European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available online at: www.oapub.org/edu

DOI: 10.46827/ejes.v12i12.6423 Volume 12 | Issue 12 | 2025

THE CONTRIBUTION OF ARTIFICIAL INTELLIGENCE TO THE LEARNING AND TEACHING OF HISTORY IN SECONDARY EDUCATION

Vasileios Bazanis[1i],
Anna Bilali[2],
Zafiria Karatziki[3],
Apostolia Katsarou[4],
Georgios Nikolaou[5]
[1]M.Ed.,
Headmaster of Geniko Lykeio Doriou,
Greece
[2]M.Ed.,
Teacher of Primary School of Kaminia Patras,
Greece
[3]M.A.,
Teacher of 1st Junior High School of Thebes,
Greece
[4]MSc,
Teacher of 6th Experimental Junior High School of Alexandroupolis,
Greece
[5]Teacher of 1st Junior High School of Naousa,
Greece

Abstract:
This paper examines the contribution of Artificial Intelligence (AI) to the learning and teaching of History in secondary education. The first part presents the theoretical framework and provides an extensive literature review on the applications, pedagogical benefits, and challenges of AI in the school environment. The second part provides a critical assessment of the international literature, with an emphasis on research gaps and the contribution of the present study. The research methodology is then described, and a case study of the application of an educational scenario in the second-grade classes of a secondary school is analysed. The scenario refers to the use of AI tools, and to how to create first-person historical narratives. Finally, the research findings are presented, and compared to international examples, highlighting the potential for the pedagogically sound, and creative integration of Information Technology (IT) in the teaching of History.

Keywords: artificial intelligence, secondary education, history

[i] Correspondence: email vbazanis@gmail.com

1. Introduction

Education in the 21st century is increasingly called upon to adapt to a rapidly evolving social, and technological landscape, integrating innovation that enrich the learning experience. AI, and in particular Large Language Models (LLMs) such as ChatGPT, have emerged as integral components of contemporary educational practice. This study explores the role and contribution of AI in the teaching of History at the secondary education level, with particular emphasis on its pedagogical affordances as well as the emerging challenges. Through a critical review of the international literature, and the analysis of an innovative case study conducted within a Greek secondary school context, the research explores the ways in which AI can support experiential, interpretive, and collaborative approaches to historical understanding. The study aims to contribute to the pedagogical redefinition of technology's role in the classroom, and to propose strategies for its creative and critically informed integration.

2. Theoretical Framework and Literature Review

2.1 The role and applications of Artificial Intelligence in the teaching of History in secondary education

The rapid advancement of AI has fundamentally transformed the educational landscape, offering innovative opportunities for enriched, and more effective teaching of History in secondary education (Acun & Acun, 2023; He, 2023; Mierwald, 2024; Sheng, 2023). AI functions as a powerful supplementary tool, enhancing the educational process by enabling personalization, experiential learning, and support for historical thinking (He, 2023; Kowalski & Charchuła, 2024; Nikitina & Ishchenko, 2023). It also allows educators to concentrate on aspects that require human mediation, such as the development of historical thinking, and the ethical interpretation of events (Hiltmann, 2023; Mierwald, 2024).

One of the primary roles of AI is the personalization of learning and the adaptation of content to the individual needs of each student, while simultaneously providing real-time feedback (He, 2023; Lee, 2023; Castaneda, 2022). Intelligent Tutoring Systems (ITS) are capable of monitoring student performance, and identifying knowledge gaps, thereby enabling the delivery of targeted instructional material alongside digital guidance (Mierwald, 2024). These systems also offer opportunities for personalized experiential learning, and the reinforcement of historical thinking (He, 2023; Kowalski & Charchuła, 2024; Nikitina & Ishchenko, 2023). This individualized approach, grounded in big data techniques, and adaptive learning mechanisms, has the potential to enhance student engagement, and improve comprehension of historical content (Sheng, 2023). Furthermore, AI can generate a variety of assessment exercises, such as multiple-choice questions, fill-in-the-blank tasks, true/false statements, as well as questions based on primary sources provided by the teacher. These functionalities allow for differentiated

assessment tailored to students' needs, and support the development of learner autonomy (Rodríguez, 2023; Gossard, 2024).

Additionally, AI contributes significantly to the creation of rich, and differentiated teaching materials. Tools such as ChatGPT can compose theoretical texts, summaries or short reports, definitions, explanations for character development, and role-playing scenarios based on specific historical periods and events (Rodríguez, 2023; Hiltmann, 2023; Nikolaou, 2024). They can also analyze historical sources, and support the cultivation of historical thinking and literacy among students (Taşar & Taşar, 2023; Zeng, 2024). According to Tirado-Olivares *et al.* (2023), and Kindenberg (2024), AI-generated texts are often well-structured, clearly articulated, and linguistically precise, achieving high scores in key dimensions of historical thinking. These capabilities enable educators to design activities that foster critical thinking, creativity, and students' ability to synthesize information (Acun & Acun, 2023; Mierwald, 2024).

The use of LLMs, such as GPT-4.0, enables the verification of historical facts and the bridging of knowledge gaps, while simultaneously providing both educators, and students with supportive information of high scientific accuracy (Tirado-Olivares *et al.*, 2023). Hiltmann (2023) approaches LLMs as interpretive tools, emphasizing the need for their critical application in the teaching of History. In the context of analyzing historical texts and sources, LLMs can be employed for the identification of key themes, text recognition (OCR), the digitization of handwritten sources, and the facilitation of understanding complex concepts or historical languages (Bender & Friedman, 2018; Hiltmann, 2023). Frameworks such as HistoLens leverage AI for multilayered, quantitative analysis of historical sources, movements, thematic patterns, and historical maps, offering students tools for interpretive engagement with historical documents - an element that can significantly enhance historical literacy (Hiltmann, 2023; Zeng, 2024).

The contribution of AI extends beyond content delivery and assessment. Through the integration of technologies such as Virtual Reality (VR) and Augmented Reality (AR), it is now possible to create interactive learning environments that enhance the experiential understanding of historical events (He, 2023; Sheng, 2023). Virtual tours of historical sites, or simulations of battles, and social developments make History lessons more engaging, stimulating students' imagination and increasing their active participation. Beyond the creation of such content, AI can also facilitate more interactive learning activities. It has the capacity to generate simulated dialogues between historical figures and produce related comprehension questions (Dede *et al.*, 2019; Sheng, 2023), thereby fostering students' historical empathy. Additionally, AI can function as a creative assistant in the development of podcasts, or other multimodal forms of presentation, such as animations, interactive concept maps, and infographics - broadening the boundaries of traditional instruction, and enabling more accessible engagement with historical information for students with diverse learning profiles (Carrasco Rodríguez, 2023).

