The Implementation of Resource Based Learning Model Assisted by Digital Scrapbook in Improving Student Historical Thinking Skills in History Lessons

Sumardi*, Fani K. Nisa, and Mohamad Naim

Department of History Education, Faculty of Teacher Training and Education, University of Jember, Jember, Indonesia
Email: sumardi.fkip@unej.ac.id (S.); nisafanikhoirun@gmail.com (F.K.N.); mohammadnaim@unej.ac.id (M.N.)
*Corresponding author

Manuscript received January 9, 2025; revised February 7, 2025; accepted March 13, 2025; published September 18, 2025

***Abstract*—Resource-Based Learning (RBL) is an instructional method that encourages students to actively interact with various learning materials. This approach is based on the idea that learning becomes more effective and meaningful when students engage directly with resources rather than passively receiving information through lectures. The purpose of this study was to improve students' historical thinking skills in history lessons by implementing the RBL model assisted by a digital scrapbook, which enables students to compile and integrate multiple historical sources into a single platform. The research was conducted with Class XI MPLB students at SMKN 4 Jember using a quantitative approach to test theoretical concepts and analyze relationships between different variables. The study employed a quasi-experimental method with a pretest and post-test design to assess the impact of the intervention. The results indicated a significant improvement in students' historical thinking skills after the implementation of the RBL model assisted by a digital scrapbook. Statistical analysis using SPSS showed an increase in post-test scores compared to pre-test scores, demonstrating the effectiveness of this instructional approach. Furthermore, qualitative analyses were conducted using phase portrait analysis, NVivo for qualitative coding and pattern identification, and SmartPLS for structural equation modeling, providing deeper insights into the learning process. These findings suggest that RBL, combined with digital scrapbooking, can serve as an effective strategy to enhance students' historical thinking skills.**

***Keywords*—digital scrapbook, history, historical thinking skills, Resource-Based Learning (RBL)**

I. Introduction

Resource-Based Learning (RBL) is not a new concept, as students have traditionally relied on various learning materials such as books. Over time, the range of learning resources has expanded to include lesson plans, study guides, textbooks, workbooks, and audiovisual media [1, 2]. RBL is an instructional approach that provides students with diverse learning materials, allowing them to explore knowledge and develop skills independently without depending entirely on teacher-led instruction [3]. This model encourages students to utilize multiple resources, such as media, people, locations, and ideas, to enhance their self-directed learning [4, 5]. Unlike traditional learning, where educators are the primary source of information, RBL shifts the responsibility to students, enabling them to actively seek information from various sources like books, magazines, newspapers, and online platforms [6, 7]. By fostering independent learning, RBL promotes deeper engagement with information, motivating students to utilize their unique abilities to explore and access knowledge in ways that best suit their needs.

RBL is a structured learning model that integrates digital technology to help educators and students achieve academic goals [8, 9]. One of its key features is its emphasis on diverse and high-quality resources that accommodate different learning styles and needs. In the digital era, access to learning resources has significantly increased, allowing for personalized learning experiences [10, 11]. Advancements in technology have made it easier to obtain and use a variety of learning materials, making it essential to optimize their potential in education.

From a philosophical perspective, RBL aligns with constructivist learning theories that emphasize student-centered learning, active engagement, and inquiry-based exploration [12]. Legally, this model is relevant to global education policies that promote digital literacy and independent learning, ensuring that students are prepared for 21st-century competencies [13]. Sociologically, RBL plays a crucial role in addressing educational disparities by providing equal access to diverse learning materials, thus supporting inclusive education [14]. Empirically, numerous studies highlight the effectiveness of RBL in fostering critical thinking and self-directed learning, particularly in history education [15, 16].

In history education, RBL helps students explore relevant information and resources that align with their abilities and interests. This approach emphasizes a key element of historical thinking: the effective use of historical resources. Through RBL, students are encouraged to investigate and generate new knowledge by addressing real-world issues. The process involves guiding students to develop their own questions, enabling them to identify and analyze historical problems. This skill is fundamental to historical thinking, especially in evaluating and making decisions about past events.

Despite its advantages, existing research has not extensively examined how digital scrapbooks enhance learning independence within an RBL framework. Previous studies have demonstrated the effectiveness of RBL in enhancing students' self-directed learning and engagement with historical sources [17, 18]. Studies on historical thinking highlight the need for instructional strategies that encourage critical analysis of historical sources [19, 20]. However, while RBL has been explored in various contexts, few studies have examined its implementation in history education with digital scrapbook integration. Digital scrapbooks facilitate learning independence by allowing students to organize and analyze historical information autonomously [21]. This aligns with

the fundamental characteristics of RBL, which emphasize self-directed learning and knowledge construction [22]. By compiling multiple historical sources into a digital format, students engage in a structured yet flexible learning process that fosters independent historical reasoning [23]. Additionally, previous research has not sufficiently investigated how RBL can be structured to support students' analytical skills in historical reasoning while maintaining a balance between autonomy and instructional guidance [24]. This study addresses these gaps by introducing a structured yet flexible approach to integrating digital technology into RBL, ensuring that students can effectively engage in historical inquiry.

RBL enables students to independently explore and deepen their understanding by gathering and analyzing information. In history lessons, this method allows students to address problems by granting them the freedom to search for and interpret information from various sources related to the topic being studied [25]. The process includes collecting, evaluating, and synthesizing historical data, which enhances students' comprehension and knowledge. RBL also promotes the construction of students' own understanding of historical events based on the information they gather [26]. As a result, RBL is an effective teaching model that strengthens students' historical thinking skills. It supports critical analysis and independent learning, making it particularly suitable for fostering autonomy within a modern curriculum framework.

To guide this study, the following research questions are formulated:

1) How does the integration of RBL with digital scrapbook media impact students' historical thinking skills?
2) How does digital scrapbook media support student learning independence within an RBL framework?
3) What instructional strategies are effective in implementing RBL with digital scrapbook media in history education?

Based on these research questions, the objectives of this study are:

1) To analyze the effectiveness of RBL assisted by digital scrapbook media in enhancing students' historical thinking skills.
2) To examine how digital scrapbook media supports student learning independence within RBL.
3) To develop an instructional model that integrates RBL with digital scrapbook media to optimize student learning experiences in history education.

The novelty of this research lies in its unique approach to combining RBL with digital scrapbooking to enhance historical thinking skills, which has not been extensively explored in prior studies. Additionally, our study proposes a systematic instructional design framework that integrates RBL, digital learning resources, and constructivist principles to foster historical reasoning. This research also contributes to a broader pedagogical discourse by providing empirical evidence on the impact of digital-assisted RBL on students' cognitive and analytical skills, filling an existing gap in the literature.

Furthermore, the role of RBL should also be examined from a psychological and educational perspective [27]. The cognitive theories of pioneers like Piaget and Vygotsky provide a strong foundation for understanding how RBL aligns with constructivist learning principles. Piaget's theory emphasizes how learners actively construct knowledge through interaction with their environment, while Vygotsky highlights the importance of social interactions and scaffolding in learning [28]. By integrating these theories, RBL fosters a learner-centered approach where students build knowledge through exploration, inquiry, and critical thinking [29]. This perspective enhances the theme of the research paper by showing how RBL not only supports knowledge acquisition but also promotes higher-order thinking skills, self-regulated learning, and adaptability in diverse learning contexts [30].

Given these challenges, the logical basis of this research is to explore how RBL can be systematically designed to foster critical thinking and historical reasoning while incorporating constructivist principles. By investigating the balance between student autonomy and structured learning guidance, this study aims to contribute to the refinement of RBL as an instructional model. It addresses how educators can scaffold learning in a way that encourages independence yet provides the necessary support for deep analytical engagement. Furthermore, it examines the role of technology in enhancing the effectiveness of RBL, ensuring that students can navigate digital learning resources effectively while developing higher-order cognitive skills.

While RBL holds great potential for promoting self-directed learning and historical analysis, it requires further investigation to ensure that it effectively supports cognitive growth and critical engagement with learning materials [31]. The research explores best practices for implementing RBL in a way that aligns with educational psychology and constructivist principles while addressing the challenges posed by digital learning environments. This approach contributes to the broader discourse on innovative pedagogies that prepare students for independent inquiry and critical reasoning in an increasingly complex information landscape.

II. Literature Review

A. Resource-Based Learning

The researcher concluded that RBL serves as a comprehensive learning approach that actively engages students in a structured and dynamic learning process. This method stimulates students' cognitive development by encouraging them to interact with various learning materials, educators, and other resources [32]. As technology continues to advance and educational resources become more widely accessible, RBL is increasingly recognized as an effective model for enhancing classroom learning experiences [33]. The primary goal of RBL is to empower students to take on the role of independent explorers of information, allowing them to expand their knowledge while also improving their critical thinking skills and academic abilities [34]. The structured steps of the RBL model, which guide students in their learning process, are presented in Table 1.

Resource-based learning emphasizes the importance of engaging in information-seeking activities, granting students the autonomy to explore various learning materials that align with their study topics [35]. This method facilitates effective problem-solving by encouraging students to utilize multiple

sources of information rather than depending on a single reference. In the context of studying history, the exploration and interpretation of diverse resources are integral to the RBL approach. Furthermore, scrapbook media serve as a repository of various content, such as memorabilia, narratives, poems, quotes, clippings, notes, and photographs, compiled into an album or a handmade book. This creative medium allows students to organize and present information in a structured manner.

Table 1. Syntax of Resource Based Learning (RBL)

Stages	Teacher Activities	Student Activities
Identify the problem	Encourage students to formulate their own questions and help them identify the specific information required to address and resolve the problem at hand.	Students determine what questions to ask in relation to the topic.
Search and access information	Assist students in finding and obtaining relevant information.	Students actively seek out and identify relevant information sources to address and resolve the problems they are working on.
Analyze and evaluate information	Encourages students to actively engage in building and organizing knowledge independently.	Students analyze and evaluate the gathered information independently or with teacher guidance, ensuring they select and apply knowledge actively during the learning process.
Using the information	Guiding to use the information appropriately.	Rather than merely copying and pasting information, students process it by interpreting and expressing it in their own words and understanding.
Evaluation	Assess the level of students' comprehension of the subject matter.	Evaluate the information gathered.

