



The Development of History Learning Media with Gis Web Based in Improving Real Understanding of Senior High School Students

Muhammad Iqbal Birsyada^{1(✉)}, Fahrurddin¹, and Muhammad Fairuzabadi²

¹ Faculty of Teacher Training and Education, Universitas PGRI Yogyakarta, Yogyakarta, Indonesia

iqbal@upy.ac.id

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

Abstract. So far, history learning is still often considered monotonous, conventionally only presenting memorizing years, numbers, and historical figures so that it seems boring for students. In the digital era 5.0, teachers are required to be able to adapt to the development of learning technology by adjusting basic competencies in subjects with the hope that students are more interested and get a real understanding of historical material. The facts on the ground are that there are still many teachers who experience difficulties when they are required to master learning technology, especially during the Covid-19 pandemic. On the other hand, history teachers are required to present a concrete understanding of history to students through online and digital media. This study seeks to answer these challenges by developing a WEB GIS-based learning media. With GIS technology, teachers and students can directly visit the location of the destination online. Thus, teachers and students do not need to be bothered to visit directly because of the many time constraints and busyness. In addition, through GIS technology, students get new references more easily and in more detail from the textbook they are holding. Thus, history learning becomes more interesting and students will gain a real understanding of the historical objects they study.

Keywords: history learning · learning media · GIS Web · understanding real

1 Introduction

In the era of industrial revolution 5.0, in Indonesia, mastery of science and technology in the field of education requires many strategies and breakthroughs that are right on target. In addition, in developing the learning process, teachers are also required to be able to develop high-level thinking in teaching and develop the critical abilities of their students[1–3]. Another thing that is no less important is that educators are always adaptive in responding to technological developments [4]. Especially in the era of the 21st century which demands 4 basic human abilities to survive, namely collaborative and communication skills to grow creative ideas (creativity and innovation) in solving

a problem (problem-solving). These four abilities are skills that must be possessed by every student in the 21st Century [5].

At the practical level, so far the subject of history is still widely regarded as a boring lesson in class. This feeling as well as stigma arises because the teacher is positioned as the only source of basic information for students in obtaining knowledge without strengthening the critical power of students [6]. Teachers as sources and managers of information carry out learning with conventional lecture and question and answer methods so that history learning becomes monotonous and boring. The problem that the teacher may not realize in delivering the material in the classroom is more oriented to the mastery of knowledge as demanded by the curriculum [7]. Therefore, future-oriented history teachers must always work hard to mix each lesson to be more creative and of high quality [8, 9].

At SMA PGRI I Kasihan Bantul, Special Region of Yogyakarta, so far the habit of history teachers and students learning history material is mostly still through the use of textbooks that have been provided by the school. However, the use of textbooks so far as a source of information in learning is still experiencing various obstacles because the textbook contains information that is conveyed mostly only in abstract verbal form, to realize student understanding, other sources are still needed that can provide concrete information., namely through learning media. Thus the selection of the right use of learning media is a solution that can be developed to strengthen the understanding of students according to the historical material taught by the teacher.

Based on the results of the observations and interviews of the research team with Heny Suprapti, S. Pd a history teacher at SMA PGRI I Kasihan Bantul, it was found that there were several problems related to learning history that had been carried out at school. So far, history learning that has been practiced both face-to-face and online which is carried out at SMA I PGRI Kasihan Bantul Yogyakarta is still considered not optimal due to several reasons such as students are constrained by internet quotas, lack of supervision from parents if there is an online schedule even some students more focused on online games than taking history classes. Although the school has provided a computer laboratory, its use is still lacking, especially in the development of IT-based history learning.

In addition to the problems above, some of the students who don't really like history subjects just flow away without a response in following the learning process in class. This phenomenon can be seen in the homework they make seem 'perfunctory'. Based on this, to bring history subjects into the classroom, the teacher must think about how to deliver creative, problem solving, and fun material in the classroom. In addition, history teachers are also required to master IT so that they can innovate in preparing various varied learning models. This includes strengthening the development of 21st Century skills as part of the demands of the times.

