People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

University of Ibn Khadoun Tiaret

Faculty of Letters and Languages

Department of English

Investigating the Integration of Artificial Intelligence (AI) in Tertiary Education:

Department of Computer Sciences Tiaret as a SAmple

A Dissertation Submitted to the Department of English in Partial Fulfillment for the Requirements of Master Degree in Didactics

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Academic year 2023-2024

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DEDICATION

*I dedicate this work to my family and my friends. A special gratitude goes to my father Dr. BOUNOUALA SAHRAOUI and my mother who cared for and raised me to be the person I am today. You have been accompanying me along every step of my schooling pathway, including both its joyful and sorrowful times. Thank you for all the unconditional love, guidance, and support you have provided me with. Also, similar appreciation is directed to my sisters **Imane** and **Loudjayn** and my brother **Abderrahmane.***

Aicha

*I dedicate this dissertation to my father's memory BENAISSA, may Allah rest his soul, to my beloved mother KHAIRA, and to the most supportive person in my life my grandfather MIHOUBI DJILALI who has always played a fatherly role in my life. Similar appreciation is also directed to my grandmother MIHOUBI FATIMA for her everlasting support and care. Equally, this work is devoted to my sisters **Maroua, Imane, Bouchra,** and my brother **Mohammed,** and my best friend **Faten**.*

Manel

Acknowledgments

Our heartfelt thankfulness goes to our supervisor Prof. BENABED Ammar who supervised and scaffolded us throughout the whole year. He is to be commended for his strenuous effort, unwavering commitment, remarkable patience and tireless work throughout this endeavor.

Besides, our sincere appreciation is extended to the jury members, namely Dr.BELARBI Khaled and Dr. TOUBEIDA Mostafa for the time and effort they devoted to thoroughly reading and assessing our work.

Special thanks are also directed to Miss BEKKI Chaima, for her positive attitude, willingness and insightful comments and recommendations.

We wish to express our sincere appreciation to Mr. DJENANE Mouloud Amine, a teacher at the mathematics and computer science department for his help in the questionnaire distribution and collection.

Huge thanks are directed to all the teachers who have accompanied us during these enjoyable years of study at the Department of English – Tiaret. We are grateful to all people who have directly or indirectly contributed in the attainment of this dissertation.

Abstract

This research explores how Algerian tertiary education teachers adopt Artificial Intelligence (AI) tools. Although AI presents possibilities for enhancing experiences and customizing learning there is a significant gap in understanding teachers' awareness levels and the obstacles they encounter when using AI tools. This lack of awareness impedes the integration of AI into teaching methods. To tackle this challenge the researchers, examine instructors' familiarity with AI tools their hands-on experiences with them and the effects of these tools on students' learning outcomes. The study utilizes a mixed methods approach combining surveys and qualitative interviews. The survey was carried out at Ibn Khaldoun University computer science department in Tiaret, Algeria. The questionnaire aimed to assess teachers' awareness of AI tools and their potential impact on classroom practices. On the other hand, interviews were conducted to gain perspectives from instructors about their experiences, including benefits perceived and challenges faced. Analysis of the collected data revealed that the teacher population can be divided into two groups: contract teachers who are well-versed in AI tool usage and its implications, in their classrooms. These teachers observed an influence, on their students' academic performance due to using AI tools in their teaching practices. On the other hand, the second group comprises more experienced teachers who seem less convinced about the potential of AI tools and are unsure about incorporating them into their teaching methods. The analysis indicates that these seasoned teachers are generally reluctant to embrace and apply AI-driven resources and technologies in their classrooms despite recognizing the benefits they could bring to student learning and progress. The contrasting views and behaviors of these two teacher groups underscore the significance of offering development and training to ensure that all educators regardless of age or tenure status have the necessary knowledge, abilities, and confidence to effectively integrate AI tools into their teaching practices. Bridging this gap could result in an impactful adoption of AI technologies among teachers, at large ultimately enhancing students' academic accomplishments and overall educational journey.

Keywords: Artificial intelligence, teachers' awareness, AI adoption, tertiary education, computer science

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List of Abbreviations and Acronyms

AI : Artificial Intelligence

AIED : Artificial Intelligence In Education

AiEDU : Artificial Intelligence Education (website)

MOOC's : Massive Open Online Courses

MTT: Montessori Teacher Training

PD: Professional Development

PLN's: Personal Learning Network

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General Introduction

The rapid advancements in artificial intelligence (AI) technologies have profoundly impacted various sectors, including the field of education. As AI continues to evolve, there is a growing interest and emphasis on incorporating AI-powered tools and applications into the teaching and learning processes within tertiary education institutions. These AI-based solutions have the potential to revolutionize the way knowledge is imparted, skills are developed, and learning experiences are enhanced for students in higher education.

The integration of AI tools in tertiary education settings presents both opportunities and challenges. On one hand, AI-driven technologies can automate routine tasks, provide personalized learning pathways, offer intelligent tutoring systems, and analyze student data to derive actionable insights. This can lead to improved efficiencies, increased engagement, and better-informed decision-making for educators. On the other hand, the adoption of AI in higher education also raises concerns about data privacy, ethical implications, and the potential displacement of traditional teaching methodologies.

To fully harness the transformative power of AI in tertiary education, it is crucial to understand the current landscape of AI tools, the perceptions and experiences of educators, and the factors that influence the successful integration of these technologies into pedagogical practices. This research study aims to delve into these aspects, providing a comprehensive examination of the awareness, benefits, challenges, and adoption factors associated with the use of AI tools in higher education settings.

Problem Statement

The integration of AI-driven tools and programs, in education settings remains a challenge despite the growing presence of AI technology and its potential to transform teaching approaches. While implementing AI solutions can offer benefits such as enhancing teaching effectiveness streamlining processes and improving decision-making, there are hurdles and limitations that universities need to address. One key issue arises from the uncertainty surrounding how teachers in education perceive interpret and utilize AI technologies. The lack of documentation on educators' attitudes, concerns, and willingness to embrace AI-driven tools in their teaching practices is a gap that needs attention given

educators' crucial role in leveraging these innovations. Moreover, it is essential to examine the implications of AI integration including its impact on students' learning outcomes, and the potential transformation of traditional teaching methodologies. Without conducting research into the interplay between AI capabilities and stakeholders' perspectives, within higher education settings and institutional factors influencing AI adoption universities may encounter obstacles in fully harnessing the transformative potential of AI tools. This study aims to address this problem by providing a look, at the situation, challenges, and possible benefits associated with the implementation of AI technologies, in higher education.

Motivation

The motivation behind this research on the integration of AI tools in tertiary education is to explore the transformative potential of these emerging technologies in enhancing teaching, learning, and institutional efficiency within higher education settings. As the education landscape continues to evolve, driven by factors such as increasing student diversity, growing demand for personalized learning, and the need to better prepare graduates for the changing job market, there is a pressing need to understand how AI-powered tools and applications can address these challenges and optimize the educational experience.

Furthermore, the research aims to provide insights into the current levels of awareness, perceptions, and adoption barriers among tertiary education faculty, as their perspectives and willingness to integrate AI tools are critical for successful implementation. By addressing these aspects, the study can inform the development of targeted support and training programs to facilitate the ethical and responsible deployment of AI in higher education. Additionally, the research findings can contribute to the ongoing policy discussions and the establishment of appropriate regulatory frameworks governing the use of AI in the education sector. Ultimately, this comprehensive investigation into the opportunities, impacts, and influencing factors surrounding AI integration in tertiary education can advance the scholarly knowledge in this emerging field and guide future research and practice.

