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Historical thinking skills from the perspective of high school students in Vietnam

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ABSTRACT

The transition from treating history as a "secondary" subject centered on rote memorization to the development of historical thinking represents a significant shift in Vietnam's national history curriculum implemented in 2022. This change poses challenges for teachers and students as they adapt to a more analytical and interpretative approach to history education. This study explores the application of Peter Seixas's historical thinking model integrated with visualization techniques to enhance high school students' historical thinking skills. A quantitative research design was employed involving Likert-scale surveys and statistical analysis of experimental data collected from 448 students across five high schools in Hanoi, Vietnam's capital. The findings highlight that using visualization techniques fosters deeper student engagement with historical content allowing them to critically analyze, interpret, and synthesize historical information. Students demonstrated improved abilities to assess historical complexities and apply historical knowledge to real-world contexts, significantly advancing their educational outcomes. This study underscores the importance of equipping students with historical thinking skills to navigate an increasingly complex and interconnected world. The research offers practical insights for teachers, policymakers, and curriculum developers to optimize history teaching practices. This method enhances the broader effort of improving Vietnam's history education system and promoting critical thinking in students by coordinating teaching strategies with present educational objectives.

Contribution/Originality: This study uniquely integrates Peter Seixas's model with visible thinking techniques to enhance high school students' historical thinking skills addressing the challenges of transitioning Vietnam's history education from memorization-based learning to analytical thinking. It offers pioneering insights into applying these methods, aligning with the 2022 national curriculum reforms.

1. INTRODUCTION

In the contemporary educational landscape, the development of historical thinking in high school students is becoming a critical element not only in Vietnam but globally (Nithyanantham, 2022). Historical thinking not only deepens students' understanding of the past but also equips them with the skills to analyze, evaluate and connect historical events with the present thereby deriving valuable lessons for the future (Kantz & Wineburg, 2002; Yoon, 2022). In Vietnam's secondary education, history is often underrated compared to subjects like mathematics and

literature (Le, 2012). This undervaluation limits opportunities for students to develop historical thinking, a crucial life skill in today's complex and ever-changing world (Barton & Levstik, 2004).

Teaching and learning history in Vietnamese high schools currently face several challenges. Duong Thi Kim and Nguyen Thi Minh (2021) suggest that traditional methods of instruction have reduced students' interest and accessibility by emphasizing rote memorization of events, dates and historical figures without promoting interaction, discussion, or critique. Additionally, a lack of resources, including teaching materials and facilities, poses significant barriers (Thanh Tu, 2015). However, alongside these challenges, there are opportunities from the integration of information technology in teaching and learning providing, more engaging and dynamic educational experiences for students (Bich & Hanh, 2021).

The development of historical thinking is included as a primary objective of the national history curriculum in Vietnam's ambitious educational reform program that started in the 2022–2023 school at the K–12 level. The national K-12 history curriculum in Vietnam aims to develop historical competencies representing the scientific capabilities formed at the middle school level with the following three components: historical understanding, historical cognition and thinking and the application of learned knowledge and skills (Ministry of Education and Training, 2022). This includes developing students' historical thinking, systemic thinking, critical thinking, skills in exploiting and utilizing historical sources and the ability to articulate history in both chronological and contemporary logic, connecting the past with the present (Ercikan & Seixas, 2015). This closely aligns with Peter Seixas' descriptions of historical thinking. By emphasizing the analysis, interpretation and critical synthesis of historical information, students gain a profound understanding of the past enabling them to think like historians. The theoretical framework of Peter Seixas' model of historical thinking originates from research in the "Historical Thinking Project" (2006 - 2014) funded by the Department of Canadian Heritage (Seixas & Morton, 2013). According to Seixas, historical thinking includes the following six elements: identifying significant events, using historical evidence, determining continuity and change, analyzing causes and consequences, presenting perspectives and understanding the ethical dimensions of historical interpretations (Seixas, 2015). Studies on historical thinking have been conducted over decades with notable contributions from Seixas, Wineburg, and Barton who have defined the components of historical thinking, including understanding principles of chronology, using historical evidence and recognizing and analyzing historical viewpoints (Barton & Levstik, 2004; Kantz & Wineburg, 2002). These studies emphasize the importance of teaching and learning history not just as a sequence of past events but as a critical and multidimensional process.

In Vietnam, research on historical thinking is relatively new but has begun to garner attention from the academic community. Recent studies have explored Vietnamese students' perspectives and approaches to history marked by the adoption of new teaching methods and the use of technology in education (Quyet, 2024; Tri, 2021). Some exemplary studies have indicated that Vietnamese students show a strong interest in learning history through stories, digital lessons and direct interaction with historical sources suggesting significant potential in developing historical thinking through new mediums (Ngoc Du, 2015).