According to Carrasco Rodríguez (2023), AI can also assist in the development of tools for organizing and sequencing historical events - such as interactive timelines - and in generating lists of key events with corresponding dates. The purpose of these digital

tools is to reinforce the chronological structure of historical narratives, and to facilitate students' understanding of causal relationships between events. Another notable feature is AI's ability to generate comparative texts on historical topics, such as comparisons of political and social systems (Rodríguez, 2023). Acun and Acun (2023), along with LePoire and Sazhienko (2025), propose the use of AI models to support the study of macro-historical developments and to explore the concept of "Big History," which seeks to interpret the history of humanity through the interplay of natural, biological, and cultural factors. Adopting a philosophical perspective, Lee (2023) emphasizes the importance of ensuring that AI systems respect cultural diversity, cautioning against the homogenization of educational experiences. He argues that History must remain a space of dialogue and plurality, even in the context of automated tools.

Finally, Mierwald (2024) highlights the potential of AI as a tool for the professional development of educators themselves, supporting lesson planning and self-improvement. Specifically, through data analysis tools and automated feedback systems, teachers can reflect on their instructional practices, and identify areas for improvement (Nguyen *et al.*, 2023). At the same time, AI can promote collaboration among educators via shared digital platforms for content creation. In the long term, the use of AI may contribute to a redefinition of the professional role of the History teacher - as a learning designer and curator of digital content.

2.2 Pedagogical benefits and challenges of Artificial Intelligence applications in the teaching of History

The rapid advancement of AI technologies in recent years has increasingly influenced education, particularly the teaching of social sciences. The teaching of History in secondary education is called upon to creatively integrate the capabilities offered by contemporary digital tools in order to enhance student engagement, experiential learning, and the development of historical thinking. Within this framework, Generative Artificial Intelligence (GAI), and especially LLMs such as ChatGPT, constitute powerful instructional tools with significant pedagogical potential, but also essential limitations (Tirado-Olivares *et al.*, 2023; Hiltmann, 2023; Rodríguez, 2023).

2.2.1 Pedagogical benefits

The integration of AI in the teaching of History offers a broad range of opportunities for the active engagement of students in processes that deepen their understanding of the historical past. A key advantage is the ability to simulate historical figures or situations, allowing students to "converse" with historical personalities, pose questions, and receive answers based on available historical data (Acun & Acun, 2023). This practice not only enhances imagination and creativity but also fosters emotional engagement, contributing to the development of empathy - a crucial skill for understanding historical consciousness.

Furthermore, AI enables the creation of personalized and differentiated educational materials that cater to the needs of a heterogeneous student population.

Carrasco Rodríguez (2023) notes that tools such as ChatGPT can be utilized to generate theoretical units, worksheets, or even creative scenarios, promoting flexibility and pedagogical innovation within the classroom.

Another domain in which LLMs offer added value is the study and analysis of primary historical sources. Due to their capability to process complex or archaic texts, they provide students access to historical documents that might otherwise be difficult to obtain. This contributes to the enhancement of historical thinking, as students can practice analysis, comparison, and drawing conclusions from authentic sources (Hiltmann, 2023).

Finally, the use of AI tools serves to enhance student motivation and engagement in the learning process. Particularly impactful is the role-playing functionality, where students are invited to adopt the perspectives of historical figures, respond as those figures, and interact with their peers within an authentic historical context (Mierwald, 2024). Through such practices, students cultivate skills in critical thinking, causal reasoning, and multiple perspectives - core components of historical literacy as described by Kalaitzidis and Trapezanidis (2010).

2.2.2 Pedagogical challenges

Despite the pedagogical potentials, the integration of AI in the teaching of History is accompanied by a series of challenges that require careful attention. Foremost among these is the issue of accuracy of the information generated by LLMs. Research has shown that, in many cases, texts produced by tools such as ChatGPT may contain inaccuracies, generalizations, or even historical errors (Acun & Acun, 2023). This necessitates the implementation of critical reading strategies, such as the Reference Check Protocol (RCP), enabling students to verify and evaluate the information they receive.

Equally important is the concern over the potential degradation of historical thinking if AI is used without adequate guidance. As Hiltmann (2023) points out, LLMs operate based on probabilistic correlations without genuine comprehension of meaning or ethical judgment. Consequently, there is a risk that students might uncritically accept AI-generated answers, bypassing fundamental methodological principles of historical analysis.

Furthermore, AI is not ideologically neutral. The databases on which LLMs are trained include cultural and historiographical stereotypes, which may be uncritically reproduced in the responses generated by the models. Nikitina and Ishchenko (2023) emphasize the need for cultivating a critical stance towards technology, so that students can recognize potential distortions, exclusions, or representations that perpetuate established narratives.

Finally, one of the most significant challenges is the adequacy and professional development of educators. The innovative use of AI requires the development of a pedagogical and teaching framework, supported by appropriate training, guidance, and sharing of best practices. Without adequate support, teachers may either avoid using AI

altogether or integrate it superficially, failing to fully exploit its potential (Mierwald, 2024; Su & Yang, 2023).

2.3 Critical evaluation of the international literature with a focus on secondary education

The international literature regarding the contribution of AI to History teaching and learning in secondary education reflects a research field that is fragmented, but evolving rapidly (Acun & Acun, 2023; Mierwald, 2024). While theoretical discussions are abundant, empirical studies examining the functional application of LLMs, such as ChatGPT, in secondary school environments are limited (Carrasco, 2023; Mierwald, 2024).

A common starting point for most studies is the recognition of the dual nature of AI. Specifically, pedagogical opportunities are identified, arising from the use of AI tools for personalizing learning, producing educational content, enhancing participation, and fostering critical thinking (Rodríguez, (2023), 2023; Zhussupbayev *et al.*, 2023; Su & Yang, 2023). According to Carrasco (2023), ChatGPT has been particularly utilized in drafting basic historical texts, generating questions, simulating dialogues, historical role-playing games, and hypothetical scenarios, making historical knowledge more accessible and engaging for adolescents.