B. Historical Thinking Skill (HTS)

The Merdeka Curriculum highlights five key competencies for history learning: (1) understanding historical concepts, (2) developing historical thinking skills, (3) fostering historical awareness, (4) mastering the use of historical resources, and (5) practicing historical skills in application [36]. These competencies provide students with a broader and deeper skill set compared to previous curriculums. As a result, history education under this curriculum focuses heavily on enhancing students' critical thinking abilities regarding historical events.

Historical thinking skills involve the ability to reason and understand historical events through logical and analytical thinking [37]. These skills allow students to interpret past events and understand their relevance to contemporary and future contexts. By fostering historical thinking, students can critically assess past occurrences and use them to inform future decisions. Such skills also help students to differentiate between past, present, and future timelines, enabling them to analyze and evaluate historical illustrations, evidence, and events more effectively.

Observations and feedback from history teachers in Class XI at SMKN 4 Jember indicate that history learning objectives have not been fully met. This is evidenced by students' low scores on daily tests and their lack of active participation in lessons. An analysis of their end-of-semester exam results also shows below-average performance, failing to meet the Minimum Completeness Criteria (MCC), which suggests students have not achieved the desired competency standards in history.

Students encounter several challenges during the learning process, including a lack of enthusiasm, passivity, low participation, and difficulty maintaining concentration. These obstacles hinder their understanding and negatively impact learning outcomes [38]. To address these issues, teaching methods need to be improved by shifting from teacher-centered approaches to more student-centered ones that actively involve learners, encouraging engagement and deeper comprehension. Indicators of historical thinking skills are presented in Table 2.

Table 2. Indicators of Historical Thinking Skills (HTS)

No.	Indicators	Sub-Indicators
1.	Chronological Thinking	a. Recognizing differences between the past, present, and future. b. Identifying the temporal structure of historical stories or narratives. c. Assessing the importance of time in constructing historical accounts. d. Analyzing data within a timeline. e. Reconstructing historical events to explain continuity and changes over time.
2.	Historical Understanding	a. Identifying and effectively using historical sources. b. Interpreting the literal meaning of historical events. c. Differentiating between factual historical accounts and interpretations.
3.	Historical Analysis and Interpretation	a. Analyzing cause-and-effect relationships in history. b. Comparing historical events or societal issues within specific time frames. c. Evaluating opinions lacking historical evidence and developing hypotheses based on records.
4.	Ability to Conduct Historical Resource	a. Collecting historical data from various sources. b. Formulating questions from documents, eyewitness accounts, artifacts, and other records. c. Verifying sources, identifying contextual knowledge, and considering differing perspectives over time. d. Applying historical evidence to address and solve problems.
5.	Historical Issue Analysis and Decision Making	a.Recognize past issues and understand their relevance to specific historical contexts. b. Apply historical evidence to address and resolve problems effectively. c.Identify significant historical events and distinguish them from those irrelevant to current issues. d. Assess alternative actions based on historical evidence and reasoning. e.Develop a clear position or course of action concerning historical issues. f. Provide detailed development or analysis of specific historical events.

C. Digital Scrapbook

A digital scrapbook integrates images and text from diverse sources like letters, articles, and magazines, created using computer software [39]. In educational settings, both

students and teachers participate actively in crafting digital scrapbook. Effective teaching aims to provide information in ways that empower students to learn independently by utilizing various tools [40]. The use of digital media enhances the functionality of scrapbooks by enabling educators to organize content according to specific learning goals.

The Merdeka Curriculum is structured to foster essential student skills, such as formulating questions, collecting data, observing, organizing information, communicating, drawing conclusions, reflecting, and planning future projects within the context of social studies [41]. History lessons under this curriculum are designed not only for memorization and comprehension of historical events but also for applying historical concepts as analytical tools to interpret events [42]. This approach significantly shapes the teaching of history, emphasizing analytical and critical thinking skills. According to the historical thinking skill indicator focusing on historical analysis and interpretation, the use of scrapbooks enables students to reconstruct historical events in a more tangible and meaningful way by synthesizing the information they collect. Indicators related to digital scrapbooks that support the development of historical thinking skills are outlined in Table 3.

Table 3. Indicators of digital scrapbook

No.	Indicators	Sub-Indicators
1.	Ability to Collect and Organize Information	a. Students can collect various digital sources (images, documents, videos, or artifacts) relevant to the given topic. b. Students can organize the information into a logical and well-structured scrapbook.
2.	Creativity in Design and Layout	a. Students can design the digital scrapbook layout aesthetically, integrating text, images, videos, and other graphic elements creatively. b. Students can use digital tools (such as Canva, Google Slides, or other design applications) to enhance the visual appeal.
3.	Selection of Relevant Content	a. Students can select information or digital elements relevant to the theme or purpose of the scrapbook. b. Students can prioritize significant content that supports the main message of the scrapbook.
4.	Presentation of Engaging Narratives	a. Students can create clear and engaging narratives for each section of the scrapbook, connecting visual elements with the story or ideas to be conveyed. b. Students can include comments, notes, or descriptions that add informational value to the presented elements.
5.	Collaboration Skills	a. If done in groups, students can collaborate effectively in creating the digital scrapbook, dividing tasks, and combining ideas. b. Students can use online collaboration tools (such as Google Drive or cloud-based applications) to work on the project efficiently.
6.	Effective Use of Technology	a. Students can effectively use digital applications, such as selecting the appropriate design tools for creating the scrapbook. b. Students can utilize multimedia features (animations, hyperlinks, or videos) to enhance the interactivity of the scrapbook.
7.	Evaluation and Reflection	a. Students can reflect on their work, identifying the strengths and weaknesses of the scrapbook they have created. b. Students can revise their work based on feedback to improve the quality of their digital scrapbook.

III. Materials and Methods

This research utilizes a mixed-method approach, combining both quantitative and qualitative research techniques. The integration of these methods provides a more accurate and comprehensive understanding of resource-related challenges by capitalizing on the strengths of both approaches [43]. Mixed methods are particularly valuable in addressing the limitations of single-method research. Due to the multifaceted and complex nature of the research question, employing various methods is crucial to explore its multiple dimensions in depth. This approach enables the study to analyze different aspects of resource issues and provides a more thorough and holistic perspective [44]. Moreover, combining qualitative and quantitative data offers a richer understanding of the problem, where qualitative data sheds light on context, motivations, and perceptions, while quantitative data highlights statistical patterns and trends.

The study employs triangulation, a technique that uses multiple methods to validate findings [45]. By cross-referencing results from different approaches, the research enhances its credibility and reliability. Qualitative data helps explain and provide context to the quantitative findings, while quantitative data offers statistical evidence to support qualitative insights. This combination of methods strengthens the conclusions, enabling a more robust understanding of the research subject [46]. Specifically, the study aims to assess students' historical thinking skills in history lessons through the implementation of a RBL model supported by digital scrapbooks. The research is scheduled to be conducted from January to June 2024.

A. Research Design

This method uses a pretest-posttest non-equivalent group design in which two groups or classes receive different interventions. These groups are called the experimental group and the control group. The experimental class receives a special treatment, namely the application of the RBL model supported by a digital scrapbook. The control group also received the RBL learning model, but not the digital scrapbook. The research design of a two-group quasi-experiment is shown in Table 4.

Table 4. Resource design of quasi-experiment

Class	Pre-Test	Treatment	Post-Test
Experiment class of 40 students	O1	X	O2
Control class of 40 students	O3	-	O4

$^{O1, O3}$ A pre-test administered to both class groups to assess the baseline historical thinking skills of students in each class; ^{X} Implementation the RBL assisted by digital scrapbook; $^{O2, O4}$ A post-test provided to both class groups to evaluate the development of students' historical thinking skills in both classes following the application of RBL assisted by digital scrapbook.

B. Research Subject

The participants in this study were students from Class XI MPLB at SMKN 4 Jember, located in Jember, Indonesia. The sample consisted of two classes, each comprising 36 students who were enrolled in history lessons. The sampling method employed was proportional random sampling, ensuring an unbiased selection of participants from each class. The

research proposal was reviewed and approved by an independent ethics committee, specifically the resource ethics committee of the faculty of teacher training and education at the university of Jember, Indonesia.

Additionally, experts in RBL and history education were involved during the development and validation phases of the teaching materials to ensure their quality and relevance. The collected data from the study was analyzed using statistical software SPSS and qualitative analysis tools Phase Portrait, NVivo, and Smart-PLS (Partial Least Squares Structural Equation Modeling) to derive meaningful insights.

C. Data Collection and Instruments

The first instrument used in this research is a learning outcomes test with a score range of 1–100. The second instrument was an interview text related to students' historical thinking ability. After collecting the students' learning outcome test data, we selected one student from each of the high, medium, and low categories of students' historical thinking ability. The selection was based on quantitative analysis using the SPSS tool. Therefore, we took three samples of students to interview, and the interview data were analyzed using the Phase Portrait, NVivo, and Smart-PLS tools to examine the correlation between variables and student indicators. This approach ensures a comprehensive understanding of how students' historical thinking skills vary across performance levels.

To analyze the interview data, this study also employed the grounded theory approach, which allows for an in-depth examination of students' responses by identifying emerging patterns and constructing theoretical explanations. Grounded theory is a qualitative research method that enables the development of concepts and theories based on systematically collected and analyzed data rather than relying on pre-existing theoretical frameworks. Through open, axial, and selective coding processes, the interview transcripts were systematically categorized into themes that represent key aspects of historical thinking skills. This iterative analysis helped refine and validate themes, ensuring that the findings were rooted in the data rather than imposed by preconceived notions. By utilizing grounded theory, the study provides a deeper and more nuanced understanding of students' cognitive development and variations in their historical thinking skills, contributing to the formulation of a data-driven theoretical framework.

D. Data Analysis Procedure

The study utilized both quantitative and qualitative analysis methods to comprehensively examine the improvement in students' historical thinking skills. The quantitative analysis involved comparing students' pre-test and post-test scores to measure skill enhancement. To determine the effectiveness of the intervention, an independent sample t-test was conducted with a significance level of $p < 0.05$. Additionally, effect size calculations were included to assess the magnitude of the improvement in students' historical thinking abilities, ensuring that the observed differences were not only statistically significant but also practically meaningful.