Research Questions

To achieve a comprehensive understanding of the current state of the integration of AI tools in tertiary education at the Department of Computer Science, informing the development of more effective strategies for the adoption and implementation of AI-driven tools and resources to enhance both teaching and learning, the following inquiries have been posed:

RQ1: To what extent are tertiary-education teachers at the Department of Computer Science aware of AI potential assets to impact their teaching practices?

RQ2: What are the benefits and challenges that tertiary education teachers face while using AI tools in teaching?

RQ3: How can AI tools integration in tertiary education impact students' learning outcomes?

By addressing these interrelated research questions above, this study aims to contribute to a deeper understanding of the current state of AI integration in tertiary education, particularly within the Department of Computer Science. The findings will inform the development of evidence-based practices and policies to promote the responsible and impactful adoption of AI technologies in service of improved teaching and learning outcomes.

Research Hypotheses

The study is guided by three key hypotheses that aim to shed light on the various aspects of AI integration and its implications for both teachers and students. Differently couched, they act as a roadmap, guiding researchers in their investigation and ensuring that the study remains focused and purposeful.

H1: Teachers may be un/aware of the AI potentialities in tertiary education.

H2: AI-tools integration may have benefits such as personalized learning and planning, and face challenges such can lack of knowledge and understanding.

H3: The use of AI tools in the learning process may impact students positively and negatively.

Research Design

The study was related in nature, using mixed-methods research. The current study follows a quantitative, and qualitative method, the sample of this study was teachers from the computer science department of ibn Khaldoun Tiaret. The current research work used two collecting data instruments. The first is teachers' questionnaire which was designed to

investigate the integration of AI in tertiary education and the second is teachers' interview which was selected to provide for the researcher with new insights, opinions, and experiences.

Research Objectives

The current research targets four different, yet complementary objectives. Its primary objective is to explore the use of AI tools in tertiary education comprehensively. Firstly, it attempts to assess the extent of awareness and understanding among teaching staff regarding AI technologies and their potential implementation in the classroom. Secondly, it seeks to identify the perceived benefits as well as the challenges associated with the adoption of AI-powered tools and systems within the teaching and learning process. Building on this, the study aspires to investigate the impact of AI integration on students' learning outcomes in higher education settings. Finally, the research will examine the key factors that influence the willingness and ability of tertiary education teachers to incorporate AI tools into their pedagogical practices. By addressing these interconnected objectives, the study aims to provide valuable insights that can guide the strategic and effective implementation of AI technologies to enhance teaching and learning experiences within the higher education sector.

Sampling

The target population for this research study consists of tertiary-education teachers within the Department of Computer Science at Ibn Khaldoun University. This specific population was selected given their direct involvement and expertise in the intersection of technology, pedagogy, and higher education. As teachers in the computer science field, they are uniquely positioned to provide insights into the emerging role of artificial intelligence tools and their applications in the tertiary classroom. To capture a representative sample, the researchers employed a purposive sampling technique, identifying and inviting all eligible faculty members from the Department of Computer Science to participate in the study. This sampling approach ensured the inclusion of diverse perspectives, encompassing teachers with varying levels of experience, technological proficiency, and familiarity with AI-driven educational tools. By focusing the research on this specific population of tertiary-education teachers in computer science, the study aims to generate findings that are directly relevant to

understanding the awareness, perceptions, and experiences of those at the forefront of integrating innovative technologies into their teaching practices.

Investigation Instruments

The research study utilized a mixed-methods approach, incorporating both quantitative and qualitative data collection instruments. The first component was an online questionnaire distributed to all eligible tertiary-education teachers within the Department of Computer Science. The questionnaire was designed to gather broad, generalizable data on the teachers' awareness of AI-driven educational tools, their perceptions of the benefits and challenges of AI integration, and their current levels of AI integration in their teaching practices. The questionnaire employed a combination of multiple-choice, Likert-scale, and open-ended questions to elicit both structured responses and enable teachers to share their unique perspectives and experiences.

Following the questionnaire, the researchers conducted in-depth, semi-structured interviews with a selected subset of the participating teachers. These interviews allowed for a deeper exploration of the themes and insights that emerged from the initial questionnaire data. During the interviews, teachers were encouraged to elaborate on their survey responses, share anecdotes and examples, and provide more nuanced reflections on the facilitators and barriers to AI-driven integration in tertiary-level teaching. The interview guide was designed to probe into the teachers' decision-making processes, their pedagogical considerations, and their vision for the future of AI in higher education. By triangulating the questionnaire and interview data, the researchers aimed to develop a comprehensive and contextually-rich understanding of the teachers' experiences, perceptions, and needs regarding the integration of AI-driven technologies in the computer science curriculum.

Structure of the Study

This research is structured into two main chapters. The first chapter provides a comprehensive theoretical review of artificial intelligence and its integration into higher education. This chapter explores the current state of AI technologies, their capabilities, and the potential benefits they offer to improve educational practices. Importantly, this chapter reviews existing literature on higher education teachers' awareness and perceptions of AI tools and their classroom applications. By synthesizing the theoretical foundations, this

chapter lays the foundation for an understanding of the current landscape and key considerations surrounding the integration of AI-driven teaching and learning in higher education.

The second chapter of the study includes a multi-faceted research methodology, detailed data analysis, and a discussion of study limitations and recommendations for future research. This empirical component of the study delves deeper into key research questions, using a combination of quantitative and qualitative methods to investigate awareness, benefits, challenges, and impacts of AI integration from teachers' perspectives of higher education within the Department of Computer Science. The data analysis section presents a comprehensive review of the collected data, highlighting key findings and trends. Finally, the chapter concludes by acknowledging the limitations of the study and offering recommendations for future research, policy development, and the continued evolution of AI integration in higher education.

Adopting this dual-chapter approach, the study offers a comprehensive exploration of the issue, combining an in-depth theoretical underpinning with empirical investigation to provide a substantial and insightful understanding of the current state and future implications of AI-driven applications in Higher Education.

Chapter one
Literature review

Introduction

Artificial intelligence is finding its way into many areas of life. The latest craze is AI chips and related applications on the smartphone. However, it started in 1642 with the first mechanical calculating machine, which was built by French mathematician Blaise Pascal. Artificial intelligence is the intelligence of machines or software, as opposed to the intelligence of humans or animals. It is also the field of study in computer science that develops and studies intelligent machines. It may also refer to the machines themselves. AI is a field that has captured the imagination of researchers, technologists, and society. AI is one of the newest fields in science and engineering. Work started in earnest soon after World War II, and the name itself was coined in 1956. Along with molecular biology, AI is regularly cited as the "field I would most like to be in" by scientists in other disciplines.

2. Artificial Intelligence: Tracing the Origins and Progression

Artificial intelligence (AI) has come a long way since its start. It began with basic ideas in the 1940s and has grown into powerful systems today. AI has experienced remarkable growth and transformation.

