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History-based Image Cloud Recognition Learning Method in Strengthening Students' Historical Thinking Skills

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ABSTRACT

History is a social science that applies historical thought processes through education. Generally, history learning focuses more on rote memorization methods, so the learning material will feel very difficult and quickly forgotten. This study aims to design Public History-based Image Cloud Recognition learning media to improve students' historical thinking skills while testing the effectiveness of the designed learning media. The research method used is the Research and Development (RnD) method with output as Image Cloud Recognition learning media based on Public History. Public History-based Image Cloud Recognition learning media design is carried out through three stages: preliminary studies, product development, and product trials. The research subjects selected three nonformal education in Semarang. Research findings show that the facilities and infrastructure owned by each school that is the research subject are adequate and complete to support the learning process, although some still need care. The history learning media used by history teachers is still in the form of presentation media that collaborates with static images or text, making it less exciting and monotonous. Public History-based Image Cloud Recognition learning media designed to be developed by applying Android applications, cloud storage, and camera scans to scan content from images of historical objects. The material expert validation test results obtained an average score of 4.39, and the media expert validation test obtained an average value of 4.45, so both values were included in the "Very Good" category. Meanwhile, based on trials with students in small groups, an average score of 4.61 was obtained. A value of 4.28 was received in the limited group, and an average value of 4.58 was obtained in the broad group. All three grades are classified as "Very Good." The effectiveness of products designed according to the t-test results (t count > t table) is known to be that public History-based image cloud recognition learning media effectively improves students' historical thinking skills and makes learning more enjoyable, active, and dynamic.

Keywords: Learning Media, Image Cloud Recognition, History Learning, Historical Thinking Skills

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INTRODUCTION

The development and progress of the times is a long human journey that cannot be avoided. Globalization will unwittingly give birth to the homogenization of human culture so that it will shift the unique and distinctive identity owned by each nation and can threaten the existence of national identity. The question is whether people are still willing to study history to understand the context of their people (Bunari et al., 2023; Shofwan, et al., 2023). Globalization and rapidly developing information and communication technology also impact today's young generation, who forget much history that can weaken the nation's identity. Ramona & Supriatna (2021) History can be interpreted more broadly as a house with many rooms. History learning involves memorizing dates, facts, and names and articulating historical competencies that pave the way for students and teachers to effectively examine, understand, and interpret past, present, and future events. History education is at an early stage in applying historical thought processes needed in education in the 21st century. One of the objectives of teaching history at all levels of education is to shape students to have historical

thinking (Shaw, 2021; (Domínguez-Castillo et al., 2021; Gracia et al., 2023; Serrano et al., 2022) because historical thinking is essential in the theory and practice of historical education to improve the interpretation of historical sources and the generation of compelling historical narratives (Ofianto et al., 2022; López-García, 2023). History educators who use the foundation of constructivism agree that students and teachers must be equipped with knowledge of historical methods or historical thinking that links intellectual skills with habits. Generally, history learning focuses more on memorization, which is very burdensome and quickly forgotten, so students cannot think historically. High-level cognitive processes can be carried out in terms of historical empathy because students are not only fixated on rote memorization of historical facts and concepts but also continue to give meaning to every historical event that occurred in the past (Anis et al., 2020; Serrano et al., 2022).

The problems that cause a person's inability to solve problems are not caused by a lack of approach, tools, or technology needed but because of the brain's lack of training to think scientifically. One of the effective ways that can be used to develop thinking skills and higher-order reasoning abilities in students is through dialogical education. According to Lukyanova, 2022Chang et al., 2023 Reis, 2021), it is challenging for the younger generation to construct historical thinking that shows the complexity of historical learning. The emergence of historical thinking instruments applied in developed countries makes historical education experts in Indonesia begin to be encouraged to conduct research studies to find valid and reliable historical thinking instruments to cover all challenges and failures of less standard instruments previously used (Anis et al., 2020).