This study employs methods such as interviews, surveys and experiments to explore the application of Peter Seixas' model of historical thinking skills combined with visualization techniques in the context of secondary education in Vietnam (Nghia, Phuong, & Huong, 2020). This research provides Vietnamese students with tools to engage more deeply with historical content, encouraging thorough analysis, interpretation, and synthesis of historical information by integrating visualization techniques into the history teaching process (Thanh Tu, 2015). Through this approach, we aim to address a significant limitation of history education: a large proportion of students dislike history, viewing it as a dry and monotonous subject centered on memorizing events. By equipping students with the initiative to explore historical knowledge, this approach prepares them to become global citizens in an interconnected world (Barton & Levstik, 2004). Ultimately, this study seeks to provide teachers, policymakers, and curriculum developers with practical information to enhance the quality of history education in

Vietnam, creating a generation capable of evaluating the complexities of the past and applying historical knowledge in real-life situations (Ministry of Education and Training, 2022).

The study aims to investigate how Vietnamese high school students understand and apply historical thinking skills in their studies. Specifically, it seeks to answer the following questions:

1. How do students define historical thinking?
2. What are the perceived barriers and facilitators to developing historical thinking skills?
3. How do educational and cultural contexts in Vietnam influence students' historical thinking?

2. LITERATURE REVIEW

Several factors influence historical thinking, including teaching methods, curriculum content, learning environments, and the role of technology and social media in shaping and developing high school students' capacity for historical thought. Teaching methods are considered the most critical factor affecting how students approach and develop historical thinking skills (Lesh, 2023; López-García, 2023). Emphasizing the use of primary historical sources, such as documents, images, and maps is an effective way to stimulate curiosity and analytical abilities in students (Miller & Kellum, 2024; Percival, 2020). Direct exposure to historical sources allows students to engage more deeply with content, posing questions and conducting independent research, thereby enhancing their skills in critical historical thinking and evaluation (Pettersson, 2022).

Curriculum content also significantly impacts the development of historical thinking abilities. A diverse history curriculum encompassing events, figures, and processes from various perspectives can help students understand the complexity and multidimensionality of history (Alexander & Weekes-Bernard, 2017) furthering their analytical and evaluative capabilities (Bhat, Rajan, & Gamage, 2023).

The learning environment including physical space and the classroom's psychological atmosphere plays a crucial role in supporting or limiting students' access to and development of historical thinking (Afari & Eksail, 2022; Shernoff, 2013). An ideal learning environment is where students feel safe encouraged to express personal viewpoints and motivated to engage in discussion and critique (Johnson, 1979; Khupavtseva & Kurytsia, 2022).

Finally, technology and social media have become undeniable factors in shaping the habits and modes of historical thinking among today's student generations (Aying, 2019; Wright-Maley, Lee, & Friedman, 2018). Technology provides a rich and easily accessible resource base making history more vivid and diverse (Angwaomaodoko, 2023; Ivanashko, Kozak, Knysh, & Honchar, 2024; Smith, 2022). Simulation software, educational games, and online learning platforms offer a wealth of materials, making history engaging and appealing (Vital, 2024). Additionally, technology facilitates collaboration and interaction among students and between students and teachers, thereby enhancing understanding and interest in history (Carretero, 2022).

3. METHODOLOGY

3.1. Research Design

This study was conducted in two phases which are as follows: (i) the development of tools to support the teaching of historical thinking skills using the ADDIE process (see Figure 1). (ii) The construction of a questionnaire to assess students' thinking capabilities.

Phase 1: Development of Tools for Visualizing Historical Thinking through the ADDIE Process the Thinking Routine Toolbox, provided by Project Zero at the Harvard Graduate School of Education includes over 80 techniques designed to foster thinking habits in learners across different age groups, disciplines, viewpoints and abilities. These teaching techniques are categorized into ten thinking groups: core thinking, statistics and comparison; perspectives, debate, and problem-solving, parts and wholes, expressing viewpoints, arts or subjects, convergent thinking, synthesis and organization of ideas, exploration and discovery of ideas, and global thinking. There are apparent similarities in thinking objectives comparing Project zero's thinking routine with Seixas and

Morton's (2013) historical thinking concepts. The ADDIE process is designed to identify and develop techniques within the thinking routine toolbox that are suitable for teaching historical thinking skills.

Step 1: Context Analysis: This activity begins by surveying the current level of students' historical thinking through a test to establish a basis for selecting and comparing the appropriate thinking routines. Next, the study analyzes the curriculum to determine the goals and components of historical thinking that need to be developed for students in each lesson.

Step 2: Design: In this activity, we explore the 80 techniques in project zero's thinking routine toolbox, selecting those that meet the needs of the students as well as the goals and components of the historical thinking skills required in the lessons. The selection process particularly focuses on aligning the techniques' objectives in the toolbox with the manifestations of historical thinking skills. Initially proposed techniques include stories, unveiling stories to develop skills to establish historical significance, red light, yellow light , facts or fiction, reporter's notebook to develop skills to use primary source evidence. Here now or there then, projecting across time to develop skills to identify continuity and change, options diamond for analyzing cause and consequence, circle of viewpoints, how else and why? what makes you say that ? tug of war for taking historical perspectives; sticking points, feelings and options for understanding ethical dimensions of history.