However, the literature converges on highlighting serious problematic aspects of AI, particularly regarding the epistemological validity and reliability of the generated content. LLMs often produce generalizations, inaccuracies, and biased information, lacking substantiated references to historical sources (Carrasco, 2023; Mierwald, 2024; Nikitina & Ishchenko, 2023). This phenomenon has been referred to as an "epistemological nightmare" by researchers in the field, emphasizing the need for pedagogical mediation and verification by the teacher (Mierwald, 2024).

The development of historical thinking through AI largely depends on the interpretive capacity of the student to ask insightful questions and critically assess the answers (Mierwald, 2024; Gossard, 2024). Therefore, the incorporation of prompt engineering into the learning process is presented as a necessary skill for the conscious and meaningful use of AI tools (Gossard, 2024).

Most of the literature still focuses on higher education, neglecting the specific characteristics, and developmental needs of adolescent students (Acun & Acun, 2023; Ayala-Pazmiño, 2023). Some studies, such as those by Mierwald (2024), and Nguyen *et al.* (2023), attempt to explore the role of AI in authentic school contexts, providing early but valuable findings on how students interact with LLMs in the process of constructing historical knowledge.

Additionally, the international literature highlights the contrast between the personalization opportunities offered by AI, and the threat of depersonalizing the educational relationship, raising ethical and philosophical dilemmas regarding the role of the teacher (Lee, 2023; Hiltmann, 2023). While the possibilities for individualized teaching are emphasized as a significant advantage (Su & Yang, 2023), there is also

concern about the risk of diminishing the human-centered nature of education, especially in shaping historical judgment and moral sensitivity (Lee, 2023).

Particular attention is paid to issues of academic integrity, arising from the widespread use of ChatGPT in out-of-class written assignments, where instances of plagiarism and reduced personal engagement of students in the learning process have been observed (Brookbanks, 2023). This phenomenon intensifies the need for continuous pedagogical guidance and the development of metacognitive self-regulation skills in adolescents (Su & Yang, 2023).

At the same time, Wang and Guo (2025) highlight the deeper technological shift brought about by GAI in education, distinguishing it from previous technological innovations. Specifically, for the first time, technology has the ability to generate new content rather than simply transmitting or storing knowledge. This observation emphasizes the need to redefine the roles of students and teachers within a changing cognitive and technological ecosystem (Wang & Guo, 2025).

Similarly, the research by Zhussupbayev *et al.* (2023), although generally focused on Computer-Assisted Learning (CAL), empirically demonstrates the improvement in students' performance, motivation, and active participation when technological tools are used in the teaching of history. This confirms the shift from passive memorization to experiential and interpretive learning (Zhussupbayev *et al.*, 2023).

Finally, while there are general references to the dynamics of AI in education, there is no specific analysis regarding secondary historical education, further highlighting the need for focused and systematic research at this level (Castaneda, 2022; Nikitina & Ishchenko, 2023).

Overall, the critical evaluation of the international literature shows that AI offers multiple opportunities for the renewal of history teaching, provided that it is pedagogically and ethically integrated in the right way. The research focus on secondary education needs to be strengthened, so that pedagogically well-founded models for the integration of AI can be developed, which will effectively serve the development of historical thinking, critical education, and moral judgment among students.

2.4 Research gaps and contribution of the current study

The critical review of the international literature on the use of AI in History teaching in secondary education reveals several research gaps, which currently limit both the theoretical depth and practical application of the field (Mierwald, 2024). Although AI has already been integrated into many areas of education, its application in teaching History to adolescents remains incomplete and largely hypothetical (Acun & Acun, 2023; Akinwalere & Ivanov, 2022).

First, the overwhelming majority of existing research focuses on general theoretical analyses, with very few empirical studies focusing specifically on secondary education (Tirado-Olivares *et al.*, 2023; Mierwald, 2024). Rarely is it captured how students interact practically with AI systems, such as ChatGPT, to develop historical thinking, analyze sources, or interpret historical events (Nguyen *et al.*, 2023).

Furthermore, although several studies confirm that AI has the potential to offer personalized learning experiences and new forms of teaching (Rodríguez, 2023), the understanding of how the use of tools such as generative models (GMs) contributes meaningfully to the development of students' historical interpretive abilities remains limited. Gossard (2024) and Su & Yang (2023) highlight the lack of pedagogical frameworks that ensure AI use does not replace cognitive effort, but instead enhances deeper historical understanding.

A critical research gap is identified in the epistemological validity of the historical narratives generated by AI. Despite the apparent logical coherence of texts produced by GMs, they often incorporate inaccuracies, generalizations, oversimplifications, and a lack of corroborated sources (Mierwald, 2024; Nikitina & Ishchenko, 2023). These further burdens the cognitive load of the teacher, who is called upon to function as a pedagogical "filter" for the generated content (Gossard, 2024).

At the same time, the literature highlights the lack of critical skills for utilizing AI effectively among students. Interacting with GMs requires the ability to formulate complex questions (prompt engineering), critically interpret the responses, and cross-check information- skills that are rarely taught systematically in the school context (Gossard, 2024; Su & Yang, 2023). Therefore, there is a need to develop new teaching models that integrate the instruction of these skills into the History curriculum.

An additional research gap concerns the ethical and philosophical dimension of utilizing AI. As Lee (2023) points out, the absolute technocratic integration of AI tools risks weakening the humanistic and ethical nature of education, especially in subjects like History, where ethical judgment and critical analysis of multiple perspectives are fundamental (Sheng, 2023).

Concern is also raised by the potential widespread violation of academic integrity, especially in secondary education, where students might resort to using ChatGPT for automatic essay writing, undermining the learning process (Brookbanks, 2023). Although this phenomenon has been identified, the literature falls short in offering sustainable pedagogical solutions that would enhance students' responsibility and self-regulation (Ayala-Pazmiño, 2023).

Although the problems are significant, this study also identifies the existing prospects for utilizing AI in history education. Rodríguez (2023) highlights innovative teaching practices, such as the use of ChatGPT for simulated historical dialogues, hypothetical interviews, and alternative historical scenario exercises, offering a more experiential and active learning environment.