In history education, thinking is historically understood as a combination of the ability to use historical evidence supported by literacy skills to obtain information and understand historical material from different sources and specific skills related to the use of sources of historical evidence from the past by historians more critically. Therefore, students' historical thinking should be included in the assessment and educational curriculum with more valid assessment instruments—previously developed historical text-based games to encourage advanced historical thinking and critical thinking skills. Students need to develop critical thinking skills to tackle fake news, enabling them to query sources, evaluate information habits, and consider the credibility of information and its sources. At the same time, a phenomenological approach was used to identify students' historical thinking skills in understanding, conceptualizing, and providing perceptions of various historical phenomena. (Domínguez-Castillo et al., 2021; by Vero & Barr, 2023; Tirado-Olivares et al., 2023; Mulyana & Kurniyavati, 2020).

This research seeks to design historical learning media in the form of Public History-based Image Cloud Recognition that is more interesting and efficient by involving technology to improve students' historical thinking skills. The novelty of this research is that learning media in the form of Public History-based Image Cloud Recognition in previous history learning has yet to be developed. This public history-based image cloud recognition learning media uses an innovative approach that will positively impact learning, making it more interactive, dynamic, and exciting and providing a different experience. This research emphasizes strengthening students' historical thinking skills by using public history-based image cloud recognition learning media so that students not only get raw historical information but also assemble, analyze, and interpret historical contexts independently. The contribution of this research is to design the development of more exciting and effective learning media for students to understand history.

METHOD

This research uses a Research and Development (RnD) approach so that the final result will be in the form of learning products that can be tested and developed. This research focuses on developing public history-based Image Cloud Recognition learning media products to improve students' historical thinking skills. The subjects of this study were students of Community Learning Center 1 (pilot project), Community Learning Center 2, and Community Learning Center 3. The procedure of this RnD research uses the development of Sukmadinata (2015), which consists of three main stages, namely: A preliminary study will explore information on learning media needs, including technology and media variations used through observation, interviews, and distribution of questionnaires with a Likert scale of 1-5 (significantly less delicious). Questionnaires were given four times: (a) questionnaires for teacher and student needs (preliminary studies), (b) questionnaires on historical thinking skills (before and after product implementation), (c) validation questionnaires for material experts and media experts (product development), (d) trial questionnaires (to students) to determine student interest in the learning media used. Product development to produce superior

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learning media through the validation process of material experts and media experts using validation questionnaires. The validation results will be used to develop and refine products designed to be more viable, followed by continued trials on small, limited, and broad groups (evaluating the shortcomings of the products produced). Test the product to test the effectiveness of the developed product. Product testing is carried out through a classroom experimental process with experimental class and control class treatment. Effectiveness tests are carried out by pre-test and post-test. A pre-test is conducted to determine students' initial abilities related to students' historical thinking skills in history learning. The experimental class was given digital map media, while the control class was given media other than digital maps. After that, it is given a post-test. Pre-test and post-test scores are used as a basis for decision-makers regarding the effectiveness of Image Cloud Recognition learning media in improving students' historical thinking skills.

The data collected through the distribution of questionnaires were analyzed by descriptive statistical analysis methods, namely through analysis prerequisite tests (normality tests and homogeneity tests) to test the validity of research data and t-tests to determine the effectiveness of public history-based Image Cloud Recognition learning media to improve students' historical thinking skills.

RESULTS AND DISCUSSION

Preliminary Study

Preliminary studies are carried out as a form of initial observation to explore information on existing learning needs and media. Based on preliminary observations, it was found that the facilities and infrastructure provided by Community Learning Center 1 to organize an education system are adequate and relatively complete, including comfortable classrooms equipped with LCD projector facilities, active speakers, air conditioning, and wifi that can be used during the learning process at school. These adequate facilities are also found at Community Learning Center 2, although more complete than those at Community Learning Center 1. Community Learning Center 3, which encourages the development of technology-based learning, provides facilities such as wifi to make the paperless program successful.

History subjects are compulsory subjects in the educational curriculum (independent curriculum or curriculum 13), used and taught by three history teachers, one of whom is a PPG SM3T graduate at Community Learning Center 1 and Community Learning Center 2. In comparison, five history teachers teach the history subject at Community Learning Center 3. Based on the learning media used in history subjects, they have applied interactive learning media in the classroom through PowerPoint percentages, videos, word walls, and infographic media to complete the final project. During the application of learning media, there are still several obstacles that can hinder the implementation of learning in class, such as the use of Wordwall as student worksheets, causing some of the students in the class to be unable to complete their learning projects during class hours, damaged facilities, and so on.