*1940-1960: Birth of AI in the wake of cybernetics. During this period, there was a convergence of technological advancements spurred by World War II and a growing interest in understanding the relationship between machines and living beings. In 1943, Warren McCulloch and Walter Pitts developed the first mathematical and computer model of the biological neuron, known as the formal neuron. In the early 1950s, John Von Neumann and Alan Turing played pivotal roles in transitioning computers from using 19th-century decimal logic to binary logic, which laid the foundation for contemporary computers. -In 1950, Alan Turing published his famous paper "Computing Machinery and Intelligence," where he proposed the Turing Test as a measure of machine intelligence. The term "artificial intelligence" (AI) is often attributed to John McCarthy of MIT, who defined it as the construction of computer programs capable of performing tasks that require human-like mental processes. The Dartmouth Conference in the summer of 1956 is considered the birthplace of AI, where McCarthy and others gathered to discuss the future of artificial

intelligence. – Despite initial enthusiasm, interest in AI waned in the early 1960s due to limitations in computing power and memory capacity. 1980-1990: Expert systems in 1968, Stanley Kubrick's film "2001: A Space Odyssey" depicted a sophisticated computer, HAL 9000, sparking public interest in AI and ethical concerns about its implications. The late 1970s and early 1980s saw the emergence of expert systems, such as DENDRAL and MYCIN, which were specialized in tasks like molecular chemistry and medical diagnosis, respectively. These expert systems were based on an "inference engine" designed to mirror human reasoning, but their development and maintenance were labor-intensive and often resulted in "black box" effects. Despite some successes, interest in expert systems declined by the early 1990s, with AI becoming a less favored term in academic and industrial circles. Since 2010 A new boom based on massive data and new computing power* Around 2010, AI experienced a resurgence due to two key factors: access to massive amounts of data and advancements in computing power, particularly the use of graphics processing units (GPUs) for accelerating learning algorithms. This new era of AI led to significant public successes, such as IBM's Watson winning Jeopardy! In 2011 and Google's AI recognizing cats in videos in 2012. Deep learning, spearheaded by researchers like Geoffrey Hinton, Yoshua Bengio, and Yann LeCun, became a dominant approach in AI, leveraging neural networks to learn from vast datasets. Deep learning techniques have achieved remarkable results in tasks like image and speech recognition, but challenges remain in areas requiring deeper understanding and context, such as natural language processing and conversation analysis.

The late 20th century and the early 21st century witnessed a significant resurgence of interest in AI, fueled by several key factors. Advancements in computing power with the development of faster and more powerful processors allowed for the training of complex AI models that were previously computationally infeasible. Additionally, the development of new algorithms and machine learning techniques, particularly the resurgence of neural networks, provided powerful tools for tackling complex problems that were previously beyond the reach of traditional AI approaches. Furthermore, the explosion of available data in recent decades has provided the fuel necessary for training and refining AI models. This, combined with ongoing research efforts in areas like deep learning and reinforcement learning, has led to significant breakthroughs in various domains. The field of AI continues to evolve at a rapid pace, with new applications and advancements emerging constantly. Understanding the historical background of AI provides valuable context for appreciating the current state of the field and navigating its future trajectory. By acknowledging the early aspirations, foundational developments, periods of both progress and setbacks, and the

ongoing challenges and opportunities, we can ensure that AI continues to be developed and utilized in a responsible and beneficial manner for the betterment of society. It's crucial to remember that not everyone embraces the phrase "artificial intelligence" in its entirety. Some, on the other hand, support enhanced intelligence, which acknowledges the superiority of the human brain and views software and computers as merely tools that can be utilized to enhance or even augment human intellect (Ekowo and I. 2016). This tactic involves using computers to perform things that are difficult for humans to perform (such identifying patterns in massive volumes of data). The majority of us acknowledge that we don't know much about many aspects of modern life, but one of those is the growth of artificial intelligence (AI). Because writings about artificial intelligence frequently feature imagery of robots and digital brains, many people confuse the field with humanoid robots. AI is being employed in a wide range of contexts and methodologies, despite the fact that robotics—embodied AI that can move and physically interact with the environment—is a core area of study for AI (Attaran et al. 2018). But science fiction dystopian visions of a robot-populated future are still common in novels, which is why we tend to ignore robotics altogether.
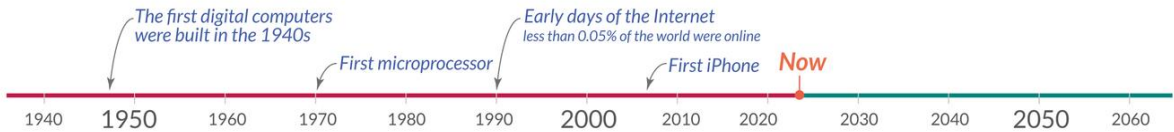
Figure 1 : time scale of history of artificial intelligence

1. Artificial Intelligence: Definition and Implication

Artificial Intelligence, as described by numerous experts, is a pioneering effort to equip computers with cognitive abilities similar to those found in it (1985) characterization captures the ambition of creating machines capable of genuine cognition, while Czarniak and McDermott's definition from the same year underscores the use of computational models to explore mental faculties. Bellman's (1978) perspective emphasizes the automation of cognitive activities such as decision-making and problem-solving, while Kurzweil's (1990) definition emphasizes the creation of machines that execute intelligent functions akin to human capabilities. Poole et al. 's (1998) definition delves into the study of designing intelligent agents, while Rich and Knight's (1991) definition and Simon's (1996) retrospective emphasize the quest to bridge the gap between human and machine intelligence. Turing's (1950) seminal inquiry poses the fundamental question of whether machines can

exhibit thought, while McCarthy's (2007) definition underscores the engineering aspect of making machines intelligent. Minsky's (1985) characterization echoes the pursuit of replicating human-like intelligence in machines, as does Schank's (1991) view. Together, these definitions paint a comprehensive picture of Artificial Intelligence as a multidisciplinary field seeking to enable computers to perform tasks that typically require human intelligence.

3. Artificial Intelligence: Implementation Insights across Varied Sectors

AI is transforming many businesses and areas. AI solutions are being explored by companies worldwide to boost efficiency, innovation, and competitiveness. This study examines AI adoption methods and best practices across industries, providing significant insights for business executives and decision-makers looking to harness this dynamic technology.

According to Forbes magazine (2023), there are many AI applications in different fields such as healthcare, finance, transportation, and manufacturing. These diverse use cases underscore the broad impact of AI and the need for a thorough understanding of effective implementation strategies. This study aims to build on the industry examples highlighted by Forbes, providing an in-depth look at AI adoption methods and best practices observed across the landscape of varied sectors. Below are some sectors that are fully altered by AI applications:

3.1 AI-Powered Transformation to Optimizing Finance

The application of AI in finance has become increasingly prevalent. AI can be used by customers to obtain information about their investing and banking accounts. AI is used by banks and credit card companies to identify trends in transactional data and identify fraudulent activity early on. Artificial intelligence is used by lenders to forecast and evaluate the risk levels of their borrowers and make loan choices. AI is used by venture capital organizations to provide tailored insights and financial risk management choices. Naturally, financial management firms and robot-

3.2 AI-Driven Transformation Optimizing Healthcare

Artificial intelligence has also entered the medical industry as its accuracy has increased. Less excitingly, AI assists administrators with data processing, scheduling, file organization, and medical note transcription. Take into consideration how robots use AI to automate surgery for additional striking examples of how AI is being used.

Machine-led surgeries may operate around the clock, are less intrusive and more exact, and have a lower margin of error. Through the use of wearable technology to track health and identify issues before people become aware of them, AI can help with medical diagnosis. AI has also been used by some programs to read body scans (such as MRIs) and find dangerous growths more quickly and accurately. Even pharmaceutical businesses using AI to examine current and historical data to find

3.3 AI-Powered Strategies Amplifying Marketing Impact

The use of artificial intelligence by marketing departments in businesses is another prevalent application. AI is employed in:

- -Produce reports about campaigns.
- -Boost client interaction
- -Customize your mess
- -Conduct internet remarketing initiatives.
- -Mid-campaign, adjust your advertising strategy in light of fresh information.

This also includes chatbots, since language processing is essential to the analysis and creation of marketing campaigns. In order to keep brands on message, editing apps like Grammarly also make the cut since AI can assess vocabulary, grammar, and sentence structure.

3.4 AI -Leveraging for Intelligent Social media Analytics and Targeting

Another great application of artificial intelligence is social networking. AI is used by companies like Twitter and Meta to evaluate vast volumes of data and produce useful insights. AI is also widely used by businesses to develop their social media brands. Specifically, AI can:

- Monitor user activity to inform advertising and marketing strategies.
- Keep an eye on comments to recommend fresh content and accounts to follow.
- Ascertain the existing trends.
- assist in creating content that is specifically targeted using behavioral and demographic data
- Combat harmful or illegal content as well as cyberbullying.