A particularly valuable contribution comes from research efforts aimed at developing systems that seek to enhance the primary analysis of historical texts, such as Zeng's HistoLens (2024), which attempts a multi-layered analysis of historical sources using AI. The focus on primary documentation can be integrated with AI, provided there is active pedagogical oversight.

Furthermore, this study contributes to the discussion on the intercultural dimension that must be considered during the teaching of History. Nguyen *et al.* (2023)

highlight that the ways in which History is perceived are influenced by cultural and national contexts. Therefore, strategies for integrating AI cannot be homogeneous, but must take into account the specific socio-cultural parameters of each educational system (Wang & Guo, 2025).

Overall, this study attempts to address the existing gap in research concerning the pedagogical use of AI in history teaching in secondary education. It develops suggestions for the critical education of students in the use of AI tools, emphasizes the centrality of historical thinking and ethical judgment in managing historical narratives through AI, and lays the foundations for the development of pedagogically sound and ethically responsible models for integrating AI into history education.

In this context, a case study was selected, a teaching proposal for History that was applied in a Greek secondary school, aiming to combine the use of AI with historical documentation and pedagogical and technological innovation.

3. Methodology

This chapter presents in detail the methodological approach adopted to achieve the research objectives. The choice of this approach is based on the need for a holistic understanding of the contribution of AI to the learning and teaching of History in secondary education, combining a review of the international literature with the analysis of a case study in a Greek school environment.

3.1 General methodological approach

This paper adopts a mixed methodological approach, combining elements of qualitative case study with a theoretical review of the international literature. This choice is considered necessary, as it allows, on the one hand, the recording and critical evaluation of existing knowledge, and research findings on AI in History education, and, on the other hand, the in-depth investigation of practical applications and learning outcomes in a specific, real teaching context (Yin, 2009).

The literature review aimed to record, evaluate, and synthesize contemporary views and research findings on the use of AI in History teaching, as contemporary research highlights the potential of LLMs for enhancing historical thinking, promoting multiple perspectives and cultivating reflection (Rodríguez, 2023; Kindenberg, 2024; Gossard, 2025).

The case study focuses on the implementation of an educational scenario that utilizes ChatGPT and d-id studio in a secondary school classroom. The choice of this scenario is based on its originality and on Yin's theory (2009), according to which the study of a historical case, through the investigation of the interaction of individuals, institutions, and social conditions and the use of multiple data sources, allows for an understanding of complex social interactions. In this context, AI is not analyzed as an abstract technological innovation, but as a tool that is integrated into daily teaching practice and influences learning practices. The interpretative nature of the study allows

for an understanding of the complex interactions between students, teachers, and technology, as well as the subjective experiences that are formed during the teaching process. Its exploratory nature aims to reveal new perspectives and generate hypotheses for further research, given the rapid development of AI applications in education. Therefore, the methodology of this study is research-intensive, interdisciplinary, and pedagogically focused, aiming to produce knowledge that combines theoretical evidence with pedagogical innovation.

3.2 Criteria for selecting the literature

The critical review of the international literature was based on strict selection criteria to ensure the relevance, scientific validity, and relevance of the sources to the research topic. These criteria were formulated as follows:

a) **Publication period:** The research focused on scientific publications (journal articles, book chapters, conference proceedings) between 2018 and 2024, with a particular emphasis on the years 2022-2024. This time period was chosen due to the rapid growth and integration of AI applications, particularly LLMs, in education in recent years (Gossard, 2024; Zeng, 2024). The focus on recent publications ensures that the review reflects the most up-to-date developments and discussions in the field.

b) **Keywords:** The literature search was conducted using combinations of the following keywords, in both Greek and English, to maximize coverage of relevant sources: "Artificial Intelligence" (AI), "Education," "History Teaching," "Secondary Education," "Language Models," "Large Language Models" (LLMs), "ChatGPT", "Generative AI", "Pedagogical benefits", "Challenges", "Applications".

c) **Sources/Databases:** The searches were initially conducted on the research platforms AI Scispace and Scite, and then the selected scientific articles were cross-checked and verified in recognized scientific databases that host a wide range of publications in the fields of education, computer science, and social sciences, such as Scopus, ERIC, and Google Scholar. The systematic application of these criteria ensured the collection of a representative and high-quality set of bibliographic sources, which formed the basis for the development of the theoretical framework and the critical assessment of the field. Finally, notebookLM, ChatGPT 4.0, and Gemini were used to analyse and synthesize the content of the scientific articles selected for the literature review.

4. Case study; The teaching application of the scenario "The work of Justinian through the words of Justinian"

4.1 Introduction

The modern educational reality is characterized by the need to adapt to the demands of the knowledge society, and the digital age. Within this context, the teaching of history in secondary school needs to be updated to make learning more experiential and engaging,

and to take advantage of the possibilities offered by information and communication technologies, and AI. The scenario "The work of Justinian through the words of Justinian" is an innovative teaching example, which was implemented by a philologist in three classes (A, B, C) of the second grade of a public junior high school in the regional union of Imathia, with the aim of activating students, strengthen critical thinking, and cultivate multiple skills through collaborative and exploratory learning (Nikolaou, 2024).

This case study aims to highlight the pedagogical parameters of this application, examine the learning outcomes, and reflect on the practical possibilities of integrating AI into History teaching. The analysis focuses on the three sections where the scenario was implemented, and adopts a comparative approach involving multiple cases, evaluating both the commonalities, and the differences that emerged during implementation.

4.2 Theoretical framework

The theoretical foundation of the study draws on pedagogical and cognitive approaches related to discovery and inquiry-based learning, the theory of sociocultural learning, the pedagogical use of IT, and the flipped classroom methodology. Inquiry-based learning emphasizes the active involvement of students in the process of constructing knowledge, which they build through data processing, source interpretation, and drawing conclusions (Lamboudis, Siakas, & Korakakis, 2021). At the same time, Vygotsky's sociocultural theory reminds us of the importance of teacher mediation and learning as a social process (Kalaitzidis, & Trapezanidis, 2010). ICT, and in particular AI applications, are tools that enhance learning interaction and provide opportunities for productive, creative, and personalized learning experiences.

4.3 Methodology

The study adopted the qualitative methodological approach of comparative multiple case studies (Yin, 2009). The scenario was implemented during three (03) teaching hours in each class, spread over two (02) to three (03) days. A total of approximately sixty (60) students participated, divided into three (03) classes of the second grade of junior high school, with an average of twenty (20) students per class taught by the same teacher, using the same teaching material, and during the same time frame for implementation.