Community Learning Center 2 has also used various multimodal learning media in learning history in the classroom. Generally, they use PowerPoint presentation media, concept maps, images, videos, and other media displayed on the projector. To support the learning of historical material, Community Learning Center 2 also conducts historical research visits in historical places in Semarang City as a form of team project learning provided by the teacher. Community Learning Center 2 is one step ahead in using technology for the educational process. Schools utilize the Alfresco application to document the track record of the educational process, including teaching materials, assessments and evaluations, assignments, and examinations. However, the application of innovative learning media also needs to be improved, namely, the application of the same learning method (PowerPoint presentation) for all classes so that there is no differentiation of learning methods, and it tends to be monotonous. This causes students to get bored more easily, sleepy, and unfocused, so the learning infrastructure needs to be improved.

While Community Learning Center 3, Community Learning Center 1, and Community Learning Center 2 also utilize PowerPoint presentation materials in learning, they also use YouTube media to display learning videos on the historical theme being taught. The history teachers at Community Learning Center 3 also explained that the school's learning support facilities were adequate and appropriate during the learning process. A teacher must be able to adapt his teaching methods to be consistent with changes and know how to utilize technology to improve the efficiency of learning media because information and communication technology are inseparable parts of the learning system. The integration of technology in education in the

digital age gets much attention, but evidence of the use of technology in supporting students' historical thinking is still limited (Ponputtha et al., 2021; Cuban & Jandric, 2015; Tirado-Olivares et al., 2023).

If traced from the extracurricular implementation, there still needs to be an extracurricular that supports history learning. Meanwhile, Community Learning Center 2 and Community Learning Center 3 already have extracurriculars that support history teaching. At Community Learning Center 2, extracurricular photography, journalism, and theater can be used to support history learning. Meanwhile, Community Learning Center 3 uses a journalism extracurricular called Canopy to support history learning through writing and communication activities.

Historical thinking combines "knowing history" and "doing history" to produce a deep understanding of history. (Wilke et al., 2022) According to him, students are categorized as able to think historically if they meet the following five criteria: (a) able to think chronologically (chronological thinking), (b) have historical understanding (historical comprehension), (c) able to analyze and interpret history (historical analysis and interpretation), (d) can conduct historical research (historical research capabilities), and (e) understand historical issues and can make decisions (historical issues-analysis and decision-making). Based on these criteria, observations found that students' chronological thinking skills were still relatively low. This is based on observational findings that students can still not sort historical events according to their timeline. UCLA History, (2024) According to the results of the study, it was found that the level of historical thinking of students still needs to be improved, so it is necessary to handle the undergraduate training of teachers in a more complex way.

The study also confirms that a direction is needed for training bachelor's degree teachers from a social science perspective. Serrano et al. (2022) The criteria for students' historical analysis and interpretation skills show that students still need to use primary sources in history learning. They are directed to learn from books, teaching materials, and digital sources like the Internet because they are more fun. According to Bel Martínez et al. (2019), the ability of textbooks to develop complex cognitive skills related to students' historical thinking is limited. According to the study, students still do not master theories associated with the appropriate terms for each historical evidence. Students are accustomed to using encyclopedias, the internet, Google, and Wikipedia as secondary historical sources to investigate historical events that incidentally can cause credibility problems, so they must be more careful (Gracia et al., 2023). The criteria for the ability to conduct historical research are still not owned by students, including basic terms in historical research. Bae et al. (2021) use a problem-based learning (PBL) approach to develop students' historical thinking by considering disciplinary norms governing historical research's complex and ambiguous nature. The criteria for understanding historical issues and the ability to make decisions based on observations have been mastered by students. Students can take the essence of any historical event nationally and apply its values to life.

Based on observations, it can be analyzed that students' historical thinking skills are still not well embedded, so efforts to strengthen and improve these abilities must be made and responded to appropriately. Historical understanding, historical thinking, and historical awareness are the needs of the nation that must be learned in history learning so that students cannot be separated from the understanding of their nation's history. Understanding history will allow you to develop a mindset to think historically through critical, creative, and imaginative thinking patterns. So, the intelligence of historical thinking can be used to understand the socio-nation phenomenon more carefully, clearly, and comprehensively to foster wisdom and awareness of history (Bunari et al., 2023) and can be the key to building a more critical and egalitarian future (Díez-Bedmar, 2022).

