

Enhancing Social Studies Learning Achievement and Analytical Thinking through the Historical Method Integrated with Artificial Intelligence

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Abstract

Developing students' analytical thinking and disciplinary understanding in social studies is essential for preparing them to engage with historical information critically, and integrating the historical method with artificial intelligence offers a promising approach to support these goals. Therefore, the purposes of this study were to: (1) develop an instructional model using the historical method integrated with AI to meet the 80/80 efficiency criterion, (2) compare students' learning achievement before and after the intervention, and (3) compare their analytical thinking performance across the same phases. The participants were 35 Grade 12 students selected through cluster random sampling. The instruments included four learning management plans, a 20-item learning achievement test, and a 20-item analytical thinking test. Data were analyzed using descriptive statistics, E1/E2 efficiency analysis, and dependent samples t-tests. The results showed that the instructional model achieved E1/E2 values of 84.65/83.18, exceeding the 80/80 benchmark, and that students' posttest scores in both learning achievement and analytical thinking were significantly higher than their pretest scores. These findings contribute to the literature by demonstrating the potential of AI-supported historical inquiry to enhance cognitive outcomes in social studies education.

Keywords: historical method, artificial intelligence in Education, learning achievement, analytical thinking

1. Introduction

The teaching of History and Social Studies plays a central role in cultivating citizens who can interpret the past, navigate contemporary issues, and make informed decisions in democratic societies (Beal et al., 2009; Çal & Demirkaya, 2020; Kennedy, 2021). Contemporary scholarship emphasizes that social studies education must move beyond the transmission of factual information toward the development of higher-order competencies such as critical thinking, contextual reasoning, evidence-based argumentation, and ethical judgment (Dhakal, 2025).

The historical method—characterized by questioning, sourcing, evaluating evidence, interpreting multiple perspectives, and constructing historical explanations—has therefore gained increasing prominence as a pedagogical framework for disciplinary learning (Burgos-Videla et al., 2025; Westberg, 2025). Burgos-Videla et al. (2025) argue that historical method and historical discourse are essential tools for transforming History and Social Sciences classrooms from spaces of rote memorization into environments that promote reflective, socio-critical thinking and civic awareness. Similarly, Goldman and Popp (2022) and Monte-Sano et al. (2020) show that inquiry-based historical instruction enables learners to read, reason, and argue like historians, although teachers often find traditional materials and assessments insufficient for supporting such inquiry-oriented pedagogy.

Within the broader field of Social Studies, historical thinking skills are also connected to students' ability to understand national identity, continuity and change, causation, and civic values (Nuttall, 2021; Tambyah, 2017). Afrina et al. (2021) highlight how historical science shapes students' understanding of time, change, and nationalism, thereby contributing to character development and responsible citizenship. However, despite the recognized value of historical inquiry, many social studies classrooms—especially in Asian and developing contexts—continue to rely on

teacher-centered lectures, emphasizing names, dates, and events rather than interpretive reasoning. Research consistently shows that such traditional practices limit learners' engagement and hinder the development of analytical thinking, a key competency emphasized in 21st-century education.

Parallel to these developments, artificial intelligence (AI) has emerged as a powerful tool with the potential to transform learning environments. AI applications such as chatbots, AI-driven text generators, and tutoring systems offer new opportunities for personalized learning, information retrieval, and analytical support (Berson & Berson, 2023; Davidson, 2024; Ogen & Faloye, 2025). Studies in higher and secondary education have demonstrated that AI tools can enhance students' abilities to analyze information, construct arguments, and make sense of complex concepts (Essien et al., 2024; Szmyd & Mitera, 2025; Sultonqulov, 2025). In Social Studies specifically, AI literacy is increasingly considered a citizenship competency, as students must learn to navigate, interpret, and ethically engage with AI-generated information (Yetişensoy & Rapoport, 2023). Recent classroom-based research also indicates that AI-powered chatbots can improve academic performance and learning retention, while promoting student engagement and sustained inquiry (Yetişensoy & Karaduman, 2024). These developments underscore the growing alignment between AI tools and the epistemic goals of social studies education—particularly inquiry, analysis, and reflective judgment.

Despite these promising findings, the intersection of AI and historical inquiry remains underexplored. Most existing AI research in education focuses on STEM, literacy, or general critical thinking, while studies on historical method predominantly examine inquiry practices, evidence evaluation, and teacher development without considering the role of intelligent technologies. Few studies have integrated AI directly into the historical method to support core disciplinary processes such as sourcing evidence, evaluating competing accounts, or synthesizing historical interpretations. This gap is especially notable in secondary-level social studies classrooms, where students often struggle to access and evaluate diverse historical sources. Given that the second step of the historical method—evidence gathering—is dependent on students' ability to search for, filter, and interpret information, AI offers a unique opportunity to scaffold and enrich these processes.