Theoretically, in the process of teaching history the teacher's role is very important because, in addition to being able to bring history into the lives of students "bringing history to student's life" besides that, history teachers must be able to present past events into a concrete contemporary context. Thus the teacher is the first resource person or the first person who should master the historical text that will be taught to students [10]. Based on this, the use of media in history learning plays a very important role and

position to assist in describing and providing information about events that occurred in the past in the present context [11]. One strategy to rebuke the past in the present context can be done through the help of learning technology to increase students' creativity and concrete understanding of learning history [12]. Thus learning history in class does not become a burden but becomes a pleasant awareness for students and teachers [13].

Several strategies for developing historical learning media through digital technology have begun to be carried out by various parties as an alternative [14]. This concept in practice can increase the creativity of history learning media in virtual spaces in school classes. Almost the same strategy can also use approaches such as history learning, one of which is digital-based to strengthen the development of local history learning media in schools [11]. However, provisional conclusions from various studies show that not many people, especially history teachers, are using local historical approaches and sources based on learning technology for teaching purposes in the classroom [15]. In fact, by using an IT-based history learning technology approach, students can easily access historical sources around them. It can also practically increase students' interest in learning history in class.

One other example of developing an IT-based history learning model is through the use of Augmented Reality (AR). Theoretically, the AR-based learning model can increase the imaginative power of students because it combines the original form with the virtual world [13]. In addition, the use of the AR method can also make it easier for students to access instantly to the location object [14]. In short, the AR-based learning model demands active student involvement in history classes [12]. However, there are not much reliable research data on the use of AR media for the wider community, for example in the use of historical relics.

After the Government of Indonesia announced the Large-Scale Social Restriction (PSBB) policy in mid-March 2020, all schools experienced a very serious impact, especially in the implementation of the history learning process. The rapid development of the spread of the Covid-19 virus has tested and changed the structure of education and caused uneven access to technology to conduct online learning in various regions [16]. Various online learning methods have also been carried out to suppress the spread of Covid 19 [17]. Based on this, there is no other way out than to develop learning technology during the current pandemic to support theory and practice in learning [18]. The Covid-19 pandemic requires history teachers to make various breakthroughs by utilizing technology creatively. This is done to realize creative and fun learning for students [10]. Several strategies for learning history have been carried out by utilizing such digital technology [15].

Another thing that needs to be considered in addition to strengthening the media in learning is that in each historical material, apart from being able to inform regarding the past, it can also develop students' concrete understanding. Therefore, at the practical level of learning, a creative history learning innovation is needed to understand the concrete meaning. History of students at school. This at the same time minimizes the assumption that historical learning is monotonous and only describes several historical facts, the role of figures, the date and year of events which are mostly recorded in the left brain of students which, if continued, will cause student saturation [20]. In short, in

presenting history material, teachers are required to be able to develop creative and fun material in each lesson in class [21].

The development of teaching media is important in this research study because it involves everything that can be used to transmit messages from the sender to the recipient, to stimulate the thoughts, feelings, concerns, and interests of students in such a way that the teaching and learning process can take place [20]. In addition, the use of learning media that has been adapted to the current context, in the millennial era will also further develop students' 21st Century skills. One of the learning media that can be used to overcome these problems is to use IT-based WEB GIS to better explain and make subjects concrete so that students are more enthusiastic in learning to create varied learning situations.

Starting from the explanations above, it is necessary to develop an innovation in history learning to improve the concrete understanding of students which so far is still considered lacking. Among the strategies that can be done is through the development of historical learning media based on WEB GIS in SMA which will be tested and developed at SMA PGRI I Kasihan Bantul, Yogyakarta. This is because apart from SMA PGRI I Kasihan Bantul, it is a partner of the PGRI Yogyakarta University campus as well as the implementation of the target school model to develop a WEB GIS-based learning application model. Through the development of this learning model, it is hoped that it can increase the concrete understanding of students in high school through history learning. The development of history learning media that will be designed is on the Hindu-Buddhist History class X material.

