

Interactive Map of Historical Sites: The Media of History Learning on the 21st Century in North Sumatra

Hafnita Sari Dewi Lubis¹, M. Rivai², Yushar³, M. Ihsan Syahaf Nasution⁴
{hafnitasari@unimed.ac.id¹, muhammadrivai@unimed.ac.id², yushartanjung@unimed.ac.id³}

Department of History Education, Universitas Negeri Medan, Jl. Willem Iskandar Pasar V
Medan, North Sumatra, Indonesia

Abstract. This study aims to develop an interactive map of prehistoric and Hindu-Buddhist sites in North Sumatra as a learning medium in the Department of History Education, Faculty of Social Science, Universitas Negeri Medan. The research method used is research and development. The results showed that the mean score from the media expert judgment reached 4.47, while the mean score from the material expert assessment was 4.69. The average score of the two validators is in the excellent category. Meanwhile, the mean score from three trials was also in the very good category: 4.42 in the first trial, 4.35 in the second trial and 4.45 in the third trial. These results indicate that the interactive map of prehistoric and Hindu-Buddhist sites in North Sumatra is very suitable for use as a medium for learning history.

Keywords: Historical Sites, Interactive Map, Learning Media, North Sumatra.

1 Introduction

Learning of Indonesian history from prehistoric periods to Hindu-Buddhist requires the development of innovative models, learning materials and media so that learning objectives can be achieved. One of the efforts made by the Department of History Education at Universitas Negeri Medan to increase students' responses and interests towards the learning of Indonesian history from prehistoric periods to Hindu-Buddhism is to develop teaching materials loaded with historical sites in North Sumatra. The development of teaching materials loaded with local historical sites aims to develop students' sense of concern and interest in the regional domain, then they can dig deeper about whatever existed in the past trajectory in their area. The development of this teaching material also aims to prevent students from being uprooted from their socio-cultural roots, because learning material that is closest to the psychological condition of students are local history. By studying the historical sites of North Sumatra, students can feel that themselves and their environment are part of a broader life, namely Indonesia as a nation-state.

North Sumatra has many historical sites that contain prehistoric and Hindu-Buddhist cultural relics. Archaeological research results at the Bukit Kerang Paya Rengas Site, Langkat Regency, show that the site was once the location of prehistoric human settlements [1]. In addition to Langkat, prehistoric sites are also found on Nias Island and Samosir Island. On these two islands, many megalithic remains are found, such as *menhir* (stone pillars), *dolmen* (stone tables), *sarcophagus* (grave containers), stone tombs and *terraced punden* [2], [3].

Meanwhile, cultural relics of the Hindu-Buddhist period can be found at the Kota Cina Site located north of Medan. References [4] suggest that the Kota Cina Site was a trading port that was visited by Chinese and Indian traders in the 11th and 14th centuries. Archaeological research on the site has found the structure of the temple, Vishnu statue, Bhudevi statue, and Buddha statue. Archaeological findings indicate that adherents of Hinduism and Buddhism once lived side by side at the Kota Cina Site in the 11th century to the 14th century [5]. In the same period, Buddhism also flourished in Padanglawas. In this area, there are Bahal Temple and Simaputung Temple which were built by Buddhists of the *Vajrayana* sect [6].

The existence of prehistoric and Hindu-Buddhist sites in North Sumatra is evidence of the high culture of the people of this region in the past. Therefore, the historical sites of North Sumatra are very important for students to learn so that they are not uprooted from their socio-cultural roots. One of the methods applied by the Department of History Education to introduce the historical sites of North Sumatra in the learning process is through study-tours. Learning will indeed be more interesting and easier to understand if it is done by looking directly at historical relics. However, the implementation of the study tour is not easy to do in the learning process because most of the historical sites are located outside the city of Medan so that it requires no small cost.

The use of historical sites in North Sumatra as a source of learning does not have to apply study-tours that require lecturers and students to go directly to historical sites. However, historical learning based on local historical sites can be streamlined by moving historical sites into a learning medium so that they can be used as a source of learning in the classroom [7]. Learning media are educational tools or aids that can be used to convey and distribute messages or lesson content in a planned manner to create a conducive learning environment and encourage an effective and efficient learning process [8]. The use of instructional media in the teaching and learning process can arouse students' motivation and interests, and even bring psychological influences on students. The use of instructional media will greatly assist the effectiveness of the learning process and the delivery of messages or lesson content. In addition to arousing student motivation and interest, learning media can also help students to increase understanding, present data attractively and reliably, and facilitate the interpretation of data and condense information [9].