In the Thai educational context, these challenges are compounded by persistent issues in history learning, including low achievement levels, limited analytical thinking, and continued reliance on teacher-centered instruction (Arphattananon, 2021). National curriculum reforms emphasize disciplinary thinking, inquiry skills, and digital literacy, yet classroom implementation often lags behind these expectations. Integrating AI tools with the historical method may therefore serve as a pedagogical innovation that aligns with both global disciplinary standards and national educational priorities.

Responding to the need for instructional models that combine disciplinary historical inquiry with AI-enhanced learning, the present study developed and implemented an instructional approach that integrates the historical method with artificial intelligence tools—specifically AI chatbots and AI-assisted information search—to strengthen Grade 12 students' social studies learning achievement and analytical thinking. In this design, AI was embedded within the evidence-gathering phase of the historical method to support students in accessing, comparing, and interpreting historical sources with greater depth and accuracy. Accordingly, the study pursued three objectives: (1) to develop the historical-method-based instructional model integrated with AI to meet the 80/80 efficiency criterion, (2) to compare students' learning achievement before and after receiving the AI-supported historical method instruction, and (3) to compare their analytical thinking performance across the same pre- and post-intervention phases. By addressing these aims, the study contributes empirical evidence to emerging scholarship at the intersection of history education, social studies pedagogy, and AI-enhanced learning, illustrating how AI-supported historical inquiry can influence students' disciplinary understanding and analytical skills.

2. Methodology

2.1 Research Design

This study employed a one-group pretest–posttest experimental design to examine the effects of integrating the historical method with artificial intelligence tools on Grade 12 students' social studies learning achievement and analytical thinking. The intervention consisted of four lesson plans on major Western civilizations taught over eight hours, during which students applied the five-step historical method and used AI applications—including ChatGPT, SciSpace, and AI chatbots—during the evidence-gathering phase. Pretest and posttest measures were administered to assess changes in learning achievement and analytical thinking, and the efficiency of the instructional model was evaluated using the E1/E2 criterion in accordance with the study's objectives.

2.2 Participants

The participants consisted of 35 Grade 12 students enrolled in a social studies course at Burapha Pittayakarn Municipal School in Maha Sarakham Province during the second semester of the 2024 academic year. They were selected through cluster random sampling, drawn from one classroom out of two available Grade 12 classes. All participants received the full instructional intervention and completed both the pretest and posttest assessments

2.3 Instruments

2.3.1 Learning Management Plan

The learning management plans were developed to provide a structured instructional sequence that integrates the historical method with artificial intelligence tools to enhance students' learning achievement and analytical thinking. Guided by the principles of historical inquiry—problem identification, evidence collection, evaluation, interpretation, and presentation—the plans were designed to promote active investigation and evidence-based reasoning. The instructional package consisted of four lesson plans on major Western civilizations (Mesopotamia, Egypt, Greece, and Rome), each delivered over two hours. For example, in the lesson on the Mesopotamian civilization, students began by identifying a historical question, used AI tools such as ChatGPT and SciSpace to search for and compare evidence, evaluated the credibility of sources, interpreted their findings collectively, and presented synthesized explanations to the class. All four lesson plans were reviewed by five experts for content alignment, methodological coherence, and instructional suitability, and were evaluated using a five-point rating scale, yielding an overall mean score of 4.50, which indicates a very high level of appropriateness.

2.3.2 Learning Achievement Test

The learning achievement test was designed to measure students' understanding of key historical concepts related to major Western civilizations taught in the intervention. The test assessed knowledge of content such as cultural development, political structures, geography, and historical significance across the four civilizations included in the learning plans. It consisted of 20 multiple-choice items, developed based on the curriculum indicators, learning objectives, and sample test formats relevant to the social studies domain. Items were initially constructed as a pool of 30 questions and then refined through expert review. All items demonstrated acceptable content validity (IOC = 0.6–1.0), and quality analysis from the try-out indicated appropriate item difficulty ($p = 0.41–0.70$) and discrimination ($r/B = 0.38–0.71$). The final 20-item test showed strong reliability, with a coefficient of 0.93, indicating high internal consistency

