



## Development of Mind Mapping Based Prezi Multimedia to Improve History Learning Outcomes

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**Abstract:** The purpose of the study was to develop, test the feasibility, and test the effectiveness of Mind Mapping-based Multimedia Prezi Next Online on Hindu-Buddhist history materials in Indonesia for students of history education at Yogyakarta State University. This research is a Research and Development, 4D model (Define, Design, Develop, Disseminate). Data collection techniques consisted of interviews, questionnaires, and tests. Data analysis techniques are in the form of preliminary studies and product feasibility. Product effectiveness analysis test for normality, homogeneity, and effectiveness. The results of the research are: (1) Developing a Multimedia Prezi Next Online product based on Mind Mapping for learning the history of materials from the Sriwijaya Kingdom. (2) The results of the feasibility of the material get 48 points and are in the appropriate category. The media aspect was assessed by media experts to get an overall score of 68, which is in the very decent category. (3) The results of the effectiveness of N-Gain describe the effectiveness of developing Mind Mapping-based Prezi Next Online with materials from the Sriwijaya Kingdom, this is indicated by an increase in learning outcomes in the classroom using Mind Mapping-based Prezi Next Online Multimedia. The use of Multimedia Prezi can deliver more interesting material and the learning process will be more fun and easy to understand.

**Abstrak:** Tujuan penelitian adalah untuk mengembangkan, menguji kelayakan, dan menguji keefektifan Multimedia Prezi Next Online berbasis Mind Mapping pada materi sejarah Hindu-Budha di Indonesia bagi mahasiswa pendidikan sejarah Universitas Negeri Yogyakarta. Penelitian ini merupakan penelitian dan pengembangan model 4D (Define, Design, Develop, Disseminate). Teknik pengumpulan data terdiri dari wawancara, angket, dan tes. Teknik analisis data berupa studi pendahuluan dan kelayakan produk. Analisis keefektifan produk dilakukan uji normalitas, homogenitas, dan keefektifan. Hasil penelitian adalah: (1) Mengembangkan produk Multimedia Prezi Next Online berbasis Mind Mapping untuk pembelajaran materi sejarah dari Kerajaan Sriwijaya. (2) Hasil kelayakan materi mendapatkan 48 poin dan berada pada kategori sesuai. Aspek media dinilai oleh ahli media mendapatkan skor keseluruhan 68 yang termasuk dalam kategori sangat layak. (3) Hasil keefektifan N-Gain menggambarkan keefektifan pengembangan Prezi Next Online berbasis Mind Mapping dengan materi dari Kerajaan Sriwijaya, hal ini ditunjukkan

*dengan peningkatan hasil belajar di kelas menggunakan Prezi Next berbasis Mind Mapping Multimedia Daring. Penggunaan Multimedia Prezi dapat menyampaikan materi dengan lebih menarik dan proses pembelajaran akan lebih menyenangkan dan mudah dipahami.*

**Keywords:** *development, mind mapping, multimedia prezi next online, sriwijaya kingdom material*

## INTRODUCTION

The learning process is essentially a process of interaction between teachers and students, both direct interaction such as face-to-face activities or indirectly, namely by using various learning media to convey material in the learning process (Setiawan & Kumalasari, 2018). This can be done by using various learning patterns (Komalasari et al., 2019; Sulistyowati et al., 2019). The use of learning patterns will make a quality learning process, so that the objectives of the learning can be achieved properly.

Learning barriers can occur, namely the emergence of communication barriers, which means that the subject matter or messages conveyed by the teacher cannot be received well by students. The existence of learning barriers resulted in not all the material in learning can be understood well by students. From these obstacles, the learning objectives will be difficult to achieve properly. To avoid all that, teachers must be able to develop learning strategies by utilizing various learning facilities and resources (Anggraeni & Setiawan, 2022; Suyudi et al., 2022).

