



Evaluating Historical Thinking Development Through an ADDIE Based History Learning Model in Secondary Education

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ABSTRACT

The development of students' historical thinking skills is an important challenge in history education because it is related to the ability to critically analyze, evaluate, and understand past events. This study aims to evaluate the influence of ADDIE-based historical learning models on the development of historical thinking of high school students. The study uses a quantitative approach with a quasi-experimental design of pretest-posttest non-equivalent control group involving 60 students. Data were collected through historical thinking ability tests and analyzed using independent t-tests and N-gain analysis. The results of the study show that the application of the ADDIE model significantly improves historical thinking skills compared to conventional learning. This research makes a theoretical and practical contribution to the development of a systematic, effective, and oriented history learning design that is oriented towards strengthening high-level thinking skills.

INTRODUCTION

History learning in secondary education has a strategic role in building students' ability to critically understand the past, analyze evidence, and connect historical events with the current social context. However, history learning practices are still often oriented towards mastering facts, memorizing chronology, and reproducing information, so they have not fully developed historical thinking skills as the main competencies of the 21st century. The paradigm shift in global history education emphasizes that students not only need to know what happened in the past, but also be able to evaluate sources, understand historical perspectives, and build interpretations based on historical evidence (Wilson et al., 2023). This condition shows that the development of learning strategies that can improve historical thinking skills is an important need in contemporary history education.

In the context of secondary education, the challenge of developing historical thinking is also related to the limitations of the application of learning models that systematically facilitate the process of high-level thinking. Research by Wilke et al. (2023) shows that the development of students' historical thinking skills requires learning designs that provide support in the form of source investigation activities, historical argumentation, and reflection on the thinking process. In addition, Geshere et al. (2025) found that teachers' understanding of historical learning objectives and historical thinking skills is still an important factor that affects the implementation of learning in the classroom. These findings show that improving the quality of history learning depends not only on the material, but also on instructional models that are able to direct the learning process in a planned manner.

One approach that has the potential to support the development of historical thinking skills is the ADDIE (Analysis, Design, Development, Implementation, Evaluation) learning design model. The ADDIE model provides a systematic framework for designing, developing, implementing, and evaluating the learning process so as to allow the integration of learning activities oriented to high-level thinking skills. Various ADDIE-based learning development studies have shown that this model is able to improve the quality of learning tools and the effectiveness of the learning process in various fields of education (Sari et al., 2022). However, most ADDIE research still focuses on the development of media or teaching materials, while studies that specifically evaluate its impact on the development of students' historical thinking in secondary history learning are still limited.

Previous studies have shown that there is a research gap related to the relationship between systematic learning design models and improving historical thinking skills. Wilson et al. (2023) through a systematic study found that pedagogical interventions that succeed in improving historical literacy generally use an inquiry-based approach and heuristic support specific to the field of history, but the effectiveness of various learning models still shows high variation. Meanwhile, Reyes Parra et al. (2023) explained that research on historical thinking continues to develop, but empirical research is still needed that tests the effectiveness of certain learning strategies through stronger research

designs. Thus, there is still room for research to quantitatively test the influence of ADDIE-based learning models on the development of historical thinking skills of secondary school students.

Based on these gaps, this study aims to evaluate the influence of ADDIE-based historical learning models on the development of students' historical thinking skills at the secondary education level. In particular, this study analyzes the difference in the improvement of historical thinking skills between students who receive ADDIE-based learning and students who obtain conventional learning through a quasi-experimental design of pretest-posttest non-equivalent control groups. This approach is used to obtain empirical evidence regarding the effectiveness of the ADDIE model in improving students' ability to analyze historical sources, understand chronology, historical interpretation, and critical thinking skills.

This research makes a theoretical and practical contribution to the development of history education. Theoretically, this research expands the study of the application of the ADDIE instructional design model in the context of history learning by placing historical thinking as the main learning achievement. Practically, the results of the research are expected to be the basis for history teachers and curriculum developers in designing learning that is more systematic, evidence-based, and oriented towards higher level thinking skills. Thus, this research contributes to answering the needs of modern history education that not only emphasizes the understanding of facts, but also the ability of students to interpret and interpret historical events critically.

