



FACULTY OF LETTERS AND HUMANITIES BEN MSIK
HASSAN II UNIVERSITY OF CASABLANCA

Department of English, Hassan II University of Casablanca

Applied Language Studies

Transforming Higher Education: Harnessing Artificial Intelligence for Enhanced Learning Experiences in the Humanities

A Research Paper Submitted in Partial Fulfilment of the Requirement of a Licence Degree

Prepared by

Abderrahman Gouhmad

Supervised by

Prof. Ayoub Loutfi

Copyright by:

Abderrahman Gouhmad

June 2024

Contents

DEDICATION	5
ACKNOWLEDGEMENTS	6
ABSTRACT	7
1 INTRODUCTORY CHAPTER	8
1.1 Problem statement	8
1.2 The purpose of the study	9
1.3 The Rationale and significance of the study	9
1.4 Research questions and hypotheses	10
1.4.1 Research questions	10
1.4.2 Hypotheses	10
1.5 The Organization of the paper	11
2 LITERATURE REVIEW	12
2.1 Introduction	12
2.2 Defining Key Concepts	13
2.2.1 Artificial Intelligence (AI)	13
2.2.2 AI-driven tools in education	13

2.2.3	Learning experience in higher education	13
2.2.4	Intelligent Tutoring Systems	14
2.2.5	ChatBots	14
2.2.6	Education Data Mining (EDM)	14
2.3	The use of AI in Higher Education	15
2.3.1	Personalized Learning	15
2.3.1.1	Intelligent Tutoring Systems (ITS) as module of Personal- ized learning	15
2.3.2	ChatBots “ChatGPT” as a module	16
2.3.3	AI and Administrative Efficiency: Streamlining Operations	16
2.3.3.1	Educational Data Mining (EDM) as a module	17
2.4	Challenges of AI in higher education	17
2.4.1	AI bias	18
2.4.2	Data privacy	18
2.5	Conclusion	19
3	METHODOLOGY	20
3.1	Introduction	20
3.2	Objectives of the study	20
3.3	Research Questions and hypotheses	21
3.3.1	Research Questions	21
3.3.2	Hypotheses	21
3.4	Research design	22
3.5	Participants	22
3.6	Instrument	22

3.7	Data collection procedure	23
3.8	Data analysis	23
REFERENCES		25

List of Tables

3.1	Participants	22
-----	------------------------	----

DEDICATION

With the guidance and blessing of ALLAH SWT, I embark on the journey of completing this research paper. I wholeheartedly dedicate this work to my cherished family—a source of unconditional love, inspiration, motivation, and support throughout my life. Their steady belief in my attempts has been a beacon of strength and hope. To my dearest family, your unshakable faith in me is the mainspring of my achievements. Therefore, I am eternally grateful.

ACKNOWLEDGMENTS

I extend my sincere gratitude to my professor and supervisor Prof. Ayoub Loutfi, whose guidance has enlightened the path of modernity often overlooked in higher education. I also extend my appreciation to him as being an invaluable lens, enabling me to delve into profound knowledge and successfully complete this paper. Hence, I appreciate his support and mentorship throughout this academic year.

ABSTRACT

This the abstract of my research paper.

Chapter 1

INTRODUCTORY CHAPTER

1.1 Problem statement

Artificial intelligence has taken all over the industries and become a revolutionized technology. It potentially transforms various industries to be more productive (Czarnitzki et al., 2023). However, the emergence of similar AI-driven tools like “ChatGPT”, which have significance capabilities, there remains a massive gap comprehending how to effectively interact with it, especially that these tools have gained prominence across sectors since their launch in late November 2020 (Marr, 2023); their full potential has not yet been used within the realm of education to foster genuine engagement and knowledge acquisition among humanities students. This has arisen questions about practical ways of integrating these tools in this context. Therefore, the key focus of this study lies in exploring how AI can be effectively integrated into education to enhance learning experiences within the humanities. The significance of this problem goes beyond implementing technology; it involves transforming education practices and methodologies. Using AI in higher education, especially in humanities, can potentially revolutionize it. Facilitating personalized learning, encouraging critical thinking skills, and en-

hancing engagement during lectures (Baskara, 2023). Addressing this gap is vital for improving the quality and effectiveness of humanities education ensuring that students have the skills to succeed in an increasingly digital and interconnected society. Therefore, exploring ways to use AI in education is an effort with significant implications, for the future of learning and acquiring knowledge.