3.5 AI-Based Insights to Increase Crop Productivity and Quality

Unexpectedly, AI has become more and more popular in the field of agriculture. Applications that can detect soil shortages and suggest plants have been made possible by advances in computer vision and machine learning. Additionally, AI supports "precision agriculture," in which farmers employ AI to:

- Determine the best crops to grow
- Address pest attacks
- Measure soil conductivity and pH

3.6 AI-Embracement to Revolutionize Commercial Strategies

The e-commerce sector has greatly benefited from AI. AI is used by businesses to help with inventory management, analyze performance, forecast trends, and more.
Artificial intelligence (AI) is a potent weapon in the battle against credit card theft and phony online evaluations because of its capacity to monitor usage patterns and validate data.

Additionally, "recommendation engines," which present products to customers based on their browsing history and tastes, are powered by artificial intelligence. Naturally, chatbots and virtual assistants also make an appearance here.

3.7 AI-Embracement to Elevate Educational Outcomes

Even though human workers still hold a major role in education, artificial intelligence helps teachers reach their full potential. AI is frequently utilized to enable automation in repetitive, data-intensive jobs such as:

- assignment grading.
- Setting up meetings
- Overseeing several online courses concurrently
- Sending personalized communications to students
- Creating or digitizing lectures and study guides

4. AI-Driven Advancements Optimizing Teaching and Learning Strategies

The emergence of AI has unlocked fresh opportunities in education and personalized learning. Through analyzing student data, delivering tailored content, and providing instant

support, AI can enhance learning effectiveness and efficiency. In healthcare, AI has made significant strides in diagnosing, treating, and managing diseases [Kaplan et al., 2021]. Within machine learning, AI has triggered notable shifts in learning and teaching methodologies [Friedrich et al., 2022].

Under the conventional system, teaching methods are often generic and fail to consider individual student differences [Narayani et al., 2019]. However, with the advent of AI, a more personalized approach can be adopted to cater to the scientific community's needs [Allen, 2019; Rahayu, 2023]. AI also facilitates the development of a more objective evaluation system [Ng et al., 2022] and simplifies the teacher's role as a facilitator in the learning process [Fauzia and Triyono, 2020]. Utilizing pre-programmed algorithms, the AI system can rectify and grade student assignments, thereby reducing human error in assessment and providing students with more objective and consistent feedback [Kannan et al., 2020].

Hence, AI serves as a collaborator in the evaluation process and offers a more precise insight into the field's progression [Ng et al., 2022]. However, while AI brings numerous benefits to education, it is crucial to maintain a balance between technology and human interaction [Alexander, Romito, and Çobanoğlu, 2020]. Despite AI's potential for personalized learning, interpersonal relationships between teachers and students remain pivotal for students' social and emotional development [Bokhari and Myeong, 2022]. AI should be regarded as a tool that complements the learning process rather than a substitute for human interaction [Ayling, Lewis, and Cotter, 2019].

Previous studies, such as "The Role of Machine Learning and Artificial Intelligence for Creating a Digital Classroom and Its Sustainable Impact on Education during Covid-19" [Ara Shaikh et al., 2022], "Vision, Challenges, Roles, and Research Issues of Artificial Intelligence in Education" [Hwang et al., 2020], "Teaching Artificial Intelligence to K-12 Through a Role-Playing Game Questioning the Intelligence Concept" [Henry, Ernestine, and Collard, 2021], and "The Role of Artificial Intelligence and Machine Learning in Harmonization of High-Resolution Post-Mortem MRI (Vir topsy) with Respect to Brain Microstructure" [O'Sullivan et al., 2019], have examined the role of Artificial Intelligence.

5. AI-Transformative Protentional in Education

OpenAI (2024) generated the advantages of AI in education as following:

1. Personalized Learning: AI applications allow students to study and learn at their own pace. With AI-powered tools, students can customize their academic curriculum based on their

individual needs and preferences. This personalized approach helps students to better understand and grasp the material.

2. Adaptive Teaching: AI technologies, such as Gesture Recognition and Facial Expression Analysis, can monitor and understand students' moods and engagement levels during lectures. By analyzing facial expressions and gestures, AI systems can identify when students are struggling to understand the material. They can then adapt the lesson to better suit the needs of individual students, ensuring effective learning experiences.

3. Inclusion and Accessibility: AI tools make global classrooms possible, accommodating students who are visually or hearing impaired. These tools can provide resources in different languages and offer real-time translation through applications like Presentation Translator. By providing inclusive learning environments, AI promotes accessibility and ensures that all students can participate and learn effectively.

4. Efficient Assessment and Feedback: AI can automate tasks such as grading homework and tests, saving teachers significant time and effort. AI systems can quickly evaluate and assess students' work, providing immediate feedback and suggesting ways to overcome learning gaps. This allows teachers to focus more on individual student assessment and development.

5. Advanced Learning Programs: AI is advancing tutoring and studying programs, enabling more interactive and engaging learning experiences. Technologies like virtual reality (VR) and gamification enhance student engagement and promote deeper understanding of the material.

6. Adaptive Group Formation: AI applications can create groups of students suited for specific tasks, fostering collaborative learning environments and enhancing student participation.

7. Instantaneous Essay Grading: AI-powered software can instantly grade student essays. By comparing them to a central database of previous essays, AI can provide consistent and reliable grading, freeing up teachers' time and ensuring fair evaluation.

8. Voice Assistants: AI-powered voice assistants, such as Google Assistant, Siri, and Alexa, allow students to interact directly with educational material. Voice assistants provide access to learning resources and information without the need for teacher involvement. They can offer prompt answers to common questions, facilitating learning outside the classroom.

9. Cost and Resource Efficiency: AI technologies can streamline administrative processes, like admissions and enrollment, reducing paperwork and improving efficiency. Additionally, voice assistants can provide students with concise and precise institutional information, reducing the need for printed study materials and internal support.

6. Overview of Higher Education

According to OpenAI (2024) Higher education, also known as tertiary education, is the level of education that follows secondary education. It's typically offered by universities, colleges, and institutes of technology. there are several types of institutions that offer higher education programs,

including universities, colleges, and institutes of technology. Higher education programs can lead to undergraduate degrees or postgraduate degrees, such as master's or doctoral degrees.

Higher education offers many benefits, such as increased earning potential, improved job prospects, personal development, and increased social mobility. However, there are also challenges, such as the cost of tuition, the burden of student debt, and the time commitment required to complete a degree program.

The future of higher education is evolving to include online learning, which can make education more accessible and affordable. Micro credentials are also becoming more popular, offering smaller, more focused credentials that can be earned in a shorter amount of time. As the world of work continues to change, lifelong learning will become more important, and people will need to continue learning throughout their lives to keep up with the demands of the job market.