LITERATURE REVIEW

Historical Thinking as the Main Competency in History Education

Modern history learning is no longer only oriented towards mastering factual information, but is directed at developing historical thinking skills as a discipline competency. Historical thinking includes the ability to understand chronology, evaluate historical sources, analyze cause-and-effect relationships, understand past perspectives, and build interpretations based on evidence. This ability is important because it helps students understand history as an investigative process, not just a collection of facts that must be memorized. Research by Jufri et al. (2025) shows that recent studies on history learning increasingly place historical thinking and critical thinking as the main goals of learning through experience-based approaches, investigations, and source analysis activities.

However, the development of historical thinking at the secondary school level still faces various challenges. Students often have difficulty distinguishing historical facts and interpretations, using evidence argumentatively, and understanding the social context of an event. Chavez Castillo et al. (2024) explained that traditional historical learning approaches that are predominantly based on information delivery have not been effective enough in building students' critical and historical thinking skills. Therefore, a learning design that is able to provide an active and structured learning experience is needed to improve historical thinking skills.

ADDIE's Learning Model in the Development of History Learning

The ADDIE (Analysis, Design, Development, Implementation, Evaluation) model is one of the instructional design models that is widely used in learning development because it provides systematic stages for designing and evaluating the learning process. This model allows teachers to analyze student needs, design learning activities, develop teaching materials, implement learning strategies, and evaluate learning outcomes. Szabo (2022) explained that ADDIE provides a flexible framework that can be used to produce a more targeted learning design that suits the needs of students.

In the context of history education, the use of ADDIE has relevance because history learning requires planning activities that are able to integrate historical sources, analytical discussions, and evaluation of student understanding. Adeoye et al. (2024) stated that ADDIE can support the effectiveness of learning through a systematic design approach, especially when learning objectives emphasize high-level thinking skills. Thus, the application of ADDIE in history learning has the potential to be a strategy to develop historical thinking skills in a more planned manner.

The Relationship of the ADDIE Model with the Development of Historical Thinking

The development of historical thinking requires learning that provides students with the opportunity to carry out the process of thinking like a historian, including interpreting sources, comparing perspectives, and compiling evidence-based arguments. The ADDIE model allows the process to be designed through systematic learning stages. In the analysis stage, teachers can identify students' initial abilities; the design and development stages can be used to organize activities based on historical sources; while the evaluation stage allows the measurement of the development of historical thinking skills.

Research by Miralles-Sánchez et al. (2024) shows that the application of active method-based learning units can increase student involvement in historical thinking activities. The study confirms that structured learning design plays an important role in building students' historical interpretation skills. In addition, Steiss et al. (2024) found that historical source-based writing activities can improve students' ability to conduct historical reasoning through the process of evaluating evidence and drafting arguments. These findings reinforce the assumption that a systematically designed learning model can influence the development of historical thinking.

Evaluating the Effectiveness of History Learning through a Quantitative Approach

Evaluating the effectiveness of a learning model requires empirical evidence through the measurement of student learning outcomes. Quantitative approaches with quasi-experimental designs are widely used in educational research because they are able to compare changes in students' abilities before and after treatment. In historical learning research, this approach allows researchers to test whether certain learning strategies result in better historical thinking skills than conventional learning.

Research by Ofianto et al. (2024) shows that the use of technology-based learning approaches in history learning provides a significant improvement in students' historical thinking skills through pretest-posttest statistical analysis. These results show that historical thinking skills can be measured quantitatively and developed through appropriate learning interventions. Therefore, this study uses a quasi-experimental design to obtain empirical evidence regarding the effectiveness of ADDIE-based historical learning models.

Research Hypothesis

Based on theoretical studies and previous research results, the research hypothesis is formulated as follows:

H₀: There was no significant difference in the development of historical thinking skills between students who received ADDIE-based history learning and students who received conventional history learning.

H₁: There was a significant difference in the development of historical thinking skills between students who received ADDIE-based history learning and students who received conventional history learning, with higher ability improvements in the group using ADDIE-based learning models.