1.2 The purpose of the study

This study examines practical ways of integrating artificial intelligence (AI) into the humanities. It also investigates effective AI-driven tools for improving learning experiences in higher education. To better understand students' perceptions and experiences, this study explores students' attitudes toward their academic performance using AI-driven tools. Furthermore, this study examines the challenges and opportunities associated with the use of AI in higher education, specifically in the humanities. By addressing these objectives, this study aligns with the goal of enriching learning experiences in humanities disciplines.

1.3 The Rationale and significance of the study

The widespread accessibility and prevalence of AI shows that 73% of US companies have already implemented AI into some aspects of their businesses as (PricewaterhouseCoopers, 2024) reports. Consequently, the fame of using AI in recent years prompted researchers to investigate practical ways of using AI tools for enhancing human productivity across various fields, including education. This study delves into AI-driven tools within a framework aimed at addressing how they can be effectively used to enhance learning experiences within humanities.

1.4 Research questions and hypotheses

1.4.1 Research questions

The study seeks to investigate the potential ways of harnessing Artificial Intelligence for Enhanced Learning Experiences in the Humanities. Hence, the following research questions will be addressed in this paper:

- What are the most effective ways to use AI-driven tools for enhancing learning experiences in higher education, especially in the humanities?
- What are students' attitudes toward their academic performance while using AI-driven tools?
- What are the challenges and opportunities associated with using AI in higher education in Morocco, specifically in the humanities?

1.4.2 Hypotheses

Following intended objectives, these hypotheses have been developed:

- Students who use AI-driven tools reveal better learning outcomes compared to those who do not in higher education, specifically in the humanities.
- AI-driven tools are significantly improving academic performance and engagement in the humanities.
- There are challenges and opportunities associated with using AI in higher education in Morocco, specifically in the humanities.

1.5 The Organization of the paper

The monograph comprises five chapters, each serving a purpose within this study. The first chapter gives an overview of the study discussing its problem, purpose, rationale, significance, questions and hypotheses. The second chapter review of relevant literature. It reviews the most existing studies on AI in education to highlight current trends, challenges, and potential strategies for using AI-driven tools. This chapter explores emerging trends, challenges, and practical approaches for using AI-driven tools. The third chapter is designed to provide a comprehensive explanation of data-collection. It describes the research design, participants, instrument, and relevant procedures adopted for analysis. The finding chapter will analysis, interpret, and discuss data-collection in depth. The chapter also aims to either validate or reject the hypotheses of the study. Finally, the concluding chapter will focus on a summary of research objectives, methodology, and findings. Furthermore, this chapter will address the study's limitations and implications while offering suggestions for further studies.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

Before discussing the study of “Harnessing Artificial Intelligence for Enhanced Learning Experiences in the Humanities,” it is imperative first to appraise the most significant insights and perspectives. This chapter presents a comprehensive survey of how AI has been incorporated into higher education, emphasizing practical methods for utilizing AI-based resources to improve academic achievement and efficiency. Ultimately, the chapter concludes by addressing the obstacles that arise when implementing AI in educational institutions. The objective is to elucidate the findings surrounding this subject matter, gleaned from other researchers’ diverse viewpoints.

2.2 Defining Key Concepts

2.2.1 Artificial Intelligence (AI)

Artificial Intelligence is the intelligence demonstrated by machines, involving tasks such as speech recognition, computer vision, and language translation. It is the ability of machines to perceive, synthesize, and infer information, distinguishing it from the intelligence displayed by non-human animals and humans (Ola, 2023). In addition, AI has the ability of a computer system to perform human tasks that human intelligence can accomplish (Sadiku et al., 2021). It has the potential to optimize and improve various aspects of human life, including education, health, business, and technology (Cheng, 2023).