The increasing prevalence of technology in daily life underscores the growing importance AI in higher education (Lew et al., 2019; Vasconcelos et al., 2020; Vyshinsky et al., 2020). AI has attracted considerable interest among researchers, as it has the ability to transform learning and broaden its scope to reach more people (Lew et al., 2019; Vasconcelos et al., 2020; Vyshinsky et al., 2020). By disseminating education to a wider populace, it has the potential to offer better standards of living (Lew et al., 2019). AI is now becoming a regular feature of higher education, overcoming the limits on education created by time and distance and providing a greater number of opportunities for more people to learn (Navarrete et al., 2016; Moreira et al., 2017). As such, AI is considered empowering, efficient, cost-friendly, and sustainable (Abdelhadi et al., 2016). AI is viewed by many scholars as a digital revolution and a significant breakthrough in education. It enhances the learning process by providing an innovative virtual environment and increases levels of satisfaction among students (Violante & Vezzetti, 2015). AI supports information sharing and creates learning opportunities for the disadvantaged and those living in remote locations (Webster & Hackley, 1997). Additionally, it facilitates connectivity between different parts of the world and between instructors and learners while also providing an environment and tools that support creativity and innovation (Violante & Vezzetti, 2015). Despite its numerous advantages, it is important not to over-emphasize its benefits. For example, some scholars tend to view e-learning as a panacea for all educational challenges (Biggs, 2003). Additionally, teachers need to be more cognizant of the need to promote learning rather than themselves as 'experts' (Biggs, 2003). Student perception of teaching greatly influences their approaches to learning and the quality of what they learn (Ramsden, 1998). The success of AI systems, such as Moodle, is dependent on their usage and acceptance by students and instructors, which can increase the return on the investments made by higher education institutions (Sharma et al., 2017). Moodle is one of the most favored and widely used learning management systems due to its

rich functionality and open-source nature. It currently hosts over 8 million courses serving more than one million instructors and in excess of 76 million students (Rawat & Dwivedi, 2019).

7. Harnessing the Transformative Potential of AI in High Education

1. Improvements in university management and education concept: The cost of investing in higher education in China is high, the cycle is lengthy, there are many colleges and universities, and resources are limited. Lack of funds for education frequently impedes the advancement of teaching and scientific research in colleges and universities, which in turn impacts the development of higher education. However, as artificial intelligence technology and social production are integrated and developed, so is the management model of colleges and universities. Artificial intelligence technology has increased managerial effectiveness and given greater consideration to educated people's learning experiences. The idea of education ought to change with the times as well. teaching pupils how to become more efficient managers of their own lives. The day-to-day administration of students' status, teaching, research, and finances, as well as their financial management, all represent this educational philosophy. It can intelligently handle transactions, cut expenses, and increase productivity by utilizing Internet and artificial intelligence technologies. Simultaneously, intelligent technology may enhance the rate of resource consumption, including laboratories and libraries in higher education institutions, and make wise decisions regarding management techniques. Regarding college students' experiences, we should prioritize the advancement of artificial intelligence; raise the standard of higher education by offering customized, diverse, and multifaceted learning environments that allow students to transcend academic boundaries; strengthen graduates' competitive advantage in the job market; support the integration of research, learning, and production to provide students with an education that differs from traditional classroom settings; and encourage the internationalization of higher education. And forever, to provide pupils with a better educational experience.

2.The updating of instructional strategies and materials. Higher education institutions have upgraded their curricula and instructional strategies. In the current context, the artificial intelligence subject system has been formed based on the requirements and capabilities of colleges and universities. The general education curriculum now includes artificial intelligence literacy, and students' interests in global governance, sustainable development, and general interests have been fostered. We have worked hard to create an online course modularization framework, improved student knowledge and skill sets, and a composite talent

training program called "artificial intelligence + X." In a similar vein, college and university teaching strategies have also changed. The emphasis of teaching activities in colleges and universities will be on learning and acquisition, and learners' preferred style of learning will shift from traditional collective learning to individual learning. When compared to the powerful intelligent reading room, the electronic reading room has greatly improved the service function, enriched the resource base, enhanced retrieval efficiency, and guaranteed the successful implementation of composite reading activities. It has also transformed the former independent book collection organization and single paper book collection method into a computer-based and network-based service. The library's event space has undergone significant expansion. It is essential to address the related issues concurrently. Readers may make better use of their time to learn about networks and, to some extent, avoid becoming lost in the vibrant and alluring world of networks if reading time is monitored and restricted.

8. The Impact of AI on the Development of Higher Education

1. Due to high-performance parallel operation, large amounts of information data and algorithm models will be used in intelligent informatization in the future to do numerous jobs. More intelligent instruments to help teaching and learning in the field of education will be made available by the implementation of artificial intelligence technology. Learners will have an unmatched learning experience thanks to intelligent instruction and teaching. Furthermore, online autonomous learning will showcase the new standard of ubiquitous learning and lifelong learning everywhere by seamlessly integrating with real-world scenarios and unrestricted human-computer interaction.

2.Give up customization. The use of AI in education can fully address each student's unique demands and advance the development of the best learning resources, learning pathways, and learning services. Teachers post customized preview materials to each student's private learning area prior to class. Teachers post customized preview materials to each student's private learning area prior to class. Teachers are able to provide remote coaching, deliver timely individualized learning resources, and remotely monitor students' learning progress. During class, teachers and students can interact in real time via the intelligent teaching platform, allowing teachers to "one to many" to solve various students' problems and track each student's progress in real time. The intelligent teaching platform can also automatically generate preview reports at any time, allowing teachers to master the learning situation of their students. After-class intelligent platform that facilitates simple access to individualized

learning help by analyzing data from students' classroom learning and making an informed assessment of each student's unique knowledge gaps.

3 The successful multidimensional collaborative development of the government, businesses, and universities is essential for the future integration of multidimensional collaborative artificial intelligence technology into education. This development offers support for various aspects such as educational resource aggregation, algorithm improvement, and teaching mode updates. The optimal impact of collaboration will be reflected in the application scenarios of AI technology education, technology R&D funding, and school enterprise cooperation and docking mode. Short-term artificial intelligence trends that support the growth of educational intelligence include human-computer collaborative development. When studying science, learning is viewed as an active process in which students create and comprehend new information in light of what they already know. AI cannot comprehend new information, hence students require the cooperation, support, and coordination of their teachers. Thus, instructor participation is crucial in the intelligent learning environment, and human-computer cooperation will be a key component of AI-assisted instruction.

9.Features of Artificial Intelligence Use in Modern Higher Education

The integration of artificial intelligence into various educational technologies, particularly learning management systems, has garnered attention recently, similar to other commercial and service industries (Roll & Wylie, 2016). When assessing artificial intelligence's impact on educational activities, it is found that more visual artificial intelligence teaching resources make students more engaged in the class (Kreps & Neuhauser, 2013). Artificial intelligence algorithms aggregate all the information regarding students' learning process, not just for the student, but also for the teacher, which facilitates closer observation of students' development (Tao, Díaz, & Guerra, 2019). Furthermore, the European Commission's Digital Education Action Plan, which lays out the strategy for 2021–2027, highlights how crucial it is to use data and artificial intelligence in teaching and learning activities. The significance of artificial intelligence in education is underscored in this road map's Action 6, which states that the process of digital transformation necessitates people's digital literacy and new technologies, including AI (European Commission, 2018). As a result, it is anticipated that in the not-too-distant future, artificial intelligence will enable the development of numerous educational specialties (Eremite, Calap, Çolak, Yavuz, & Aydın, 2020). Nevertheless, despite the

extraordinary rise in interest in and demand for artificial intelligence, educational systems have not yet developed the knowledge, abilities, and competency that will equip students in this area (Westerheide, 2019). Arslan (2020) highlights that more qualified individuals will be raised for the future if improved education models arise with the advancement of technologies. AI-directed learning supports electronic learning (e-learning) and other forms of education and training by using methods like fuzzy logic, decision trees, neural networks, Bayesian networks, and hidden Markova models (Colchester et al. 2017). Constructivist learning is a paradigm that encourages learner-centered and learner-driven learning, in which students actively create new information under the direction of their teachers (Maphosa and Maphosa 2021). Learning based on artificial intelligence is modeled after the constructivist approach. Neural networks, deep learning, machine learning, speech and image recognition, natural language processing, and other technologies that mimic human intellect are all categorized as artificial intelligence (AI) by Lu et al. (2018). Chatbots, expert systems, intelligent tutors, machine learning, personalized learning systems, visualization, and virtual learning environments are a few examples of AI technologies used in education (Zhang and Aslan 2021). Large amounts of data are needed for AI technologies to function more accurately. Massive volumes of data are produced by the spread of social media, online learning platforms, and mobile technologies, which are used to create AI systems (Chaudhry and Kazim 2021). Large volumes of data about student records, learning activities, and performance results are produced by advances in information technology, learning management systems, and massive open online courses (Daniel 2015). Artificial intelligence (AI) techniques in education can be used to detect difficult pupils, increase access to education, and get insight into how kids learn (Mou 2019).