Step 3: Development at this Stage: We consult historical science experts and history education specialists to refine and finalize the selection of techniques. After expert consultation, all techniques in the thinking routine toolbox are agreed upon, except for red light, yellow light which are adjusted by adding blue light for information that is historically accurate.

Step 4: Application: We guide teachers in designing and implementing lessons that use techniques for developing students' historical thinking skills. Teachers are trained in these thinking development techniques and are proactive in proposing content knowledge and designing learning activities that employ these historical thinking skills development techniques. During the classroom implementation, we observe and evaluate the students' working process.

Step 5: Evaluation and Improvement: To assess the effectiveness of the historical thinking development techniques, this step focuses on evaluating the specific thinking skills components developed in the lessons and gathering student feedback. We will make appropriate adjustments and improvements to the techniques.

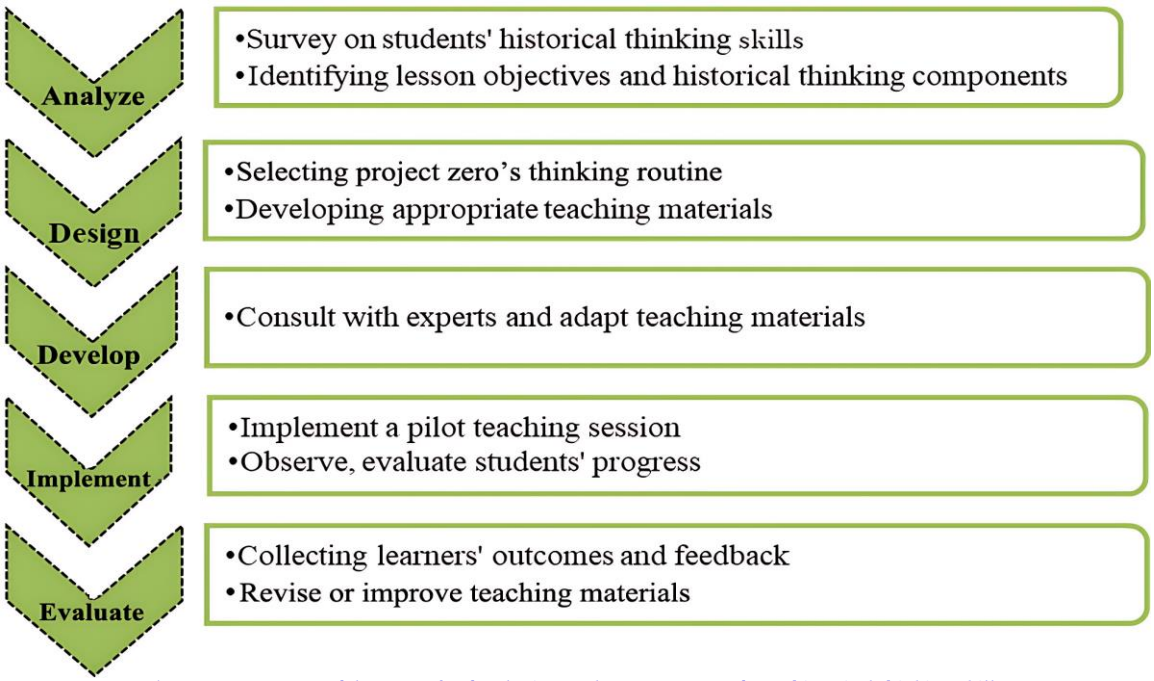

Figure 1. ADDIE model process for developing tools to support students' historical thinking skills.

Phase 2: Assessment of Students' Thinking Skills: In this phase, we assess the effectiveness of the thinking support tools developed in phase 1. Here, we employ the historical thinking concepts model by Seixas and Morton (2013) to construct a Likert-scale questionnaire aimed at evaluating the students' thinking abilities after implementing the visualization techniques developed earlier.

3.2. Research Participant

A total of 448 students from five different high schools in Hanoi, the capital city participated in the study. These schools represent the basic types of educational institutions in Vietnam including public, semi-public, specialized and private schools.

Table 1. List of schools and number of participating students in surveys and experiments (n = 448).

No.	School name	Number of students	School type
1	High school A	88	Specialized public and urban
2	High school B	90	Semi-public and urban
3	High school C	91	Private and urban
4	High school D	89	Public and suburban Hanoi
5	High school E	90	Public and suburban Hanoi

Table 1 presents the list of schools and the number of participating students in surveys and experiments, totaling 448 students. The table includes five schools of varying types and locations. This distribution illustrates a mix of urban and suburban schools with diverse administrative structures such as specialized public, semi-public, private, and regular public schools. The relatively balanced number of students from each school ensures a comprehensive representation across different types of educational institutions allowing for a more generalized analysis of the data. The total sample size (n = 448) underlines the robustness of the data collection process providing a reliable basis for subsequent evaluations or experiments.

