

Development of Web Based Teaching Materials on Environmental History

Deny Yudo Wahyudi^{1*}, Daya Negri Wijaya², Andhika Yudha Pratama³, Shela Dwi Utari⁴

^{1,2,4}History Education, Faculty of Social Sciences, Universitas Negeri Malang, Indonesia

³Department of Law and Citizenship, Faculty of Social Sciences, Universitas Negeri Malang, Indonesia

*correspondence email : deny.yudo.fis@um.ac.id

Received 30 September 2024; Received in revised form 24 February 2025; Accepted 25 February 2025

Abstrak

Tujuan penelitian ini adalah untuk mengembangkan bahan ajar berbasis website dengan materi sejarah lingkungan yang diintegrasikan dengan *ecopedagogy*. Hal ini sebagai salah satu upaya untuk memberikan sebuah wawasan baru bagi mahasiswa S1 Pendidikan Sejarah dan Pendidikan Profesi Guru (PPG) Universitas Negeri Malang jurusan sejarah mengenai sejarah lingkungan dan *ecopedagogy*. Penelitian ini menggunakan metode penelitian pengembangan milik Borg and Gall yang disesuaikan dengan kondisi penelitian di lapangan. Teknik analisis data dilakukan secara deskriptif, sedangkan perhitungan data kuesioner dilakukan secara kualitatif dan kuantitatif untuk uji responden mahasiswa. Hasil penelitian menunjukkan bahwa bahan ajar berbasis website, *ecohistory* mencapai skor 82,89%. Hal ini menunjukkan bahwa bahan ajar ini layak dan dapat digunakan secara efisien. Keberhasilan uji coba ini menjadi indikator yang baik bagi potensi penerapannya di masa depan dalam lingkungan pembelajaran di kelas.

Kata kunci: bahan ajar, website, sejarah lingkungan.

Abstract

This research aims to develop website-based teaching materials with environmental history material integrated with eco-pedagogy. This is an effort to provide new insight for undergraduate History Education and Teacher Professional Education (PPG) undergraduate students at the State University of Malang majoring in history regarding environmental history and eco pedagogy. This research uses Borg and Gall's development research method, which is adjusted to the research conditions in the field. The data analysis technique was carried out descriptively, while the questionnaire data was calculated qualitatively and quantitatively for the student respondent test. The results showed that ecohistory scored 82.89% for website-based teaching materials. This shows that this teaching material is feasible and can be used efficiently. The success of this trial is a good indicator of its potential future application in a classroom learning environment.

Keywords: teaching materials, website, environmental history.

INTRODUCTION

History has developed various new topics that can be taught to students. One topic that is often discussed in the 21st century is environmental history. Environmental history is multidisciplinary and connects the interaction between humans and their environment in changing ecology (Hanim, 2020; Santosa & Irawan, 2020). The study of environmental history provides new

insight for students in understanding environmental changes due to the impact of these interactions over time.

In its application in the curriculum, environmental history can be integrated with *eco pedagogy*, where students are sought to be aware of sustainable development. Ecopedagogy provides an overview for students to be more critical in facing environmental changes and

thinking of new changes for a friendly life (Kahn, 2010). Freire (in Misiaszek, 2017) argues that *eco-pedagogy* is a transformational environmental pedagogy centred on efforts to end socio-environmental injustice. The main goal of *eco-pedagogy* is for students to understand how actions that damage the environment can cause oppression of humans (anthropocentric aspect) and everything on Earth (biocentric aspect), how such actions are politicised, and how such actions can be found solutions to end socio-environmental oppression (Misiaszek, 2017:3).

One way to teach environmental history through the concept of *eco pedagogy* is to give freedom to educators and students to propose various environmental problems in the frame of history. Although students are given freedom, it must still be with the aim that the analysis is to analyse social-environmental justice (Kinyota, 2021; Misiaszek, 2016; Payne, 2015). Therefore, the environmental history students and educators want to discuss must be based on contextual and actual principles so that what is discussed can have the essence and accurate solutions for the future.