On the qualitative side, advanced tools and techniques were used to gain deeper insights into students' learning experiences. Interviews were conducted to gather students' perspectives and reflections. The qualitative data were analyzed using Phase Portrait, which visualized dynamic patterns in the progression of historical thinking skills. Additionally, NVivo, a qualitative data analysis software, was employed to identify recurring themes, categorize responses, and uncover patterns in students' cognitive development. A thematic analysis approach was adopted, where interview responses were coded and categorized into emerging themes related to historical reasoning, source evaluation, and contextual interpretation. This method allowed for systematic extraction of meaningful insights that aligned with the research objectives.

To further validate the results and explore relationships between various factors, Smart-PLS was used. This method provided robust statistical insights into the interplay of factors influencing the enhancement of students' historical thinking skills. Additionally, pattern-matching techniques were employed to compare qualitative findings with quantitative data trends, ensuring consistency in the interpretation of results.

To ensure the validity and reliability of the interview process, rigorous methodological procedures were implemented. The interview questions were carefully designed based on established frameworks in historical thinking skills and were reviewed by subject matter experts to ensure alignment with the study's objectives. Pilot interviews were conducted to refine the questions and eliminate potential ambiguities. Reliability was addressed through inter-rater agreement, where researchers independently coded and analyzed the interview transcripts using NVivo software to identify recurring themes and patterns. Additionally, member checking was employed by allowing participants to review and verify their responses, reducing potential biases and ensuring accurate representation of their perspectives. These measures strengthened the credibility of the qualitative findings, providing a comprehensive understanding of students' historical thinking skill development.

E. Indicators of Success

To assess the effectiveness of the intervention, this study established the following indicators of success:

1) A statistically significant improvement in students' post-test scores compared to pre-test scores ($p < 0.05$) using the independent samples t-test.
2) An effect size (Cohen's d) greater than 0.5, indicating a moderate to high impact of the intervention on historical thinking skills.
3) The emergence of strong qualitative themes, as analyzed through NVivo, demonstrates an improvement in students' ability to analyze historical sources, evaluate evidence, and construct well-reasoned historical arguments.
4) Consistent patterns between qualitative interview findings and quantitative test score improvements, reinforcing the validity of the observed learning outcomes.
5) Students demonstrate increased engagement and autonomy in historical inquiry, as reflected in their responses and self-reported learning experiences.

By incorporating these success indicators, the study ensures a more systematic and measurable approach to

evaluating the impact of the RBL model assisted by digital scrapbooks on students' historical thinking skills.

IV. Result and Discussion

A. Pre-Test Data Analysis

This study involved two classes, each comprising 36 students, divided into experimental and control groups. Both groups were administered pretest questions to assess their initial historical thinking skills. Analysis of the pretest results in the experimental class revealed that none of the students exhibited high historical thinking skills, 9.5% were at a medium level, and 90.5% were at a low level. Similarly, the pretest analysis for the control class showed no students with high historical thinking skills, 12.5% with a medium level, and 87.5% with a low level of historical thinking skills.

To further analyze the data, an independent sample t-test was conducted using SPSS software. Prior to this test, two preliminary evaluations were performed: the normality test and the homogeneity test. The normality test was used to determine if the data from both groups were normally distributed. Statistical tools like the Kolmogorov-Smirnov or Shapiro-Wilk test were employed to ensure that the data followed a normal distribution curve, which is essential for proceeding with the t-test analysis.

The findings presented in Table 5 indicate that the data from both classes are normally distributed. This conclusion is based on the *p*-values (sig.) obtained from the Kolmogorov-Smirnov and Shapiro-Wilk tests, which are greater than the 0.05 threshold. This implies that the data distribution does not significantly differ from a normal distribution, satisfying an essential assumption for parametric analysis. Additionally, a homogeneity test was conducted to assess whether the variances between the two classes were consistent. The results confirm that the variances are homogeneous, as shown in Table 6. These outcomes validate the suitability of the data for comparative analysis and ensure that the necessary assumptions for reliable and accurate parametric testing are met.

Table 5. Results of normality test on pre-test

Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Control	0.101	36	0.200*	0.970	36	0.422
Experiment	0.115	36	0.200*	0.973	36	0.509

* This is a lower bound of the true significance; [a] Lilliefors significance correction.

Table 6. Results of homogeneity test on pre-test

	Test Type	Levene Statistic	df1	df2	Sig.
Score	Based on Mean	0.143	1	70	0.707
	Based on Median	0.072	1	70	0.790
	Based on Median and with adjusted df	0.072	1	67.060	0.790
	Based on trimmed mean	0.136	1	70	0.714

According to Table 6, the sig. value based on the mean is 0.707, which is greater than 0.05, indicating that both classes have the same variance and are therefore homogeneous. Following the completion of the normality and homogeneity tests, an independent samples t-test was performed to determine whether there were differences in the mean scores of historical thinking skills tests between the two classes.

Table 7. Results of independent samples t-test on pre-test

Assumptions		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Score	Equal variances assumed	0.143	0.707	−0.354	70	0.724	−0.194	0.549	−1.290	0.901
	Equal variances not assumed	-	-	−0.354	69.436	0.724	−0.194	0.549	−1.290	0.901

As shown in Table 7, the significance value (sig. 2-tailed) is 0.724, which exceeds the threshold of 0.05. This indicates that there is no statistically significant difference between the pretest scores of the experimental and control classes in terms of historical thinking skills. The finding suggests that before the teaching intervention was introduced, both groups demonstrated similar levels of historical thinking abilities.

B. Post-Test Data Analysis

The post-test data analysis for the experimental class revealed that 94.5% of students achieved high historical thinking skills, while 5.5% were categorized as having moderate historical thinking skills. Notably, none of the students fell into the low historical thinking skills category. Conversely, the post-test analysis for the control class indicated that 100% of the students had moderate historical thinking skills, with no students classified as having high or low historical thinking skills.

Additionally, an independent sample t-test was conducted using SPSS software to assess the differences between the two classes. Before performing the t-test, two preliminary tests were carried out: the normality test and the homogeneity test. The normality test was conducted to evaluate whether the data from both classes followed a normal distribution.

Table 8. Results of normality test on pre-test

Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Control	0.114	36	0.200*	0.972	36	0.471
Experiment	0.115	36	0.200*	0.963	36	0.275

* This is a lower bound of the true significance; [a] Lilliefors significance correction.

The analysis presented in Table 8 shows that the data for both classes are normally distributed, as evidenced by the *p*-values (sig.) from the Kolmogorov-Smirnov and Shapiro-Wilk tests, which are greater than 0.05. This confirms that the data distribution does not significantly deviate from normality, meeting a critical assumption for conducting parametric analyses. Additionally, a homogeneity

test was performed to assess whether the variances between the two classes were consistent. The results of this test demonstrate that the variances are homogeneous, ensuring the data's reliability for comparative statistical analysis.

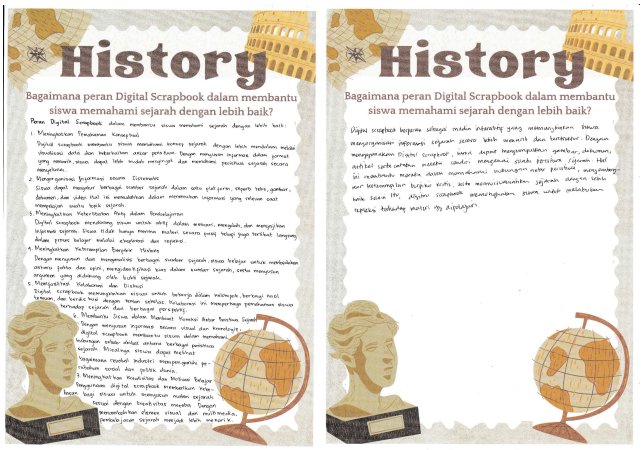
According to Table 9, the variance of both classes is the same, as indicated by a sig. value of 0.739, which is greater than 0.05. This confirms that the two classes are homogeneous. Following the normality and homogeneity tests, an independent sample t-test was conducted to determine whether there was a significant difference in the average historical thinking skills test scores between the two groups. This step ensures the validity and reliability of the statistical comparison. The t-test results serve as essential evidence in evaluating the effectiveness of the teaching intervention in improving students' historical thinking skills.

Table 9. Results of homogeneity test on pre-test

	Test Type	Levene Statistic	df1	df2	Sig.
Score	Based on Mean	0.112	1	70	0.739
	Based on Median	0.107	1	70	0.745
	Based on Median and with adjusted df	0.107	1	69.953	0.745
	Based on trimmed mean	0.130	1	70	0.719

Table 10. Results of independent samples t-test on post-test

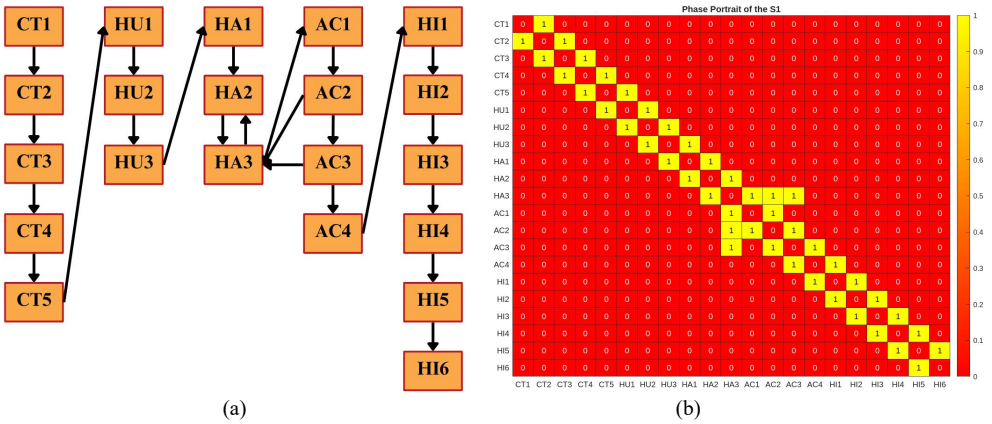
Assumptions		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Score	Equal variances assumed	0.112	0.739	−26.809	70	0.000	−15.833	0.591	−17.011	−14.655
	Equal variances not assumed	-	-	−26.809	69.883	0.000	−15.833	0.591	−17.011	−14.655



(a). (b).

Fig. 1. Results of answer sheets of students with (a) high HTS, and (b) low HTS.