Data collection was carried out through observation by the teacher, study of worksheets, examination of students' digital projects (mainly videos created with the d-id tool), as well as through questionnaires and informal interviews with students. The data analysis focused on both learning outcomes and the learning process, emphasizing group functioning, the use of AI tools, the formation of historical thinking, and the emotional engagement of students.

4.4 Description of the scenario

The main theme of the scenario was the teaching of Justinian's work, as presented in the school textbook approved by the Ministry of Education and Religious Affairs for the second grade of secondary school. The teaching model followed was that of the flipped

classroom, which involved studying the theoretical material at home, using the school textbook, and an accompanying presentation sent electronically. In class, the students were organized into five (05) groups and worked collaboratively, using computers in the computer lab. Each group took on a thematic area related to Justinian's political or cultural activity: foreign policy, domestic policy, legislative work, religious policy, and construction work.

The innovation of the scenario lies in the fact that the students, having drawn information from books, websites, and mainly from the AI ChatGPT 3.5, and Copilot applications, were asked to compose a short historical narrative in the first person, embodying Justinian. This text, after being edited and approved by the group and the teacher, was converted into a digital video using the d-id tool, which created a digital personification of Justinian as the narrator. The educational process was completed with the presentation of the videos to the whole class, their distribution for review, and the evaluation of the students through worksheets and electronic tests (Nikolaou, 2024).

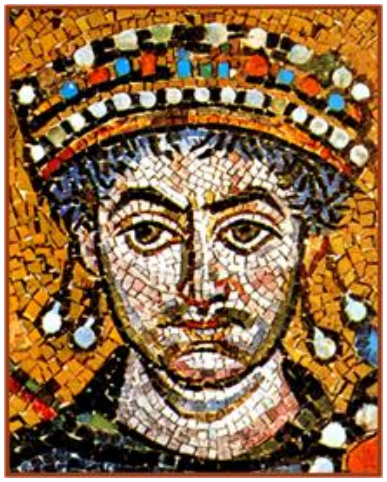

Image 1: Mosaic portrait of Justinian I,
Basilica of San Vitale, Ravenna (6th century).

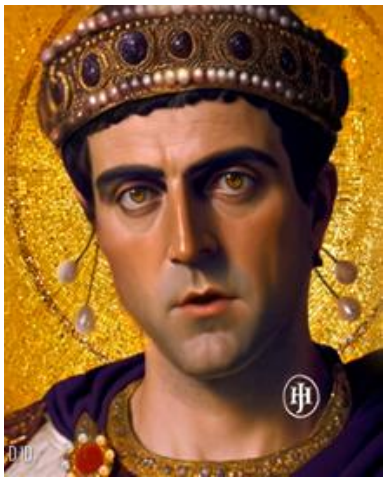

Image 2: Representation of Justinian I through AI.
Jack Huang (2023)

4.5 Analysis and findings

The implementation of the scenario in the three (03) sections produced rich data, and revealed both recurring patterns and peculiarities. One of the most interesting findings concerned the use of ChatGPT by students, and how they approached the initial prompts included in the worksheets. It was found that the answers they received were not always adequate, or entirely relevant in terms of thematic focus and completeness. For this reason, several students, either at the teacher's suggestion, or spontaneously, rephrased the questions, or used the "Regenerate" function to obtain alternative versions of the answers. Repeating the prompt with different elements, rephrasing, or adding secondary questions led to improved content, while also enhancing students' awareness of how to critically evaluate AI. In addition, several students chose to expand on the original questions in the worksheets, adding their own variations or additional terms in order to produce more complete and substantiated answers. This trend reveals not only an understanding of the platform's functions, but also a metacognitive skill: the ability to reflect on how I learn and how I ask questions.

There was an increased level of student engagement in all classes, particularly due to the nature of the activity, which combined technology with creativity. The students showed keen interest in using the IT tools, and responded enthusiastically to the challenge of composing, and transforming their speech into a digital narrative. The opportunity to play the role of Justinian served as a strong motivator, adding a personal dimension to the learning experience.

However, there were notable differences in the dynamics of the groups. In the first part, the groups worked with a clear division of roles and obvious cooperation, which allowed for the production of highly coherent videos. In the second section, inequalities in digital skills among students created tensions, which the teacher managed through mediation. The third part showed a remarkable degree of autonomy and initiative, with teams taking full responsibility for the design and implementation of the videos, even proposing to merge the narratives into a joint project.

In terms of cognitive performance, it was found that students strengthened their skills in searching for and evaluating historical information, developed narrative skills, and deepened their understanding of cause-and-effect relationships in historical phenomena. Particular emphasis was placed on understanding the significance of Justinian's imperial choices, and their social consequences. The worksheets showed that the majority of students were able to recognize the interconnection between politics, legislation, and culture in their era.

The use of AI tools was not limited to simply extracting information. It served as a source of inspiration, guidance, and reinforcement for creative writing. The students seemed to understand the function of AI as supportive rather than automated, which indicates the development of digital literacy. The process of writing the monologue in the first person and converting it into a digital persona enhanced identification and empathy, allowing students to approach history from a personal perspective.

The challenges identified were mainly related to technical issues, such as the need to create accounts to access the platforms, and the limited use of the computer lab and AI tools. Furthermore, on a technical level, students who had no previous experience with AI tools such as ChatGPT or d-id needed more guidance to understand how they work. In terms of digital literacy, differences were identified among students in their ability to formulate prompts and manage the responses generated. At the cognitive level, some students had difficulty organizing the information they collected from multiple sources. In terms of collaboration, there were some difficulties in assigning roles, managing time, and ensuring the balanced participation of all team members. In a few cases, strong personalities took on a leadership role at the expense of participation. Nevertheless, with the support of the teacher, and the structure of the scenario, most challenges were turned into learning opportunities, strengthening skills of adaptability, collaboration, and critical thinking.