This article will only focus on the subject matter of the development of the Hindu-Buddhist kingdoms with basic competencies (3.6) Analyzing the characteristics of community life, government, and culture during the Hindu-Buddhist kingdoms in Indonesia and showing examples of valid evidence. in the life of Indonesian society today. The indicator used is (3.6.1) which is to explain the development of the Hindu-Buddhist kingdoms in Indonesia, (3.6.2). Analyzing the development of cultural results from the Hindu-Buddhist era and (3.6.4), namely showing evidence of the life and results of Hindu-Buddhist culture that still exist today. This study aims to develop WEB GIS history learning media at SMA PGRI I Kasihan Bantul Yogyakarta to improve students' concrete understanding of learning history.

2 Method

This research is research and development (R&D). This study aims to: (1) design and constructs historical learning media packaged in the form of web-based e-learning (2) develop spatial-based historical learning materials for the development of Hindu-Buddhist kingdoms; (3) test the functional validity of the application and content developed. The stages in this research are illustrated in Figs. 1, 2 and 3:

1. Data collection stage. The stages of data collection include: (a) Interview (b) Literature Study, (c) Observation (d) Questionnaire.
2. Application analysis and design. Methods of analysis and application design using a structured approach include Requirements Analysis, data flow diagrams, entity-relationship diagrams, and user interface design.