Learning barriers can be caused by many factors. Learning difficulties can occur because the teacher does not use tools or media that match the characteristics of the students (Ihsan et al., 2020; Utami, 2020). History learning still uses improvised media so that students have difficulty understanding the material. This is also in accordance with the preliminary study conducted by the researcher, it can be seen that most of the students have difficulty in understanding and studying the material, especially regarding the Hindu-Buddhist period that occurred in Indonesia in the Hindu-Buddhist Indonesian History course (Fantula et al., 2021).

The learning process is carried out using the group presentation method and theoretical discussion which only uses the lecture method and only uses improvised learning media to make the learning process, in addition to the limited lecture time. The emergence of problems in learning history must be addressed properly by the teacher, one of which is by developing learning media (Fahrudin et al., 2022; Sastranegara et al., 2020; Setiawan et al., 2020; Setiawan & Aman, 2018; Soni et al., 2018). Moreover, it is supported by the fact that there is a lot of material during the Hindu-Buddhist period in Indonesia, which makes students tend to have to quickly grasp the material given. In addition, it is also coupled with students who lack learning motivation which is reflected in the lack of student activity in the learning process.

In order to overcome this, teachers can use efficient and effective learning media that can generate interest and interest in students to actively participate in the learning process in accordance with learning in the 4.0 era. Learning media is a tool for delivering messages (learning content) and learning information designed in such a way as to assist students in understanding the material provided by the teacher to achieve learning objectives. The learning process using learning media will be more effective and efficient by packaging material that is creative, innovative, and easy to understand and can attract student interest and motivation (Kawuryan et al., 2021; Setiawan & Hadi, 2018; Syahputra, 2020).

The series of learning processes carried out with this learning media is a condition, because the learning process is effective and varied. Furthermore, effective learning varies because in the learning process students do not merely communicate verbally through teacher explanations but students also

acquire specific skills, knowledge and attitudes, in other words effective and varied learning will occur if there are changes in cognitive aspects, affective, and psychomotor (Basri et al., 2022; Inayatillah, 2022; Munjiatun, 2018).

The use of multimedia in the learning process is expected to be one of the solutions so that classroom learning becomes effective and efficient. This multimedia helps students to be more active and motivated to participate in learning activities (Komalasari et al., 2019; Suharso, 2017). Multimedia is also expected to improve student achievement. This is to Ridwan's statement which states that "to create active student learning in students, lecturers can use multimedia and hold questions and answers and discussions". This is also reinforced by the results of a study entitled "The Role of Prezi Multimedia in Improving Student Learning Activities in the Reaction Rate course at PGRI Palembang University" by Nirfayanti which states that the role of Prezi multimedia in the learning process can involve students directly and can deliver subject matter chemistry concretely and reduce verbalism (Nirfayanti & Syamsuriyawati, 2019).

Referring to the facts obtained in the field, it encourages researchers to develop historical learning media with material about the history of Hindu-Buddhist Indonesia by using media that can convey learning materials effectively and efficiently and can increase students' knowledge, skills, and motivation to learn by using learning media using Multimedia Prezi. Through the use of Multimedia Prezi, it is hoped that it can help teachers to deliver material that is more interesting and not monotonous, so that the learning process will be more fun and easy to understand. This is because Multimedia Prezi is a program for creating animation and multimedia content. Program design is present consistently across desktops and multiple devices, including tablets, and smartphones (Langer et al., 2019).

Multimedia Prezi is used to make presentation slides more structured because

the presentation slides are in the form of a mind map (Mind Map). The Mind Map can be used to describe a lot of material in Indonesian Hindu-Buddhist history courses, can make the content of the material more attractive with colors, images, and symbols can help students concentrate more on learning material.

In Prezi presentations, text, images, videos, and other presentation media are placed on one presentation canvas and can be grouped in the provided frames. The user then determines the relative size and position between all presentation objects and can circle and highlight objects according to the concept of the Mind Mapping method. This attractive and easy-to-use presentation display is expected to make it easier for students and teachers to create a more enthusiastic and creative learning atmosphere that can increase student motivation and learning outcomes.