3.3. Analyzing of Data

Descriptive analysis of all quantitative data was performed using the Statistical Package for the Social Sciences (SPSS) software program (version 27.0). Descriptive statistical analysis was conducted to calculate the Cronbach's alpha (CA), Mean (M), Standard Deviations (SD), descriptive statistics and rotated component matrix for each item assessing their respective levels.

4. FINDINGS

Table 2 shows the dimensionality insight into the level of historical thinking of Vietnamese high school students measured through some critical dimensions. The items are divided into subscales representing a core feature of historical thinking. The reliability of these responses can vary between good and excellent (α = 0.770 to 0.923).

There were questions within the "establish historical significance" factor that sought to measure if students could identify key events and people. Alpha values in this section ranged from 0.786 for the identification of key events to 0.820 for understanding the variability of significance over time and among different groups. The values would suggest a quite solid understanding among students that historical significance is not static but changes with time and perspective.

The "use primary sources" factor consisting of drawing conclusions, asking quality questions, verifying source authenticity and considering historical context showed very high reliability scores (α = 0.809 to 0.850). This indicates with good confidence that students consistently engage in exercising critical thinking and analysis when working with primary historical sources and understand that conclusions must be verified and contextually analyzed.

Table 2. Survey items and Cronbach's alpha.

Items	Factor and description	Cronbach's alpha
Factor A. Establish historical significance		
A1	Identify significant historical events and figures by pointing out the changes brought about by them.	0.786
A2	Explain significant historical events and figures by highlighting their impact on past or current issues.	0.770
A3	Recognize that each historical event presented in textbooks or sources conveys a specific message or lesson.	0.779
A4	Understand that identifying which historical events and figures are significant can vary over time and among different groups of people.	0.820
Factor B. Use primary sources		
B1	Draw insightful conclusions from primary sources.	0.827
B2	Ask quality questions that transform primary sources into evidence for historical research and discussion.	0.829
B3	Regularly search for and verify the authenticity of sources.	0.819
B4	Consistently consider the historical context when analyzing a source.	0.809
B5	Believe that conclusions drawn from a source are never entirely certain and require verification with other sources.	0.850
Factor C. Identify continuity and change		
C1	Demonstrate that continuity and change in history always coexist.	0.843
C2	Describe the pace and direction of development or decline of an event.	0.838
C3	Identify pivotal events in history.	0.824
C4	Determine historical periods based on specific criteria.	0.839
C5	Understand that what constitutes progress for one may be seen as decline by another.	0.851
Factor D. Analyze cause and consequence		
D1	Identify direct and underlying causes of each event as well as the complex relationships between them.	0.873
D2	Identify the immediate and long-term consequences of each event as well as the complex relationships between them.	0.879
D3	Analyze the causes leading to a specific historical event and rank them by their impact on the event.	0.877
D4	Determine the relationship between a historical figure's actions and the specific historical context.	0.881
D5	Distinguish between anticipated consequences and unforeseen outcomes of a historical event.	0.878
D6	Prove that historical events are not inevitable.	0.897
Factor E. Take historical perspectives		
E1	Provide examples showing differences in perspectives and thoughts between people in the past and present.	0.873
E2	Be cautious when drawing conclusions about common human issues (Like love, death, poverty, etc.).	0.878
E3	Understand and explain the viewpoints of historical figures in a specific context.	0.872
E4	Make accurate inferences based on evidence about the beliefs, values, and motives of historical figures.	0.881
E5	Recognize the limits of one's understanding of past human perspectives and thoughts.	0.874
E6	Distinguish the diversity of perspectives of historical figures in the same event.	0.872
Factor F. Understand ethical dimensions of history		
F1	Recognize the ethical values explicitly expressed in historical interpretations in media (Movies, museum exhibitions, books, etc.).	0.918
F2	Recognize the ethical values underlying historical interpretations in media (Movies, museum exhibitions, books, etc.).	0.914
F3	Make objective ethical judgments about controversial actions of people in the past.	0.923
F4	Be cautious when using contemporary standards to judge right and wrong in historical events.	0.918
F5	Make objective assessments of the ethical value of actions in history.	0.916
F6	Identify one's responsibility in remembering and compensating for contributions, sacrifices, and injustices in history.	0.918
F7	Use historical knowledge to evaluate current issues.	0.919
F8	Recognize the limitations of lessons from history.	0.922

The students even scored high in " identifying continuity and change," with Cronbach's alpha values of 0.824 to 0.851. They showed a deeply inlaid understanding of history as a process involving change and continuity and

how to establish the pace and nature of historical developments. The ability is centrally placed in the understanding of how history functions dynamically while recognizing both the more subtle continuities and significant changes across time.

Another area where the students show very high reliability of their answers is in " analyze cause and consequence" (α = 0.873 to 0.897). They seem to be able to dissect complex historical events into the direct and underlying causes and multiple often interconnected effects that are brought on as a result of these events. The highest alpha value in this section (0.897) is related to the awareness that it is not inevitable that these historical events would occur, which would seem to hint at a high level of analysis.