2.3.3 Analytical Thinking Test

The analytical thinking test was constructed to assess students' ability to analyze, compare, interpret, and evaluate historical information in relation to ancient civilizations. The test measured core analytical skills aligned with historical inquiry, including identifying relationships, distinguishing credible evidence, synthesizing ideas, and drawing logical conclusions. It consisted of 20 multiple-choice items, developed from curriculum standards, analytical thinking indicators, and prior assessment frameworks in social studies. An initial pool of 30 items was created and refined through expert review before selection of the final set. All items demonstrated acceptable content validity, with IOC values ranging from 0.60–1.00, and item analysis from the try-out showed appropriate difficulty ($p = 0.35–0.71$) and discrimination ($r = 0.24–0.65$). The complete 20-item instrument yielded a reliability coefficient of 0.82, indicating satisfactory internal consistency for measuring analytical thinking.

2.4 Data Collection

Data collection followed a structured sequence aligned with the one-group pretest–posttest design. First, permission to conduct the study was obtained from the Faculty of Education and the participating school. Students then completed a pretest consisting of the learning achievement test and the analytical thinking test to determine their baseline performance. The instructional intervention was implemented across four lesson plans (eight hours total), during which students engaged in historical inquiry supported by AI tools. After completing each lesson, students also took short formative assessments. Upon completion of the full instructional sequence, students completed the posttest using the same instruments administered before the intervention.

2.5 Data Analysis

Data were analyzed using descriptive and inferential statistics. Mean, standard deviation, and percentage scores were calculated to summarize students' performance on the achievement and analytical thinking tests. The E1/E2 efficiency criterion was used to assess the effectiveness of the instructional model during the learning process (E1) and after instruction (E2). E1 reflects students' performance on formative tasks throughout the lessons, while E2

represents their mastery on the posttest, allowing a comprehensive evaluation of both process and product efficiency. To determine the impact of the intervention, a dependent samples t-test was used to compare pretest and posttest scores for both learning achievement and analytical thinking. All analyses were conducted in accordance with the study's objectives and the assumptions of the selected statistical procedures.

3. Results

3.1 Efficiency of the AI-Supported Historical Method (E1/E2)

Table 1. Efficiency (E1/E2) of the Instructional Model

Efficiency Indicator	N	Score (%)
E1 (process)	35	84.65
E2 (product)	35	83.18

Note. Both values exceed the 80/80 criterion.

The efficiency of the AI-Supported Historical Method was examined using the E1/E2 efficiency criterion. E1 (process efficiency) was calculated as the percentage of the mean scores obtained from learning activities and formative assessments during instruction relative to the total possible score. E2 (product efficiency) was calculated as the percentage of the mean posttest score relative to the full score of the achievement test.

As shown in Table 1, the instructional model achieved an E1 value of 84.65%, indicating that students attained 84.65% of the total possible process score during the learning activities. The E2 value was 83.18%, indicating that students achieved 83.18% of the total posttest score after completing the instruction. Both values exceeded the established 80/80 efficiency criterion, demonstrating that the instructional model was efficient in terms of both instructional process and learning outcomes. These results indicate that the instructional model integrating the historical method with AI tools demonstrated satisfactory process and product efficiency.

3.2 Comparison of Learning Achievement Before and After Instruction

Table 2. Pretest–Posttest Comparison of Learning Achievement

Test	N	M	SD	t	p
Pretest	35	8.15	1.81	33.88	.000
Posttest	35	16.64	1.54		

Note. $p < .05$.

A dependent samples t-test was used to compare students' learning achievement before and after the intervention. Table 2 shows that posttest scores ($M = 16.64$, $SD = 1.54$) were significantly higher than pretest scores ($M = 8.15$, $SD = 1.81$), $t(34) = 33.88$, $p < .05$. The results indicate a marked increase in students' learning achievement, with the mean score nearly doubling from pretest to posttest. In addition, the reduction in standard deviation suggests that students' performance became more consistent after instruction, indicating that the instructional intervention benefited not only high-performing students but also supported lower-performing learners in achieving improved outcomes.

3.3 Comparison of Analytical Thinking Before and After Instruction

Table 3. Pretest–Posttest Comparison of Analytical Thinking

Test	N	M	SD	t	p
Pretest	35	7.85	1.68	33.46	.000
Posttest	35	16.12	0.96		

Note. $p < .05$.

