_i} \times 100\%$$

Descriptions:
P: percentage.
Σx: Total number of respondence answers.
Σx^i: Total number of ideal score in item.

Based on the results of the analysis of the data obtained, the next step is to change the percentage of the assessment into descriptive qualitative data. The quality of the feasibility of media products can be seen from the feasibility criteria of the validation results which are described in Table 2.

Distribution
This stage integrates existing content with the Vredeburg Fort Museum Virtual Tour application.

3   Result and Discussion

The design of the social studies learning video based on the Vredeburg Fort museum of this study employed the subjects at the Elementary, Junior and High School levels. At the elementary one, the diorama that would be the object of research is diorama 1a, that is the formation of the Army at the beginning of Indonesia's independence and diorama 1 D, which is the Indonesian Women's Association. At the junior and senior high school levels, the diorama that will be used as the basis for compiling the video is Diorama II, which displays scenes from the historical events of the Proclamation of Independence of the Republic of Indonesia in 1945 until the begin of the Dutch Military Aggression I In 1947, President Soekarno went to the pulpit where a great meeting was held at the Indonesian youth congress in Yogyakarta, young students were actively training in the military during the physical revolution, the great commander Soedirman gave a mandate after the TKR conference that decided him as Commander in Chief.

Table 3. The Design of Social Science Learning Video Storyboards for the Fifth Graders of Elementary School at the Vredeburg Fort Museum Yogyakarta Indonesia

No.	Audio	Visual	Storyboard
1.	Sound FX 0-6 second	 Source: Alinea.ID	Time : 22 —25 December 1928 Location : Dalem Joyodipuran Jl Kintelan 139 (Now Jl Brigjend Katamso 23 Yogyakarta. Now becomes the center for the study of History and Traditional Values of Yogyakarta Occurrence : Congress of Women I in Yogyakarta
2	Sound FX 0-6 second		The scene of the congress: The Event was very significant for the Indonesian Women's Congress that President Sukarno set December 22 as the Mother's Day through Presidential Decree No. 316 of 1959. This event is remembered as the beginning of the struggle of women in Indonesia.
3	Sound FX 0-6 second		The initiators of the 1st Indonesian Women's Congress on December 22, 1928 in ndalem Joyodipuran Yogyakarta: 1. Mrs. Sukonto from Wanita Utomo 2. Mrs. Hadjar Dewantara from Wanita Tamansiswa 3. Miss. Sujiatin from Putri Indonesia
4	Sound FX 0-6 second		Women Congress II Time : 20-24 July 1935 Location of Congress : Jakarta The theme of the Congress is the position of women in marriage law, Protection of women and children in marriage, Preventing child marriage, Education for Indonesian children
5	Sound FX 0-6 second	 Source: Wartakotalive.com	Women Congress III Time : Tahun 1938 Location : Bandung Women Congress III was conducted in Bandung in 23-28 July 1938 led by Mrs. Emma Puradireja

Source : Data Analysis, 2021-2022.

The design of the social studies learning video for the elementary level in Verdeburg, Yogyakarta Indonesia, employed the theme of 1D diorama with the theme of the Indonesian Women's Congress. This theme is in accordance with the material for the fifth graders of Elementary School theme 7 (Events in Life) subtheme 1 (Colonial National Events) learning 6. The storyboard design that has been successfully compiled is presented in Table 3. Core competencies consists of 4 competencies, namely (1) KI-1 Accept, practice, and respect the teachings of the religion they adhere to. (2) KI-2 Demonstrate honest, discipline, polite, confident, caring, and responsible behavior in interacting with family, friends, teachers, neighbors, and the nation. (3) KI-3 Understanding factual, conceptual, procedural, and metacognitive knowledge at the basic level by observing, asking questions, and trying based on curiosity about themselves, God's creatures and their activities, as well as objects they find at home, in the community, schools, and playgrounds. (4). KI-4 Demonstrate creative, productive, critical, independent, collaborative, and communicative thinking and acting skills. In clear and understandable language, systematic, logical and critical language, in aesthetic works, in movements

that reflect healthy children, and actions that reflect children's behavior according to their developmental stages. Basic Competence (KD) for Social Studies subject for the fifth graders is 3.4. Identifying the important factors causing the colonization of the Indonesian people and the efforts of the Indonesian people in defending their sovereignty. 4.4 Presenting the results of the identification of the important factors causing the colonization of the Indonesian people and the struggles of the Indonesian people in defending their sovereignty.