Learning media have various types, ranging from print, visual, audiovisual, to multimedia. Multimedia is a learning medium that combines text, images, graphics, audio, and video to create dynamic and interactive presentations [10]. Multimedia can be used as interactive learning because learner (students or people who are learning) are better able to understand explanations if delivered with words and pictures rather than just with words. The process of multimedia learning can be seen as information acquisition or as knowledge instruction [11].

One type of multimedia that can be used in history learning is interactive maps. Interactive maps include multimedia group because it uses more than one presentation media (text, images, videos, and maps) controlled by the computer, and involves the participation of users to give commands, control and manipulate. Interactive maps use the components of a Geographic Information System (GIS). GIS is a computerized tool for mapping and analyzing things that exist and events that occur on earth. GIS integrates a variety of database operations, such as queries and statistical analysis with unique visualization and benefits of income level geographic analysis through mapping or using maps. It is this ability that distinguishes GIS from other information systems and makes it valuable or useful for explaining events and predicting strategic planning with a wide range [12].

Based on the description above, this study aims to develop an interactive map loaded with prehistoric and Hindu-Buddhist sites in North Sumatra that is suitable for use as a learning medium in the Department of History Education, Faculty of Social Sciences, Universitas Negeri Medan. The decision to develop an interactive map as a learning medium is in accordance with the criteria for selecting instructional media, namely: (a) in line with the objectives to be achieved, referring to one or a combination of two or three cognitive domains; (b) appropriate to support the content of lessons that are facts, concepts, principles or generalizations; (c) practical, flexible and enduring; (d) skilled educators use it; (e) grouping of targets; and (f) technical quality [13].

2 Research methods

This study uses the Borg & Gall development model because this model has detailed, but simple steps [14]. The Borg & Gall development model consists of ten steps: (1) research and information collecting, (2) planning, (3) developing preliminary forms of product, (4) preliminary field testing, (5) playing product revision, (6) playing field testing, (7) operational product revision, (8) operational field testing, (9) final product revision, and (10) dissemination and implementation. Of the ten steps, this study only uses nine steps because it adjusts to the research objectives. The nine steps of development in this study can be seen in Figure 1.

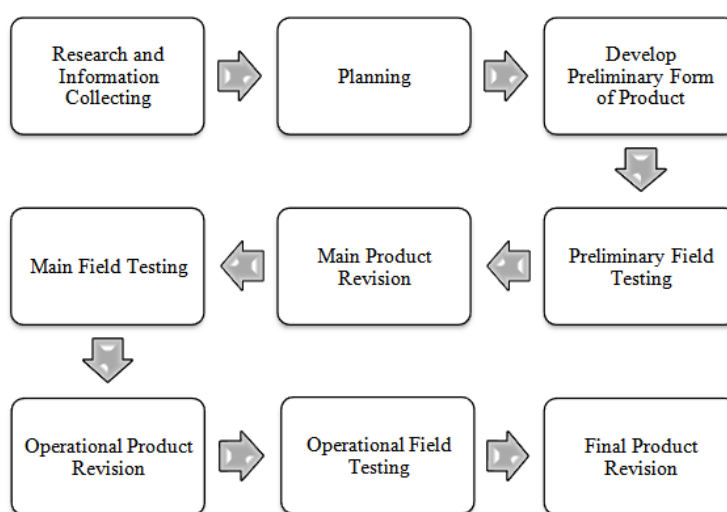


Fig. 1. Model of Media Development.

Data were collected by a questionnaire which could be divided into three types, for an expert on media, an expert on the matter, and our students as prospective users. There were 30 students from class A forces 2018 in the Department of History Education, Universitas Negeri Medan, involved as users. Data obtained from the questionnaire will be analyzed based on the average score. An interactive map of prehistoric and Hindu-Buddhist sites in North Sumatra

will be considered valid and fit for use as a medium of historical learning if it reaches the minimum validity criteria, see Table 1.

Table 1. Validity means the score.