2.2.2 AI-driven tools in education

AI-driven tools encompass the application of AI tools like “ChatGPT” to assist students, educators and administration in an education process. These AI-driven tools are used for planning and reactive execution of educational phases, such as student admission, lesson planning, knowledge delivery and performance evaluation (Mallik & Gangopadhyay, 2023). Additionally, it serves as an extension of human intelligence, enabling increased productivity in the educational sphere by performing tasks such as problem-solving, learning, and decision-making (Cheng, 2023).

2.2.3 Learning experience in higher education

It refers to designing and implementing educational activities to create positive and foster engaging student learning experiences (Ebner et al., 2023). It involves comprehending and

assessing the students' educational experience, including their satisfaction, self-efficacy, engagement, and self-regulated learning experience(Lyz' et al., 2022). The focus is on improving the quality of education by enhancing students' academic success, readiness for self-education and self-development, and subject well-being(Iordache-Platis, 2018).

2.2.4 Intelligent Tutoring Systems

ITS is educational software that incorporates AI. The software monitors students' progress, adjusts feedback, and provides hints to offer personalized guidance(Shute & Zapata-Rivera, 2010). It aims to provide individualized, sophisticated instructional advice (Sedlmeier, 2001).

2.2.5 ChatBots

Chatbots are computer programs that replicate human conversation with a conclusion. While not all chatbots possess AI capabilities, modern chatbots are progressively integrating AI techniques to analyze human input("What Is a Chatbot?", n.d.). It enables the digitization of human interaction through written or vocal means, giving the impression of ongoing communication with another individual (Oracle, n.d.).

2.2.6 Education Data Mining (EDM)

EDM is a technique that is used to evaluate students' academic performance, assess the learning process, determine the overall quality of education, and enhance outcomes in higher education. It entails processing and analyzing large amounts of data to extract relevant information that can be used for decision-making and policy-making in the education sector (Arifin et al., 2022).

2.3 The use of AI in Higher Education

Artificial intelligence has been increasingly integrated into various aspects of higher education, transforming traditional education (Wang et al., 2023). This section explores ways AI can enhance learning experiences and increase academic students' performance by focusing on personalized learning, intelligent tutoring, and administrative task automation.

2.3.1 Personalized Learning

The application of AI technology in higher education has been found to enhance academic performance and engagement by providing personalized learning experiences for students. By utilizing algorithms and data analysis, AI can recognize patterns in student performance and preferences, leading to personalized content and activity suggestions. This, in turn, enhances the student's learning experience, motivation, and engagement. Furthermore, AI can offer customized resources based on individual needs and learning styles while monitoring real-time progress to identify areas that require additional support and adjusting learning materials accordingly (Guerrero-Quiñonez et al., 2023) and (Lecturer, Department of Computer Science Akshara First Grade College, Anekal et al., 2023).

2.3.1.1 Intelligent Tutoring Systems (ITS) as module of Personalized learning

Intelligent Tutoring Systems (ITS) have shown great promise in enhancing online learning through AI. They provide personalized support, immediate feedback, and ongoing monitoring for more effective and independent learning. By analyzing student data with AI algorithms, these systems deliver tailored experiences that adapt to each student's needs, offering relevant content and personalized feedback. According to a recent study by (Lecturer, Department of

Computer Science Akshara First Grade College, Anekal et al., 2023), it improves adaptiveness and leverages personalized learning by considering each student's individual needs. This approach to personalized learning is also supported by (Bradáč et al., 2022) who believe it can greatly improve students' learning experiences.

2.3.2 ChatBots “ChatGPT” as a module

ChatGPT has become a valuable tool in higher education, providing students personalized recommendations based on their learning history. With minimal input, it can accurately answer questions and assist students in improving their study skills and time management. Additionally, it motivates and engages students by offering access to many resources. ChatGPT can assess students' writing abilities (Mohammed et al., 2023). Moreover, ChatGPT is an effective teaching aid that enables educators to make informed decisions and provides personalized support outside regular class hours. It also promotes engagement and active learning through interactive and dynamic experiences, facilitating discussions, stimulating critical thinking, and delivering immediate feedback to enhance the learning experience (Schönberger, 2023). Ultimately, ChatGPT has the potential to enhance both learning and teaching processes, serving as an invaluable tool for class preparation, exam preparation, and personalized tutoring (Domenech, 2023).