The development of education today which is faced with learning communication problems, namely the Covid-19 pandemic makes the learning process that must be carried out indirectly/online (Meiza et al., 2020; Mustakim, 2020; Sadikin et al., 2020) possibly require learning media so that communication barriers can be resolved properly. The use of Mind Mapping-based Prezi Next Online can be used as a medium or infrastructure that can make it easier for students to understand history learning materials.

The development of learning media using Prezi has been discussed in Pratiwi research with the title "Development of Mind-Based Prezi Learning Media Mapping (Preparation) on PPKN Content (Pratiwi, 2020), in addition to that, Rohman research entitled "Development of prezi-based media in history subjects class X high school with 4d model" (Rohman et al., 2021).

## **METHOD**

The method used is Research and Development (R & D) (Akgul-Gundogdu & Selcuk-Tosun, 2021; Purba, 2018; Setiawan et al., 2021; Sugiyono, 2020), with a 4-D

development model (four D models) (Irawan et al., 2018), namely: (a) definition, (b) design (design), (c) development (develop), and (d) dissemination (Disseminate).

Define, carried out to obtain and collect information and determine the needs needed in the learning process related to the specifications of the product being developed. Design, the design of a product that can be used in the Indonesian Hindu-Buddhist History course is carried out by the selected material. Develop, at this stage produces a product in the form of Multimedia PNO learning history that has been improved based on suggestions from material experts and media experts. Furthermore, product trials to see student responses involving 49 students and course lecturers by looking at the readability of the products that have been developed. Disseminate, which is limited dissemination by distributing the final product in the form of Multimedia PNO history learning that has been developed for lecturers who teach Indonesian Hindu-Buddhist History courses.

The research at the field trial stage used two classes, namely the experimental class and the control class (Bunari et al., 2023; Endaryati et al., 2020; Fantula et al., 2021; Junaidi, 2019; Laila et al., 2021; Setiawan & Aman, 2019; Srirahayu & Arty, 2018; Waffak et al., 2022). This trial was conducted to see the effectiveness of the PNO Multimedia product for learning the history of Hindu-Buddhist history materials in improving student learning outcomes. The research design used in this product trial is the pretest-posttest control group. The trial design of this product can be seen in Table 1.

Table 1. Trial Design

Class	Pretest	Treatment	Posttest
Experiment	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>
Control	O <sub>1</sub>	X <sub>2</sub>	O <sub>2</sub>

Information:

O<sub>1</sub> : Pretest

O<sub>2</sub> : Posttest

X<sub>1</sub> : Using Mind Mapping-based PNO Multimedia

X<sub>2</sub> : does not use Mind Mapping-based PNO Multimedia

The trial subjects in this study consisted of three subjects, namely: first, the expert who tested the feasibility of the product to be developed. These experts consist of media experts who assess the appropriateness of the media display and material experts who assess the suitability of the content of the material. To determine the experts in this study using the purposive random sampling technique. The two students and lecturers assessed the product being tested, involving 49 students and lecturers who support courses. The technique used in the selection of students is by using a purposive random sampling technique that represents the ability of students from high to medium. and low. Three students as many as 52 students were selected to test the effectiveness of the product with the cluster random sampling technique.

Data collection techniques used in this study were interviews, questionnaires, and tests (Gilmanshina et al., 2021; Maulani et al., 2022). Interviews to obtain information about the needs of lecturers and students, as well as learning outcomes, can be a reference for the development of a proper history learning PNO Multimedia. The questionnaire used is useful for obtaining information from experts and respondents. The test used to measure the effectiveness of the PNO Multimedia learning history developed in improving student learning outcomes. This test is divided into two tests, namely: pre-test and post-test.