Mean score	Criteria	Note
> 4,2	Very good	No revision
> 3,4 – 4,2	Good	Minor revision
> 2,6 – 3,4	Enough	Partial revision
> 1,8 – 2,6	Less	Major revision
≤ 1,8	Very less	Overall revision

3 Result and discussion

From the observation of the learning process in class A, force 2018 in the Department of History Education obtained information that students still have difficulty understanding the subject matter about the history of North Sumatra from the prehistoric period to Hindu-Buddhism. They can only explain a small part of the relics of prehistoric times and Hindu-Buddhist in North Sumatra. Though this area has a lot of prehistoric and Hindu-Buddhist sites. The lack of student knowledge about prehistoric and Hindu-Buddhist sites in North Sumatra is due to the limited time allocation for delivering material and the absence of media that supports the delivery of material.

Based on observations it can be concluded that the subject matter of the history of North Sumatra from prehistoric to Hindu-Buddhist periods requires learning media that can contain images, videos, maps and material summaries in one application so that students can access them anywhere. That way, learning media based on an interactive map based on prehistoric and Hindu-Buddhist sites would be appropriate to be developed because it could contain various kinds of media and be accessed through the internet.

Planning activities undertaken to develop interactive maps of prehistoric and Hindu-Buddhist sites in North Sumatra include the preparation of material, selecting photos and videos that are appropriate to the material, and registering on the ESRI (Environment Science & Research Institution) website so that they can access ArcGis software developed by the agency. ArcGis is a compilation of functions from various kinds of GIS (Geographic Information System) software, such as Desktop GIS, GIS Server, and GIS Web.

The main product of ArcGis is ArcGis Desktop, a comprehensive professional GIS software. ArcGis Desktop has several features: (1) ArcMap as the main application used in GIS data management. ArcMap can visualize, edit, create thematic maps, manage tabular data, select (query), and use the geoprocessing feature to analyze and customize data or perform output in the form of map views. Operators can process data as they wish; (2) ArcGlobe, one application that has a display like Google Earth that can function as a display of the earth's surface datum using satellite imagery; (3) ArcCatalog, applications that have features to create vector data and group them according to the desired function. With the ability of tools to explore information (browsing), organize data, share data (distribution) and document spatial data and data relating to geographical information; (4) ArcScene, an application used to process and display maps in 3D. The advantages of ArcGis software make researchers choose to use the software to create interactive maps. To access the ArcGis software, registration is done on the ESRI website.

3.1 Designing product components

The development of interactive maps of prehistoric and Hindu-Buddhist sites in North Sumatra using ArcGis software starts from creating content. In creating content, researchers use templates contained in ArcGis. The selected template is the Story Map Shortlist. The reason is that the Story Map Shortlist template looks more interesting, see Figure 2.

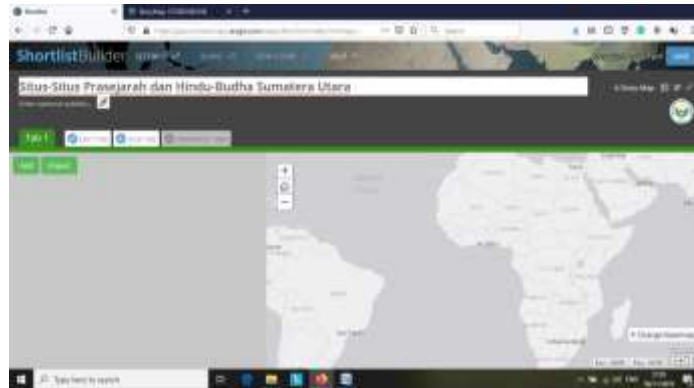


Fig. 2. Initial Display of Content with the Story Map Shortlist Template

However, the initial display of the content shown in Figure 2 is still very simple. The next step is to design the page header background. We can choose the background as desired, add content titles and change the agency logo. The next step is to display a map of North Sumatra on the homepage. After that, the researchers made a menu of categories of historical sites. Researchers have created three menus, the Hoabinh Site menu, the Megalithic Site menu, and the Hindu-Buddhist Site menu, see Figure 3.