Learning environmental history can start with undergraduate students, history education Teachers, and Professional Education students. This is because these students are prospective educators who will later provide more contextualised

learning to students. In addition, in the independent curriculum, teachers are given the freedom to teach other materials that are not in the textbooks but remain within the corridor of the material regulated in the curriculum (Badan Standar, Kurikulum, dan Asesmen Pendidikan, 2022; Sulistiyo, 2022).

This environmental history learning must also keep up with the times, including the teaching materials and media used. Based on the results of preliminary observations on 20 July 2024, it was found that environmental history material is not taught directly through special courses. However, in this case, for example, in teacher professional education, majoring in history, it can be integrated into other similar courses. Based on the initial analysis results, it was found that 69% of students did not understand what *eco-pedagogy* was. This is because, in classroom learning, the concept of *eco-pedagogy* has yet to be taught directly by lecturers. In addition, 71% of students still need help implementing it with their teaching subjects. Students need more explicit guidance on how to link *eco-pedagogy* concepts with the curriculum and existing learning materials.

Potential problems were also found when distributing questionnaires to PPG students. Students also often use websites to access various sources of information and learning resources. This can be seen

in the chart below, where 32% of students and 68% often use the Website as teaching material.

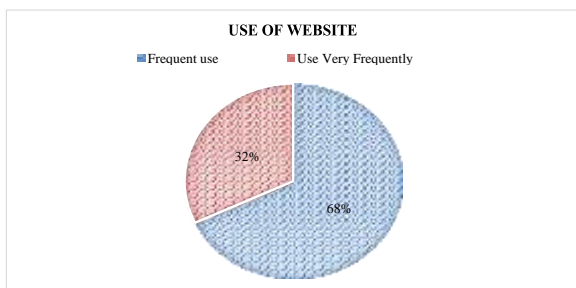


Diagram 1. Results of Questionnaire Distribution (Researcher, 2024).

Based on this analysis, it is formulated that students need teaching materials that can be accessed online. In addition, some previous research on *eco-pedagogy* and history only focuses on the application of the site as a history learning resource (Ponirin, 2022; Sumaludin, 2022), content analysis of history textbooks that incorporate *eco-pedagogy* (Sair et al., 2019), development of android-based *eco-pedagogy* media for learning history (Ponirin, 2022; Sair et al., 2019), and learning history to reduce the impact of climate change (Maulana et al., 2015; Nurdiantie, 2023). There is no *website-based* learning teaching material that students can access. Therefore, this research aims to integrate *eco-pedagogy* learning based on environmental history with technology that is currently quite popular, namely the *Website*.

METHODS

The research method used is the Research and *Development* (R&D) method. *R&D*

research is a research method aimed at producing a product and then continuing to test the effectiveness of the product that has been developed (1). The model was chosen because it has detailed, systematic research stages and is based on the development of the education field (see Figure 1) (Gall et al., 2003, 2007). The research and development method (*Research & Development*) in the field of education and learning aims to produce learning products through development activities. In this research, the resulting product is a *Website* that can be accessed *online* by loading the results of environmental history studies and connecting with *eco pedagogy*. So, in its implementation, the location used as a source of field data in this study is the Malang, Sidoarjo and Madura regions. The application of research and development steps is adjusted to the needs of researchers, given the limited time and funds owned by researchers (Gall in Utari, 2024:37).