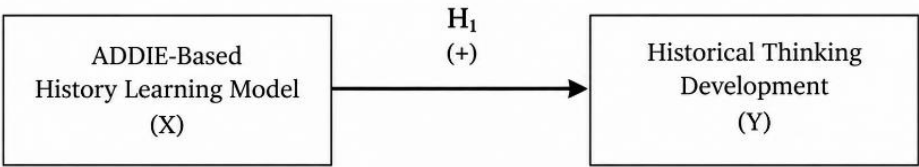


Figure 1. Conceptual Framework

METHODOLOGY

Research Design

This study uses a quantitative approach with a quasi-experimental pretest-posttest non-equivalent control group design. This design was used to evaluate the influence of ADDIE-based history learning models on the development of students' historical thinking skills through a comparison of pretest and posttest results between the experimental and control groups (Creswell & Creswell, 2023). The experimental group obtained ADDIE-based learning, while the control group used conventional history learning.

Population and Sample

The research population was high school students who participated in history learning. The sample consisted of 60 students selected using the purposive sampling technique, with a division of 30 students in the experimental group and 30 students in the control group. The sample selection took into account similarities in academic characteristics and learning conditions to obtain a more objective comparison (Taherdoost, 2022).

Research Instrument

The research instrument was a test of historical thinking ability given before and after treatment. The instrument measured five aspects, namely analysis of historical sources, chronology, cause-effect, historical perspective, and historical interpretation. The validity of the instrument was tested through the validity of

the content by experts, while the reliability was tested using Cronbach's Alpha to ensure the consistency of the instrument (Havekes et al., 2022).

Data Collection Procedure

The research was carried out through three stages: (1) the preparation stage in the form of the preparation of ADDIE-based learning tools and instrument testing; (2) the implementation stage in the form of providing pretests, the application of the ADDIE model in the experimental group, and conventional learning in the control group; and (3) the evaluation stage through the provision of posttests to measure the development of students' historical thinking skills.

Data Analysis Technique

Data were analyzed using IBM SPSS Statistics. The analysis began with a normality and homogeneity test as a prerequisite test. Furthermore, an independent sample t-test was used to test the difference in learning outcomes between the experimental and control groups, while the N-Gain score was used to determine the level of improvement in students' historical thinking skills. The hypothesis was accepted if the significance value < 0.05 .

RESEARCH RESULT

Characteristics of Respondents

The study involved 60 high school students who participated in history learning and was divided into two research groups, namely the experimental group that obtained ADDIE-based learning and the control group that obtained conventional history learning. Each group consisted of 30 students. Respondent characteristics were analyzed by gender and treatment group to ensure the distribution of samples in the study.

Table 1. Characteristics of Respondents Based on Demographic Distribution

Features	Category	ADDIE Experimental (n=30)	Conventional Control (n=30)	Total (n=60)
Gender	Male	14	13	27
	Women	16	17	33
Research Group	Experiment ADDIE	30	-	30
	Control Convention	-	30	30

Based on the table, the number of female respondents was higher than that of men, namely 33 students (55%), while male students were 27 students (45%). The distribution of respondents between the experimental group and the control group had a balanced number, each amounting to 50% of the total sample. The composition showed that the two groups had an equal number of participants, making it possible to compare the improvement of historical thinking skills more objectively.

This study analyzes the effectiveness of the ADDIE-based history learning model on the development of historical thinking skills of high school students. The analysis was carried out based on a quasi-experimental pretest-posttest non-equivalent control group design involving 60 students divided into experimental groups and control groups. Data were analyzed using a comparison of pretest-

posttest scores, independent sample t-test, and N-Gain according to the research design.

Description of Changes in Students' Historical Thinking Ability

The results of the analysis showed that both groups had relatively equal initial abilities based on pretest scores. The experimental group obtained an average pretest of 57.40, while the control group of 57.67. After being given treatment, the experimental group using the ADDIE-based learning model showed an increase in the average posttest score to 83.10, while the control group using conventional learning reached an average of 68.10.

Table 2. Characteristics of Respondents Based on Demographic Distribution

Groups	Number of Students	Mean Pretest	Mean Posttest	Improvement
ADDIE Experimental	30	57,40	83,10	25,70
Conventional Control	30	57,67	68,10	10,43

These results show that the improvement of historical thinking skills was higher in the group that received ADDIE-based learning.