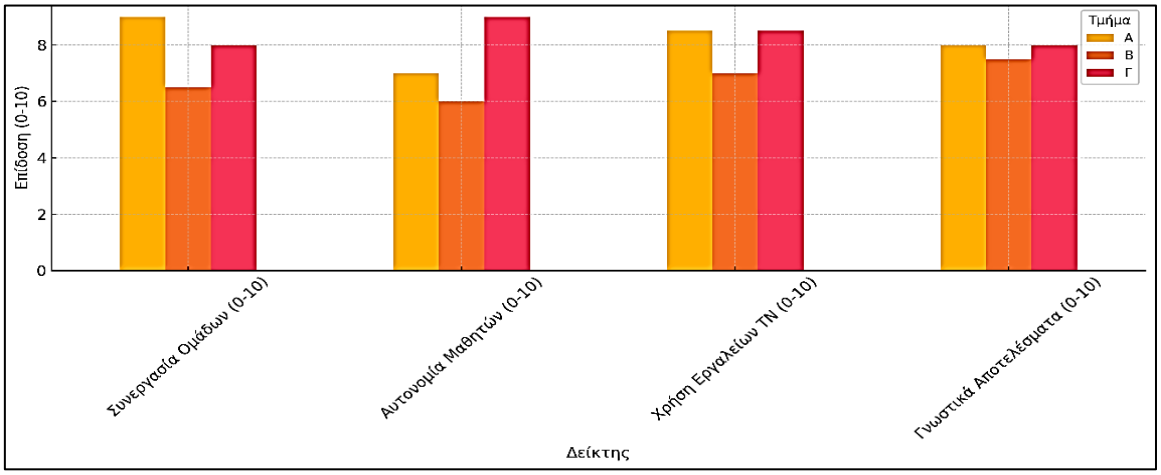

Table 1: Comparison of sections in terms of evaluation indicators such as Teamwork, Student autonomy, Use of AI tools, and Cognitive outcomes

4.6 Conclusions

In summary, this case study highlights the potential for implementing innovative teaching approaches even in the context of compulsory education. The integration of AI into History teaching is not merely a technological upgrade, but a fundamental transformation of the learning experience, making it more personal, collaborative, and critical. Thanks to its pedagogical design and the teacher's skilful guidance, the scenario examined it strengthened students' interest in the subject, cultivated multifaceted skills, and demonstrated that history can be taught in a contemporary, lively, and meaningful way.

This study may be a template for similar applications, encouraging teachers to experiment with a combination of methods and tools without the fear of complexity or technical requirements. It is recommended that the research be extended to more schools and classrooms, that AI tools be used across different subjects, and that teachers receive systematic training in the pedagogical uses of new technologies. The school of the 21st

century needs practical examples of applied innovation, and this case offers such an example, backed up by empirical data, educational intent, and methodology.

4.7 Comparative analysis of the case study with other international examples

In order to understand the potential and limitations of AI in History education, it is particularly useful to compare the case of Imathia with other international examples: the study by Rodríguez (2023) in Spain, which focuses on the use of ChatGPT 4.0 by teachers to produce teaching materials, and the study by Mierwald (2024) in Germany, which examines the interaction of students with AI in the context of historical personification. This comparative analysis aims to highlight common pedagogical trends, different models of AI integration, and the challenges arising from its use in history teaching at the international level.

As mentioned above, the case study at the secondary school in Imathia focuses on the innovative pedagogical use of AI (ChatGPT 3.5, Copilot) in History teaching in the second grade of a secondary school, through the scenario "The work of Justinian through the words of Justinian." This approach incorporates methods like the flipped classroom, inquiry-based and collaborative learning, seeking to enhance historical and critical thinking, as well as the active participation of students through creative activities, such as writing first-person narratives and creating digital videos with AI tools (ChatGPT, Copilot, d-id) (Nikolaou, 2024).

Similarly, the study by Rodríguez (2023) presents the use of ChatGPT 4.0 as a tool for the production of educational material by teachers, with the aim of supporting the teaching of Modern European History, specifically Charles V. ChatGPT was used to produce theoretical content, activities, and exercises, which the teacher edited, adapting the model's responses to the pedagogical needs of the class (Rodríguez, 2023). Unlike the application in the school in Imathia, where AI was used by the students themselves as a cognitive tool, in this study, ChatGPT was a support tool for the teacher.

The two studies converge in finding that AI can enhance the teaching of History in secondary education, either as a creative tool for students or as an aid for teachers (Rodríguez, 2023; Nikolaou, 2024). However, both studies report challenges related to the accuracy and reliability of ChatGPT's responses. Students in Imathia found that responses often required rephrasing of questions or use of the "Regenerate" function, as they were not sufficiently documented or historically accurate (Nikolaou, 2023). Similarly, Rodríguez (2023) reports that ChatGPT exhibits common inaccuracies, generalizations, and a tendency to invent non-existent sources.

Similar findings are reported in Mierwald's article (2024), which studies the interaction of students with the historical "digital interlocutor" Louise Otto-Peters. The AI's responses were characterized as one-dimensional, biased, and sometimes misleading, which reinforced the need for students to develop a critical attitude (Mierwald, 2024). The phenomenon of ChatGPT's "pseudo-cognitive persuasion," i.e., the use of persuasive language without sufficient documentation, makes the use of AI in History education ambiguous: both useful and unreliable. The theoretical study by

Hiltmann (2023) provides a basis for these concerns, emphasizing that LLMs do not "understand" meaning but operate with statistical patterns. The content produced is the result of probabilistic language prediction rather than historical analysis, or interpretation based on humanities methodology (Hiltmann, 2023). Therefore, models such as ChatGPT should be understood as tools for generating "thought proposals" rather than authentic interpretive sources.

The research by Tirado-Olivares *et al.* (2023) confirms this ambiguity. When students - future teachers - evaluated a historical text written by AI and one written by a human, they considered the former to be more adequate in terms of historical thinking dimensions. However, when they learned that the text had been generated by AI, they expressed reservations about the machine's ability to express authentic opinions and emotions, highlighting the ambivalence towards the use of AI in history (Tirado-Olivares *et al.*, 2023).

Another interesting case study comes from Hacettepe University in Turkey, where an innovative model for using AI in teaching the university course "History of Science" was implemented. Within the framework of the "GAI-Enhanced Assignment Framework" (GAIEnAF), students were asked to participate in interview roles with personalized versions of historical scientists, represented by ChatGPT, and then cross-check the answers with authoritative sources, applying the "Reference-Check Protocol" (RCP). This approach enhanced critical thinking, authentic engagement, and the ability to cross-check information, providing a structured pedagogical methodology for the responsible use of AI (Acun & Acun, 2023). In line with the study in Imathia and other international applications, challenges were identified regarding the accuracy of AI responses, as well as the need to cultivate its ethical use by students. The contribution of this study lies in the clear structure of a framework that can be applied in both secondary and university education, with an emphasis on collaborative learning and academic integrity.