Take Historical Perspectives: Knowledge, respect, and appreciation of different historical perspectives and contexts (α = 0.872 to 0.881) should enable students to develop empathy and a sense of multiperspectivity in history to understand the diversity of experiences and opinions that shape historical narratives. Finally, "understanding ethical dimensions of history" showed the highest Cronbach's alpha values (α = 0.914 to 0.923) which means that the students are very reliable in what concerns the evaluation of the ethics regarding events and historical persons. They acknowledge the ethical issues of the process of meaning-making from historical stories, for example, from sources in the media and realize it is not to judge the past according to modern moral standards.

Table 3. Descriptive statistics.

Items	N	Minimum	Maximum	Mean	Std. deviation	Skewness	Kurtosis
A1	448	Statistic	Statistic	3.26	1.095	-0.034	-0.697
A2	448	1	5	3.26	1.129	-0.119	-0.705
A3	448	1	5	3.52	1.249	-0.447	-0.861
A4	448	1	5	3.40	1.281	-0.372	-0.890
B1	448	1	5	3.20	1.149	-0.017	-0.732
B2	448	1	5	3.14	1.159	-0.039	-0.642
B3	448	1	5	3.32	1.228	-0.214	-0.969
B4	448	1	5	3.42	1.231	-0.439	-0.775
B5	448	1	5	3.57	1.248	-0.486	-0.834
C1	448	1	5	3.21	1.171	-0.111	-0.820
C2	448	1	5	3.03	1.083	0.071	-0.491
C3	448	1	5	3.29	1.208	-0.256	-0.838
C4	448	1	5	3.35	1.140	-0.199	-0.771
C5	448	1	5	3.36	1.244	-0.247	-0.943
D1	448	1	5	3.24	1.154	-0.068	-0.769
D2	448	1	5	3.19	1.107	-0.049	-0.666
D3	448	1	5	3.14	1.119	-0.044	-0.671
D4	448	1	5	3.33	1.187	-0.212	-0.889
D5	448	1	5	3.09	1.156	-0.049	-0.664
D6	448	1	5	3.00	1.149	0.000	-0.613
E1	448	1	5	3.37	1.195	-0.198	-0.915
E2	448	1	5	3.48	1.211	-0.327	-0.945
E3	448	1	5	3.28	1.084	-0.049	-0.622
E4	448	1	5	3.13	1.141	0.030	-0.699
E5	448	1	5	3.45	1.205	-0.312	-0.882
E6	448	1	5	3.36	1.140	-0.137	-0.800
F1	448	1	5	3.56	1.250	-0.369	-1.041
F2	448	1	5	3.45	1.238	-0.312	-0.974
F3	448	1	5	3.27	1.136	-0.085	-0.719
F4	448	1	5	3.41	1.221	-0.252	-0.988
F5	448	1	5	3.36	1.164	-0.149	-0.852
F6	448	1	5	3.69	1.285	-0.589	-0.828
F7	448	1	5	3.33	1.162	-0.128	-0.841
F8	448	1	5	3.31	1.266	-0.236	-0.967

It can be suggested that high school students in Vietnam have very comprehensive and sophisticated historical thinking, with high scores of reliability for all factors. This indicates that the current educational approach enables

students to achieve detailed and comprehensive historical knowledge, which not only includes analytical abilities but also allows them to engage with their past meaningfully and thoughtfully.

Table 3 shows the student perceives through different historical thinking facets. The dataset items are presented in terms of their mean, standard deviation, skewness and kurtosis so that co-understanding the distribution and the tendency of the responses is possible because the mean scores of all items range from 3.00 (D6) to 3.69 (F6) indicating a slight positive tendency towards students' estimations about their historical thinking abilities and perceptions since they are all above the likely mid-point of the 1-5 scale in use.

The standard deviation values from 1.083 (C2) to 1.285 (F6) show a moderate variability of student responses among different items. This evidence shows that there is concurrence in viewing the self-assessment of historical thinking skills positively though varying at the level of individual perceptions.

Most of the skewness values are negative meaning the distribution of responses is to the right, and therefore, more students tend to self-rate highly on the historical thinking scale. For example, the most pronounced right skew is in item F6 equal to -0.589 indicating that many students self-rated high on this particular historical thinking dimension. On the other hand, items such as C2 have a slight positive skew (0.071), i.e., there is a slight tendency towards lower scoring.

The general kurtosis values are mainly negative which implies that the distribution of responses tends to be somewhat flatter than a standard bell curve; it means there is less peakiness around the mean and thicker tails. This might be taken to indicate the divergent opinions of students toward concrete aspects of historical thinking. According to Table 3, most of the students show relatively positive mean scores and in general, high school students tend to regard themselves as competent in historical thinking. However, from the variation and skewness in the data, even though most of the students were showing very high confidence regarding their competence, there are still divergences in the data that may hence be attributed to either education experience differences or personal interest in history.

A broad range of opinions and attitudes is also shown by the generally flat distribution. Most items have relatively low kurtosis—an area that will be further explored through more qualitative research to comprehend the underlying causes of these patterns.