Based on Table 10, the significance value (sig. 2-tailed) is 0.000, which is below the 0.05 threshold. This indicates a statistically significant difference between the post-test scores of students in the experimental and control classes in terms of historical thinking skills. This finding indicates that the two groups showed different levels of historical thinking skills after the implementation of the instructional intervention. In particular, the experimental class showed a significant improvement in historical thinking skills compared to the control class. The analytical results presented here have reflected the improvement in students' historical thinking skills, as stated in the research objectives in the abstract. Also included are the results of the students' answer sheets shown in Fig. 1.



(a) (b)

Fig. 2. (a) Graph representation of S1, (b) Adjacency matrix of distance 1 of S1.

C. Phase Portrait Analysis

A phase portrait is a visual representation that illustrates a person's thought process through diagrams or illustrations. In this study, phase portraits were used to depict students' historical thinking skill patterns as they engaged with the RBL model supported by Digital Scrapbook. The first student response (S1) from the post-test results indicated that S1 demonstrated a high level of historical thinking skills. Fig. 2(a) visually represents the historical thinking patterns of students categorized as having high historical thinking

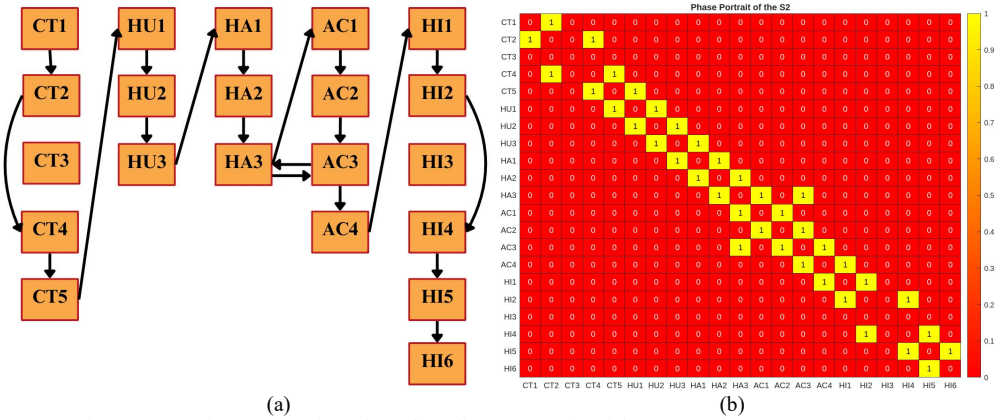
abilities. Meanwhile, Fig. 2(b) displays the adjacency matrix associated with the phase portrait pattern derived from S1.

The next step in the analysis involves evaluating several key metrics of the S1 phase portrait flow, including Total Depth (TD), Mean Depth (MD), Relative Asymmetry (RA), and Real Relative Asymmetry (RRA). This evaluation is essential for assessing students' historical thinking skills by analyzing the structure of their thought processes. TD represents the sum of the path lengths for the observed sub-indicators, while MD is calculated by dividing TD by (n − 1). RA is determined using the formula RA = 2(MD − 1)/(n − 2), and Graph Length (GL) is computed as GL = 2(L(L)^(1/2) − 2L + 1)/((L − 1)(L − 2)). The RRA is then derived by dividing RA by GL (RRA = RA/GL). As shown in Table 11, the HA3 sub-indicator has an RRA value of 1.32. The RA value for this sub-indicator is considered optimal, as a lower RRA value—unless negative—suggests higher integrity and can be classified as favorable. In this particular sub-indicator, students require additional practice in distinguishing unsupported opinion statements from hypotheses grounded in historical evidence.

Table 11. Total Depth (TD), Mean Depth (MD), Relative Asymmetry (RA), and Real Relative Asymmetry (RRA) values of S1 phase portrait

No	Sub-indicators	TD	MD	RA	RRA
1.	CT1	193	9.65	0.91	3.13
2.	CT2	174	8.7	0.81	2.78
3.	CT3	157	7.85	0.72	2.48
4.	CT4	142	7.1	0.64	2.20
5.	CT5	129	6.45	0.57	1.97
6.	HU1	118	5.9	0.51	1.77
7.	HU2	109	5.45	0.46	1.61
8.	HU3	102	5.1	0.43	1.48
9.	HA1	97	4.85	0.40	1.39
10.	HA2	94	4.7	0.39	1.33
11.	HA3	93	4.65	0.38	1.32
12.	AC1	155	7.75	0.71	2.44
13.	AC2	103	5.15	0.43	1.50
14.	AC3	99	4.95	0.41	1.43
15.	AC4	107	5.35	0.45	1.57
16.	HI1	117	5.85	0.51	1.75
17.	HI2	129	6.45	0.57	1.97
18.	HI3	143	7.15	0.64	2.22
19.	HI4	159	7.95	0.73	2.51
20.	HI5	177	8.85	0.82	2.84
21.	HI6	197	9.85	0.93	3.20

Next, we discuss the phase portrait of S2 students. S2 is a student with moderate historical thinking skills. Fig. 3(a) shows the graphical representation of student S2's thinking flow, while Fig. 3(b) shows the one-dimensional adjacency matrix of the graphical representation. The graphical representation in Fig. 3(a) illustrates how S2 organizes and connects historical information, highlighting the relationships between key concepts and events. Meanwhile, the adjacency matrix in Fig. 3(b) provides a quantitative view of these connections, showing the frequency and strength of relationships between various historical elements identified by the student.



(a) (b)

Fig. 3. (a) Graph representation of S2, (b) Adjacency matrix of distance 1 of S2.

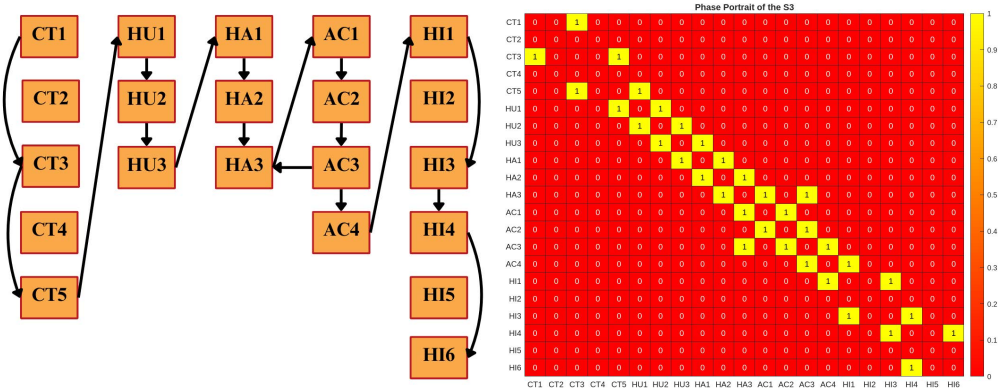
The next phase of analysis focuses on evaluating key metrics of the S2 phase portrait flow, including TD, MD, RA, and RRA. This analysis is valuable in measuring students' historical thinking skills by examining the structure of their reasoning processes. TD represents the sum of the path lengths for the observed sub-indicators, while MD is calculated as MD = TD/(n − 1). RA is derived using the formula RA = 2(MD − 1)/(n − 2), and GL is computed as GL = 2(L(L)^(1/2) − 2L + 1)/((L − 1)(L − 2)). The RRA is obtained by dividing RA by GL (RRA = RA/GL). According to Table 12, the HA3 sub-indicator has an RRA value of 1.30. The RA value for this sub-indicator is considered optimal since a lower RRA value, as long as it is not negative, indicates stronger integrity and falls within the "good" classification. This suggests that students in this category exhibit a more structured and coherent historical thinking process. However, in this sub-indicator, students require additional activities that allow

them to compare opinion-based statements lacking historical evidence with hypotheses grounded in historical data. This highlights the need for more exercises that encourage students to critically assess and differentiate between unsupported claims and well-founded historical arguments.

Next, we discuss the phase portrait of S3 students with low historical thinking skills. Fig. 4(a) shows the graphical representation of student S3's thinking flow, while Fig. 4(b) shows the one-dimensional adjacency matrix of the graphical representation. The graphical representation in Fig. 4(a) illustrates how S3 organizes and connects historical information, highlighting the relationships between key concepts and events. Meanwhile, Fig. 4(b) provides a quantitative view of these connections, showing the frequency and strength of relationships between various historical elements.

Table 12. TD, MD, RA, and RRA values of S2 phase portrait

No	Sub-indicators	TD	MD	RA	RRA
1.	CT1	168	9.33	0.98	3.27
2.	CT2	150	8.33	0.86	2.88
3.	CT4	134	7.44	0.75	2.53
4.	CT5	120	6.66	0.66	2.22
5.	HU1	108	6	0.58	1.96
6.	HU2	98	5.44	0.52	1.74
7.	HU3	90	5	0.47	1.57
8.	HA1	84	4.66	0.43	1.44
9.	HA2	80	4.44	0.40	1.35
10.	HA3	78	4.33	0.39	1.30
11.	AC1	126	7	0.70	2.35
12.	AC2	159	8.83	0.92	3.07
13.	AC3	81	4.5	0.41	1.37
14.	AC4	89	4.94	0.46	1.54
15.	HI1	99	5.5	0.52	1.76
16.	HI2	111	6.16	0.60	2.02
17.	HI4	125	6.94	0.69	2.33
18.	HI5	141	7.83	0.80	2.68
19.	HI6	159	8.83	0.92	3.07



(a) (b)

Fig. 4. (a) Graph representation of S3, (b) Adjacency matrix of distance 1 of S3.