In summary, the sources complement each other and confirm the need for teaching practices that cultivate historical thinking, critical awareness, and source evaluation skills. AI can be a valuable tool, provided that its role is understood not as authority but as a stimulus for reflection, dialogue, and interpretation (Hiltmann, 2023; Mierwald, 2024; Nikolaou, 2024).

5. Conclusions

This paper has highlighted the potential of AI as a tool that can redefine the teaching of history in secondary education. Through a critical review of the international literature and the presentation of an empirical case study, both the pedagogical potential and the limitations of its integration into the classroom were demonstrated.

AI offers opportunities for personalized, and experiential learning, enhancing students' imagination, narrative skills, and historical thinking. Special tools such as LLMs allow interaction with historical content in ways that promote active participation and

multiple perspectives. However, the reliability of information, the risk of depersonalizing knowledge, and the potential degradation of historical judgment without appropriate pedagogical mediation are critical challenges.

The case study presented confirms that, when AI is integrated with a designed pedagogical framework, it can enhance student engagement, cultivate 21st-century skills, and transform the teaching of history into a lively and creative experience. The role of the teacher emerges as crucial: as a motivator, mediator, and supervisor of technology use.

In conclusion, the use of AI in History education is not an end in itself, but an opportunity. Provided that it is integrated critically and used in an ethically oriented pedagogical manner, it can make a significant contribution to the development of historical awareness, digital literacy, and responsible thinking among secondary school students.

Supplementary Materials
Not applicable.

Funding Statement
This research received no external funding.

Acknowledgments
Not applicable

Data Availability Statement
Not applicable.

Conflict of Interest Statement
The authors declare no conflict of interest.

About the Authors
Vasileios Bazanis holds a bachelor degree from the Department of Greek Language and Literature (Specialization in Classical Literature), School of Philosophy of the National

and Kapodistrian University of Athens (NKUA), and a Master's degree in Educational Programmes and Materials (Conventional and e-Formats) from the Department of Social and Educational Policy of the University of Peloponnese (UoP). He is a post-graduate student of the programme "Digital and Soft Skills in Education Sciences" of the International Hellenic University (IHU), an experienced teacher of secondary education, and nowadays is the headmaster of Geniko Lykeio Doriou in Messenia's region. He has participated in various school, European and Erasmus+ projects related to Environment, Culture, Mental Health, and pedagogical issues. He is one of the authors of a school book and the author of articles in peer-reviewed scientific journals, as well as of conference presentations in proceedings of Greek and International conferences. His research interests are related to Pedagogy, ICT and AI in Education, Leadership and Mentoring. Publications are linked to his Google Scholar, and ResearchGate account.

Anna Bilali is a teacher and philologist at a primary school and a postgraduate student at the International Hellenic University (IHU). She holds a Master's Degree in Education titled 'Organization and Administration of Education and Educational Units' from the Department of Primary Education at the University of Patras. Her research interests include ICT integration, AI in education, Special Education, inclusion, and the organization and administration of education. She has published research on educational evaluation and articles on special education and inclusion. She also participates in innovative national and European programmes.

Zafeiria Karatziki is a German language teacher at the 1st Junior High School of Thebes with 20 years of service in secondary education. She holds a Magister Artium (M.A.) from the Albert-Ludwigs-University of Freiburg and she is a postgraduate student in the Master's program "Digital and Soft Skills in Education Sciences". Her research interests include language teaching methodology, Artificial Intelligence in education, and digital tools for inclusive and intercultural learning. She has participated in Erasmus+, eTwinning, and Eco-Schools projects.

Apostolia Katsarou holds a bachelor degree from the Departments of Greek Language and Literature, School of Philosophy, Aristotle University of Thessaloniki (AUTH), and from the Department of Early Childhood Education, Democritus University of Thrace (DUTH). She is the holder of a postgraduate degree in "Environmental Education and Communication" from DUTH and she is a postgraduate student at the International Hellenic University (IHU). She serves as an appointed Greek teacher in public secondary education. For the past three years, she has been an Educational Project Coordinator and Mentor at the 6th Experimental Junior High School of Alexandroupolis.

Georgios Nikolaou is a philologist in secondary education and postgraduate student at the International Hellenic University. His research focuses on ICT integration, innovative pedagogy, and Artificial Intelligence in education. He has published educational material, participated in Erasmus+ projects, and presented at national and international conferences. He is Vice President of the Association of Philologists of Imathia and President of the "Hercules" Gymnastics Club.

References

Acun, C., & Acun, R. (2023). *GAI-enhanced assignment framework: A case study on generative AI powered history education. Proceedings of the Neur IPS'23 Workshop on Generative AI for Education (GAIED)*. Retrieved from https://gaied.org/neurips2023/files/48/48_paper.pdf

Akinwalere, S. N., & Ivanov, V. (2022). Artificial Intelligence in Higher Education: Challenges and Opportunities. *Border Crossing, 12*(1), 1–15. https://doi.org/10.33182/bc.v12i1.2015

Ayala-Pazmiño, M. (2023). Artificial intelligence in education: Exploring the potential benefits and risks. *593 Digital Publisher CEIT, 8*(3), 892–899. https://doi.org/10.33386/593dp.2023.3.1827

Bender, E. M., & Friedman, B. (2018). Data Statements for Natural Language Processing: Toward Mitigating System Bias and Enabling Better Science. *Transactions of the ACL, 6*, 587–604. https://doi.org/10.1162/tacl_a_00041

Brookbanks, G. (2023). Teaching and learning of History at a high school level—the reality of AI/ChatGPT and the process of assessing understanding. *Yesterday & Today, 29*, 1–12. Retrieved from https://www.scielo.org.za/pdf/yt/n29/09.pdf

Rodríguez, A. C. (2023). Reinventing the teaching of early modern history in secondary school: The use of ChatGPT to enhance learning and educational innovation. *Stud. Hist. Hist. Mod, 45*, 101-145. https://doi.org/10.14201/shhmo2023451101146

Dede, C., Richards, J., & Saxberg, B. (2019). *Learning engineering for online education: Theoretical contexts and design-based examples*. Routledge. https://doi.org/10.4324/9781351186193