The analysis of Table 4 above reveals significant insights into the structure and distribution of various factors assessed through the rotated component matrix. This matrix effectively delineates how different items group under multiple components, reflecting underlying patterns in the dataset. Each factor represents a distinct domain of historical understanding and skills with clear loadings on various components.

The table includes six main components with items ranging from F8 to A2 indicating diverse aspects of historical understanding and analysis. The first component heavily features items from factor F which pertains to "understand ethical dimensions of history." Items like F8 (recognize the limitations of lessons from history, load=0.797) and F7 (use historical knowledge to evaluate current issues, load=0.783) score highly suggesting this component's focus on the ethical evaluation of historical events and lessons.

In contrast, the second component is dominated by items from factor B, "use primary sources," with B3 (regularly search for and verify the authenticity of sources, load=0.762) and B1 (draw insightful conclusions from primary sources and load=0.652) illustrating a strong inclination towards primary source analysis. This component emphasizes the skills necessary to handle and interpret primary historical sources critically.

Component three focuses on "analyze cause and consequence" as seen in items D1 through D6 where D5 (distinguish between anticipated and unforeseen outcomes of historical events and load=0.801) and D2 (identify the immediate and long-term consequences of events and load=0.750) are prominent. This suggests a methodological focus on understanding and teaching the complexities of causality in history.

Table 4. Rotated component matrix.

Items	Components					
	1	2	3	4	5	6
F1	0.703					
F2	0.687					
F3	0.699					
F4	0.660					
F5	0.775					
F6	0.752					
F7	0.783					
F8	0.797					
B1		0.652				
B2		0.651				
B3		0.762				
B4		0.648				
B5		0.677				
D1			0.687			
D2			0.750			
D3			0.718			
D4			0.738			
D5			0.801			
D6			0.742			
E1				0.775		
E2				0.742		
E3				0.682		
E4				0.643		
E5				0.762		
E6				0.730		
C1					0.759	
C2					0.753	
C3					0.695	
C4					0.672	
C5					0.660	
A1						0.614
A2						0.659
A3						0.788
A4						0.745

The fourth component is enriched with items from factor E, " take historical perspectives," such as E1 (provide examples showing differences in perspectives and load=0.775) and E5 (recognize limits of one's understanding of past perspectives and load=0.762). This component underscores the importance of recognizing and teaching the diversity of historical viewpoints and the evolution of perspectives over time.

Lastly, components five and six appear to handle items from factors C and A, respectively dealing with " identify continuity and change" and "establish historical significance." For instance, C2 (describe the pace and direction of historical change and load=0.753) and A3 (recognize that each historical event conveys a specific message and load=0.788) highlight the focus on recognizing patterns of continuity and pivotal events in history, along with their messages or lessons.

Table 5 reveals key factors affecting students' historical thinking preferences. These results show significant variations across multiple items in sections A–F. We used the sum of squares, degrees of freedom (df), mean square, F-statistic, and significance (Sig.) to evaluate each item.

The data strongly suggests that students recognize the importance of historical thinking elements. All F-values reported across items are significant ($p < 0.05$) indicating statistically significant differences and unlikely random chance associations.

Table 5. Influencing factor: Level of favorability.

Items	Sum of squares	Df	Mean square	F	Sig.
A1	54.884	4	13.721	12.635	0.000
A2	54.940	4	13.735	11.814	0.000
A3	55.149	4	13.787	9.505	0.000
A4	49.765	4	12.441	8.066	0.000
B1	70.183	4	17.546	14.955	0.000
B2	59.823	4	14.956	12.246	0.000
B3	107.870	4	26.967	21.100	0.000
B4	74.872	4	18.718	13.762	0.000
B5	50.745	4	12.686	8.714	0.000
C1	65.803	4	16.451	13.316	0.000
C2	63.539	4	15.885	15.266	0.000
C3	73.419	4	18.355	14.037	0.000
C4	73.722	4	18.431	16.109	0.000
C5	43.174	4	10.793	7.373	0.000
D1	60.119	4	15.030	12.450	0.000
D2	51.188	4	12.797	11.405	0.000
D3	52.430	4	13.108	11.453	0.000
D4	84.223	4	21.056	17.098	0.000
D5	56.539	4	14.135	11.573	0.000
D6	47.392	4	11.848	9.673	0.000
E1	45.163	4	11.291	8.427	0.000
E2	36.293	4	9.073	6.487	0.000
E3	71.513	4	17.878	17.439	0.000
E4	40.557	4	10.139	8.300	0.000
E5	72.826	4	18.206	14.000	0.000
E6	55.242	4	13.810	11.633	0.000
F1	55.383	4	13.846	9.536	0.000
F2	59.339	4	14.835	10.507	0.000
F3	51.784	4	12.946	10.915	0.000
F4	51.859	4	12.965	9.343	0.000
F5	55.302	4	13.825	11.139	0.000
F6	40.332	4	10.083	6.400	0.000
F7	50.365	4	12.591	10.079	0.000
F8	34.457	4	8.614	5.594	0.000

Category B items which could refer to historical knowledge acquisition (e.g., understanding historical events, and chronology) have high F-values with B3 having the highest at 21.100. This suggests that students thought the B3 item had a greater impact on their historical thinking favorability than other factors.