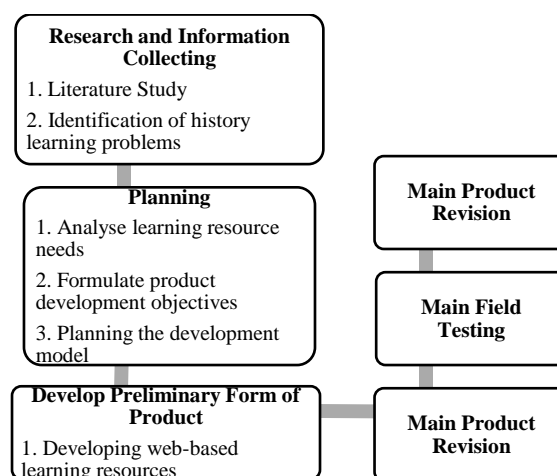


Figure 1. the research flow

The product was also tested on small and large groups to determine practicality. The small group trial sample consisted of 8 PPG students from the Department of History, State University of Malang, who were selected through *cluster sampling* (11) based on the level of knowledge scores (*high cluster*, *middle cluster*, and *lower cluster*). The large group trial subjects included 25 PPG students from the Department of History, State University of Malang. Data collection for the trial was carried out using an instrument in the form of a product trial questionnaire using a *Likert scale*. The formula used to determine the percentage of validity and feasibility of teaching material products is as follows (Arikunto, 2014):

$$P = \frac{\sum x}{N} \times 100\%, \text{ dan } NA = \frac{\sum p}{n}$$

Description

P: Percentage score

$\sum x$: Number of answers to each question

N: Total score of validator's answer who answered correctly

NA: Final score

n : Number of questions

Table 1. Data Analysis Interval Score (Akbar, 2013:42, with Adjustments)

Score Interval	Score Interval		
	1	2	3
81.00-100.00%	Very Decent	Very Valid	No Revision
61.00-80.00%	Feasible	Valid	Minor Revision
41.00-60.00%	Less Feasible	Less Valid	Major Revision
21.00-40.00%	Not Feasible	Not Valid	Not Used
00.00-20.00%	Very inappropriate	Very Invalid	Not Used

The Role of Immanuel Church Jakarta in the 1998 Reformation event used a historical research method using a multidisciplinary approach. The historical method is a process of testing, explaining and analyzing. The methodology of historical research is the process of testing and critically analyzing records and relics of the past. This method is very useful for historians to reconstruct the past imaginatively based on facts obtained through historiography (Gosttchlak, 1985: 32). In addition, the historical method is a process of reviewing, explaining and critically analyzing records and relics of the past (Sjamsuddin, 2007: 17-19).

According to Helius Sjamsuddin (2019) in his book entitled *Historical Methodology*, there are four stages in research methodology, including: (1) Heuristics (collecting sources), (2) Verification (Criticism, both external and internal criticism), (3) Interpretation, and (4) Historiography (writing) (Sjamsuddin, 2019: 54).

(1). Heuristics is the initial stage in writing history such as searching, finding and collecting sources and facts related to how the conditions and situations that existed during the reformation period in Indonesia with the economic crisis, ethnic and religious dynamics and the push for democratization entered into the role of the Immanuel Church in Jakarta during the reformation event in 1998. In this study, historical sources are used as "historical

data", which means historical materials that require processing, selection and categorization. The technique used to search for and collect historical sources is known as "heuristics." The library materials that are the sources for this research are divided into two, namely primary sources and secondary sources. The sources used are interviews with administrators and active congregations at the Immanuel Church in Jakarta in 1998.

(2). Criticism In this study, historical sources collected by researchers must be analyzed critically. Critical methods are used to assess sources used in research by comparing them with other sources to obtain accurate data. The researcher's goal at this stage is to assess historical sources related to the research problem and compare data obtained from primary and secondary sources. Internal and external criticism are two components of criticism carried out. Criticism of historical sources is a term in research for validation tests carried out simultaneously with the discovery of historical sources (Daliman, 2015: 65).

The next step in historical research is to interpret. There are two main modes in interpretation, namely analysis and synthesis (Kuntowijoyo, 2005: 103). Analysis means breaking down the data obtained. Synthesis means combining data so that historical facts are found. In this study, the interpretation step taken is to determine the interconnected meaning

between the facts that have been collected. Based on this, what is meant by interpretation is the activity of arranging and connecting or linking historical facts by trying to be as objective as possible so that it can reveal past historical events.

