

AI and New Digital Education

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Abstract

The impact of artificial intelligence (AI) on society and research cannot be underestimated. We urgently need to address this transformation with a strategic and long-term perspective, also involving historical sciences. From a historical standpoint, artificial intelligence raises three main issues: the use of AI to support research, the reliability of the information generated, and the digital literacy that must be imparted to students. Specifically, it is expected that historical research and student activities will increasingly rely on AI tools, despite current limitations in distinguishing automatically generated content. This challenges us to reverse the problem: how can historians, especially at the academic level, effectively leverage AI and pass these skills on to students? The central challenge lies in learning to speak the language of AI content production, known as prompt engineering. This discipline involves formulating optimized inputs for AI models to obtain more relevant and accurate responses, thereby increasing productivity in historical research without compromising the quality of critical analysis. The goal is not to create a technological tool but to design an innovative approach that enables historians to fully exploit AI's potential while maintaining the centrality of source criticism and methodological rigor. Through advanced application of prompt engineering, historians can improve research, interpretation, and communication processes, addressing some of the traditional challenges associated with historical source analysis. The new methodology aims to equip historians with conceptual tools to manage and analyze large amounts of data, evaluate sources more effectively, and narrate history in a more dynamic and accessible way. Moreover, the integration of AI in teaching will open new opportunities to make learning more interactive and personalized, stimulating students' critical thinking and enhancing their historical understanding. This interdisciplinary approach, combining humanities and computer engineering, will prepare future historians for an increasingly digital research landscape.

CCS Concepts

Artificial Intelligence → Education → History – Historiography

1. Introduction

The impact of artificial intelligence (AI) on society and research cannot be underestimated. AI is rapidly reshaping various academic disciplines, influencing the way knowledge is generated, analyzed, and disseminated. As digital transformation progresses, the integration of AI in education becomes increasingly relevant, raising crucial questions regarding its role in research methodologies, the reliability of AI-generated information, and the necessary digital literacy skills that students must acquire to navigate this evolving landscape effectively.

From a historical standpoint, artificial intelligence presents three primary challenges: the use of AI as a tool to support academic research, the evaluation of the accuracy and credibility of AI-generated content, and the need for students to develop critical thinking skills to interpret and analyze digital information effectively. Despite the limitations in distinguishing automatically generated content from human-authored material, the reliance on AI in historical research and student activities is expected to grow. This prompts the academic community to reconsider its approach: how can historians, particularly at the university level, leverage AI effectively and pass on these skills to students in a meaningful way?

2. The Challenge of AI Content Production and Prompt Engineering

A fundamental challenge in utilizing AI for historical research lies in mastering the "language" of AI content production, commonly referred to as prompt engineering. This emerging discipline focuses on the formulation of optimized inputs to guide AI models toward generating more relevant and accurate responses. By refining the way questions are posed to AI systems, researchers can enhance productivity while ensuring that the quality of critical analysis remains uncompromised.

The goal is not merely to develop a new technological tool but to design an innovative research approach that allows historians to exploit AI's potential fully while maintaining the core principles of source criticism and methodological rigor. Through advanced applications of prompt engineering, historians can improve research methodologies, enhance interpretation processes, and communicate historical findings more effectively. This approach also addresses some of the traditional challenges associated with analyzing historical sources, such as bias, availability, and contextualization.

By integrating AI into historical methodologies, scholars can access vast amounts of data, analyze multiple sources efficiently, and develop narratives that are both comprehensive and dynamic. Furthermore, AI-assisted research enables historians to identify patterns and connections that might otherwise remain unnoticed. The interdisciplinary integration of humanities and AI technologies fosters a more holistic approach to understanding historical events and their broader implications.

3. AI in Teaching: Enhancing Learning Experiences

The integration of AI in historical education extends beyond research and holds significant potential for enhancing teaching methodologies. The use of AI in classrooms can create interactive and personalized learning experiences that stimulate students' critical thinking and historical understanding. By employing AI tools, educators can facilitate deeper engagement with historical material, making it more accessible and thought-provoking.