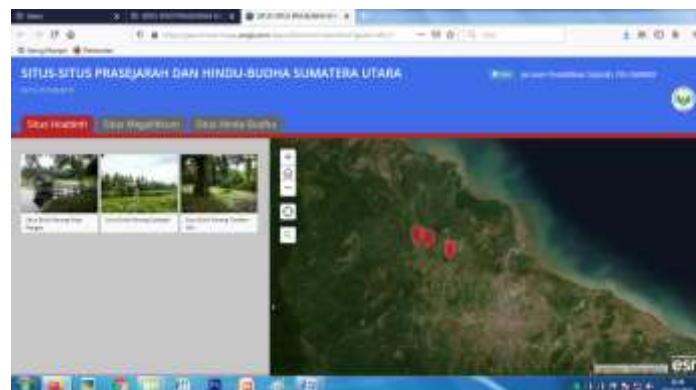


Fig. 3. Menu Category Historical Sites

After creating a menu of three site categories, the next step is to fill each menu with its historical site type. For example, the Prehistoric Site menu is filled with the Bukit Kerang Paya Rengas Site, the Bukit Kerang Sukajadi Site and the Bukit Kerang Tandem Hilir Site, see

Figure 3. Each site type content is equipped with images, descriptions, videos, supporting literature in the form of e-books and e-journals, and the coordinates on the map, see Figure 4.



Fig. 4. Display Content from One Historical Site

3.2 Media expert validation

Display interactive maps of prehistoric and Hindu-Buddhist sites in North Sumatra have been validated by Dr. Samsidar Tanjung, M.Pd., instructional media expert from the Faculty of Social Sciences, Universitas Negeri Medan. Based on the validation done by media experts it can be concluded that our interactive map is valid. There are several components validated by media experts, such as layout design (4.66), text or typography (4), images (4), maps (5), videos (4,5), supporting literature (4,5), navigation (4,5) and user benefits (4,5). Analysis of the average overall score by media experts is 4.47 with a very good category. Therefore, an interactive map of prehistoric and Hindu-Buddhist sites in North Sumatra is considered valid and does not need to be revised. For an illustration of the results of the validation of media, experts see Figure 5.

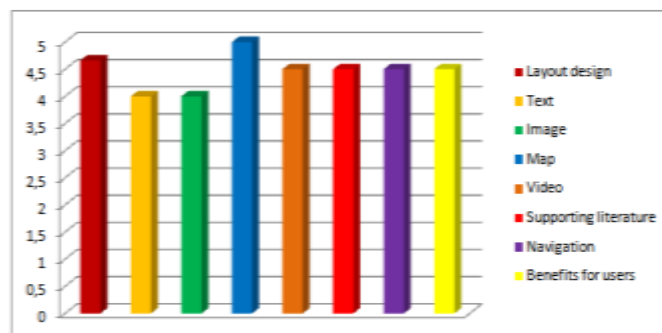


Fig. 5. Media Expert Validation Results

3.3 Material expert validation

Material expert validation is needed to ensure that the material presented in the interactive map is suitable for use in the learning process. Material experts in this study are Dr. Phil. Ichwan Azhari, M.S., from the Faculty of Social Sciences, Universitas Negeri Medan. Based on the validation, it can be concluded that the material in our interactive map is valid. Two components are validated, and each component consists of several indicators. The mean score for the text component was 4.7 and the mean score for the language component reached 4.66. The analysis of the average overall by the material experts was 4.69 in the very good category. Therefore, the map of prehistoric and Hindu-Buddhist sites in North Sumatra is considered valid and does not need to be revised. For an illustration of the results of the material, expert validation sees Figure 6.

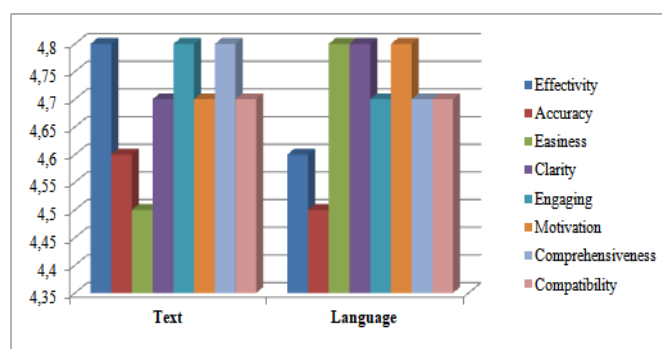


Fig. 6. Material Expert Validation Results

3.4 Product trial

After an interactive map of prehistoric and Hindu-Buddhist sites in North Sumatra was considered valid by media experts and material experts, we conducted an interactive map test. Trials were carried out three times. The first trial involved 3 students who took the course "History of Indonesia from the prehistoric period to Hindu-Buddhist". Based on the assessment of three students, it can be concluded that our interactive map is suitable for use as a learning medium. There are several aspects assessed by students, such as media (4.44), material (4.4), learning (4.33) and language (4.5). The overall average analysis of the results of student assessments is 4.42 with a very good category, so the interactive map does not require any revision.