(3). The interpretation carried out at this stage is reading books related to the events being studied. Then a comparison is made with other sources so that relevant facts can be selected and irrelevant facts can be eliminated. Furthermore, connecting one historical fact with another, so that the causal relationship between one event and another can be known. Finally, interpreting the data that has been made to then be connected so that it becomes a complete whole and becomes a historical fact. After conducting source criticism and finding relevant data, then writing the findings with a theoretical study along with opinions to write the research results produced must also have objective data such as data findings obtained from observation results, then linking one source of results with other primary data sources obtained with book sources and providing assumptions about the discovery of the data, so that it can become a whole that can be used as a study and is worth reading.

(4). As a form of the results of this research, historiography is carried out, namely an exposition in scientific language with a distinctive art explaining

what was found along with its arguments systematically. Historiography is the final step in the historical research procedure. In historiography, a writer not only uses technical skills, the use of quotations and notes, but the writer is also required to use critical thinking and analysis (Helius Sjamsudin, 2007: 153).

The historiography activity in this study was carried out by describing the results of the interpretation of historical sources that had previously been collected at the heuristic stage and had been verified at the critical stage. In this study, an attempt was made to present objective research results based on historical source data that had gone through the heuristic, critical, and interpretation stages so that what the researcher wrote was data that could be accounted for its validity in accordance with the problems studied in this study.

RESULTS AND DISCUSSION

The Relationship between Environmental History and Ecopedagogy

Ecopedagogy and environmental history are closely related and influence each other, and this is because environmental history is the context of the past, and *ecopedagogy* is how issues in the past become the foundation for making decisions in the future. Environmental history looks at how human and environmental relationships have changed over time, highlighting how human

activities shape and are shaped by the environment (Carey et al., 2014; Dearing, 2006; Li & Li, 2022). This information provides *eco-pedagogy* with an essential foundation for understanding the causes of current environmental problems and creating long-term solutions (Dentith et al., 2022; Kahn, 2010; Misiaszek, 2017).

Environmental history also highlights humans' mistakes in managing nature, such as overexploitation, pollution and habitat destruction. In 2005, the most extensive analysis of the planet's ecological condition was released by the UN-funded *Millennium Ecosystem Assessment* (MEA). The MEA found that over the past 50 years, human activities have altered (significantly damaged) the Earth's ecosystems, primarily due to economic and social changes that have increased human demand for crops (Kahn, 2010; Kovel, 2021). These problems can be seen in illegal mining, wrong drilling procedures, flooding, deforestation, and other cases that can be traced through historical sources. *Ecopedagogy* utilises historical events to emphasise the importance of maintaining a healthy ecosystem and avoiding the same mistakes in the future.

The study of environmental history, especially in Indonesia, is rarely discussed by historians who generally discuss politics, society and economics (Santosa & Irawan, 2020). However, by looking at environmental problems in the past, the

same problems in the present and future can be anticipated. In the context of *eco-pedagogy*, environmental history has a diagnostic function by providing an intellectual perspective in revealing symptoms of social pathology and providing predictions that can ensure a better future (Kahn, 2010:4). In understanding the complexity of human relationships with nature, environmental history and *eco-pedagogy* use an interdisciplinary approach that combines social sciences, humanities, and natural sciences (Hanim, 2020; Yunansah & Herlambang, 2017). One of the efforts to foster and develop the concept of thinking oriented towards the sustainable use of the environment requires *eco-pedagogy-based* environmental history learning for students.

Students of teacher professional education and history education are prospective teachers who have the role of educating students. This role allows teachers to teach *eco-pedagogy-based* environmental history in the classroom. This learning is expected to increase their awareness of the impact of their actions on the environment by studying environmental history. *Ecopedagogy-based* learning can stimulate individuals to take proactive steps in preserving the environment and foster a sense of responsibility towards nature (Rabbianty et al., 2022; Yunansah et al., 2020; Yunansah & Herlambang, 2017).

Understanding environmental history helps develop solutions considering the social, cultural, and ecological context of the area around the students being taught.