N-Gain Capability Enhancement Analysis

N-Gain analysis was used to determine the level of development of historical thinking skills after treatment. The results showed that the experimental group obtained an average N-Gain value of 0.594, while the control group obtained a mean value of 0.251.

Table 3. N-Gain Analysis of Historical Thinking Development Between Experimental and Control Groups

Groups	Mean N-Gain	Upgrade Categories
ADDIE Experimental	0,594	Medium
Conventional Control	0,251	Low

Based on the improvement category, the experimental group showed a higher development of historical thinking skills than the control group.

Distribution of Historical Thinking Ability Levels

The distribution of historical thinking ability categories after treatment showed differences between the two groups. In the experimental group, most of the students were in the medium and high categories, while the control group was more in the low category.

Table 4. Distribution of Students' Historical Thinking Development Levels After the Intervention

Groups	Height	Medium	Low
ADDIE Experimental	11 students	19 students	0 students
Conventional Control	0 students	9 students	21 students

These results show that the application of ADDIE-based learning models results in a more positive change in the category of historical thinking skills.

Hypothesis Testing Results

Before hypothesis testing, an analysis prerequisite test was carried out. The results of the normality test showed that the posttest data was normally distributed ($p > 0.05$), and the homogeneity test showed the variance of the two homogeneous groups ($p > 0.05$).

The results of the independent sample t-test showed a significant difference between the experimental group and the control group on the posttest score.

Table 5. Independent Sample t-Test Results for Differences in Historical Thinking Development

Analysis	t-value	df	Sig. (p)	Verdict
Posttest Score	7,431	58	<0.001	H ₀ rejected
N-Gain Score	9,291	58	<0.001	H ₀ rejected

Based on these results, there is a significant difference in the development of historical thinking skills between students who follow ADDIE-based learning and students who follow conventional learning. Thus, an alternative hypothesis (H₁) is accepted, namely that the ADDIE-based historical learning model has a significant influence on improving students' historical thinking skills.

Summary of Key Findings

Table 6. Summary of Main Research Findings

No.	Research Findings	Statistical Evidence	Interpretation
1	The experimental group experienced a higher increase in historical thinking skills than the control group.	Mean posttest ADDIE group = 83.10; control group = 68.10	ADDIE-based learning provides a greater improvement in historical thinking skills than conventional learning.
2	The ADDIE-based learning model results in a higher rate of gain.	Mean N-Gain of ADDIE group = 0.594; control group = 0.251	The experimental group showed development of historical thinking skills in the medium category, while the control group was in the low category.
3	There was a significant difference	Independent sample t-test: $p < 0,001$	The difference in posttest results shows that the

	between the experimental and control groups.		application of the ADDIE model has a significant influence on the development of students' historical thinking skills.
4	The ADDIE model supports the development of historical thinking skills in secondary education.	The results of the pretest-posttest and N-Gain analysis showed consistent improvement in the experimental group	The ADDIE model is effective as a history learning design that supports students' ability to analyze sources, interpretation, and historical understanding.

DISCUSSION

The results showed that the application of the ADDIE-based historical learning model had a significant influence on the development of historical thinking skills of secondary school students. The experimental group that received ADDIE-based learning showed a higher improvement in ability compared to the control group, with an average posttest score of 83.10 compared to 68.10. In addition, the N-Gain value of the experimental group of 0.594 was higher than that of the control group of 0.251, and the results of the independent sample t-test showed a significant difference ($p < 0.001$). These findings support the research hypothesis that ADDIE-based learning models are effective in improving students' historical thinking skills. These results show that a systematic learning design is able to create a more in-depth history learning experience compared to conventional learning that tends to focus on the delivery of factual information.