2.3.3 AI and Administrative Efficiency: Streamlining Operations

Artificial intelligence has proven to be a valuable tool in enhancing administrative processes for educators. By automating tasks, educators can prioritize important activities such as curriculum design (Drach et al., 2023). Furthermore, AI can streamline enrollment and improve retention rates, offering opportunities for resource optimization and successful online training

experiences (Lukianets & Lukianets, 2023). In addition, AI's data analysis capabilities and pedagogical reporting facilitate evidence-based decision-making, empowering educators to make informed choices (Guerrero-Quíñonez et al., 2023).

2.3.3.1 Educational Data Mining (EDM) as a module

Educational Data Mining (EDM) is a powerful tool for extracting knowledge from academic, socioeconomic, and learning analytics data. EDM can significantly improve academic performance, learning quality, and decision-making by utilizing statistical analysis, machine learning, and data mining techniques (Arifin et al., 2022; Hooda et al., 2022). Recent studies have highlighted the effectiveness of EDM in predicting students' performance using practical techniques such as J48¹ and K-means.² With its potential to enhance overall efficiency and success (Prince Sattam Bin Abdulaziz University et al., 2016), the use of Data Mining methods, particularly EDM, is becoming increasingly essential for educational institutions.

2.4 Challenges of AI in higher education

The emergence of artificial intelligence (AI) and its growing utilization in educational contexts have brought numerous challenges accompanying its implementation. This section explores the obstacles and issues when integrating AI into education settings, particularly its

¹J48 is a decision tree algorithm that is commonly used in educational data mining (EDM) for classification tasks.

²K-means is a clustering algorithm that is often used in educational data mining (EDM) for grouping similar data points together. It is an unsupervised learning algorithm that aims to partition the data into K clusters, where K is a predefined number. The algorithm iteratively assigns data points to the nearest cluster centroid and updates the centroids until convergence. K-means is widely used in EDM for analyzing student behaviors and identifying patterns in educational data.

use for academic purposes.

2.4.1 AI bias

Concerns have been raised regarding the potential negative impact of using AI in admission or grading processes for students. AI algorithms can produce racially biased output when trained on biased data. For example, in medical appointment scheduling, certain algorithms predict that black patients are more likely to miss appointments compared to non-black patients. This perpetuates racial inequalities and creates a lack of access to healthcare, highlighting the crucial need for accuracy and fairness in AI. The implications of this extend beyond the medical field and into other domains such as education, judicial systems, and public safety(Shanklin et al., 2022). The facial detection algorithms used by the software may be biased against students based on their skin tone or gender. The study shows that students with darker skin tones and black students are more likely to be marked for review, and women with darker skin tones are selected for review more often than white men. This highlights the need for caution when using automated proctoring software, as biased AI algorithms can significantly affect education, social justice, equity, and diversity (Yoder-Himes et al., 2022).

2.4.2 Data privacy

Schools, teachers, and students generate vast amounts of private data in digital formats, but often have little control over this data, which is instead held by third-party institutions. This lack of autonomy poses challenges in protecting student privacy. The use of AI systems and big data analytics in education has significantly enhanced the capacity to identify information about student users. This includes data traces from online learning activities, such as browsing history, download history, and location data. The security boundary of personal information

privacy is becoming increasingly blurred, posing challenges in protecting student data privacy (Huang, 2023). It is important to address the issue of data privacy in artificial intelligence (AI) within higher education. AI technology aggregates a vast amount of data from various sub-fields, making it crucial for data processing and consumption to adhere to privacy and security principles. With the advent of the Internet, the retention period of information has significantly increased. Therefore, data for AI systems must be collected, utilized, shared, stored, and deleted under information security standards. Protecting personal information related to the lifespan of AI technology should be ensured by legal frameworks and ethical norms(UNESCO, 2022).