The development of historical thinking skills must be planned through active learning-centered activities, different learning methods, and strategies to attract students' attention. According to (Keleşzade et al., 2018; Avianto, 2023), applying local history learning methods becomes more attractive than conventional learning. Learning local history can also be used as a new alternative to improve nationalism and critical thinking skills in students. History learning is given to train students to think about history. A unique evaluation model is needed to determine the extent of achievement of students' ability to think historically.

There needs to be more than just learning with traditional models to encourage the strengthening and improving students' historical skills. Still, it must be accompanied by developing and implementing learning media that use technology. According to the observations, teachers and students agreed to accept the new learning media developed in this study. This positive opportunity will positively impact the development of Public History-based Image Cloud Recognition learning media. This is because learning media development is carried out by looking at the needs and relevance of the research environment. According to epistemological beliefs, history teachers are highly influential in their teaching practice and the need to develop students' historical thinking skills. But, to develop historical thinking in the classroom, history teachers need to lay a

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solid foundation on the concepts of thinking historically, understanding history, studying disciplines, and looking for markers of students' cognitive development. Historical thinking will help us understand a complex process, increase appreciation of context and contingencies, teach students to show the influence of history on the future, and encourage intelligent attitudes towards information and its use (Anis et al., 2020; Wilke et al., 2022; Romera et al., 2019; Large & Calderón, 2021)

Educational innovation involves global changes in learning methods and approaches to subject content for learning to be more meaningful, competent, and critical. Noticeable changes in teaching history, approaches to teaching history, and the process of history education can be improved. The learning media design for public history-based Image Cloud Recognition learning media is developed based on historical material from the RPP and syllabus. The historical material studied is related to local historical events in Semarang, which is integrated with colonialism material in Indonesia written by relevant historians and academics (Sáiz Serrano, 2023; Guerrero-Romera & Pérez-Ortiz, 2022).

Product Development

This product development stage will present the design of Image Cloud Recognition learning media relevant to historical learning, including its content, pedagogy, appearance, language, and the purpose of designing the learning media. Image Cloud Recognition learning media is created by implementing Android applications, cloud storage systems, and camera scans. Cloud computing and digital technology in the digital age are used to perform image processing, including image identification. More extensive and flexible cloud storage when collaborating with intelligent hardware and software will become tight (Gao & Zhou, 2022; Xie et al., 2021).

Image Cloud Recognition learning media is one form of ethnographic teaching materials. Pratic and effective ethnophotography teaching materials can improve learning outcomes and foster students' awareness of historical thinking. The development of Learning Media Image Cloud Recognition based on Public History is a form of information and communication technology application in education. According to him, it is essential to pay more attention to information and communication technology as part of globalization, as well as remind policymakers to consider the use of technology as a critical component in the design of educational curricula in the future (Purnamasari, 2023; Rafiepour & Farsani, 2021).

Figure 1. Logo Media "Digital History"

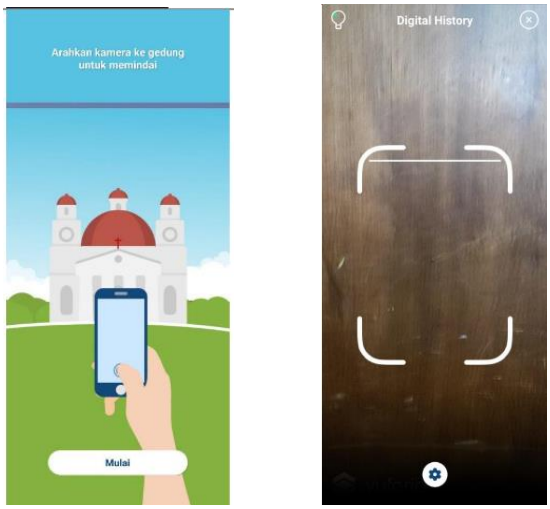

Figure 2. Application Display "Digital History"

Researchers also collaborate with media and material experts to align the application's appearance with historical content to improve students' historical thinking skills. The content that becomes input in the application is adjusted to the criteria determined by teachers and students while referring to the lesson plan and history learning syllabus. In developing historical thinking students, it is essential to teach and evaluate historical thinking skills because it allows us to know the cognitive abilities of students to organize and understand historical events in the past chronologically (Sepúlveda, 2021).