Data analysis techniques are: (1) preliminary study data analysis is used to see the level of student need for PNO Multimedia for Hindu-Buddhist history learning. (2) product feasibility data analysis, in the form of assessment questionnaires from material experts and media experts analyzed by data tabulation. Determination of the range of product eligibility criteria scores in this study refers to the formula in Table 2.

Table 2. Product Eligibility Criteria

No	Interval	Criteria
1	$(Mi + 1,5 SD) > X \leq (Mi + 3 SD)$	Very Eligible
2	$Mi > X \leq Mi + 1,5 SD$	Eligible
3	$Mi - 1,5 SD > X \leq Mi$	Less decent
4	$Mi - 3 SD > X \leq Mi - 1,5 SD$	Not Eligible

Information:

X = Empirical Score  
 Mi = Ideal mean  
 SD = Standard Deviation  
 $Mi = \frac{\text{highest score} + \text{lowest score}}{2}$   
 $SD = \frac{\text{highest score} - \text{lowest score}}{6}$

This history learning PNO Multimedia product can be used if it gets the "Eligible" category based on the assessment of material experts and media experts, then the PNO Multimedia for Hindu-Buddhist history learning materials can be used for learning.

To determine the effectiveness of the product, several prerequisite tests were carried out, including: (1) The normality test was carried out to determine whether the data used were normally distributed or not. (2) Homogeneity test was conducted to determine the similarity of variance (Isfara & Ermawati, 2018; Srirahayu & Arty, 2018). (3) The effectiveness test was conducted to measure how effective the PNO Multimedia learning history developed was to improve student learning outcomes. Test the effectiveness using the following formula.

Table 3. N Gain Rumus formula

$$N \text{ Gain} = \frac{S_{\text{post}} - S_{\text{pre}}}{S_{\text{ideal}} - \text{skorPre}}$$

Information:

N Gain = Score Gain  
 S Post = Post-test Score  
 S Pre = Pre-test Score  
 S ideal = Maximum Score

## RESULTS AND DISCUSSION

### 1. Results

#### Mind Mapping-based Prezi Next Online Development

This research produces a product in the form of Multimedia Prezi Next Online based on Mind Mapping with Indonesian Hindu-Buddhist historical material, especially the relics of the Sriwijaya Kingdom. The development of this product can improve student learning outcomes of history education at Yogyakarta State University. The product is designed using the Mind Mapping-Based Prezi Next Online application. The development of this product is the development of the Mind Map-based Prezi Next Online multimedia of Indonesian Hindu-Buddhist historical material for students of history education at Yogyakarta State University in semester 1.

The development of making a product in the form of Multimedia Prezi Next Online Based on Mind Mapping of history learning was then revised according to suggestions from media experts, material experts, and supervisors. Development of Prezi Next Online Multimedia Based on Mind Mapping, historical learning material from the Sriwijaya Kingdom was developed using an online program with Prezi and PDF file formats. The components of the Mind Mapping Based Prezi Next Online Multimedia consists of an opening, body, and closing section. The opening section consists of the front cover and how to use Multimedia Prezi Next Online Based on Mind Mapping. In the content section, there is material left by the Sriwijaya Kingdom. In the end, there are conclusions, glossary, references, and developer identity.