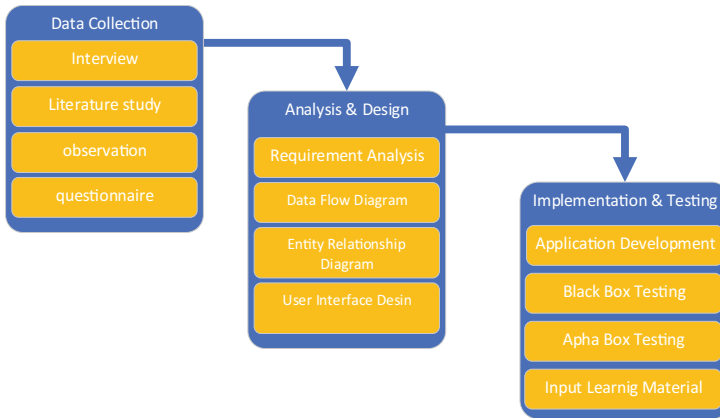


Fig. 1. Research Design

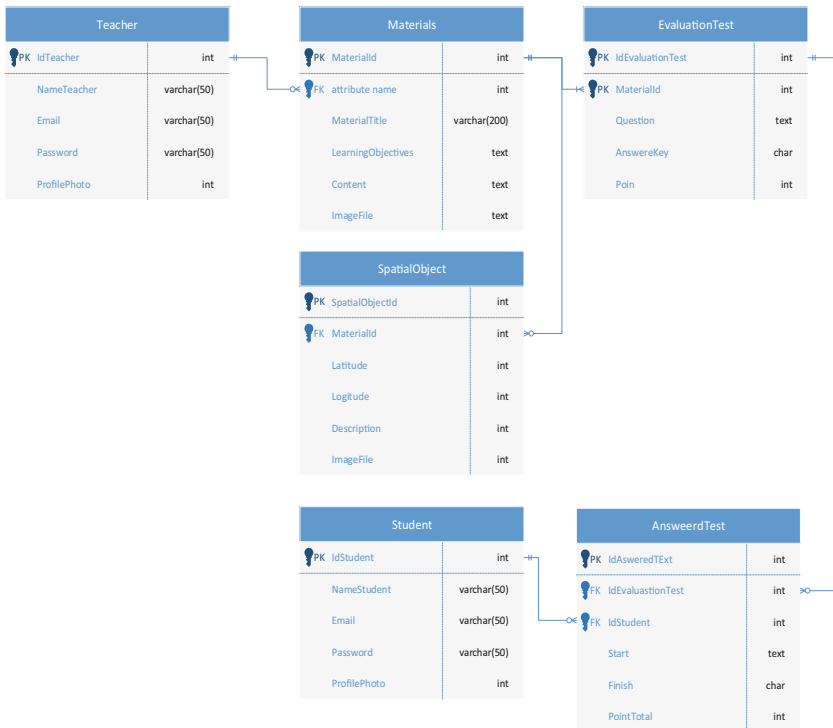


Fig. 2. Entity Relationship Diagram

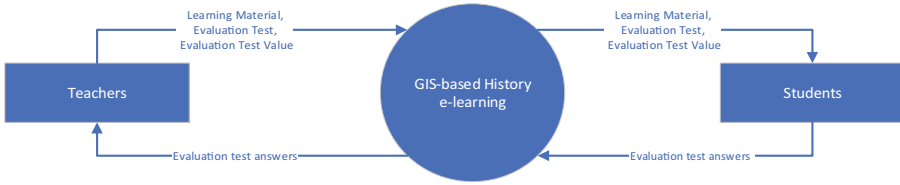


Fig. 3. Data Flow Diagram

3. Implementation and Testing of Applications; at this stage carried out several stages, namely: (a) Application development using the programming language PHP, HTML, Javascript, Bootstrap, Google Map API; (b) Black Box Testing, c) Alpha Testing, testing user interactivity to applications, (d) Input Learning Materials.

3 Results and Discussion

Practically, GIS technology is used to disseminate information in the form of attribute data and maps to increase the need for location observations needed. In the world of education, GIS technology is needed to fulfill references for teachers and students so that they can observe the required objects in detail and concretely. With the existence of GIS technology, teachers and students visit directly the location of the destination online [23]. Thus, teachers and students do not need to be bothered to visit directly because of the many time constraints and busyness [24]. With the existence of GIS technology, teachers and students get new references with more detail than the textbook they hold (Fig. 4).

GIS technology can also provide a new discourse in presenting geographic information online which is equipped with spatial data analysis in the form of images and other attribute analysis. Through GIS technology, teachers and students can select layers and items of choice and their criteria, to get the desired information. This GIS technology can add insight to teachers and students in analyzing data that is more accurate, complete, and up-to-date. Students and teachers will not be wrong in observing the intended object, because GIS technology always presents the latest data and displays changes that have occurred previously [23] (Fig. 5).

The development of GIS technology has been developed even more interestingly by adjusting learning needs. One that has been widely developed in the form of a website. Through the website, it is easier for teachers and students to use it and can arrange it according to their wishes regarding the tools needed to support students' understanding [24]. In history subjects, for example, WEB GIS has now been widely used to study historical material that requires an overview of its original location [13]. For example, when studying kingdoms such as Kutai, Mataram, and Majapahit, students need to be shown an original description of the location of their kingdoms, their heritage temples, the resulting culture, and their system of government, their triumphs, and their downfalls.

With the WEB GIS, students can easily visit historical sites online [13]. In WEB GIS, a menu is also provided to provide more detailed information to students by presenting book references that support the displayed data. An evaluation menu is also provided for