Ecohistory Website Development

The material on the *Website* results from open contributors of essays collected from students, academics, and lecturers. The central theme of the collected essays is discussing environmental history and education in Indonesia. Then, the researcher developed a *podcast* that discusses environmental history events and concepts that can be applied in education. There is also a video feature to visualise environmental history and its relevance to the present. Some resources will be filled with historical sources that can be used as learning resources for students and lecturers to learn more about environmental history and *eco-pedagogy*. These aspects are the basis for making the *ecohistory Website prototype*.

Table 2. Features of the *ecohistory website*.

Navigation	Function
<i>Home Button</i>	It brings users back to the main page, making it easy to access navigation and features on the Website.
<i>Podcast Button</i>	It serves to bring users to listen to podcasts.
<i>Essays Button</i>	It takes users to the works of contributors who discuss the environmental history and <i>eco pedagogy</i> .
<i>Video Button</i>	Serves to take users to videos that relate to history, environment, and <i>eco-pedagogy</i> .

Resources Button	Serves to take users to the desired historical sources.
About Button	Its primary function is to provide information about the Website or the organisation/company that owns it.
Contact Button	It directs users to a page that provides contact information or a form to communicate with the user's Website owner.

The eco-history Website, which the researcher created, can be seen below, but it still needs improvement and refinement. Although this Website may still require some improvements, its functionality has improved over time with continuous improvement and refinement.



Figure 2. Home Page Display

The home function on a Website makes it easy for users to navigate back to the homepage from any page on the Website by utilising the homepage icon functionality. This is very beneficial for visitors who may need help with problems or quick navigation to the main page without manually entering the URL (Uniform Resource Locator). On the home function, several other buttons, such as podcasts, direct users to the podcast page. The next button is essays, which directs users to a collection of essays from

contributors. The last is the video button, which directs users to the video page.

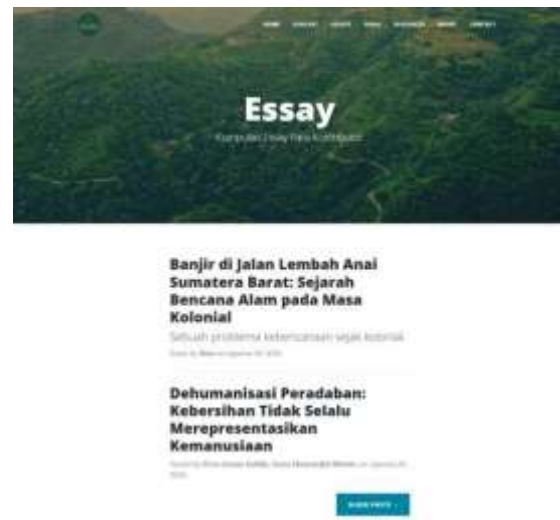


Figure 3. Essays Page Display

The essays page contains a collection of contributors' works on environmental history, focusing on environmental history from prehistoric to contemporary times. Contributors can also discuss integrating environmental history into the scope of education.

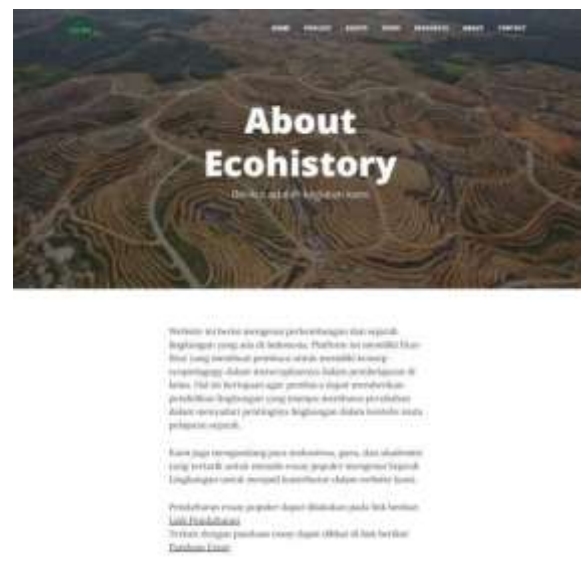


Figure 4. About Page Display

The about page serves as a platform for users to engage directly with

submissions and to find out about the activities carried out by ecohistory. Users can also submit their work through forms and guidelines on the page.