The workings of the "Digital History" application are designed to be very simple both in terms of operation and content, so it is easy to apply during the learning process. The "Digital History" application can be installed on smartphones through the Google Play Store. The learning content in the application carries the mission of promoting public history in Semarang City, for example, historical building materials such as Blenduk, Marba, and Spiegel Churches, which are carefully arranged to look more attractive.

Figure 3. Content Payload Example

The existence of this learning media in the future can be developed for the general public, not only for school students, so that it will help those who are interested in conducting historical studies and tourism in Semarang City while still paying attention to the relevance and ease of learning historical material to improve historical thinking skills. Because, strengthening the ability to think historically is needed by everyone to describe the chronology of events based on historical facts (Warmansyah Abbas & Susanto, 2022).

Product Validation Test

This product validation test goes through two stages of testing, namely validation testing from the content side by two material experts and validation testing from the media side by two media experts. After the validation test, the feasibility test of Public History-based Image Cloud Recognition learning media was carried out through trials in small, limited, and broad groups. The trial results will be obtained in several notes, either in suggestions or revisions to developing the Public History-based Image Cloud Recognition learning media product that is designed to be improved.

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Table 1. Product Validation and Trial Results

No	Validation and Trials	Average rating	Category	Information
1.	Family material of Validasi	4,39	Excellent	Make improvements to content content that is truncated and repeats occur
2.	Validation family media	4,45	Excellent	Make improvements to some parts (text and graphics) to make it more attractive
3.	Limited group trials	4,28	Excellent	
4.	Small group trials	4,61	Excellent	
5.	Wide group trials	4,58	Excellent	

Based on the results of the validation of material experts and media experts in Table 1, it is known that the application's material and media content (design) are designed very well. However, some parts must be improved according to the findings of expert experts. After improvement, researchers conducted feasibility tests through trials on several groups: limited, small, and broad. The trial results stated that the Public History-based Image Cloud Recognition learning media designed by researchers suits the history learning process.

Product Effectiveness Test

Product effectiveness testing is carried out by forming learning classes as experimental classes and control classes for each research subject. The provisions of the experimental class and the control class are determined as follows:

Table 2. Treatment for Effectiveness Tests

No	Class	Treatment	Meeting	Time	Beginning of Meeting	End of Meeting
1.	Experiment	History learning using Public History-based Image Cloud Recognition learning media	1 x	90 minutes (2x45 minutes)	Pre-test	Post-test
2.	Control	History learning using power point presentation media	1 x	90 minutes (2x45 minutes)	Pre-test	Post-test

The learning mechanism in the experimental class was given a pre-test (20 questions) at the beginning of the meeting, then continued learning history using Public History-based Image Cloud Recognition learning media. At the end of the meeting, a post-test will be given to determine the mastery of each student's material after using Public History-based Image Cloud Recognition learning media. Learning is implemented using the Contextual Teaching Learning system with a discussion method, so students are more active.

The learning mechanism in the control class was given a pre-test (20 questions) at the beginning of the meeting to find out the learning achievement of each student before receiving learning material, then continued learning history using PowerPoint media and lecture methods. At the end of the meeting, a post-test will be given.

The learning outcomes of the experimental class and the control class are as follows:

Table 1. Student Learning Outcomes

No	Test	Experimental Class			Control Class		
		Value			Value		
		Min	Max	Average	Min	Max	Average
Community Learning Center 1							
1.	Pre-test	25	55	35,8	20	60	38,6
2.	Post-test	70	90	81,8	45	70	58,6
Community Learning Center 2							
1.	Pre-test	30	50	36,8	30	50	37,2
2.	Post-test	60	85	80,6	50	65	48,4
Community Learning Center 3							
1.	Pre-test	25	60	37,4	30	60	39,6
2.	Post-test	65	80	79,4	45	75	49,4

Based on pre-test scores, students in the control class had better learning outcomes than those in the control class. After the experimental class was given learning treatment using Public History-based Image Cloud Recognition learning media, student learning outcomes in the experimental class were higher than in the control class. The application of learning models in history learning is an obligation that students are motivated to think critically, which can positively impact learning outcomes so that the ability to think historically in history learning can be achieved. According to the findings, historical thinking skills in students need to be applied comprehensively in the learning process because they are related to increasing students' intrinsic motivation (Zaenal Arifin Anis et al., 2021; Kaviza et al., 2018).