A dependent samples t-test was also conducted to assess changes in analytical thinking. Table 3 demonstrates that posttest scores ($M = 16.12$, $SD = 0.96$) were significantly higher than pretest scores ($M = 7.85$, $SD = 1.68$), $t(34) = 33.46$, $p < .05$. The findings reveal a substantial improvement in students' analytical thinking ability, reflected in a large increase in mean scores from pretest to posttest. The notably smaller standard deviation in the posttest indicates reduced variability among students, suggesting that the instructional approach effectively supported the development of analytical thinking skills across the entire group rather than benefiting only a subset of learners.

4. Discussion

The findings suggest that integrating the historical method into social studies instruction was associated with notable improvements in students' learning achievement and analytical thinking; however, these outcomes should be interpreted in relation to the instructional processes rather than as automatic effects of the method itself. The historical method requires learners to formulate questions, gather and scrutinize evidence, evaluate source credibility, and construct reasoned interpretations. These processes closely resemble the cognitive operations underlying analytical thinking and may explain why students demonstrated substantial gains in both analytical performance and content mastery. Nevertheless, the effectiveness of the method likely depends on how consistently these inquiry stages are enacted and scaffolded within classroom practice, rather than on the method as a standalone instructional label.

The present findings are broadly consistent with prior research emphasizing the role of historical inquiry in fostering critical and reflective thinking. Burgos-Videla et al. (2025) argue that the historical method supports socio-critical citizenship by encouraging learners to engage with multiple perspectives and challenge dominant narratives through evidence-based reasoning. Similarly, Afrina et al. (2021) highlight that historical inquiry helps students develop an understanding of continuity, change, and causation—concepts that are fundamental to disciplinary comprehension and academic achievement. Empirical studies by Goldman and Popp (2022) and Monte-Sano et al. (2020) further demonstrate that inquiry-based history instruction can enhance students' historical reasoning and content understanding. However, these scholars also caution that such outcomes are not guaranteed and may require sustained teacher support, carefully designed tasks, and gradual instructional change—factors that should be considered when interpreting the results of the present study.

The integration of artificial intelligence tools appears to have further supported students' learning, particularly during the evidence-gathering stage of historical inquiry. AI-assisted search tools and chatbots enabled students to access information more efficiently, compare multiple sources, and clarify complex concepts, which may have reduced cognitive load and allowed greater focus on analysis and interpretation. At the same time, the contribution of AI should not be understood as replacing historical reasoning processes, but rather as providing scaffolding that supports students' engagement with those processes. This interpretation aligns with Szmyd and Mitera (2025), who found that AI tools can facilitate information analysis and argument construction while simultaneously raising concerns about over-reliance and diminished independent thinking. Similarly, Sultonqulov (2025) emphasizes that AI's effectiveness in developing analytical skills depends on pedagogical design and guided use rather than unrestricted automation.

Within social studies education, AI integration also raises broader questions related to citizenship and literacy. Yetisensoy and Rapoport (2023) argue that AI literacy is increasingly inseparable from social studies education, given the subject's emphasis on evaluating information, interpreting complex social issues, and making informed judgments. Empirical evidence from Yetisensoy and Karaduman (2024) supports the instructional potential of AI-powered chatbots in social studies classrooms, showing gains in achievement and retention. Nevertheless, these authors also note design limitations and the need for further refinement, suggesting that AI tools should be critically integrated alongside disciplinary goals rather than treated as neutral or universally beneficial technologies. Viewed in this light, the positive outcomes observed in the present study likely reflect the complementary interaction between structured historical inquiry and carefully guided AI use, rather than the effect of either component in isolation.

5. Conclusion

This study developed and implemented an instructional model that integrated the historical method with artificial intelligence tools to enhance Grade 12 students' social studies learning achievement and analytical thinking. Using a one-group pretest–posttest design, the study evaluated the model's efficiency and its impact on student outcomes. The results demonstrated that the instructional model exceeded the 80/80 efficiency criterion and produced significant gains in both learning achievement and analytical thinking. These findings contribute to the growing

literature on disciplinary inquiry in social studies and AI-enhanced learning by providing empirical evidence of how AI-supported historical inquiry can strengthen students' cognitive outcomes.

The findings carry meaningful implications for social studies instruction, suggesting that combining historical inquiry with AI tools can promote deeper engagement with historical sources, more rigorous analysis, and higher levels of conceptual understanding. However, the study is limited by its one-group design, short intervention duration, and single-school sample, which restrict the generalizability of the findings. Future research should employ experimental or quasi-experimental designs with larger and more diverse samples to establish causal relationships and examine how different AI tools or forms of inquiry-based instruction influence learning. Studies may also explore long-term retention, student engagement patterns, and teacher readiness for integrating AI within disciplinary instruction.