The success of the ADDIE model in this study can be explained through the characteristics of the model which provides structured learning stages ranging from needs analysis, activity design, material development, learning implementation, to evaluation of learning outcomes. These stages allow teachers to integrate activities that support historical thinking skills, such as analysis of historical sources, interpretation of evidence, and preparation of understanding based on historical context. This finding is in line with Adeoye et al. (2024) who stated that the ADDIE model is able to increase the effectiveness of learning through a systematic and needs-oriented instructional design process for students. In the context of history education, the structure of ADDIE provides space for students to not only receive historical information, but also to carry out the process of investigation and reasoning as characteristic of historical thinking.

The improvement of historical thinking skills in the experimental group also reinforced the view that effective history learning requires an active and evidence-based approach. Historical thinking skills include the process of

understanding chronology, evaluating sources, establishing cause-and-effect relationships, and understanding historical perspectives. Havekes et al. (2022) explained that learning activities involving historical reasoning can help students develop the ability to relate historical evidence to interpretation. Therefore, the improvement in learning outcomes in this study not only shows the success of the ADDIE model as a learning strategy, but also shows that the right learning design can support the development of high-level thinking skills in history education.

The findings of this study also expand on the results of previous research on learning strategies that support the development of historical thinking. Miralles-Sánchez et al. (2024) showed that the application of active learning methods was able to increase student involvement in historical interpretation activities, while Steiss et al. (2024) found that historical source-based activities can improve students' ability to conduct historical reasoning. In contrast to the study, this study places ADDIE as a comprehensive learning design framework and tests it through a quasi-experimental approach. Thus, this study makes an empirical contribution that the effectiveness of history learning is not only influenced by certain methods, but also by how the entire learning process is systematically designed.

Several factors are suspected to contribute to the success of the application of the ADDIE model in this study. First, the ADDIE structure helps teachers organize learning based on the needs and characteristics of students so that the learning process becomes more directed. Second, the use of activities oriented to historical analysis and interpretation provides opportunities for students to be actively involved in the learning process. Third, the existence of continuous evaluation allows teachers to identify the development of students' abilities in a more measurable manner. However, this study has several limitations. The relatively limited number of samples, namely 60 students, makes the generalization of results need to be done carefully. In addition, the study only uses historical thinking ability tests as the main instrument so that it has not yet described in depth the students' learning experiences and teachers' strategies during the implementation of learning.

Theoretically, this research contributes to the development of the study of historical education by strengthening the understanding that the ADDIE instructional design model can be used as an effective approach to develop students' historical thinking skills. Practically, the results of the study provide implications for history teachers and curriculum developers that history learning needs to be designed in a systematic, evidence-based, and high-level thinking skills orientation. Further research is suggested to involve a broader sample, using a mixed methods approach, as well as exploring the integration of ADDIE with digital technology or project-based learning to expand the effectiveness of this model in various educational contexts.

CONCLUSIONS AND RECOMMENDATIONS

This study shows that the ADDIE-based history learning model has a positive and significant influence on the development of historical thinking skills

of secondary school students. Based on the results of the analysis, the experimental group that obtained ADDIE-based learning showed a higher increase in historical thinking skills compared to the control group that used conventional learning. This improvement can be seen from the difference in posttest scores and N-Gain values which shows that the ADDIE model is able to support the development of students' historical source analysis skills, interpretation, chronological understanding, and historical reasoning. These findings reinforce that a systematic and structured learning design can be an effective approach in improving the quality of history learning oriented towards high-level thinking skills.

However, this study has limitations in the limited number of samples and the use of test instruments as the main source of measurement of the development of historical thinking skills. Therefore, further research is recommended to involve a larger number of respondents, more diverse school contexts, and combine quantitative and qualitative approaches to gain a deeper understanding of the development process of students' historical thinking. In addition, the integration of the ADDIE model with digital technology, project-based learning, or historical investigation approaches can be the direction of the next research development to expand the effectiveness of history learning at various levels of education.

ADVANCED RESEARCH

Further research can develop a study on the effectiveness of the ADDIE model by exploring other variables such as student learning engagement, motivation to learn history, critical thinking skills, and digital literacy. In addition, the use of mixed methods design can provide a more comprehensive picture of how the stages of ADDIE affect the process of forming students' historical thinking skills cognitively and affectively. Future research can also test the application of the ADDIE model in different educational contexts to determine the level of sustainability and generalization of the model.

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