Category D which may reflect attitudes toward historical evidence and sources also has high F-values, particularly D4 at 17.098. Students may view historical thinking as requiring the ability to critically evaluate and use historical sources.

Items in categories E and F which may relate to subjective factors like personal interest in history or how historical narratives affect personal identity had both high and low influence. E3 and E5 have strong influences with F-values of 17.439 and 14.000 while E2 has 6.487. This suggests that personal engagement and narratives affect students' historical thinking favorability differently.

Table 5 shows how historical thinking affects Vietnamese high school students in complex and varied ways. The data supports each factor's significance statistically highlighting the multidimensionality of historical thinking in education. This analysis validates the factors' relevance and identifies areas where educational strategies can improve students' history engagement and understanding.

Table 6. Independent samples test: Favorite level.

Items	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
A1	4.867	0.028	-1.141	236	0.255	-0.170	0.149	-0.463	0.123
A2	4.595	0.033	-1.614	236	0.108	-0.240	0.149	-0.532	0.053
A3	0.001	0.970	-1.429	236	0.154	-0.231	0.162	-0.550	0.088
A4	4.437	0.036	0.860	236	0.391	0.149	0.173	-0.192	0.489
B1	6.518	0.011	-1.008	236	0.314	-0.152	0.151	-0.449	0.145
B2	2.095	0.149	-1.825	236	0.069	-0.280	0.153	-0.582	0.022
B3	5.400	0.021	-2.825	236	0.005	-0.416	0.147	-0.706	-0.126
B4	0.278	0.598	-2.348	236	0.020	-0.374	0.159	-0.688	-0.060
B5	1.495	0.223	-1.052	236	0.294	-0.171	0.163	-0.491	0.149
C1	1.441	0.231	-2.733	236	0.007	-0.422	0.154	-0.725	-0.118
C2	3.682	0.056	-2.550	236	0.011	-0.365	0.143	-0.647	-0.083
C3	0.038	0.845	-1.703	236	0.090	-0.272	0.160	-0.587	0.043
C4	0.138	0.711	-1.933	236	0.054	-0.275	0.142	-0.555	0.005
C5	0.814	0.368	-1.969	236	0.050	-0.321	0.163	-0.642	0.000
D1	1.253	0.264	-1.464	236	0.144	-0.229	0.156	-0.537	0.079
D2	6.065	0.015	-2.085	236	0.038	-0.308	0.148	-0.599	-0.017
D3	4.423	0.037	-1.664	236	0.097	-0.251	0.151	-0.548	0.046
D4	0.025	0.874	-1.672	236	0.096	-0.253	0.152	-0.552	0.045
D5	2.642	0.105	-1.985	236	0.048	-0.310	0.156	-0.618	-0.002
D6	2.307	0.130	-2.716	236	0.007	-0.419	0.154	-0.724	-0.115
E1	0.075	0.785	-1.058	236	0.291	-0.164	0.155	-0.470	0.141
E2	0.512	0.475	-0.639	236	0.523	-0.100	0.156	-0.407	0.208
E3	0.001	0.978	-2.536	236	0.012	-0.353	0.139	-0.628	-0.079
E4	1.443	0.231	-1.727	236	0.086	-0.268	0.155	-0.574	0.038
E5	0.082	0.775	-0.687	236	0.493	-0.104	0.151	-0.402	0.194
E6	0.006	0.940	-1.317	236	0.189	-0.196	0.149	-0.489	0.097
F1	0.866	0.353	-1.404	236	0.162	-0.218	0.155	-0.524	0.088
F2	7.083	0.008	-0.746	236	0.457	-0.121	0.162	-0.441	0.199
F3	10.418	0.001	-1.603	236	0.110	-0.243	0.152	-0.541	0.056
F4	3.955	0.048	-0.915	236	0.361	-0.148	0.162	-0.468	0.171
F5	0.805	0.370	-1.836	236	0.068	-0.284	0.155	-0.589	0.021
F6	2.187	0.141	-0.311	236	0.756	-0.051	0.165	-0.377	0.274
F7	1.042	0.308	-2.144	236	0.033	-0.333	0.155	-0.638	-0.027
F8	0.598	0.440	-1.505	236	0.134	-0.261	0.173	-0.602	0.081

Table 6 presents the results of the independent samples test for the favourite levels of different items, providing insights into the equality of variances and mean differences between groups. The table includes statistical measures such as Levene's test for equality of variances, t-test values, significance levels, mean differences, and confidence intervals.

For instance, the results below give Levene's test of equality of variances and the t-test of equality of means for some items, whereby findings indicate differences in some items. For example, the items of B3 and C1 are conspicuous whereby the significant mean differences ($p < 0.01$) seem to suggest differences to a considerable extent in the way groups perceive aspects of historical thinking related to these items. The difference in means for B3 is -0.416 with a 95% CI between -0.706 and -0.126 whereas for C1, the difference in means is -0.422 with a 95% CI between -0.725 and -0.118. Both would suggest one of the groups has a lower favorability score compared to the other.