Table 13. TD, MD, RA, and RRA values of s3 phase portrait

No	Sub-indicators	TD	MD	RA	RRA
1.	CT1	134	8.37	0.98	3.18
2.	CT3	118	7.37	0.85	2.74
3.	CT5	104	6.5	0.73	2.37
4.	HU1	92	5.75	0.63	2.04
5.	HU2	82	5.12	0.55	1.77
6.	HU3	74	4.62	0.48	1.56
7.	HA1	68	4.25	0.43	1.40
8.	HA2	64	4	0.4	1.29
9.	HA3	62	3.87	0.38	1.24
10.	AC1	100	6.25	0.7	2.26
11.	AC2	130	8.12	0.95	3.07
12.	AC3	65	4.06	0.40	1.32
13.	AC4	73	4.56	0.47	1.53
14.	HI1	83	5.18	0.55	1.80
15.	HI3	95	5.93	0.65	2.12
16.	HI4	109	6.81	0.77	2.50
17.	HI6	125	7.81	0.90	2.93

Next, we evaluate the TD, MD, RA, and RRA of the S3 phase portrait flow. The advantage of conducting this analysis lies in assessing students' historical thinking skills through the lens of flow configuration. TD refers to the sum of the path lengths for the observed sub-indicators, MD = TD/(n − 1), RA = 2(MD − 1)/(n − 2), G_L = 2(L(L)^(1/2) − 2L + 1)/((L − 1)(L − 2)), and RRA=RA/G_L. As shown in Table 13, the HA3 sub-indicator has an RRA value of 1.24. The RA value associated with this sub-indicator is considered optimal since a lower RRA value, as long as it is not negative, reflects stronger integrity and can be classified as good. This suggests that students in this category demonstrate a more structured and coherent historical thinking process. However, students still need additional activities that require them to compare opinion-based statements that lack historical evidence with hypotheses supported by historical facts. Providing more exercises in this area would help enhance students' ability to critically evaluate different types of historical claims and develop stronger analytical reasoning skills.

D. NVivo Analysis

Using NVivo software, a qualitative examination of the variation in students' historical thinking skills was conducted, utilizing the Word Frequency Query tool to visually display text and identify recurring themes and concepts within the data. This tool enables researchers to see how often specific words occur in transcripts of in-depth interviews with students, providing insights into patterns of thought and understanding. By identifying key terms and exploring their context, researchers can better understand the cognitive processes students engage in, such as interpreting evidence, constructing narratives, and analyzing cause-and-effect relationships. The analysis compiled a collection of frequently occurring terms, reflecting students' focus on historical understanding and thinking, as shown in Fig. 5. This visual representation highlights the emphasis placed on particular concepts, offering valuable insights into students' engagement and depth of learning.

In this study, the word "historical" was chosen as one of the terms that appeared frequently in the interview data. Furthermore, the search results are shown in the form of a

word tree in Fig. 6. This visual representation shows the connections and patterns of usage, highlighting key phrases and themes such as "historical events", "historical evidence", "historical narratives", and "historical continuity and change". The word tree demonstrates that students engaged in resource-based learning supported by digital scrapbooks tend to focus on interpreting historical evidence, reconstructing events, and formulating hypotheses based on historical data. This approach appears to aid in understanding history lessons, fostering analytical skills, and enhancing students' skill to think historically. By incorporating diverse sources, such as documents, eyewitness accounts, and artifacts, the model encourages students to explore cause-and-effect relationships, compare past and present issues, and develop a nuanced understanding of historical timelines and narratives.

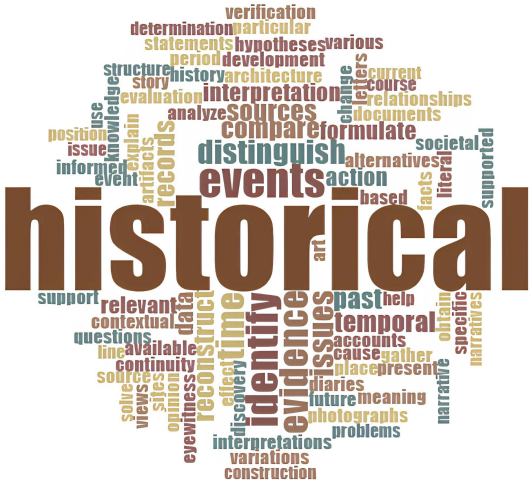


Fig. 5. Word cloud of historical thinking skills.

Next, we examine the comparative information provided by the three interviews. Comparative information is a valuable feature of NVivo, allowing researchers to systematically compare and contrast participants' responses and performance across various indicators and sub-indicators. In this section, historical thinking skill is divided into several sub-indicators, each categorized under five main indicators. The first indicator is chronological thinking, which focuses on the skill to organize events in sequential order and has five sub-indicators coded as CT1 to CT5. The second indicator is historical understanding, which emphasizes the comprehension of historical contexts and has three sub-indicators coded as HU1 to HU3. The third indicator is historical analysis and interpretation, which highlights the skill to critically evaluate and interpret historical events, with three sub-indicators coded as HA1 to HA3. The fourth indicator is the skill to conduct historical research, focusing on the use of resources and evidence, and has four sub-indicators coded as AC1 to AC4. The final indicator is historical issue analysis and decision-making, which involves evaluating historical problems and formulating decisions, and has six sub-indicators coded as HI1 to HI6.

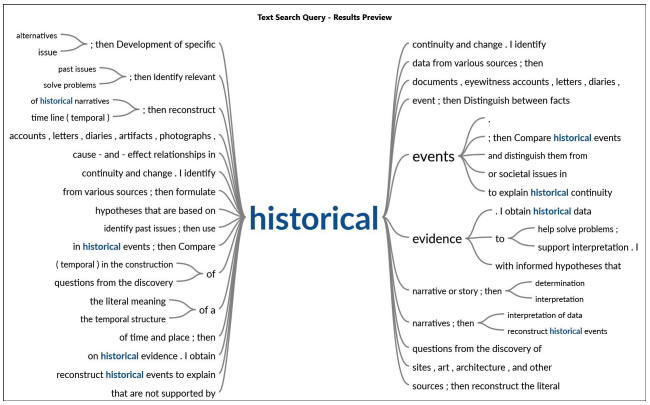
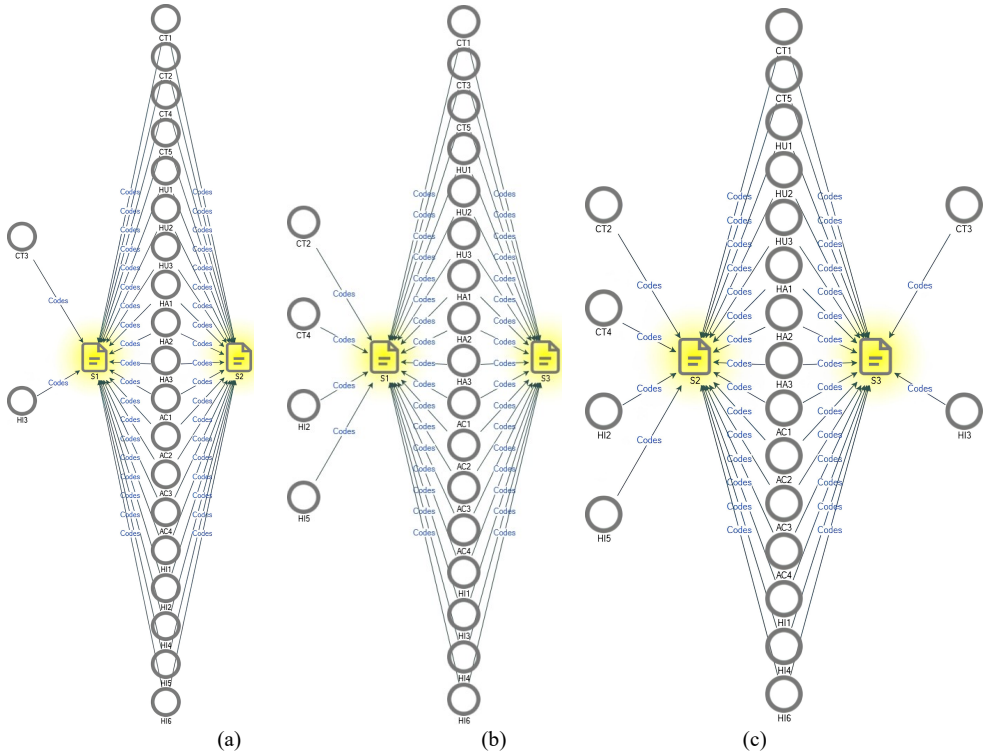


Fig. 6. Word tree of the word "historical".



(a) (b) (c)

Fig. 7. (a) Comparison of S1 and S2, (b) Comparison of S1 and S3, and (c) Comparison of S2 and S3.

The comparative analysis provides insights into the variations in students' performance across these sub-indicators. From Fig. 7 (a), we can observe the differences in the sub-indicators that students S1 and S2 can successfully achieve. Notably, S1 is able to pass sub-indicators CT3 and HI3, which S2 does not achieve. Fig. 7 (b) highlights the differences between S1 and S3, showing that S1 successfully passes sub-indicators CT2, CT4, HI2, and HI5, while S3 does not. Meanwhile, Fig. 7 (c) compares S2 and S3, revealing that sub-indicators CT2, CT4, HI2, and HI5 are successfully passed by S2 but not by S3, while S3 uniquely passes CT3 and HI3, which are not achieved by S2.

The final NVivo feature used in this study is that we compare the overall student data and how it relates to the predefined categorization. This comparative analysis provides a comprehensive view of how students' historical thinking skills align with the established indicators and sub-indicators. We also show the classification results from the interviews, which highlight the extent to which each student meets the predefined criteria. Fig. 8 illustrates the NVivo Project Map feature, offering a visual representation of the categorization and relationships among the data. It can be seen that this project map is consistent with the previous analysis, where S1 fulfills all sub-indicators, while S2 and S3 do not fulfill some sub-indicators.

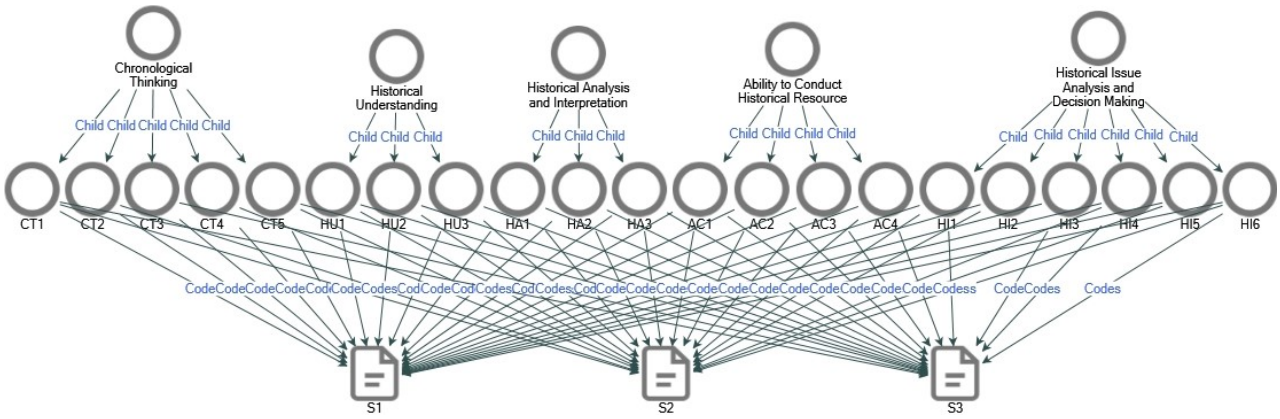


Fig. 8. Project map of historical thinking skills on S1, S2, and S3.