The second trial was conducted involving 10 students who took the same course. The mean score for the media aspects of the results of the assessment of ten students reached 4.34, for the material aspects and learning aspects respectively 4.3, and 4.45 language aspects. The overall average analysis of the results of the second phase of the trial was 4.35 with a very good category, so the interactive map does not require any revision.

The third trial was conducted involving 20 students who all took the course History of Indonesia from the prehistoric period to Hindu-Buddhist. The mean score for the media aspect from the results of the twenty students' assessment reached 4.44, for the material aspect 4.46 and the learning aspect 4.5, while the language aspect gained an average score of 4.58. The overall average analysis of the results of the third phase of the trial is 4.45 with a very good

category, so the interactive map does not require any revision. An illustration of the results of the three trials can be seen in Figure 7.

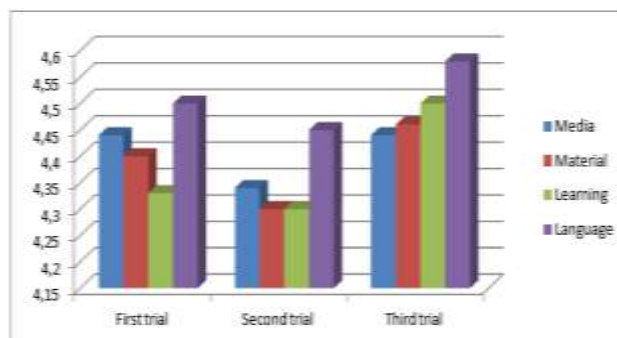


Fig. 7. Three-stage trial results

3.5 Discussion of validated product

The development of interactive maps of prehistoric and Hindu-Buddhist sites in North Sumatra is based on the problem of limited media in Indonesian history courses from prehistoric periods to Hindu-Buddhism, especially on the material of prehistoric and Hindu-Buddhist sites in North Sumatra, which are taught in Department of History Education, Universitas Negeri Medan.

Development of interactive maps of prehistoric and Hindu-Buddhist sites in North Sumatra using ArcGis software developed by ESRI. This interactive map contains material that has been adapted to the scope of Indonesian history courses from prehistoric to Hindu-Buddhist periods. Through this media, students can learn on their own by using a computer connected to the internet or through an intelligent cellphone (gadget). The use of interactive maps in learning also encourages students to utilize technology appropriately.

Our interactive map has been validated by media experts who are lecturers who have expertise in learning media, as well as material experts who are lecturers who have expertise in the history of North Sumatra. The feasibility assessment of the media experts on the interactive map of prehistoric and Hindu-Buddhist sites in Sumatra received an average score of 4.47 in the excellent category, while the average score of the material experts reached 4.69 in the excellent category. The results of the validation of material and media experts indicate that the interactive map of prehistoric and Hindu-Buddhist sites in Sumatra is very suitable for use as a learning medium in the Department of Historical Education, Medan State University. Even the response from students also stated that interactive maps of prehistoric and Hindu-Buddhist sites in Sumatra were very suitable for use as learning media. This is indicated by the high average score for each trial, which is 4.42 for the first trial, 4.35 for the second trial and 4.45 for the third trial.

4 Conclusion

Interactive maps of prehistoric and Hindu-Buddhist sites in North Sumatra embraced in this study can be said to be very suitable for use as learning media in the Department of Historical Education, Faculty of Social Sciences, Universitas Negeri Medan. The feasibility of the interactive map is based on the results of the validation of media experts, material experts, and user trials. The mean score for media validation, material validation and trial is in the excellent category. Thus, an interactive map of prehistoric and Hindu-Buddhist sites in North Sumatra can be used in Indonesian history courses from prehistoric periods to Hindu-Buddhism. This interactive map can also be used in the learning process at the top, middle and elementary school levels. Even this interactive map can also be used as a tourism promotion for North Sumatra.

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