A key advantage of AI in education is its ability to provide personalized learning pathways tailored to students' individual needs. Adaptive learning platforms powered by AI can analyze students' strengths and weaknesses, offering customized content that helps them grasp complex historical concepts. This personalized approach enables students to explore history at their own pace, fostering a more inclusive and effective learning environment.

Additionally, AI-driven tools can support active learning methodologies by enabling students to interact with historical sources in innovative ways. Virtual simulations, AI-generated reconstructions of historical events, and automated data analysis tools can provide students with new perspectives on history, encouraging them to ask complex questions and engage in analytical thinking.

4. Why Start with Contemporary History?

One of the most practical applications of AI in historical research lies in contemporary history. Generative AI models are trained on vast datasets, primarily consisting of recent digital information, making their knowledge more detailed and accurate for modern historical periods. This allows AI to provide more reliable responses when analyzing recent historical events compared to more distant historical periods, where digital data is limited or unavailable.

Focusing on contemporary history also facilitates a more empirical approach to assessing AI's capabilities. Since a wealth of digital sources is available, researchers can cross-reference AI-generated content with verified sources to evaluate its accuracy and potential biases. This method provides an opportunity to refine prompt

engineering techniques, improving AI's reliability in historical research.

5. Strategic Directions for the Future

5.1 Establishment of an Interdisciplinary Research Group

To fully explore the intersection between historical research and AI technologies, the creation of an interdisciplinary research group is essential. This group will focus on evaluating the compatibility between historical epistemology and prompt engineering techniques. Through systematic experimentation, researchers will analyze how AI-generated responses vary based on different prompting strategies, particularly in relation to specific topics such as 20th-century Italian history.

The research group will aim to:

- Develop specialized prompt techniques tailored for historical analysis.
- Assess the credibility and reliability of AI-generated historical content.
- Contextualize AI-generated information within broader historiographical debates.

A critical aspect of this initiative will be testing and validating AI methodologies through real case studies, conducted in collaboration with historians and students. The goal is to measure the benefits of AI in academic research while ensuring that critical analysis standards remain uncompromised. To facilitate this process, AI-based interactive workshops and lab sessions will be integrated into university curricula, drawing inspiration from existing digital humanities programs.

5.2. From Experimentation to Education

Once refined, the methodologies developed through this research will be incorporated into educational programs designed for historians and university students. Prompt engineering will become a core skill, enabling future historians to use AI responsibly and effectively in their research and teaching activities. This methodological shift will revolutionize the way historians explore and interpret the past, making historical inquiry more dynamic and interactive.

Innovative educational applications include:

- **Active Learning:** AI-powered platforms will allow students to ask complex historical questions and receive detailed, contextualized responses. For instance, AI can generate interactive timelines that illustrate connections between political events and social movements, enhancing students' analytical skills.

- **Historical Simulations:** AI can generate alternative historical scenarios, enabling students to explore "what-if" situations. By analyzing the impact of different decisions on historical events, students will develop a deeper understanding of the contingency and complexity of history.
- **Rapid Access to Sources:** AI can facilitate access to an extensive range of primary and secondary historical sources, streamlining the process of source comparison and interpretation. This capability will encourage students to critically evaluate multiple perspectives and refine their historiographical approaches.

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6. Conclusions: The Future of AI in Historical Education

The increasing integration of artificial intelligence into the field of historical research presents new opportunities to transform both research methodologies and educational approaches. By developing a robust framework that combines AI prompt engineering with historical epistemology, academic institutions can equip a new generation of historians with the skills necessary to navigate an increasingly digital research landscape.

This interdisciplinary approach will not only enhance the effectiveness of academic research but also enrich students' educational experiences. As AI continues to evolve, its application in historical sciences will contribute to a more dynamic and accessible understanding of history. By embracing this technological shift, the academic community can ensure that historical scholarship remains rigorous, innovative, and responsive to the demands of the digital age.

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