Fig. 4. Hindu Buddhist Kingdoms Page

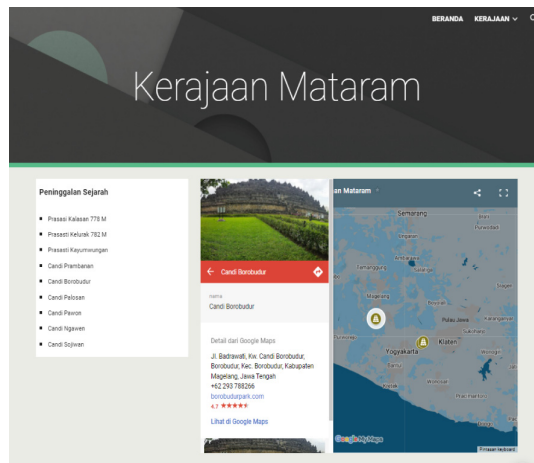


Fig. 5. Hindu Buddhist Kingdoms Page

students so that they can measure how high their level of understanding of students is after studying the material presented. With the WEB GIS, students will be more interested in learning history because they feel like they have visited the site that is presented directly. With pictures and explanations of material as well as supporting references, the analytical power of students is getting better. The existence of an evaluation menu that can be updated by the teacher whenever desired, then students will be trained to work on questions related to the material so that the level of student history learning achievement is increasing [25].

4 Conclusion

WEB GIS-based history learning can be applied at the high school level to develop students' concrete understanding, especially of the history of Hindu-Buddhist kingdoms in the archipelago. In addition, through the development of WEB GIS, students and history teachers can overcome learning difficulties in implementing distance-based or

online-based learning models. In the next stage, the historical learning development model can be used in various historical topics by the curriculum, competency standards, and core competencies of students at the high school level. In short, we can conclude that the development of a WB GIS-based learning model has potential value in increasing students' concrete understanding of learning history.

Acknowledgment. The researchers wish to thank Mrs. Heny Suprapti, S. Pd as a history teacher at SMA PGRI I Kasihan Bantul. Also, thanks are conveyed to PGRI Yogyakarta University for their support and assistance.

Authors' Contributions. Data collection in the field was carried out together by visiting several temples. Then the historical material by adjusting the basic competencies of the subjects was done by Iqbal Birsyada. The assessment instrument was carried out by Fahrudin. While the design of the WEB GIS and the operation of the WEB GIS system were carried out by Muhammad Fairuzabadi.

References

1. M. I. Birsyada, "Pengembangan strategi pembelajaran ips sejarah berbasis critical pedagogy di sekolah," *J. Sej. Dan Budaya*, vol. 9, no. 2, pp. 200–216, 2015.
2. H. Cooper, "Downloaded from: <http://insight.cumbria.ac.uk/id/eprint/4023/>," vol. 46, pp. 636–647, 2018.
3. Gunawan; Ni Made Yeni Suranti; Fathoroni, "Variations of Models and Learning Platforms for Prospective Teachers During the COVID-19 Pandemic Period," vol. 1, no. 2, pp. 75–94, 2020.
4. A. O. Karpov, "Education for knowledge society: Learning and scientific innovation environment," *J. Soc. Stud. Educ. Res.*, vol. 8, no. 3, pp. 201–214, 2017.
5. Zakaria, "Kecakapan Abad 21 Dalam Pembelajaran Pendidikan Dasar Masa Pandemi Covid-19," *J. Dirasah*, vol. 4, no. 2, pp. 81–90, 2021, [Online]. Available: <https://stai-binamadani.e-journal.id/jurdir/article/view/276>.
6. Muhammad Iqbal Birsyada, *Dasar-Dasar Pendidikan IPS (Suatu Pendekatan Teoritis dan Praktis)*. Yogyakarta: Ombak, 2016.
7. J. Sayono, "Pembelajaran Sejarah Di Sekolah: Dari Pragmatis Ke Idealis," *J. Sej. Dan Budaya*, vol. 7, no. 1, pp. 9–17, 2013, [Online]. Available: <http://journal.unnes.ac.id/sju/index.php/ijhe%0APENGARUH>.
8. Y. Liu, "Social Media Tools as a Learning Resource," *J. Educ. Technol. Dev. Exch.*, vol. 3, no. 1, 2010, doi: <https://doi.org/10.18785/jetde.0301.08>.
9. T. M. Kelly, *Teaching History in the Digital Age*. Michigan: University of Michigan Press, 2013.
10. N. Supriatna and Maulidah Neni, *Pedagogi Kreatif*. Bandung: PT. Remaja Rosdakarya, 2020.
11. A. T. Azinar, *Implementasi Critical Pedagogy Dalam Pembelajaran Sejarah Kontroversial Pada SMA Negeri Kota Semarang*. Surakarta: Tesis UNS, 2010.
12. W. G. Clarke and J. K. Lee, "The Promise of Digital History in the Teaching of Local History," *Clear. House A J. Educ. Strateg. Issues Ideas*, vol. 78, no. 2, pp. 84–87, Nov. 2004, doi: <https://doi.org/10.3200/TCHS.78.2.84-87>.
13. M. Mamoura, "History Teachers' Conceptions of Professional Identity in Developing Historical Consciousness to Students," *Am. Int. J. Soc. Sci.*, vol. 2, no. 7, pp. 49–57, 2013.
14. P. Tamm, M., & Burke, *Debating New Approaches to History*. London: Bloomsbury Publishing, 2018.