However, in the case of A1, A4, and E2, there are no such differences ($p > 0.05$) which means that the level of favorability in these cases tends to be consistent among the groups analyzed. Therefore, this means that there is not a great deal of difference between student perceptions of this aspect of historical thinking.

Of course, it is possible to explain the dispersion of the responses as the meaning of the significance values in Levene's test for equality of variances. For example, for items F2 and F3, Levene's test was significant implying unequal variances across groups and requiring cautious interpretation of the t-test result on those items.

5. DISCUSSION

The findings of this study highlight the potential of applying thinking visible techniques in enhancing historical thinking skills among high school students in Vietnam (Lien, 2022; Shreiner, 2019). These techniques have contributed to creating a more engaging and positive educational environment, transforming the predominantly narrative-based teaching of characters and events in textbooks (Hanh, 2022). This change addresses the new requirements of the 2022 high school history curriculum which emphasizes guiding students to identify and utilize historical sources, reconstruct the past, understand historical contexts, make inferences, and scientifically assess the origins and development of historical events to seek historical truth and apply historical knowledge in practice (Ministry of Education and Training, 2022). These results also reflect the suitability of applying Peter Seixas' historical thinking theory within the Vietnamese educational context.

A noteworthy aspect is the diversity of research methods used ranging from program analysis to interviews and experiments providing a multidimensional view of the effectiveness of visible thinking techniques. Preliminary results from evaluating the impact of these techniques have encouraged students to think more deeply and comprehensively about historical issues (Shreiner, 2019). Students interact with primary sources, engage in discussions with peers and express their views and creativity in the learning process (Van Hover, Hicks, & Dack, 2016).

Additionally, the study sheds light on the role of teachers in promoting the development of historical thinking skills through the use of thinking techniques (Carrasco, Fernández, & Vera, 2023). The meticulous preparation of teachers in supplementing primary sources providing detailed guidance, and offering support during the teaching process along with their creativity and flexibility in using teaching tools and methods are crucial factors that enhance the learning process (Davis, 2021; Joan, 2013) .

However, it should be noted that applying thinking techniques alone is not a standalone solution for developing historical thinking skills. To achieve optimal results, these techniques should be combined with diverse teaching methods and organized learning activities to truly engage learners in the process and make them part of it Phap (2017) and Lei and Jeyaraj (2023). Knowledge of the past becomes more vivid and accessible. Moreover, developing thinking skills requires time. Initially, students may struggle with tasks requiring thoughtful analysis (Carrasco et al., 2023). Teachers should guide students step-by-step through each visible thinking technique in a continuous process to facilitate experiential learning and habit formation (Dajani, 2016; Gholam, 2018; Lan, 2023).

Overall, this study provides significant insights into both the theoretical and practical aspects of implementing innovative teaching methods in historical education in Vietnam contributing to the enhancement of educational quality and the development of historical thinking skills among high school students.

6. CONCLUSION

The study demonstrates that employing visualization techniques alongside Peter Seixas' historical thinking model significantly enhances historical understanding among secondary education students in Vietnam. This research used Likert-scale questionnaires to assess various components of historical thinking conducted with 448 high school students across five diverse schools in Hanoi. The results showed high reliability with Cronbach's alpha ranging from 0.770 to 0.923 indicating strong internal consistency in the students' historical thinking skills.

Notably, students exhibited substantial improvement in analyzing causes and consequences ($\alpha = 0.879$) and understanding the ethical dimensions of history ($\alpha = 0.918$) reflecting their ability to critically assess and ethically reflect on historical events and figures. This means the students were enabled not only to engage themselves in

history as a living narration but also to critically assess and ethically reflect on historical events and personages. Visualization techniques greatly boosted student engagement and depth of knowledge as evidenced by higher recognition of major historical events and figures post-intervention ($\alpha = 0.820$) compared to pre-intervention ($\alpha = 0.786$). Additionally, students demonstrated an enhanced capability to critically use primary sources with a reliability score of 0.850.

The students' comprehension of historical continuity and change was also strong with Cronbach's alpha values between 0.824 and 0.851 indicating a nuanced understanding of how social, political, and cultural factors evolve over time. Their ability to engage with different historical perspectives was robust ($\alpha = 0.872$ to 0.881) showing an appreciation for the complexity of historical narratives. This is an important competency that allows students to make sense of other perspectives, contexts, and interpretations in the historical narrative, thereby engaging with the complexity of history. Furthermore, students' capacity to make ethical judgments about historical events was well-developed ($\alpha = 0.923$) preparing them to address moral issues raised by historical studies in a globalized world.

Overall, the evidence strongly suggests that visualization techniques when combined with a sound theoretical foundation in historical thinking significantly enhance students' ability to think critically, reason ethically, and appreciate the complexity of human history. This comprehensive improvement across various dimensions of historical thinking underscores the effectiveness of these educational approaches in fostering a deeper and more engaged understanding of history among high school students.

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