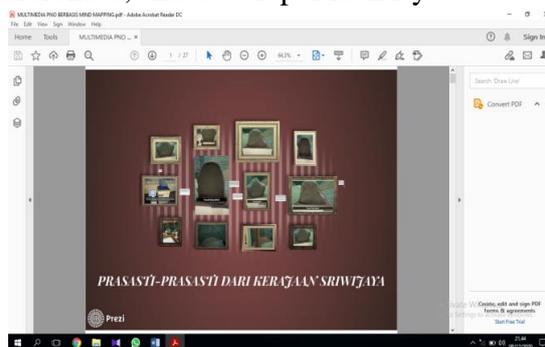


Figure 1. Front View

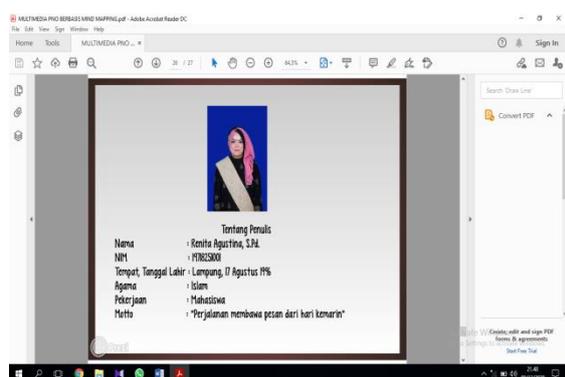


Figure 2. Back View

### Prezi Next Online Eligibility Validation based on Mind Mapping

The feasibility of the Prezi Next Online Multimedia based on Mind Mapping for learning the history of material from the Sriwijaya Kingdom includes two aspects of feasibility, namely based on material and media, each aspect is assessed by an expert. In addition, the response from lecturers and students.

Table 4. Recapitulation of Assessment Validation Results

Validator/Expert	Number/score	Criteria
Material	48	Eligible
Media	68	Very Eligible
Lecturer Response	70,006	Very Eligible
Student Response	12,071	Very Eligible

Based on table 4, the results of the product feasibility assessment according to material experts obtained an overall score of 48. The score of 48 in the feasibility category table is in the feasible category. Aspects of material expert assessment include: completeness of material content, actively involving students, material content, and learning outcomes. The media aspect assessed by media experts obtained an overall score of 68. The score of 68 in the table of eligibility categories is in the very feasible category. Aspects of media expert assessment include: Cover Multimedia Prezi Next Online based on Mind Mapping, language use, image display, readability, layout, and presentation.

Product assessment by lecturers obtained an overall score of 70.006. The score of

70.006 in the feasibility category table is in the very feasible category. Aspects of assessing the lecturer's response to the product include: material suitability, language suitability, usefulness, presentation, image readability, Mind Mapping-based Multimedia Prezi Next Online display, and usage. The conclusion of the product assessment based on the assessment of material experts, media experts, and product lecturers is declared very feasible to be used as multimedia in learning for students at universities.

After making product improvements based on suggestions and comments by material experts, media experts, and lecturers, the product was tested on students to see student responses. Based on the results of student responses, an overall score of 12.071 was obtained. A score of 12,071 based on the table of eligibility categories is in the very feasible category.

### The effectiveness of Prezi Next Online based on Mind Mapping to improve history learning outcomes

The effectiveness of the Prezi Next Online Multimedia product based on Mind Mapping for learning the history of materials from the Sriwijaya Kingdom to improve student learning outcomes in terms of the results of the pretest and posttest of the control class and the experimental class. The assessment of learning outcomes in the control class was carried out without the application of Mind Mapping-based Multimedia Prezi Next Online. Meanwhile, in the experimental class, after the pretest, the Multimedia Prezi Next Online product based on Mind Mapping was applied and then a posttest was carried out. The effectiveness test was carried out using the N-Gain formula.

Table 5. Average Test Results (N-Gain)

Category	Total/score	Criteria
N-Gain Control Class	13,0763	Low
Experimental Class N-Gain	57,9336	Moderate/Sufficiently Effective

Based on table 5 the N-Gain value for the learning outcome variable, the N-gain value

in the control class is 13.0763 which is included in the "low" category, while for the learning outcome variable in the experimental class the N-Gain value is 57.9336 which is included in the "medium" category".

Based on the results of the effectiveness of the application of Multimedia Prezi Next Online based on Mind Mapping, historical learning materials from the historical heritage of the Sriwijaya Kingdom increased learning outcomes by 57%. These results are based on the category table for the interpretation of the effectiveness of N-Gain in the "fairly effective" category. The conclusion is that the use of Multimedia Prezi Next Online based on Mind Mapping for historical learning materials from the Sriwijaya Kingdom is quite effective in improving student learning outcomes at UNY History Education.