Le (2018) observed that AI enhanced educational decision-making and student performance. Among the uses of AI in education include natural language processing, EDM, recommendation systems (RS), intelligent tutoring systems, and predictive analytics. EDM is a new genre with the intention of improving student learning performance through pattern recognition, knowledge analysis, and behavior analysis, as well as through curriculum and planning process improvement (Zhang et al. 2021). According to Akgun and Greenhow (2022) predictive analytics is also used to discover learning patterns based on statistical analysis. It can help identify students who are at danger of failing a course or not finishing it, allowing for early interventions. In education, artificial intelligence (AI)-supported assessment algorithms are used to assist with test and assignment scoring as well as automate

manual chores, freeing up teachers and decreasing their burden to focus on higher productivity jobs (Akgun and Greenhow (2022). In education, dialogue systems, usually referred to as conversational agents or chatbots, are utilized; this software converses with a user via text or speech on a certain topic (Smutny and Schreiber ova 2020). Chatbots, commonly referred to as intelligent tutoring systems, are being deployed as pedagogical agents, according to Lorillard (2013). Because they naturally respond to learners, chatbots have found favor in education. For example, they have been deployed to help students with registration procedures (Greenhow et al. 2020).

AI tools can help educators implement the most effective teaching strategies that take into account the unique circumstances of each student and automate labor-intensive processes like evaluations, comments, and grading schemes. AI teaching assistants are being used by educators to respond to routine student inquiries in online discussion boards, freeing up the instructor to concentrate on more important tasks (Seo et al. 2021). Precision education (PE) is a behavior-based method and educational philosophy that uses big data analysis to categorize student characteristics and pinpoint strengths and shortcomings in accordance with the constructivist learning paradigm (Ellis 2019). PE seeks to identify kids who are at-risk and quickly construct treatments by utilizing previous data (Luan et al. 2020).

Big data in higher education is gathered via digital tools and platforms, examined, and used to inform choices according to the requirements and learning styles of each individual student (Daniel 2019). Personalized learning (PL) is supported by big data, where information about Human behavior analysis can be used to determine students' learning requirements and assist teachers in creating lesson plans tailored to each student (Klarna-Milicevic, Ivanovic, and Budi Maci 2017). According to the constructivist learning paradigm, intelligent learning systems can generate PL utilizing the learner's learning style, emotional state, and social background information (Xu 2021). EDM examines sizable data sets produced by educational settings in order to address certain issues pertaining to education (Maphosa and Maphosa 2020).

Artificial intelligence (AI)-powered face recognition systems record and track students' facial expressions to offer behavioral insights and help educators create learner-centered teaching strategies that increase student engagement (Akgun and Greenhow 2022). By providing individualized activities and tasks, RS enhances learning outcomes (Thai-Nghe et al.2011). course RS can be used to help students make educated decisions and can be used to ascertain how students decide to enroll in a specific course (Elaraby and Karpas 2016). The efficacy of RS for elective courses is demonstrated by its accuracy rates, which exceed 90%

(Maphosa, Doersam, and Paul 2020). To improve the learning environment, Learning Analytics (LAs) relate to gathering, evaluating, and disseminating student data (Lang et al. 2017). Big data technologies are used in conjunction with LAs to precisely forecast student performance (Huang et al. 2020). Large data sets are analyzed by LAs to obtain understanding of the learner's context. enhance the educational setting (Adowa, Al-Samurai, & Faizy 2019). LAs assist early interventions that help identify students who are at risk of failing and dropping out by using past data. By seeing trends, generating hypotheses, and learning new information, machine learning creates a knowledge base. According to Azer, Guerrero, and Walsh (2013), deep learning involves students applying their information through analogies in order to build advanced thinking skills.

10.   Awareness: Definition as a Catalyst for Personal Growth

Awareness or Self-awareness is an individual's capacity to become the object of their very own attention (Duval & Wicklund, 1972). A person is aware when they reflect on the experience and perceive the stimulus in their environment. To do this, reflection should focus on preferences, goals, attitudes, personality traits, intentions, and sensations (Morin, 2011). Morin and Everett (1990) discussed awareness in terms of consciousness with meta-self-awareness being the highest level because a person is aware that they are in fact self-aware. (Megan Johnson Mccullough EdD,2023, para,01).

11.   Awareness as a Vital Role

According to (Nicole Krueger 2023), Teachers who avoid using AI in the classroom not only lose out on teaching students the life and professional skills they will need in the future, but they also miss the chance to engage in crucial discussions with them concerning the ethical and practical implications of AI use. It's important for teachers to know that AI tools are not flawless. like CHATGPT, it seems to be able of writing an original and persuasive essay on any subject at first glance. It can also write code, conduct research, and write poetry or novels. However, a closer inspection exposes obvious shortcomings in the chatbot's functionality.

"With any new technology we tend to overestimate its abilities in the short term and underestimate its abilities in the long term," says ISTE CEO Richard Coletta. (Nicole Krueger,2023, para4)

According to (WALDEN UNIVERSITY2024), Artificial intelligence in education has potential benefits and opportunities, but there are risks and disadvantages as well.

11.1 Potential Drawbacks of Incorporating AI-Focused Professional Development

Bias: The quality of artificial intelligence's knowledge is determined by the data it has been taught on. When students ask questions of a computer such as ChatGPT, they may receive biased responses that reinforce social injustices and stereotypes if the program is trained on biased data. Students can get low grades depending on their gender or race if a biased AI technology is utilized for grading.

Errors: Artificial intelligence has the potential to produce incorrect data in addition to bias. AI may use data that is outdated, incorrect, or propagates false information. Teachers and students shouldn't take the information generated by AI at face value.

Cheating: Learners can complete their homework, complete essays, and respond to quiz questions using ChatGPT. The irony is that teachers may now use AI writing detection algorithms to find out if their students are cheating. However, sometimes those programs could mistakenly identify a student's original work as plagiarized.

Isolation: Students may start to feel alienated and alone if they engage with a computer program more than they do with an instructor. Dropout rates may rise as a result of a decline in their engagement and motivation.

Jobs: Artificial intelligence holds great promise as a successful tool for education. Some educators fear they will be replaced by AI.

12.2 Potential Advantages of Incorporating AI Technologies in the Classroom

Assistance: Teachers who have experimented with AI have discovered that it may simplify a variety of tasks for them, including developing quizzes, lesson plans, and student project ideas. Artificial intelligence has the potential to let teachers spend more time with their students.

Speed: In the event that a teacher or caregiver is unavailable and a student feels "stuck" on an assignment, artificial intelligence applications can offer prompt, beneficial support. For example, a student can ask to be reminded of the processes involved in calculating an equation, "How do I solve for X?" Even if a student asks, "What are some effective strategies for improving my essay writing?" ChatGPT will respond with information and guidance immediately.

Individualization: AI systems can assist in providing students with more individualized learning possibilities. For example, ChatGPT can translate content into another language fast and effortlessly, which makes it simpler for students who don't speak that language to grasp tasks. Additionally, ChatGPT can modify content to fit different grade levels and customize assignments to fit the interests and ability levels of the students.