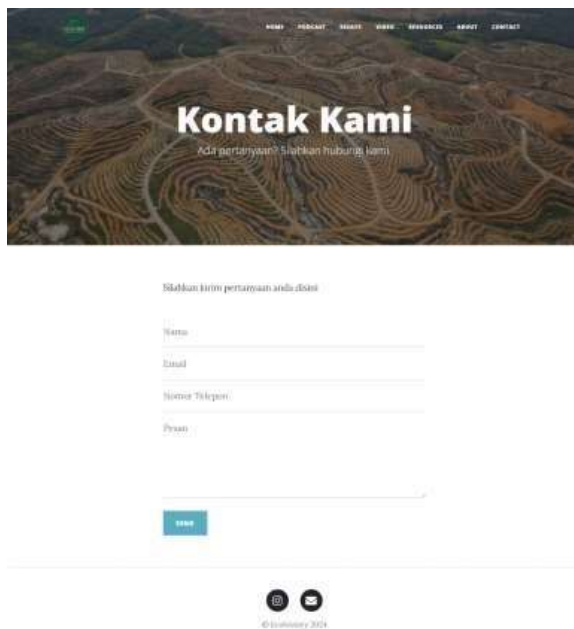


Figure 5. Contact Page Display

The contact page is a platform for users to engage directly with the Website owner. It allows users to provide feedback or ask questions.

Trial Results

The pilot test covered six indicators: language and bias, technical issues, curriculum, visual elements, activities and creativity, and material aspects (see Table 3). These categories were created to facilitate respondents in providing appropriate feedback, thus allowing researchers to implement product revisions. The linguistic component scored 443 out of a maximum score of 525 (84.38%), the technical component scored 443 out of a maximum score of 525 (84.38%), the curriculum component

scored 433 out of a maximum score of 525 (82.48%), and the visual component scored 859 out of a maximum score of 1050 (81.81%). The activity and creativity component scored 284 out of a maximum score of 350 (81.14%), while the material component scored 294 out of 350 (84%). Details of these scores and evaluations are presented in Table 3.

Table 3. Percentage Calculation Table of Trial Results

Language and Bias Aspects	Technical Aspects
$\frac{\sum 443}{\sum 525} \times 100\%$ = 84.38%	$\frac{\sum 443}{\sum 525} \times 100\%$ = 84.38%
Curriculum Aspects	Visual Aspects
$\frac{\sum 433}{\sum 525} \times 100\%$ = 82.48%	$\frac{\sum 859}{\sum 1050} \times 100\%$ = 81.81%
Aspects of Activity and Creativity	Material Aspect
$\frac{\sum 284}{\sum 350} \times 100\%$ = 81.14%	$\frac{\sum 294}{\sum 350} \times 100\%$ = 84%
Total	
$\frac{\sum 2756}{\sum 3325} \times 100\% = 82.89\%$	

The results of the small group experiment for web-based teaching materials were 82.89%. This result falls into the feasible category and is valid according to the product feasibility criteria outlined in Table 1. Therefore, the website-based teaching tool is considered feasible for history teaching and suitable for broader group trials.

CONCLUSION

Environmental history is an essential topic in eco-pedagogy because it allows

students to understand the evolution of the human-environment relationship and its impact on current environmental conditions. Undergraduate students in History Education and the Teacher Professional Education (PPG) program with a major in history have an essential role as prospective teachers who will later teach this subject in schools. Website-based teaching materials created by researchers integrate Website technology with history teaching materials, mainly focusing on environmental history integrated with eco-pedagogy. Based on the trial results, it was found that the teaching material Website named ecohistory has a score of 82.89%. This indicates that the teaching material is suitable and can be widely used.

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