## 2. Discussion

The results of this study have shown an increase in learning outcomes in students of the History Education study program, at Yogyakarta State University by 57.9336, which previously was only 13.0763. This study is very relevant to the research conducted by Pratiwi (Pratiwi, 2020). Based on this research, it is known that the gain test, which begins with changing the pretest and posttest values into a gain value, obtains an increase in the average gain of student learning outcomes of 0.79 and includes high criteria. This shows that the use of Prezi Next Online-based learning media in subjects has increased the average pretest and posttest scores.

International research conducted by Rohman (Rohman et al., 2021) also supports that the use of Prezi Next Online learning media can improve students' cognitive processes. The results of this study indicate that students who are taught using Prezi Next Online presentations have increased concept learning abilities and faster cognitive processes in computer network system materials. So Prezi Next Online is the right alternative for concept learning.

Meanwhile, research that supports the effectiveness of mind mapping on learning outcomes was carried out by Masita & Wulandari (Masita & Wulandari, 2018) which can be seen from the results of the t test and strengthened by the test of increasing the average score (gain) of students' pretest and posttest scores. Based on the t test, the results of  $H_0$  were rejected because  $t_{count} > t_{table}$  ( $20.4771 > 2.0930$ ). This means that there are differences in student learning outcomes that become better after learning using a mind mapping-based pocketbook. In addition, there was a gain of 0.64 in the medium category and the average difference in learning outcomes was 32. The number of students who completed the pretest and posttest also increased from 6 students (30%) to 20 students (100%). So it can be concluded that a mind mapping-based pocket book in science learning the material of heat and its transfer is effectively used in learning.

In addition, the international research conducted by Wibowo (Wibowo, 2018) also supports the use of mind mapping learning models that can improve student learning outcomes. The results showed that the application of the mind mapping learning model could improve the science learning achievement of fifth-grade elementary school students. This can be seen from the increase in student learning completeness from 65.7 to 82.34% in science learning.

This study shows that the use of Mind Mapping-based Multimedia Prezi Next Online in history learning for the material heritage of the Sriwijaya Kingdom is quite effective in improving student learning outcomes in the history education study program, at Yogyakarta State University. This is a concern that learning using interactive learning media must always be improved to attract student learning interest, so that students can easily understand the material in lectures.

## CONCLUSION

Based on the results of data analysis and discussion, it can be concluded: (1) A Mind

Mapping-based Prezi Next Online Multimedia has been developed which is appropriate to improve student learning outcomes of History Education, Yogyakarta State University in the Hindu-Buddhist History course, sub-chapter of the Heritage of the Sriwijaya Kingdom. (2) Feasibility of Prezi Next Online Multimedia based on Mind Mapping learning the history of material from the Sriwijaya Kingdom has been tested for product feasibility aspects based on material experts and media experts. The product feasibility assessment according to the material expert obtained an overall score of 48 and was in the appropriate category. The media aspect assessed by media experts obtained an overall score of 68. The score of 68 in the table of eligibility categories is in the very feasible category. As well as the results of student responses obtained an overall score of 12.071 which is in the very feasible category. (3) The effectiveness of developing Mind Mapping-based Prezi Next Online is shown by an increase in learning outcomes in the classroom using Mind Mapping-based Prezi Next Online Multimedia. The results of the pretest and posttest results of the control class and experimental class obtained the results of the control class pretest of 54 and the posttest of the control class of 57. For the experimental class, the results of the pretest were 51 and the posttest of the experimental class was 68. Based on the results of the effectiveness of the application of Multimedia Prezi Next Online based on Mind Mapping learning the history of historical relics of the Sriwijaya Kingdom increased learning outcomes by 57%. These results are based on the category table for the interpretation of the effectiveness of N-Gain in the "fairly effective" category.

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