References

- Afrina, A., Abbas, E. W., & Susanto, H. (2021). The Role of Historical Science in Social Studies Learning Materials for Increasing Values of Student's Nationalism. *The Innovation of Social Studies Journal*, 3(1), 1-8. <https://doi.org/10.20527/iis.v3i1.3769>
- Arphattananon, T. (2021). Social studies curriculum in Thailand: A contested terrain. In *Social Studies Education in South and South East Asian Contexts*. Routledge.
- Beal, C., Bolick, C. M., & Martorella, P. H. (2009). *Teaching Social Studies in Middle and Secondary Schools*. Allyn & Bacon/Pearson.
- Berson, I. R., & Berson, M. J. (2023). The Democratization of AI and Its Transformative Potential in Social Studies Education. *Social Education*, 87(2), 114-118.
- Burgos-Videla, C., Parada-Ulloa, M., & Martínez-Díaz, J. (2025a). Critical thinking in the classroom: The historical method and historical discourse as tools for teaching social studies. *Frontiers in Sociology*, 10. <https://doi.org/10.3389/fsoc.2025.1526437>
- Burgos-Videla, C., Parada-Ulloa, M., & Martínez-Díaz, J. (2025b). Critical thinking in the classroom: The historical method and historical discourse as tools for teaching social studies. *Frontiers in Sociology*, 10. <https://doi.org/10.3389/fsoc.2025.1526437>
- Çal, Ü. T., & Demirkaya, H. (2020). The Role and Importance of Social Studies in The Education of Gifted Students. *Journal of History Culture and Art Research*, 9(2), 25-39. <https://doi.org/10.7596/taksad.v9i2.2344>
- Davidson, D. (2024). *AI in Education: Revolutionizing Learning and Administration*. Pure Water Books.
- Dhakal, K. R. (2025). Relevance of Social Studies Curriculum in the 21st Century: Exploring the Experiences of Secondary Level Learners. *Perspectives on Higher Education*, 15(01), 147-154. <https://doi.org/10.3126/phe.v15i01.80974>
- Essien, A., Bukoye, O. T., O'Dea, X., & Kremantzis, M. (2024). The influence of AI text generators on critical thinking skills in UK business schools. *Studies in Higher Education*, 49(5), 865-882. <https://doi.org/10.1080/03075079.2024.2316881>
- Goldman, S. R., & Popp, J. S. (2022). Transforming Sixth-Grade Social Studies from "Just the Facts" to Historical Inquiry: A Case Study of Teacher Learning. *The History Teacher*, 56(1), 41-75.
- Kennedy, K. J. (2021). *Social Studies Education in South and South East Asian Contexts*. Routledge.
- Monte-Sano, C., Bordonaro, A., & Aumen, J. (2020). Successes and Challenges in Learning to Teach History as Inquiry: Novices' Uptake of Core Practices. *The History Teacher*, 53(4), 675-706.
- Nuttall, D. (2021). What is the purpose of studying history? Developing students' perspectives on the purposes and value of history education. *History Education Research Journal*, 18(1). <https://doi.org/10.14324/HERJ.18.1.06>
- Ogen, O., & Faloye, B. (2025). *Advancing the Frontiers of Education. Science and Technology in Nigeria: A Festschrift in Honour of Professor Olufemi Victor Adeoluwa*. GRIN Verlag.
- Sultonqulov, G. M. (2025). The role of ai tools in enhancing analytical and critical thinking skills in university students. *UniPublish Conference Proceedings*, 1(1), 297-300.
- Szmyd, K., & Mitera, E. (2025). The Impact of Artificial Intelligence on the Development of Critical Thinking Skills

in Students. *European Research Studies*, XXVII(2), 1022-1039.

Tambyah, M. (2017). Teaching for 'Historical Understanding': What Knowledge(s) do Teachers Need to Teach History? *Australian Journal of Teacher Education*, 42(5). <https://doi.org/10.14221/ajte.2017v42n5.3>

Westberg, J. (2025). Historical methods in educational research: Sources, contextualisation, periodisation and analysis. *Paedagogica Historica*, 0(0), 1-21. <https://doi.org/10.1080/00309230.2025.2473704>

Yetişensoy, O., & Karaduman, H. (2024). The effect of AI-powered chatbots in social studies education. *Education and Information Technologies*, 29(13), 17035-17069. <https://doi.org/10.1007/s10639-024-12485-6>

Yetisensoy, O., & Rapoport, A. (2023). Artificial Intelligence Literacy Teaching in Social Studies Education. *Journal of Pedagogical Research*, 7(3), 100-110.

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