E. Smart-PLS Analysis

Smart-PLS analysis was used to determine the conclusion analysis. In this study, we used several sub-indicators of the latent variable. There are 21 sub-indicators of the latent variable of Historical Thinking Skills (HTS), namely CT1, CT2, CT3, CT4, CT5, HU1, HU2, HU3, HA1, HA2, HA3, AC1, AC2, AC3, AC4, HI1, HI2, HI3, HI4, HI5, and HI6. There are 7 sub-indicators of the latent variable of Digital Scrapbook (DS), namely DS1, DS2, DS3, DS4, DS5, DS6, and DS7. There are 5 sub-indicators of the latent variable of RBL, namely RBL1, RBL2, RBL3, RBL4, and RBL5.

The initial stage of this research involved utilizing the SEM-PLS (Structural Equation Modeling-Partial Least Squares) algorithm to assess the validity and feasibility of the proposed model and its associated indicators. This process is depicted in Fig. 9, where the standardized algorithm was analyzed based on several key components. These components include the loading factor values, reliability measurements, and the Average Variance Extracted (AVE). The loading factor value is critical for confirming the convergent validity of each sub-indicator, which is deemed acceptable and robust if it exceeds the threshold of 0.7. This evaluation ensures that the indicators accurately represent the intended construct, thereby enhancing the model's reliability and validity.

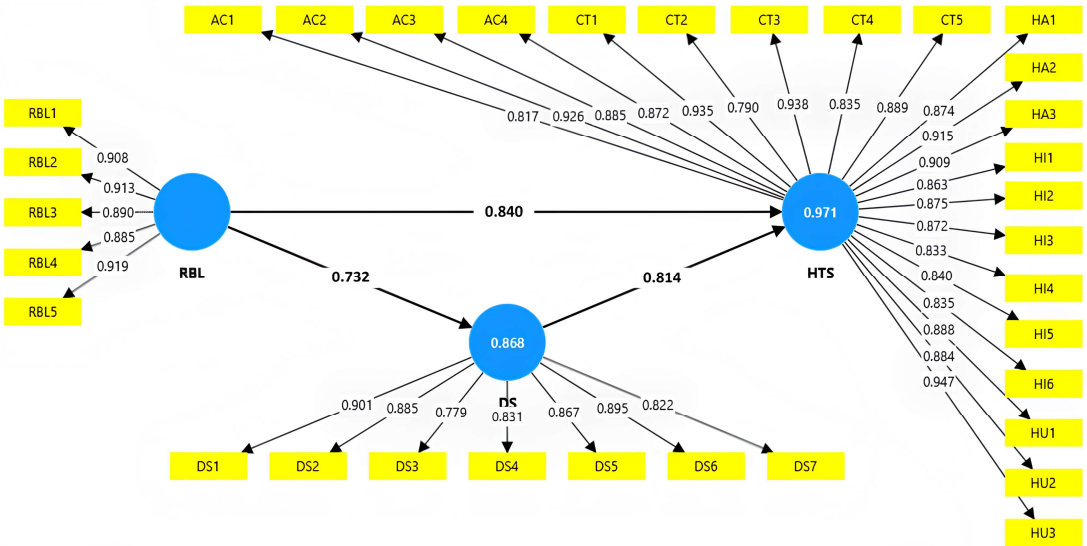


Fig. 9. Structural Equation Modeling-Partial Least Squares (SEM-PLS).

Smart-PLS enables a thorough assessment of the research model through the SEM-PLS algorithm. Essential parameters include loading factor values, which demonstrate convergent validity when they exceed 0.7, signifying a strong correlation between sub-indicators and their constructs. Furthermore, Cronbach's alpha and composite reliability are used to evaluate internal consistency, while the AVE measures the proportion of variance explained in relation to error. This detailed evaluation ensures the model's reliability and validity, providing a solid foundation for drawing robust research conclusions.

Table 14 provides a detailed assessment of the reliability and validity of the indicators and sub-dimensions used in the SEM analysis. This model examines the impact of the RBL approach, supported by a Digital Scrapbook, on students' historical thinking skills in history education. The analysis confirmed that all sub-indicators had loading factor values greater than 0.7, demonstrating strong convergent validity and ensuring that the constructs were effectively measured.

Table 14. Loading factor, reliability Cronbach's alpha, composite reliability, AVE of SEM-PLS.

Indicator	Sub Indicator	Loading Factor	Reliability Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
RBL	RBL1	0.908	0.943	0.957	0.816
	RBL2	0.913			
	RBL3	0.890			
	RBL4	0.885			
	RBL5	0.919			
DS	DS1	0.901	0.938	0.950	0.731
	DS2	0.885			
	DS3	0.779			
	DS4	0.831			
	DS5	0.867			
	DS6	0.895			
	DS7	0.822			
HTS	CT1	0.935	0.985	0.986	0.771
	CT2	0.790			
	CT3	0.938			
	CT4	0.835			
	CT5	0.889			
	HU1	0.888			
	HU2	0.884			
	HU3	0.947			
	HA1	0.874			
	HA2	0.915			
	HA3	0.909			
	AC1	0.817			
	AC2	0.926			
	AC3	0.885			
	AC4	0.872			
	HI1	0.863			
	HI2	0.875			
	HI3	0.872			
	HI4	0.833			
	HI5	0.840			
	HI6	0.835			

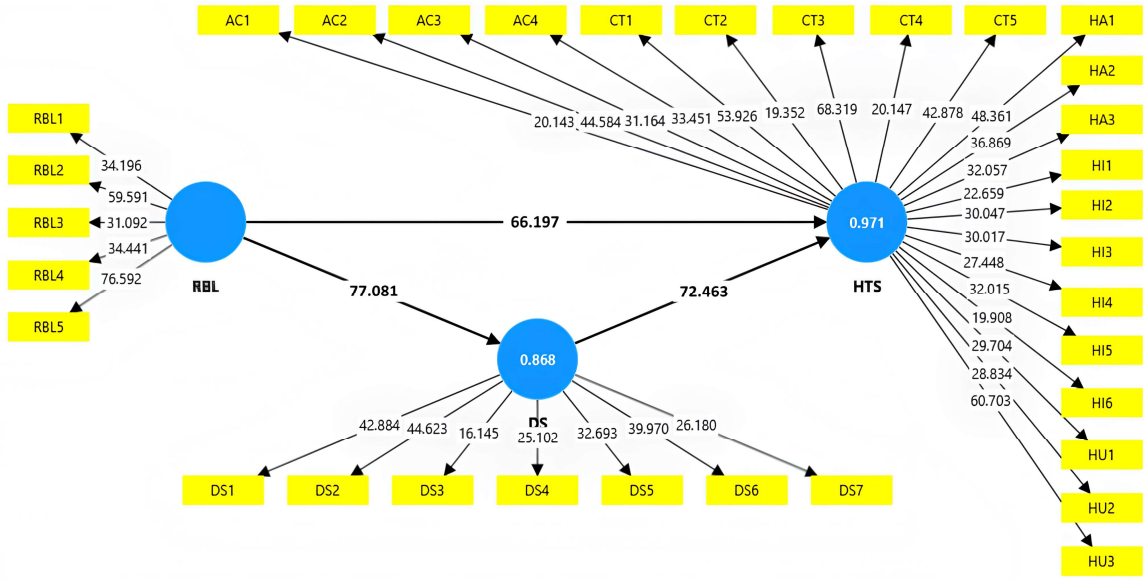


Fig. 10. Bootstrapping.

Reliability measures, including Cronbach's alpha and composite reliability, showed high internal consistency and

stability, with values consistently exceeding 0.7. This indicates that the indicators used in the model produced reliable and consistent results. Furthermore, the AVE values were above 0.5, reinforcing the convergent validity of the model by confirming that each indicator effectively represented its corresponding construct. The assessment of discriminant validity through factor cross-loadings further verified that each construct was distinct and measured different aspects of the theoretical framework.

The SEM model demonstrated strong reliability and validity, providing a robust foundation for evaluating the effectiveness of the RBL model and the digital scrapbook in improving students' historical thinking skills in history learning. These findings support the credibility of the research model and reinforce the positive impact of integrating RBL with digital tools in history education.

The analysis illustrated in Fig. 10 utilizes t-values to assess the relationships between different constructs within the SEM framework. Specifically, it examines how the RBL model, when supported by digital scrapbooks, influences students' historical thinking skills in history education. The t-values serve as indicators of the statistical significance and strength of these relationships, confirming their validity and ensuring the reliability of the model in evaluating the effects of innovative teaching methods. This analysis not only reinforces the effectiveness of the proposed model but also offers valuable insights into how resource-based learning, in combination with digital tools, enhances students' critical engagement with historical material. Ultimately, it highlights how these teaching strategies contribute to improved learning outcomes and a deeper understanding of historical concepts.

This analysis brings together the research findings to explore the connection between the RBL model, the use of digital scrapbooks, and students' historical thinking skills. The results in Table 15 indicate a strong relationship between these variables, as demonstrated by the path coefficients. The first hypothesis (H1) revealed a statistically significant link between the RBL model and the digital scrapbook, with a *p*-value of 0.000 and a high t-value of 77.081. This suggests that the RBL model effectively integrates the digital scrapbook as an interactive learning tool, enhancing students' engagement with the subject matter. Similarly, the second hypothesis (H2) confirmed a strong relationship between the digital scrapbook and students' historical thinking skills. The *p*-value of 0.001 and a t-value of 72.463 indicate that the use of digital scrapbooks plays a crucial role in improving students' ability to think critically and analytically about historical events. These findings reinforce the effectiveness of digital scrapbooks as an educational resource in history learning.

Table 15. Path coefficient.