Based on the results of statistical analysis using SPSS V.25, the normality test using the One-Sample Kolmogorov-Smirnov Test method and homogeneity tests in both experimental and control classes obtained a significance value of more than 0.05, which means that research data from pre-test-and-post-test-results-are-normally-distributed-and-homogeneous. Meanwhile, to test the effectiveness of Public History-based Image Cloud Recognition learning media on student achievement in the experimental class using the Paired Sample Test, a significance value of 0.000 < 0.05 was obtained, which means that there was a good increase in student achievement scores in the experimental class before and after being given Public History-based Image Cloud Recognition learning media. Meanwhile, based on the t-test using the Independent Sample Test, a significance value of 0.00 < 0.05 was obtained, which means that there are differences in the influence of learning media on students' historical thinking skills in experimental and control classes. When using a calculated t value, the calculated t value > t table means that Public History-based Image Cloud Recognition learning media is more effectively used to improve students' historical thinking skills than PowerPoint.

CONCLUSION

The provision of facilities in the form of facilities and infrastructure to support the learning process provided by the school is very adequate. Varied learning media are often not accompanied by competent human resources in their fields, so the learning media cannot be applied optimally. Public history-based Image Cloud Recognition learning media is expected to be developed to encourage the improvement of students' historical thinking skills. The design of public history-based Image Cloud Recognition learning media has five essential stages: learning media analysis, library resource collection, material preparation according to relevant competencies, making media design and learning content, and drafting public history-based Image Cloud Recognition. The application of public history-based Image Cloud Recognition learning media is declared feasible based on material and media experts' validation. In addition, public history-based Image Cloud Recognition learning media has also proven effective in improving students' historical thinking skills compared to PowerPoint presentation media. This research implies that public history-based Image Cloud Recognition learning media triggers the use of many human senses. It will strengthen students' recording power because they get a more exciting learning experience. In addition, public history-based Image Cloud Recognition learning media effectively improves students' historical thinking skills, so historical content is still needed for continuous development, including the resources involved in it to be more optimal.

REFERENCES

Anis, M. Z. A., Putro, H. P. N., Susanto, H., Hastutui, K. P., & Mutiani. (2020). Historical Thinking Model in Achieving Cognitive Dimension of Indonesian History Learning. *PalArch's Journal of Archaeology of Egypt / Egyptology*, *17*(7), 7894–7906. https://dx.doi.org/10.13140/RG.2.2.25528.57606

Avianto, B. N. (2023). The Historical Communities Capacity In Fostering Nationalism And Tradition Of Critical Thinking. *Journal of Community Positive Practices*, *23*(1), 50–66. https://doi.org/10.35782/JCPP.2023.1.05

Bae, H., Craig, K., Xia, F., Chen, Y., & Hmelo-Silver, C. E. (2021). Developing Historical Thinking in Large Lecture Classrooms Through PBL Inquiry Supported with Synergistic Scaffolding. *Interdisciplinary Journal of Problem-Based Learning*, *15*(2). https://doi.org/10.14434/ijpbl.v15i2.28776

Bel Martínez, J. C., Colomer Rubio, J. C., & Montés, R. V. (2019). Visual literacy and historical thinking development: Activities with pictures in textbooks. *Education XX1*, *22*(1), 353–374. https://doi.org/10.5944/educxx1.20008

Bunari, Fadli, M. R., Fikri, A., Setiawan, J., Fahri, A., & Izzati, I. M. (2023). Understanding history, historical thinking, and historical consciousness, in learning history: An ex-post-facto correlation. *International*

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https://journal.unnes.ac.id/journals/jone

Journal of Evaluation and Research in Education, *12*(1), 260–267. https://doi.org/10.11591/ijere.v12i1.23633

Chang, C. C., Wegerif, R., & Hennessy, S. (2023). Exploring dialogic education used to teach historical thinking within the cultural context of East Asia: A multiple-case study in Taiwanese classrooms. *Learning, Culture and Social Interaction*, *41*. https://doi.org/10.1016/j.lcsi.2023.100729