Museums are public places that can be visited by everyone regardless of ethnicity and race. Why? Because education is the right of every human being. Museums should be more inclusive. However, in America, the results of research from [30] found information that black individuals were less likely to attend art museums than white people, although there was no difference in terms of the cost of visiting the museum.. The motivation to visit the museum is lower and the barriers to visiting the museum for black people are higher than for white people. Black people and Latinos visit museums because of the motivation to preserve cultural heritage [30]. Motivation to visit museums varies at individual, social and institutional levels. Such as the motivation of visitors at Hangzhou Cuisine Museums in China, at the individual level, the most dominant motivation for visiting museums is seeking education and knowledge and sensory experiences. At the social level, museum visitors are motivated to highlight the importance of social togetherness and kinship. At the institutional level, visitors' motivation is to learn the authenticity of food and media information needs [5].

Museums can also be used as learning resources to improve students' pedagogic abilities [14] through museum education. Museum education can foster special interests and improve skills and increase students' knowledge by familiarizing students with popularizing science [31]. P., Iliopoulos, I., & Kokkaliari, M. (2022). Museum education activities have been carried out by students of the History Education study program at PGRI Yogyakarta University through "museum internships" at the Fort Verdeburg museum, Yogyakarta Indonesia (Fig. 2). PGRI University Yogyakarta sends students from the History Education study program to participate in a museum internship program in all museums in Yogyakarta. This "museum apprenticeship" program is intended to equip graduates with museum competencies so that museums are closer and popular to the public.

The introduction of museums as a learning resource was also carried out for early childhood education and Kindergarten students. The Verdeburg Fort Museum has facilities for learning Indonesian history for preschool and kindergarten age children. The introduction of the history of the struggle of the Indonesian nation to pre school and kindergarten students is adjusted to the characteristics of children who are still in the playing stage. The joy and excitement that is identical with children is illustrated by the selection of room designs in the museum whose colors and layouts match the characteristics of early childhood and kindergarten age children. In its development, the museum made innovations as an effort to bring the museum closer to the community. The public also agrees that museums innovate in providing convenience services to the community [32]. These innovation includes 13 kinds of ways including (1) online reservation [33], (2) social media Instagram [34], (3) an information system called SIMVONI [35]; (4) Virtual Art Museum [36]; (5) digital technology [37]; (6) digital learning videos [38]; (7)

Mobile learning [39]; (8) augmented reality [40]; (9) Android platform technology [41]; (10) Museum visualization [18]; (11) web museum [42, 1] (12) YouTube [1, 42]; (13) Virtual tour [43, 44, 45, 32, 46, 34, 47, 48, 33, 49, 50, 7, 45]. Virtual tours are indeed the most widely used in developing museums in Indonesia and in the world. Virtual tours can also be used as an effective social studies learning resource in addition to learning videos. One of the examples of a virtual tour at the Fort Verdeburg Museum, Yogyakarta Indonesia. Although this museum has already had Virtual Tour content which is quite good, it still has a weakness, namely the absence of Virtual Tour content development that clarifies the respective contents of the dioramas and miniramas that have been displayed in the gallery. The dioramas displayed are still limited to explaining the names of historical events in Yogyakarta in a very short where visitors' first come will certainly not fully understand the meaning of each diorama. For example, gallery 1 tells the diorama of Prince Diponegoro's struggle until the Japanese occupation. In the galleries and dioramas, the content displayed is still simple, short and partial, so it cannot be read in its entire. This shortage makes it difficult for visitors to Vredeburg Fort in understanding, most of whom are students, especially elementary, middle and high school students.

In the current era of the Covid-19 Pandemic, students have difficulty to directly access to explore Vredeberg Fort according to the needs of the lesson content due to the prohibition on gathering to prevent the transmission of Covid-19. Developing this social studies learning video can be a solution to the problem of access for these students so that learning resources for elementary, middle and high school students can still be accessed. The results of an in-depth interview with the Head of the Vredeburg Fort Museum on Tuesday, August 24, 2021, also found several things that still need to be addressed and developed in this museum, one of which is the most basic of making social studies learning videos in each gallery and dioramas. By developing dioramas and miniramas in a social studies learning video, it is hoped that (1) it will give a more lively and interesting feel to the museum so that the function of the museum as a learning resource can be maximized, (2) further expand access to learning resources throughout Indonesia and even the world (3) attracting more visitors (especially elementary, middle and high school students) in accessing the entire gallery of the Vredeburg Fort Museum through websites orvirtual worlds, (4) strengthening national arts and culture in supporting the tourism.

4 Conclusion

Social studies learning videos based on the Verdeburg Fort Yogyakarta Museum are an important and urgent need to fulfill the learning resource needs of fifth graders of elementary. Museum-based social studies learning videos are a supporting medium for teachers in increasing competence in introducing history during the struggle for Indonesian Independence. The basic competencies of social studies subjects that can be improved are at KD 3.4 and 4.4. This research is still at the design stage of social studies learning videos with the Vredeburg Fort museum as the basis for thinking. The next step of this research is a social studies learning video based on the Vredeburg Fort Museum, where validity tests, reliability tests, effectiveness tests and usability tests are carried out.

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