Context: Sal Khan, the CEO and creator of Khan Academy, described in a 2023 TED Talk how an AI tutor assisted a student in comprehending the meaning of the green light in F. Scott Fitzgerald's The Great Gatsby. The student asked the AI tutor to respond to her inquiry, "Why do you keep staring at the green light?" by assuming the role of Jay Gatsby. In addition to being right, the AI tutor's reaction as Gatsby was sophisticated and appropriate for the situation.AI might be used by future pupils to converse with historical figures such as Anne Frank, Marie Curie, and Shakespeare about their lives and scientific accomplishments.

Personalization: Learning for students can also be made more unique by artificial intelligence. AI-powered solutions can identify which students require assistance to enhance their learning experiences and the most effective ways to support them by evaluating student performance data.

It requires careful preparation, thought, and continual assessment to strike a balance between artificial intelligence's potential advantages and downsides in education. AI has the ability to empower teachers, speed up learning, and conveniently and quickly personalize educational experiences. However, close examination is necessary due to the potential for bias, incorrect data, and student isolation. To effectively represent themselves and their pupils, educators need to investigate the possibilities of artificial intelligence.

13. Empowering Teachers through AI Focused Professional Development Programs

According to (Rachelle Dene Poth,2023) , The field of education has changed significantly in the previous few years. The entire world is becoming more digital, with new technologies like artificial intelligence (AI) bringing out rapid advances in the world in which we live and work. Not only are technologies changing our lives as teachers, but they also have an impact on the workforce that our students will be joining.

Teachers must continually change and adapt in order to keep up with these changes and provide the greatest preparation. Nevertheless, there are drawbacks to these technologies, such as a dearth of possibilities for professional development, a lack of time for participation, and confusion over the most effective learning resources. It might often seem like adding to an already full plate when new technology is introduced. More than just teaching teachers how to utilize and integrate technology into their lessons is covered in professional development (PD) aimed at using it in the classroom. To engage instructors and show them the potential for enhancing learning through educational technology, it calls for rich and customized learning experiences.

13.1. Tips for Planning AD around AI

(Rachelle Dené Poth, 2023, para,6) also provides some tips for planning PD around AI:

1. Start with the basics. Ask questions about what people think of when they hear the term artificial intelligence. Share ideas and then provide information about what it is, how it works, where we see it in everyday life. It is important to understand the key concepts and terminology

2. Leave time for exploration. Offer resources that give educators a chance to explore AI. Hands-on learning opportunities are the best and will help them understand how AI works in practice and become familiar with its capabilities.

3. Make space for collaboration. A great way to build confidence and also help educators get started is by setting aside time for collaboration. Whether by grade level or content area, educators can exchange their ideas, share what they found during their own exploration, and come up with new ideas to try.

13.2 Types of Professional Development Programs

There are different approaches to professional development for educators. Here are some of the most common ways for professional development for teachers:

Courses/workshops, Observation visits to other institutes, Mentoring/Coaching, Peer observation, Qualification Programs, Conferences or seminars, Research. (Samiya Rashid,2022, para,05).

14. Teachers Perceptions and Attitudes about ai

AI implementation in the classroom has not been fully accepted due to the great number of teachers who still view technology negatively and prefer not to utilize it (Prensky, 2008; Kaban and Ergul, 2020; Istenic et al., 2021). Reasons include teacher anxiety about using new technologies (Zimmerman, 2006), and their preference to stay in their comfort zone, using the same materials and methodologies they are already familiar with (Tallvid, 2016) and hindering efforts to introduce technology on-site (Hébert et al., 2021). Research examining educators' overall perception of AI revealed that in the past, they had been greatly influenced by the concept of AI disseminated through the media and science fiction, which caused them to consider AI to be an occupational threat that would replace their jobs rather than be used to support the enhancement of learning and instruction (Luckin et al., 2016). However, recent studies have contributed to raising teachers' expectations for significant changes in the educational field such as the implementation of AI in different educational settings (Panigrahi, 2020). In light of this, a new concept has been introduced: Artificial Intelligence in Education (AIED), involving all aspects of educational uses of AI (Roll and Wylie, 2016; Hrastinski et al., 2019; Petersen and Batchelor, 2019). Teachers' perceptions of AIED systems vary according to their pedagogical belief, teaching experience, prior experience using educational technology, and the effectiveness and necessity of a particular technology, all of which can influence their willingness to adopt new educational technology (Gilakjani et al., 2013; Ryu and Han, 2018). Several studies investigating teachers' perception of AIED revealed that they commonly expected AI to be able to (a) provide a more effective teaching and learning process through digitalized learning material and multimodal human-computer interactions (Jia et al., 2020); and (b) resolve various learning difficulties each student has, catering to their needs in spite of large class sizes (Heffernan and Heffernan, 2014; Holmes et al., 2019). Moreover, research has shown the hope for AIED to significantly reduce teachers' administrative workload by taking over simple and repetitive tasks (Qin et al., 2020). Despite these educators' positive expectations of AIED, researchers have indicated that before adopting AI in the classroom, teachers first need to learn how to use technology and, most importantly, how to successfully integrate it into their curricula. They also need to understand the importance of AI and the affordances that it can bring to instruction so that they are open to integrating advanced technology into their lessons. Additionally, a great number of teachers and school officials have not yet experienced AI-based learning support and might simply recognize it as slightly more advanced educational technology, which can underestimate the AI's role in the classroom. Consequently, before a successful application of an AI support

system into education, it becomes necessary for teachers to first utilize it themselves so that they can fully understand how it can scaffold learning. (Nam Ju Kim, Min Kyu Kim,2022, p.04)

Since the 1960s, researchers have examined how teachers use computers and related technologies in the classroom (Parker & Davey, 2014). Early educational technology typically served a single, clear-cut goal, but artificial intelligence (AI) stands apart from earlier technology due to its relative novelty, intrinsic complexity, and vast potential uses. According to Celik et al. (2022), who looked at research published since 2000, the first studies with teachers actively using AI for educational objectives started in 2004, with the largest increase in studies occurring in 2018. Researchers have expressed worries about educators' viewpoints being left out of the larger discussions surrounding AIED, despite a drive for integration from commercial and nonprofit institutions (Celik et al., 2022; Cope et al., 2021; Zawacki-Richter, 2019).

15. The AI Effect in the Classroom

many pedagogical implications may be affected by Instructors' knowledge of AI such as :

15.1 Curriculum development

15.1.1 Pros of using AI for curriculum development

1. Greene (2023) . It is seen that the AI in learning can be helpful in creating question banks.

2. Include germination points and skeletal outlines for lesson development. (Greene, 2023)

3. According to instrucko (2022). AI Offer a good beginning and inspiration or help in creating the course or identifying problems for the students.

4. Set out course aims and create cohesion in the course outline and structure between unit lessons.

5. Personalized Learning: Consider providing more help to the students who require clarification or more information on the matter. (Instrucko,2022)

6. It can also allow SMEs to potentially save time through idea generation and summery of information readily available on the Internet.

15.1.2 Cons of using AI for curriculum development

1. Establish a safety and provide a human experience locality. Thus, there are concerns about the eradication of human teachers by artificial intelligent ones. (Greene, 2023).

2. Lack of Privacy: In today's world, there really does not seem to be a viable method of managing information other than to go fully digital. Yet, as is the story with every other technology, the students' data can also be considered vulnerable to hacking. This danger of a malicious party getting hold of school data always remains as a possibility when schools expose the students' and employees' personal information to them. (The Knowledge Review ,2020).