Cuban, L., & Jandric, P. (2015). The dubious promise of educational technologies: Historical patterns and future challenges. *E-Learning and Digital Media*, *12*(3–4), 425–439. https://doi.org/10.1177/2042753015579978

De Vero, I., & Barr, M. (2023). A Historical Text-Based Game Designed to Develop Critical Thinking Skills. *International Journal of Game-Based Learning*, *13*(1). https://doi.org/10.4018/IJGBL.323138

Díez-Bedmar, M. del C. (2022). Feminism, Intersectionality, and Gender Category: Essential Contributions for Historical Thinking Development. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.842580

Domínguez-Castillo, J., Arias-Ferrer, L., Sánchez-Ibáñez, R., Egea-Vivancos, A., García-Crespo, F. J., & Miralles-Martínez, P. (2021). A competency-based test to assess historical thinking in secondary education: Design, application, and validation. *Historical Encounters*, *8*(1), 30–45. https://doi.org/10.52289/hej8.103

Gao, Y., & Zhou, Z. (2022). Automatic Recognition and Repair System of Mural Image Cracks Based on Cloud Edge Computing and Digitization. *Mobile Information Systems*, *2022*. https://doi.org/10.1155/2022/1534596

Gracia, P. R., Morán, B. A., & García-Ceballos, S. (2023). Progression of Historical Thinking in High School Students: Sources and Critical Thinking. *Electronic Journal of Educational Research*, *25*(e09), 1–16. https://doi.org/https://doi.org/10.24320/redie.2023.25.e09.4338

Guerrero-Romera, C., & Perez-Ortiz, A. L. (2022). The Training Needs of In-Service Teachers for Teaching Historical Thinking Skills in Compulsory Secondary Education and the Baccalaureate Level. *Frontiers in Education*, *7*. https://doi.org/10.3389/feduc.2022.934646

Kaviza, M., Rahim, F. A., & Bukhari, N. (2018). (Historical thinking skills application on a history subject and its relationship with intrinsic motivation: A correlation study). *Asia Pacific Journal of Educators and Education*, *33*, 95–108. https://doi.org/10.21315/apjee2018.33.7

Keleşzade, G., Güneyli, A., & Özkul, A. E. (2018). Effectiveness of history teaching based on social constructivist learning and development of historical thinking skills. In *Egitim ve Bilim* (Vol. 43, Issue 195, pp. 167–191). Turkish Education Association. https://doi.org/10.15390/EB.2018.7479

Large, J., & Calderón, J. P. R. (2021). Gauging reflexive historical thinking: An exploratory study of Columbian undergraduates. *Historical Encounters*, *8*(1), 139–155. https://doi.org/10.52289/hej8.109

López-García, A. (2023). Effectiveness of a teaching methodology based on the theory of historical thinking through active methods and digital resources in Spanish adolescents. *Frontiers in Education*, *8*. https://doi.org/10.3389/feduc.2023.1175123

Mokiy, V., & Lukyanova, T. (2022). Prospects of Integrating Transdisciplinarity and Systems Thinking in the Historical Framework of Various Socio-Cultural Contexts. *Transdisciplinary Journal of Engineering and Science*, *13*, 143–158. https://doi.org/10.22545/2022/00184

Mulyana, A., & Kurniawati, Y. (2020). Phenomenography analysis of students' historical thinking ability in studying social history. *Educational Horizons*, *39*(3), 666–678. Hatps://doi.org/10.21831/cp.v39i3.28982

Ofianto, Aman, Ningsih, T. Z., & Abidin, N. F. (2022). The Development of Historical Thinking Assessment to Examine Students' Skills in Analyzing the Causality of Historical Events. *European Journal of Educational Research*, *11*(2), 609–619. https://doi.org/10.12973/eu-jer.11.2.609

Ponputtha, W., WannapiroonWannapiroon, P., & Nilsook, P. (2021). Creative History Learning Model Using Digital Storytelling through Cloud Learning to Enhance Analytical Thinking. *International Journal of E-Education, e-Business, e-Management and e-Learning*, *11*(2), 42–50. https://doi.org/10.17706/ijeeee.2021.11.2.42-50

Purnamasari, I. (2023). Fostering Historical Thinking Skills with Ethnophotography-based Teaching Materials in Elementary Schools. *Paramita*, *33*(2), 341–352. https://doi.org/10.15294/paramita.v33i2.41601

Rafiepour, A., & Farsani, D. (2021). Cultural, historical analysis of Iranian school mathematics curriculum: The role of computational thinking. *Journal on Mathematics Education*, *12*(3), 411–426. https://doi.org/10.22342/JME.12.3.14296.411-426

Ramona, N., & Supriatna, N. (2021). Historical Literacy as Strengthening Character Education. *Advances in Social Science, Education, and Humanities Research, Volume 578 Proceedings of the 6th International Conference on Education & Social Sciences (ICESS 2021)*, 224–231.