15. J. K. Clarke, W.G. & Lee, "The promise of digital history in the teaching of local history," *A J. Educ. Strateg.*, vol. 78, no. 2, pp. 84–87, 2004.
16. M. Lynch, "E-Learning during a global pandemic," vol. 15, no. 1, pp. 189–195, 2020.
17. P. T. Febrianto, U. Trunojoyo, E. J. Province, L. A. Megasari, U. Airlangga, and E. J. Province, "Implementation of Online Learning during the Covid-19 Pandemic on Madura Island , Indonesia," vol. 19, no. 8, pp. 233–254, 2020.
18. D. Darmawan, *Teknologi Pembelajaran*. Bandung: PT. Remaja Rosdakarya, 2011.
19. J. Y. Seo, "The effects of group work on interaction and learning outcomes in non face-to-face synchronous general english classes in the efl setting," *J. Educ. e-Learning Res.*, vol. 8, no. 2, pp. 230–237, 2021, doi: <https://doi.org/10.20448/JOURNAL.509.2021.82.230.237>.
20. A. . H. Sadiman, A.S., Rahardjo, R., Haryono, *Media Pendidikan, Pengertian, Pengembangan dan Pemanfaatannya*. Jakarta: PT Raja Grafindo Persada, 2016.
21. A. Patricia Aguilera-Hermida, "College students' use and acceptance of emergency online learning due to COVID-19;" *Int. J. Educ. Res. Open*, vol. 1, no. September, p. 100011, 2020, doi: <https://doi.org/10.1016/j.ijedro.2020.100011>.
22. hamidi, "Software Dan Hardware ," *Apl. Sist. Inf. Geogr. Berbas. Web Penyebaran Dana Bantu. Oper. Sekol.*, vol. 2, pp. 1–14, 2017.
23. Y. M. Efendi, I. Lutfi, W. P. Utami, and S. S. Jati, "Pengembangan Media Pembelajaran Sejarah Augmented Reality Card (ARC) Berbasis Pada Pokok Materi Peninggalan Kerajaan Singashari Untuk Peserta Didik Kelas X KPR 1 SMK Negeri 11 Malang,," *Jpsi*, vol. 1, no. 2, pp. 176–187, 2018.
24. H. P. N. Putro, "Model Pembelajaran Sejarah Untuk Meningkatkan Kesadaran Sejarah Melalui Pendekatan Inkuiri," *Paramita Hist. Stud. J.*, vol. 22, no. 2, 2012, doi: <https://doi.org/10.15294/paramita.v22i2.2121>.
25. Fahrudin, "Hubungan Kinerja Guru, Sikap Nasionalisme dan Kesadaran Sejarah dengan Prestasi Belajar Sejarah Peserta Didik SMA di Yogyakarta Tahun Ajaran 2017–2018,," Yogyakarta, 2018.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