2.5 Conclusion

This literature review comprehensively explored the burgeoning integration of Artificial Intelligence (AI) in higher education. AI offers a multitude of benefits, including personalized learning pathways through intelligent tutoring systems and chatbots, streamlined administrative tasks via automation, and data-driven decision-making empowered by educational data mining (EDM). These advancements hold immense promise for a future characterized by optimized learning experiences and efficient institutional operations. However, challenges such as algorithmic bias and student data privacy necessitate careful consideration. To ensure AI's ethical and equitable implementation, future endeavors should focus on mitigating bias within algorithms and developing robust data security protocols. In essence, AI presents a powerful but nuanced tool for transforming higher education. By navigating the ethical and practical hurdles and harnessing its full potential, AI can revolutionize learning experiences and empower educators to cultivate a more effective and equitable educational landscape.

Chapter 3

METHODOLOGY

3.1 Introduction

The goal of the present chapter is to illustrate the research design employed to investigate the integration of Artificial Intelligence in enhancing learning experiences in the Humanities. It details the research design, participants, instruments, data collection, and analysis procedures. The chosen methodology will be justified for its relevance according to research questions and hypothesis posted in chapter 1 section: 1.4, aiming to provide insight over the impact of AI-driven tools in higher education.

3.2 Objectives of the study

The main objective of this study is to examine the effectiveness, usefulness and benefits of using AI-driven tools as learning tool to enhance the students' academic performance. The purpose tends to discover students' perception along with the effective ways they use AI tools to enhance their academic performance. Accordingly to the objectives the following research questions and hypotheses have been formed.

3.3 Research Questions and hypotheses

3.3.1 Research Questions

The study aims to investigate hressing AI within higher education espacially humanities.

Hence, the following question are formulated:

- What are the most effective ways to use AI-driven tools for enhancing learning experiences in higher education, especially in the humanities?
- What are students' attitudes toward their academic performance while using AI-driven tools?
- What are the challenges and opportunities associated with using AI in higher education in Morocco, specifically in the humanities?

3.3.2 Hypothese

In terms of achieving the current purpose, the follwing hypotheses have been formulated:

- Students who use AI-driven tools reveal better learning outcomes compared to those who do not in higher education, specifically in the humanities.
- AI-driven tools are significantly improving academic performance and engagement in the humanities.
- There are challenges and opportunities are associated with using AI in higher education in Morocco, specifically in the humanities.

3.4 Research design

In this study, a mixed-methods approach is adopted to investigate the effective utilization of AI-driven tools in enhancing learning experiences within the Humanities. Surveys will be employed as a primary data collection method to gather insights on the ways AI-driven tools can be effectively integrated into the educational process. Additionally, the surveys will capture students' perceptions of their academic performance when utilizing these tools. By combining quantitative data from surveys with qualitative information from student perspectives, this study aims to provide a comprehensive analysis of the impact of AI technology on learning outcomes and student engagement in the humanities department.

3.5 Participants

This is the participants we have got from the form

Table 3.1: Participants

	Gender			Age					Acad
	male	female	prefer not to say	Under 18	18-25	26-35	36-45	46-above	First Year
Frequency								12	13
percentage								5%	10%

3.6 Instrument

To collect, measure, and interpret data related to this study, various data collection instruments tools are used by research. To that end, one these instrument was put into use namely

“the questionnaire”.

Two type of questions are used in this study, factual and attitudinal questions. In the first part of the survey, factual questions will be used to identify some demographic characteristics of the respondents such as their gender, age, academic year, department. While attitudinal questions will explore students’ attitudes towards the use of AI-driven tools in higher education, specifically in the humanities department.

The questionnaire design predominantly adopts a closed-ended format with predetermined response options for participants. However, it also includes four open-ended questions to encourage detailed responses and qualitative insights from the participants. These open-ended questions focus on soliciting examples of opportunities for integrating AI-driven tools in higher education, suggestions for enhancing the integration of AI in higher education, sharing experiences of using AI-driven tools, and providing comments or feedback regarding AI-driven initiatives.

3.7 Data collection procedure

With the help and guide of my supervisor professor Loutfi Ayoub, the questionnaire was created to target Humanities students. the survey was sent to many humanities student department with different semsters through social media platform such as WhatsApp.

3.8 Data analysis

The data of the recent study was gathered from the questionnaire that was sent to the target group via online platforms as mentioned earlier. Google form was used to collect our data since it offers various features to benefit from. In Google form, several types of questions can be

used such as multiple-choice, checklists, rating scales, and short answers text. This web-based application “Google Form” was enough to rely on for data collection.