Reis, A. S. C. (2021). Historical Thinking Operations of Young Students: a Study on the Concept of Evidence. *Revista Brasileira de Historia*, *41*(86), 67–86. https://doi.org/10.1590/1806-93472021v41n86-03

Romera, C. G., López--García, A., & Fernández, J. M. (2019). Historical thinking in the classroom can be developed through a training program for secondary education. In *Revista Electronica Interuniversitaria de Formacion del Profesorado*,*22*(2). 81–93. https://doi.org/10.6018/REIFOP.22.2.363911

Sáiz Serrano, J. (2023). Training future secondary school teachers in historical thinking: analysis of levels and discourses. *Interuniversity Journal of Teacher Training. Continuation of The Old Journal of Normal Schools*, *98*(37-53). https://doi.org/10.47553/rifop.v98i37.3.96970

Sepúlveda, H. Á. (2021). Evaluation of the historical thinking of high school students through constructing historical narratives about the native peoples of Chile. *Revista Do Programa de Pós-Graduação Em História*, *28*, 1–18. https://doi.org/10.22456/1983-201X.111650

Serrano, M. J. L., García-Morís, R., López-Fernández, J. A., & Quintana, S. M. (2022). Narratives and Didactics of Social Sciences: The Historical Thinking of Future Teachers in Primary Education. *Multidisciplinary Journal of Educational Research*, *12*(3), 275–294. https://doi.org/10.4471/remie.5919

Shaw, E. (2021). Historical thinking and family historians: Renovating the House of History? *Historical Encounters*, *8*(1), 83–96. https://doi.org/10.52289/hej8.106

Shofwan, I., Sunardi, S., Gunarhadi, G., & Rahman, A.H. (2023). Entrepreneurship Education: Encouraging Entrepreneurial Intentions for Equality Education Students in Semarang. *International Journal of Learning, Teaching and Educational Research*. https://doi.org/10.26803/ijlter.22.6.10

Tirado-Olivares, S., Navío-Inglés, M., O'Connor-Jiménez, P., & Cózar-Gutiérrez, R. (2023). From Human to Machine: Investigating the Effectiveness of the Conversational AI ChatGPT in Historical Thinking. *Education Sciences*, *13*(8). https://doi.org/10.3390/educsci13080803

UCLA History. (2024). *Historical Thinking Standards*. Public History Initiative. https://phi.history.ucla.edu/nchs/historical-thinking-standards/

Warmansyah Abbas, E., & Susanto, H. (2022). Strengthening Historical Thinking Skills Through Transcript-Based Lesson Analyses Model In The Lesson Of History. *ISTORIA: Journal of Education and History*, *18*(1). https://journal.uny.ac.id/index.php/istoria

Wilke, M., Depaepe, F., & Nieuwenhuyse, K. Van. (2022). The interplay between historical thinking and epistemological beliefs: A case study with history teachers in Flanders. *Historical Encounters*, *9*(1), 196–219. https://doi.org/10.52289/hej9.111

Xie, P., Ma, E., & Xu, Z. (2021). Cloud Computing Image Recognition System Assists the Construction of the Internet of Things Model of Administrative Management Event Parameters. *Computational Intelligence and Neuroscience*, *2021*. https://doi.org/10.1155/2021/8630256

Zaenal Arifin Anis, M., Susanto, H., & Mardiani, F. (2021). Analysis of the Effectiveness of MPBH: The Mains of Mandai as a Saving Food in Banjarmasin Community. *Advances in Social Science, Education, and Humanities Research, Volume 525 Proceedings of the 2nd International Conference on Social Sciences Education (ICSSE 2020)*, 89–94. https://dx.doi.org/10.2991/assehr.k.210222.012