Path	Direct Effect	
	***p*-values**	**T-values**
H1: RBL -> Digital Scrapbook	0.000	77.081
H2: Digital Scrapbook -> Historical Thinking Skill	0.001	72.463
H3: RBL -> Historical Thinking Skill	0.002	66.197
H4: RBL -> Digital Scrapbook -> Historical Thinking Skill	0.000	78.958

Hypothesis 3 (H3) established that the RBL model has a significant and direct influence on students' historical thinking skills. This finding was supported by a *p*-value of 0.002 and a t-value of 66.197, demonstrating that RBL alone is effective in enhancing students' historical reasoning and analytical abilities. Furthermore, Hypothesis 4 (H4) highlighted the role of the digital scrapbook as a mediator in the relationship between RBL and historical thinking skills. With a *p*-value of 0.000 and the highest recorded t-value of 78.958, this hypothesis confirmed that incorporating digital scrapbooks strengthens the effectiveness of the RBL model, amplifying its impact on students' historical thinking development. The study's findings affirm that combining RBL with digital scrapbooks significantly improves students' historical thinking skills. The presence of both direct and mediated effects underscores the importance of integrating interactive digital resources into RBL strategies to foster innovation and engagement in history education. The consistently high t-values across all tested hypotheses further validate the strength and reliability of these relationships.

F. Discussions

The findings of this study indicate that the RBL model, when integrated with digital scrapbook media, significantly enhances students' ability to critically engage with historical content. This supports Parmiti's claim that RBL is a project-based approach that exposes students to various sources of knowledge [47]. Previous studies have demonstrated that project-based learning approaches, such as RBL, lead to significant improvements in students' ability to analyze and synthesize information from diverse sources [48]. The results reinforce the argument that RBL encourages a dynamic and self-directed learning experience, enabling students to explore historical narratives beyond the constraints of traditional textbooks.

The integration of digital scrapbooks further enhances this learning experience by providing an interactive platform for organizing, analyzing, and synthesizing historical information. Zhang [49] research highlights how digital tools like scrapbooks improve students' ability to structure historical data, allowing them to develop a more coherent interpretation of historical narratives. Digital scrapbooks facilitate deeper engagement with historical sources by enabling students to categorize and evaluate information efficiently, which aligns with previous findings on the effectiveness of digital media in education [50].

From a historical thinking perspective, this study emphasizes the importance of utilizing diverse historical sources to develop students' analytical and interpretative skills. The findings are consistent with An's [51] historical thinking framework, which underscores the necessity of engaging with multiple sources to develop critical perspectives on historical events. Similarly, Haydn's research [52] suggests that students who interact with various sources exhibit more sophisticated historical reasoning than those who rely solely on traditional textbooks. By encouraging students to examine historical issues from multiple perspectives, RBL facilitates a more nuanced and informed understanding of the past.

The study also highlights the role of RBL in fostering student autonomy and inquiry-based learning. Research by Georgiou [53] supports this, demonstrating that students using RBL show greater engagement in historical inquiry by formulating their own questions and analyzing primary and

secondary sources more effectively. This approach is closely related to historical resource skills, which are essential components of historical thinking. Through RBL, students explore and generate new knowledge by addressing real-world problems. As part of the process, they are encouraged to ask critical questions that help them identify and examine historical issues. This practice reflects an important aspect of historical thinking: analyzing and making informed decisions about historical events.

Moreover, the study underscores the broader benefits of RBL in fostering key competencies such as research skills, hypothesis formulation, data analysis, and evidence-based reasoning. Previous studies have shown that inquiry-based learning approaches, including RBL, enhance students' ability to critically analyze historical events, evaluate different perspectives, and construct well-supported arguments [54]. These skills are essential not only for historical inquiry but also for developing students' overall cognitive abilities, particularly in disciplines that require critical analysis and synthesis of information.

Furthermore, the use of digital scrapbooks as an educational tool was found to be instrumental in consolidating various historical learning resources within a single platform. Research by Bunari *et al*. [55] emphasizes the importance of historical thinking and consciousness in helping students gain a deeper understanding of historical narratives. Digital scrapbooks enable students to engage with historical content in a structured and interactive manner, facilitating deeper engagement with the subject matter. Previous research suggests that digital tools such as scrapbooks enhance students' ability to organize, categorize, and synthesize historical information, thereby improving their overall comprehension and analytical skills. By interacting with digital scrapbooks, students were able to develop a more structured and informed understanding of historical events, reinforcing the value of digital learning media in history education.

The findings also indicate that students in the experimental classroom displayed greater enthusiasm and engagement with historical learning. The active nature of RBL encouraged students to take ownership of their learning, search for relevant historical sources, and actively participate in discussions. This aligns with prior research on self-directed learning, which suggests that students who take an active role in knowledge construction tend to develop a deeper understanding of the subject matter [56]. The study further supports the argument that resource-based approaches enhance students' ability to critically evaluate historical sources and develop a well-rounded perspective on historical narratives.

This study contributes to the growing body of research supporting the integration of RBL and digital learning tools in history education. By providing students with opportunities to explore historical content through diverse sources, engage in critical discussions, and construct their own interpretations, RBL fosters a more meaningful and engaging learning experience. These findings highlight the potential of RBL not only in improving historical thinking skills but also in promoting independent learning, critical inquiry, and digital literacy in the study of history.

Despite its promising findings, the study has certain limitations. First, the research was conducted within a specific academic setting, which may limit the generalizability of the results to other educational contexts. Second, while the study successfully demonstrated improvements in historical thinking, long-term retention and application of these skills beyond the classroom remain areas for further investigation. Additionally, the research relied on a relatively small sample size, which may affect the broader applicability of the conclusions.

V. Conclusion

This study has demonstrated that integrating the RBL model with digital scrapbook media significantly enhances students' historical thinking skills. The findings confirm that students in the experimental group who received RBL-assisted digital scrapbook instruction exhibited a marked improvement in their ability to critically analyze and interpret historical events compared to the control group. This outcome underscores the pedagogical effectiveness of combining RBL with digital tools in history education.

Beyond immediate learning gains, this study highlights the broader significance of digital integration in education. By engaging students with diverse historical resources through digital scrapbook media, this approach fosters self-directed learning, critical engagement, and digital literacy—competencies essential for 21st-century learners. The study contributes to educational research by validating the methodological integration of RBL with digital technology as an effective strategy for enhancing historical cognition.

From a theoretical perspective, these findings reinforce the importance of constructivist learning models that leverage technology to enrich student interactions with historical content. The practical implications suggest that history educators should adopt RBL-assisted digital tools to facilitate deeper student engagement and critical reflection on historical narratives. Furthermore, this study provides empirical support for incorporating technology-enhanced learning strategies in history curricula, offering a scalable and innovative approach for fostering critical thinking in students.

Future research should explore the long-term impact of RBL with digital scrapbook media on historical knowledge retention and transferability across different educational contexts. Investigating how varying levels of student autonomy within RBL influence engagement and learning outcomes could further refine instructional strategies. Additionally, integrating emerging technologies such as Artificial intelligence-driven historical analysis or virtual reality into RBL frameworks may offer new pathways for immersive and interactive history education.

In conclusion, this study reaffirms the potential of combining RBL with digital resources to cultivate students' historical thinking skills. By bridging traditional historical inquiry with modern technological tools, this approach aligns with contemporary educational demands and provides a sustainable model for fostering critical and analytical thinking in history education.

Conflict of Interest

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

S led the primary research, taking responsibility for designing the study framework and supervising the implementation of the Resource-Based Learning (RBL) model with the support of the Digital Scrapbook; FKN managed the collection, organization, and statistical analysis of data to assess the effects on students' historical thinking skills; MN played a key role in developing and adapting the digital scrapbook for educational purposes while also ensuring the validation of the teaching materials. All authors contributed to interpreting the findings, co-authored the manuscript, and participated in reviewing for publication; all authors had approved the final version.

ACKNOWLEDGMENT

We sincerely appreciate the support of the Jember University of Indonesia for granting a collaborative award, which has greatly contributed to the completion of this research and the preparation of this paper in 2025.

REFERENCES

[1] M. Stewart, *Understanding Learning: Theories and Critique*, University Teaching in Focus, 1st ed, 2021, pp. 3–28.

[2] M. Hooda, C. Rana, O. Dahiya, A. Rizwan, and M. S. Hossain, "Artificial intelligence for assessment and feedback to enhance student success in higher education," *Mathematical Problems in Engineering*, no. 1, 2022.

[3] M. T. Chandio, N. Zahar, and G. M. Solangi, "Bloom's taxonomy: Reforming pedagogy through assessment," *Journal of Education and Educational Development*, vol. 8, no. 1, pp. 109–140, 2021.

[4] N. Kononets, O. Ilchenko, V. Zhamardiy, O. Shkola, O. Kolhan, R. Padalka, and H. Broslavka, "Software tools for creating electronic educational resources in the resource-based learning process," *Journal for Educators, Teachers and Trainers*, vol. 12, no. 3, 2021.

[5] N. Kononets, I. Denysovets, L. Derevianko, T. Blahova, O. Zhyrov, O. Shkola, and V. Zhamardiv, "Resource-based learning of students in the system of cross-cultural training of future specialists in fitness and recreation," *Journal for Educators, Teachers and Trainers*, vol. 13, no. 1, 2022.

[6] H. Wan and S. Yu, "A recommendation system based on an adaptive learning cognitive map model and its effects," *Interactive Learning Environments*, vol. 31, no. 3, pp. 1821–1839, 2023.

[7] P. Gao, J. Li, and S. Liu, "An introduction to key technology in artificial intelligence and big data driven e-learning and e-education," *Mobile Networks and Applications*, vol. 26, no. 5, pp. 2123–2126, 2021.

[8] M. F. Falah, E. S. Andayani, and R. R. Hudiyanto, "Analysis of the need for digital history teaching materials for the merdeka curriculum in senior high schools," *Jurnal EDUCATIO: Jurnal Pendidikan Indonesia*, vol. 10, no. 1, pp. 171–177, 2024.

[9] T. Drummond and P. R. Nakamura, "An examination of early grade reading assessments in central Asia: Using factor analysis to determine the latent data structure in Kyrgyz, Russian, and Tajik," *Reading and Writing*, vol. 34, no. 5, pp. 1343–1366, 2021.

[10] R. M. Bhat, P. Rajan, and L. Gamage, "Redressing historical bias: Exploring the path to an accurate representation of the past," *Journal of Social Science*, vol. 4, no. 3, pp. 698–705, 2023.