REFERENCES

- What is a chatbot?* | IBM. (n.d.). Retrieved March 7, 2024, from <https://www.ibm.com/topics/chatbots>
- Arifin, M., ., W., & ., F. (2022). Using education data mining (EDM) and tracer study (TS) data as materials for evaluating higher education curriculum and policies. *KnE Social Sciences*. <https://doi.org/10.18502/kss.v7i14.11948>
- Baskara, R. (2023). PERSONALISED LEARNING WITH AI: IMPLICATIONS FOR IG-NATIAN PEDAGOGY. *International Journal of Educational Best Practices*, 7(1), 1. <https://doi.org/10.31258/ijebp.v7n1.p1-16>
- Bradáč, V., Smolka, P., Kotyrba, M., & Průdek, T. (2022). Design of an intelligent tutoring system to create a personalized study plan using expert systems. *Applied Sciences*, 12(12), 6236. <https://doi.org/10.3390/app12126236>
- Czarnitzki, D., Fernández, G. P., & Rammer, C. (2023). Artificial intelligence and firm-level productivity. *Journal of Economic Behavior and Organization*, 211, 188–205. <https://doi.org/10.1016/j.jebo.2023.05.008>
- Cheng, X. (2023). The widespread application of artificial intelligence in education necessitates critical analyses. *Science Insights Education Frontiers*, 16(2), 2475–2476. <https://doi.org/10.15354/sief.23.co081>

- Domenech, J. (2023). ChatGPT in the classroom: Friend or foe? *9th International Conference on Higher Education Advances (HEAd'23)*, 339–347. <https://doi.org/10.4995/HEAd23.2023.16179>
- Drach, I., Petroye, O., Borodiyenko, O., Reheilo, I., Bazeliuk, O., Bazeliuk, N., & Slobodianiuk, O. (2023). The use of artificial intelligence in higher education. *International Scientific Journal of Universities and Leadership*, 15, 66–82. <https://doi.org/10.31874/2520-6702-2023-15-66-82>
- Ebner, M., Edelsbrunner, S., & Schön, S. (2023, December 13). Supporting learning and teaching with good design: Report and lessons learned from learning experience design in higher education. In K. Kang & F. Namisango (Eds.), *E-service digital innovation*. IntechOpen. <https://doi.org/10.5772/intechopen.107489>
- Guerrero-Quíñonez, A. J., Bedoya-Flores, M. C., Mosquera-Quíñonez, E. F., Mesías-Simisterra, Á. E., & Bautista-Sánchez, J. V. (2023). Artificial intelligence and its scope in latin american higher education. *Ibero-American Journal of Education & Society Research*, 3(1), 264–271. <https://doi.org/10.56183/iberoeds.v3i1.627>
- Hooda, M., Rana, C., Dahiya, O., Shet, J. P., & Singh, B. K. (2022). Integrating LA and EDM for improving students success in higher education using FCN algorithm (V. Kumar, Ed.). *Mathematical Problems in Engineering*, 2022, 1–12. <https://doi.org/10.1155/2022/7690103>
- Huang, L. (2023). Ethics of artificial intelligence in education: Student privacy and data protection. *Science Insights Education Frontiers*, 16(2), 2577–2587. <https://doi.org/10.15354/sief.23.re202>