Gossard, J. M. (2024). Introduction: Teaching history in the time of generative AI. *Teaching History: A Journal of Methods, 49*(1), 3–4. https://doi.org/10.33043/5zbfza2bc

Grever, M., Haydn, T., & Lorenz, C. (2023). Chatting about the past with ChatGPT? An exploratory study of artificial intelligence as a tool in history education. *Journal of Educational Media, Memory, and Society, 15*(2), 1–20. https://doi.org/10.3167/jemms.2023.150201

He J. (2023). Analysis of the application of artificial intelligence in education and teaching. *Advances in Educational Technology and Psychology, 7*(2), 52-58. https://doi.org/10.23977/aetp.2023.070210

Hiltmann, T. (2023). Large Language Models as Hermeneutic Instruments in the Historical Sciences in *Hermeneutics in Times of AI*: De Gruyter. https://doi.org/10.1515/9783111351490-014

Kalaitzidis, G., & Trapezanidis, G. (2010). The effective teacher in the context of Vygotsky's theory. *Scientific Step,* (pp. 51-59). Retrieved from https://www.syllogosperiklis.gr/old/ep_bima/epistimoniko_bima_13/51e60.pdf

Kindenberg, B. (2024). ChatGPT-generated and student-written historical narratives: A comparative analysis. *Education Sciences, 14*(5), 530. https://doi.org/10.3390/educsci14050530

Kowalski, M., & Charchuła, J. (2024). Editorial: Education in the age of artificial intelligence. *Horizons of Education*, *23*(65), 5–6. https://doi.org/10.35765/hw.2024.2365.01

Lee, S.-E. (2023). Otherwise, than teaching by artificial intelligence. *Studies in Philosophy and Education*, *42*, 191–205. Retrieved from https://academic.oup.com/jope/article/57/2/553/7083943

LePoire, D.J., Sazhienko, E. (2025). AI and Big History: Unveiling Complexity Insights into Human Evolution and Future Scenarios. *Journal of Big History, VIII* (1); 71-82. https://doi.org/10.22339/jbh.v8i1.8110\

Lamboudis, S., Siakas, S., & Korakakis, G. (2021). *Advantages and disadvantages of the flipped classroom. In Proceedings of the 13th Conference on Informatics in Education – Informatics in Education (pp. 361–376).* Retrieved from http://events.di.ionio.gr/cie/images/documents21/CIE2021_OnLineProceedings/31CIE2021_Lampo_Final_P%20361-376.pdf

Mierwald, M. (2024). Chatting about the past with artificial intelligence: A case study of pupils' interaction with ChatGPT while completing a history-learning task. *Journal of Educational Media, Memory, and Society, 16(*2), 143–173. https://doi.org/10.3167/jemms.2024.160206

Nguyen, X.-H., Nguyen, H.-A., Cao, L., & Truong, H. (2023). ChatGPT's understanding of history: A comparison to Vietnamese students and its potential in history education. https://osf.io/preprints/edarxiv/8z9tj_v1

Nikitina, I., & Ishchenko, T. (2023). ChatGPT in the paradigm of modern education. *Scientific Journal of Polonia University, 61*(6), 100–106. https://doi.org/10.23856/6112

Nikolaou, G. (2024, May). *The work of Justinian through the words of Justinian – Utilizing AI tools in the teaching of history. Abstract at the International Scientific Conference: Language, Education, and Artificial Intelligence (pp. 158–159).* University of Crete. https://le-ai.edc.uoc.gr/images/book_of_abstracts_LE-AI2024-final.pdf

Sheng, X. (2023). The role of artificial intelligence in history education of Chinese high schools. *Journal of Education, Humanities and Social Sciences, 8,* 238–245. https://pdfs.semanticscholar.org/d70f/2ff03b5bbfddda316bbaf7f6725193d39761.pdf

Su, J.-H., & Yang, W.-P. (2023). Unlocking the power of ChatGPT: A framework for applying generative AI in education. *ECNU Review of Education 6*(3). Retrieved from https://journals.sagepub.com/doi/10.1177/20965311231168423

Taşar, D. E., & Taşar, C. O. (2023). Bridging history with AI: A comparative evaluation of GPT 3.5, GPT-4, and Google-BARD. *arXiv.* https://doi.org/10.48550/arXiv.2305.07868

Tirado-Olivares, S., Navío-Inglés, M., O'Connor-Jiménez, P., & Cózar-Gutiérrez, R. (2023). From human to machine: Investigating the effectiveness of the conversational AI ChatGPT in historical thinking. *Education Sciences, 13*(8), 803. https://doi.org/10.3390/educsci13080803

Castaneda, A. U. (2022). Un viaje hacia la inteligencia artificial en la educación. *Realidad y Reflexión*, *22*(56), 121–136. https://doi.org/10.5377/ryr.v1i56.15776

Wang, M. Q., & Guo, W. G. (2023). The potential impact of ChatGPT on education: Using history as a rearview mirror. Retrieved from https://journals.sagepub.com/doi/10.1177/20965311231189826

Yin, R. K. (2009). *Case study research: Design and methods* (Vol. 5). Sage. Retrieved from https://books.google.ro/books/about/Case_Study_Research.html?id=FzawIAdilHkC&redir_esc=y

Zeng, H. (2024). Zeng, Y. (2024). *HistoLens: An LLM-Powered Framework for Multi-Layered Analysis of Historical Texts--A Case Application of Yantie Lun.* Sun Yat-sen University. *arXiv* https://doi.org/10.48550/arXiv.2411.09978

Zhussupbayev, S., Nurgaliyeva, S., Shayakhmet, N., Otepova, G., Karimova, A., Matayev, B., & Bak, H. (2023). The effect of using computer assisted instruction method in history lessons on students' success and attitudes. *International Journal of Education in Mathematics, Science, 11*(2), 424-439. Technology (IJEMST) https://doi.org/10.46328/ijemst.3136

Mosaic portrait of Justinian I. (2023, September 23). In Wikimedia Commons. Retrieved from https://commons.wikimedia.org/wiki/File:Mosaic_of_Justinianus_I_-_Basilica_San_Vitale_(Ravenna).jpg

Huang, J (2023). Justinian I - Artificial Intelligence (AI) representation. Retrieved from https://www.artstation.com/artwork/klqJJA