[11] J. Miles and L. Gibson, "Rethinking presentism in history education," *Theory & Research in Social Education*, vol. 50, no. 4, pp. 509–529, 2022.

[12] S. Patnaik, S. Munjal, A. Varma, and S. Sinha, "Extending the resource-based view through the lens of the institution-based view: A longitudinal case study of an Indian higher educational institution," *Journal of Business Research*, vol. 147, pp. 124–141, 2022.

[13] R. Walling-Wefelmeyer, "The methodological potential of scrapbooking: theory, application, and evaluation," *Sociological Research Online*, vol. 26, no. 1, pp. 3–26, 2021.

[14] D. A. C. Li and S. M. Waring, "Historical thinking: Analyzing student and teacher ability to analyze sources," *Journal of Social Studies Education Research*, vol. 8, no. 1, pp. 115–145, 2020.

[15] D. Rumahlatu, K. Sangur, M. M. Berhitu, S. Y. Kainama, V. V. Kakisina, and C. Latupeirissa, "Resource Based Learning Design Thinking (RBLDT): A model to improve students' creative thinking skills, concept gaining, and digital literacy," *Cypriot Journal of Educational Sciences*, vol. 16, no. 1, pp. 288–302, 2021.

[16] J. K. Matitaputty and J. Sopacua, "The effectiveness of the learning cycle 5E learning model in an effort to improve learning outcomes of history," *JIM: Jurnal Ilmiah Mahasiswa Pendidikan Sejarah*, vol. 8, no. 2, pp. 740–747, 2023.

[17] M. D. Wolcott and N. G. Lobczowski, "Using cognitive interviews and think-aloud protocols to understand thought processes," *Currents in Pharmacy Teaching and Learning*, vol. 13, no. 2, pp. 181–188, 2021.

[18] Y. K. Nengsih, C. Handrianto, M. Nurrizalia, E. R. K. Waty, and S. Shomedran, "Media and resources development of android based interactive digital textbook in nonformal education," *Journal of Nonformal Education*, vol. 8, no. 2, pp. 185–191, 2022.

[19] S. F. Farizi, N. Umamah, and R. A. Surya, "Schoology effectiveness as a history learning environment during industrial revolution 4.0 era," *IOP Conference Series: Earth and Environmental Science*, vol. 747, no. 1, 012058, 2021.

[20] S. Garg, S. Sinha, A. K. Kar, and M. Mani, "A review of machine learning applications in human resource management," *International Journal of Productivity and Performance Management*, vol. 71, no. 5, pp. 1590–1610, 2022.

[21] M. Ruelmann, C. Y. Charalambous, and A. K. Praetorius, "The representation of feedback literature in classroom observation frameworks: An exploratory study," *Educational Assessment, Evaluation and Accountability*, vol. 35, no. 1, pp. 67–104, 2023.

[22] A. Khang, V. Shah, and S. Rani, *Handbook of Research on AI-Based Technologies and Applications in the Era of the Metaverse*, IGI Global, 2023.

[23] M. Wilke, F. Depaepe, and K. Van-Nieuwenhuyse, "Fostering secondary students' historical thinking: A design study in Flemish history education," *Journal of Formative Design in Learning*, vol. 7, no. 1, pp. 61–81, 2023.

[24] J. Setiawan, A. Sudrajat and, D. Kumalasari, "Development of higher order thinking skill assessment instruments in learning Indonesian history," *International Journal of Evaluation and Research in Education*, vol. 10, no. 2, pp. 545–552, 2021.

[25] L. Jay, "Revisiting lexington green: Implications for teaching historical thinking," *Cognition and Instruction*, vol. 39, no. 3, pp. 306–327, 2021.

[26] U. Sadasivan, B. Balachander, and S. Vijayalakshmi, "Examining resource based learning and individual learning capabilities in todays' scenario," *Journal of Physics: Conference Series*, vol. 1783, no. 1, 012118, 2021.

[27] J. B. Barney, D. J. Ketchen Jr, and M. Wright, "Resource-based theory and the value creation framework," *Journal of Management*, vol. 47, no. 7, pp. 1936–1955, 2021.

[28] R. Varadarajan, "Customer information resources advantage, marketing strategy and business performance: A market resources-based view," *Industrial Marketing Management*, vol. 89, pp. 89–97, 2020.

[29] D. M. M. Sari and Y. Prasetyo, "Project-based-learning on critical reading course to enhance critical thinking skills," *Studies in English Language and Education*, vol. 8, no. 2, pp. 442–456, 2021.

[30] Sumarno, Gimin, Dafik, E. Noviana, Z. R. Ridlo, and I. L. Mursyidah, "The analysis of the RBL-STEM application in improving student financial literacy in controlling consumptive behavior," *Heliyon*, vol. 10, 2024.

[31] E. S. W. Jannah, Dafik, and A. I. Kristiana, "The development of RBL-STEM learning materials to improve students' information literacy in solving rainbow antimagic coloring problem for ETLE technology," *International Journal of Current Science Research and Review*, vol. 7, no. 1, 2024.

[32] H. Gao, X. H. Ding, and S. Wu, "Exploring the domain of open innovation: Bibliometric and content analyses," *Journal of Cleaner Production*, vol. 275, 122580, 2020.

[33] V. Kononets, "Resource-based learning of students in the system of cross-cultural training," *Journal for Educators, Teachers, and Trainers*, vol. 13, no. 1, pp. 41–50, 2022.

[34] J. Mukagihana, C. M. Aurah, and F. Nsanganwimana, "The effect of resource-based instructions on pre-service biology teachers' attitudes towards learning biology," *International Journal of Learning, Teaching and Educational Research*, vol. 20, no. 8, pp. 262–277, 2021.

[35] A. Aslan, "Problem-based learning in live online classes: Learning achievement, problem-solving skill, communication skill, and interaction," *Computers & Education*, vol. 171, 104237, 2021.

[36] H. Park, H. S. Kim and, H. W. Park, "A scientometric study of digital literacy, ICT literacy, information literacy, and media literacy," *Journal of Data and Information Science*, vol. 6, no. 2, pp. 116–138, 2021.

[37] A. Afrina, E. W. Abbas, and H. Susanto, "The role of historical science in social studies learning materials for increasing values of student's nationalism," *The Innovation of Social Studies Journal*, vol. 3, no. 1, pp. 1–8, 2021.
[38] H. Do, P. Budhwar, H. Shipton, H. D. Nguyen, and B. Nguyen, "Building organizational resilience, innovation through resource-based management initiatives, organizational learning and environmental dynamism," *Journal of Business Research*, vol. 141, pp. 808–821, 2022.
[39] A. Alam, "A digital game-based learning approach for effective curriculum transaction for teaching-learning of artificial intelligence and machine learning," presented at 2022 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS), pp. 69–74, 2022.
[40] H. Sitompul and A. H. Saragih, "Learning model development accelerated learning based on multiple intelligences to improve the vocal ability of middle school student groups," *Russian Law Journal*, vol. 11, no. 5, pp. 2091–2104, 2023.
[41] L. Burnett and J. Cuevas, "Using historical thinking strategies for improving elementary students' content knowledge and attitudes towards social studies," *Georgia Educational Researcher*, vol. 20, no. 1, pp. 28–96, 2023.
[42] E. W. Abbas, M. Syaharuddin, and M. S. Mutiani, "Strengthening historical thinking skills through transcript-based lesson analysis model in the lesson of history," *Kajian-Kajian Lokal Kalimantan Selatan*, vol. 6, p. 54, 2023.
[43] T. Z. Ningsih and N. F. Abidin, "The development of historical thinking assessment to examine students' skills in analyzing the causality of historical events," *European Journal of Educational Research*, vol. 11, no. 2, pp. 609–619, 2022.
[44] D. Saripudin, W. I. Fauzi, and E. Nugraha, "The development of interactive e-book of local history for senior high school in improving local wisdom and digital literacy," *European Journal of Educational Research*, vol. 11, no. 1, pp. 17–31, 2022.
[45] S. Tirado-Olivare, C. López-Fernández, J. A. Gonzalez-Calero, and R. Cozar-Gutierrez, "Enhancing historical thinking through learning analytics in primary education: A bridge to formative assessment," *Education and Information Technologies*, pp. 1–25, 2024.
[46] S. M. Waring and R. Hartshorne, *Conducting Authentic Historical Inquiry: Engaging Learners with SOURCES and Emerging Technologies*, 2020.
[47] D. P. Parmiti, I. G. W. S. Antara, and I. G. A. A. M. Wulandari, "The effectiveness of e-scrapbook media containing HOTS questions on science learning outcomes of elementary school students," *Journal of Education Research and Evaluation*, vol. 6, no. 3, pp. 484–491, 2022.
[48] S. D. Miller, "Oppression pedagogy: Revisiting and reassessing maxine hairston's "diversity, ideology, and teaching writing", M.S. thesis, Loisiana State University, 2020.
[49] Y. Zhang, Z. Hou, F. Yang, M. M. Yang, and Z. Wang, "Discovering the evolution of resource-based theory: Science mapping based on bibliometric analysis," *Journal of Business Research*, vol. 137, pp. 500–516, 2021.
[50] Thorp and Persson, "On historical thinking and the history educational challenge," *Educational Philosophy and Theory*, vol. 52, no. 8, pp. 891–901, 2020.
[51] Y. An, "A history of instructional media, instructional design, and theories," *International Journal of Technology in Education*, vol. 4, no. 1, pp. 1–21, 2021.
[52] T. Haydn and A. Stephen, *Learning to Teach History in Secondary School: A Companion to School Experience*, 5th ed, London, Routledge, 2021.
[53] I. Georgiou, "The literature review as an exercise in historical thinking," *Human Resource Development Review*, vol. 20, no. 2, pp. 252–273, 2021.
[54] W. H. Burston, *Principles of History Teaching*, 1st ed, Routledge, 2021.
[55] B. Bunari, M. R. Fadli, A. Fikri, J. Setiawan, A. Fahri, and I. M. Izzati, "Understanding history, historical thinking, and historical consciousness, in learning history: An ex-post-facto correlation," *Int J Eval & Res Educ*., vol. 12, no. 1, p. 260–267, 2023.
[56] T. M. Kessner and L. M. Harris, "Opportunities to practice historical thinking and reasoning in a made-for-school history-oriented videogame," *International Journal of Child-Computer Interaction*, vol. 34, 2022.