- Iordache-Platis, M. (2018). Building a higher education learning experience strategy; theoretical and practical approaches. *Proceedings of the International Conference on Business Excellence*, 12(1), 486–497. <https://doi.org/10.2478/picbe-2018-0044>
- Lecturer, Department of Computer Science Akshara First Grade College, Anekal, N C, A., Kumar, N., M, N., & V, S. (2023). Leveraging artificial intelligence in education: Transforming the learning landscape. *International Research Journal of Computer Science*, 10(5), 192–196. <https://doi.org/10.26562/irjcs.2023.v1005.16>
- Lyz', N., Golubeva, E., & Istratova, O. (2022). Students' educational experience: The conceptualization and development of a tool for the assessment of education quality. *Voprosy Obrazovaniya / Educational Studies Moscow*, (3). <https://doi.org/10.17323/1814-9545-2022-3-67-98>
- Lukianets, H., & Lukianets, T. (2023). PROMISES AND PERILS OF AI USE ON THE TERTIARY EDUCATIONAL LEVEL. *Grail of Science*, (25), 306–311. <https://doi.org/10.36074/grail-of-science.17.03.2023.053>
- Mohammed, A. A. Q., Al-ghazali, A., & Khalid A. S. Alqohfa. (2023). Exploring ChatGPT uses in higher studies:: A case study of arab postgraduates in india. *Journal of English Studies in Arabia Felix*, 2(2), 9–17. <https://doi.org/10.56540/jesaf.v2i2.55>
- Marr, B. (2023, October). A short history of chatgpt: How we got to where we are today. <https://www.forbes.com/sites/bernardmarr/2023/05/19/a-short-history-of-chatgpt-how-we-got-to-where-we-are-today/?sh=4111329e674f>
- Mallik, S., & Gangopadhyay, A. (2023). Proactive and reactive engagement of artificial intelligence methods for education: A review. <https://doi.org/10.48550/ARXIV.2301.10231>

- Ola, A. F. (2023, January 9). *Artificial intelligence (AI) is intelligence—perceiving, synthesizing, and inferring information—* (preprint). Open Science Framework. <https://doi.org/10.31219/osf.io/37m9k>
- Oracle. (n.d.). *What is a chatbot?* Retrieved March 7, 2024, from <https://www.oracle.com/chatbots/what-is-a-chatbot/>
- Prince Sattam Bin Abdulaziz University, Osman Hegazi, M., & Abugroon, M. A. (2016). The state of the art on educational data mining in higher education. *International Journal of Computer Trends and Technology*, 31(1), 46–56. <https://doi.org/10.14445/22312803/IJCTT-V31P109>
- PricewaterhouseCoopers. (2024). 2024 AI Business Predictions. Retrieved February 16, 2024, from <https://www.pwc.com/us/en/tech-effect/ai-analytics/ai-predictions.html>
- Sadiku, M. N. O., Ashaolu, T. J., Ajayi-Majebi, A., & Musa, S. M. (2021). Artificial intelligence in education. *International Journal Of Scientific Advances*, 2(1). <https://doi.org/10.51542/ijscia.v2i1.2>
- Schönberger, M. (2023). ChatGPT in higher education: The good, the bad, and the university. *9th International Conference on Higher Education Advances (HEAd'23)*, 331–338. <https://doi.org/10.4995/HEAd23.2023.16174>
- Sedlmeier, P. (2001). Intelligent tutoring systems. In *International encyclopedia of the social & behavioral sciences* (pp. 7674–7678). Elsevier. <https://doi.org/10.1016/B0-08-043076-7/01618-1>
- Shanklin, R., Samorani, M., Harris, S., & Santoro, M. A. (2022). Ethical redress of racial inequities in AI: Lessons from decoupling machine learning from optimization in medical appointment scheduling. *Philosophy & Technology*, 35(4), 96. <https://doi.org/10.1007/s13347-022-00590-8>

- Shute, V., & Zapata-Rivera, D. (2010). Intelligent systems. In *International encyclopedia of education* (pp. 75–80). Elsevier. <https://doi.org/10.1016/B978-0-08-044894-7.00247-5>
- UNESCO. (2022). *Recommendation on the ethics of artificial intelligence*. Retrieved March 15, 2024, from <https://unesdoc.unesco.org/ark:/48223/pf0000381137>
- Wang, T., Lund, B. D., Marengo, A., Pagano, A., Mannuru, N. R., Teel, Z. A., & Pange, J. (2023). Exploring the potential impact of artificial intelligence (AI) on international students in higher education: Generative AI, chatbots, analytics, and international student success. *Applied Sciences*, 13(11), 6716. <https://doi.org/10.3390/app13116716>
- Yoder-Himes, D. R., Asif, A., Kinney, K., Brandt, T. J., Cecil, R. E., Himes, P. R., Cashon, C., Hopp, R. M. P., & Ross, E. (2022). Racial, skin tone, and sex disparities in automated proctoring software. *Frontiers in Education*, 7, 881449. <https://doi.org/10.3389/feduc.2022.881449>