3. be employed merely as an invention of teachers coming up with content which does not give a second thought to the fact that students are using AI to assist them on the same content developed, will likely lead to the teachers and the learners obtaining poor scores. (Greene, 2023)

15.2 Assessment methods

it is clear that AI can be used in exam management, handling essay grading and decision making in relation to students' performance. According to Yuan et al (2020), the automated essay scoring system has the capability of not only enhancing the effectiveness of the test but also ensuring that scoring of the test is as fair as possible. Thus, one can note that researchers are turning to the study of AI affordances for analyzing automated systems. As mentioned by Dawson et al. (2020) one of the useful applications of AI-assisted tools in the assessment context is to check the essays produced by students for plagiarism. As mentioned in the works of Samar Alharbi & Khalid Al-Hoorie (2020), several established AI-based systems (for example, Turnitin) enable teachers to verify the originality of essays completed by students in graduate programs. Perhaps, this might be helpful in the sense of evaluation of students, which definitely is one of the main uses of AI. . Moreover, the machine vision techniques (Ozdemir & Tekin, 2016) can be used for analyzing the change in position of teachers' body which will be obtained through the video recording. It may be of great help to new teachers to help them to shape their teaching style in a more efficient way. AI can also assist teachers with a number of aspects of their instructional practice, including feedback on how effective it is (Farhan et al. , 2018; Lamb & Premo, 2015). A variety of teaching aspects that are pedagogically meaningful to teachers can be identified and modeled from operational data and AI, as evidenced in the case of Dillenbourg (2016b) Prieto et al. (2018). Ideally, these models can help teachers enhance their instruction approaches and processes. In addition, the pedagogically efective models can again program the AI algorithms to make them more scientific.

15.3 Teaching methods

In the view of (Jia Zhang, Zhuo Zhang2024), AI can impact teaching in a positive manner as it can promote class management, fostering of learning environment, improving technology skills, delivery of individual and unique teaching approaches and building up the rapport between the teacher and the learner.

16. barriers and Challenges for Educators Learning About AI

Despite the availability of so many advantages of AI integration in the classroom, there are also several barriers for teachers. Another threat is conflicts of interest, competition, and the lack of personnel with technical knowledge and skills. Engaging teachers who do not know anything about AI might face challenges when adopting this technology in their practices, and they may require resources and institutionalization. The other issue is the cost of AI tools and applications as there is a higher cost associated with the implementation of AI tools and applications. The main issue revealing itself here is the inability of many schools and universities to fund and sustain the needed technology for the integration of AI to education systems, where they might have to look for outside funding to support their programs. Last but not the least; there are also some specious issues that are related to integration of AI within classroom teaching. With advancement in the use of AI there are several risks that face the society that include; privacy and security risks as well as concern risks of the altering employment market. These concerns must not be lost to teachers especially because they have to ensure that their students are safeguarded while enjoying this rather fascinating area of innovation. (Noureddin Melo,2023)

17. tools and resources for teachers learning about AI

According to (gemini2024) There's a list of educators' resources to cast light on AI and how to incorporate AI into the learning process. Here's a breakdown of some key support structures:

17.1 Online Courses and Professional Development

Massive Open Online Courses (MOOCs): Since Coursera, EdX and Udacity are open for anybody to join free or for a fee, one can take an online course on Basics of AI, AI for Education and AI Tool among others.

Teacher Training Programs: Other institutions that could deliver and provide workshops, conferences, and certification in AI in education are universities, educational organizations, and all set-up for professional development.

Online Learning Modules: Some educational technology firms could offer professional development in the form of coursework on their AI applications meant for educators, free of charge and at personalized rates, accessible at a set price.

17.2 Teacher-Specific Resources

Websites and Blogs: It is always worth visiting a specific organization's website devoted to EdTech, like ISTE (https://iste. org/) or reads the articles, tutorials or lesson plans specifically about AI run by educational technology companies.

Curriculum Materials: Some of the potential sources of AI materials and lessons for students include pre-packaged curricular and lesson plans that are already developed in sources such as aiEDU ([http www aiedu org]).

Open Educational Resources (OERs): There could be instances in which educators have developed content with emphasis on certain learning standards, and OER Commons ([https www oercommons org]) could contain such materials that pertain to the teaching of AI.

17.3 Online Communities and Networks

Online Forums and Social Media Groups: By becoming a member of some social networks and groups such as Facebook groups or forums where people share their experiences and seek information regarding implementation of AI in their learning institutions, enables teachers to get other teachers with whom they can communicate, share their challenges and seek information.

Professional Learning Networks (PLNs): Teachers can seek to develop or find existing online PLNs related to AI with an aim of maintaining a support network with an aim of sharing resources, tips, and being well equipped with knowledge on how to approach AI projects.

Twitter Chats and Hashtags: Twitter chats are effective, in which educators can use specific hashtags, such as #AIEd, thereby implying in real time with a vast online community about the use of AI in education.

17.4 Educational Technology Companies

Freemium Tools and Resources: Some companies that employ the use of AI in the development of their products in education provide open trials or their instruments to teachers and academics for free.

Support Resources: Educational institutions could in turn seek tips, training sessions, guides, or/and access to specialists for embracing AI tools in teaching from the suppliers.

18. The Impact of Teacher AI Knowledge on Student Learning

As stated by (gemini2024) Speculation is rife in the trainer's capacity in tutoring in the presence of an AI system. While research is still evolving, here's how teacher familiarity with AI might positively impact students: While research is still evolving, here's how teacher familiarity with AI might positively impact students:

18.1 Enhanced Engagement

Personalized Learning: Artificial intelligence can used in a classroom as it aids in student differentiation due to the ability of the tools to customize the content and mode of delivery to suit the student's ability and preferences. Typically, this system can motivate and engage students due to its specialized nature of the plan set for each individual. To my knowledge I never really found any research that is done on Adaptive Learning Platforms.

Interactive Learning Activities: In this case, the use of AI will include designing platforms for developing rich, engaging educational games that will help capture the interest of students. Gamification has been defined variously with some defining it as the process of applying game dynamics into non-gaming related areas. Specifically, this concept has been applied in educational fields where researchers seek to find ways of making learning more effective. Gamification in Education can be researched by identifying the following.

Real-Time Feedback and Support: This may include challenges that are faced by students, encouragement and motivation throughout the course of that particular learning process by an AI tools.

18.2 Deeper Critical Thinking

Inquiry-Based Learning: Sophisticated software may show students problem settings and assist the students in going through the research and analysis part of problem solving as well as provide solutions to problems, thereby enhancing critical thinking skills. It is important to dissect studies about AI in oriented Inquiry Learning Environments.

Evaluating Information: Students should embrace AI as it enables it to get insights into different perspectives, datasets, and setups that can prompt critical thinking skills in an individual. Since self-directed learning involves seeking information, the integration of AI can be considered as the following: (Research to identify papers concerning AI-based Information Literacy).

Debunking Misinformation: There are number of possible teaching-learning activities that, with the help of AI tools, can be developed by educators to enable students decide what information to trust and how to evaluate it as true or false. Exploring Scholarly Articles on the Use of Fact-Checking AI Tools in Educational Events).

18.3 Sharper Problem-Solving Skills

Scenario-Based Learning: Various learning theories of use AI tools to develop simulations and scenarios emulating real-life problems so as to inculcate skills in solving the problems in the students safely in a simulated environment. This article also discusses Oskamp's suggestions on exploring research about AI-driven Simulated Learning Environments.

Algorithmic Thinking: Thus, within the process of familiarization with AI tools, students are engaged in algorithmic thinking – understanding an issue or a problem in terms of stages and creating an effective approach to its solution. The following are some sources that may be of interest in exploring Algorithmic Thinking in the Curriculum

Collaboration and Communication: It also uses AI to help facilitate collaborative problem-solving activities, in which students are put in groups assigned with specific problems, in order to come up with solutions, this encourages commitment to communication and teamwork. With regard to this research focuses, an investigation of research on Collaborative Learning Platforms with AI Support was conducted.

19. future directions of AI in higher education

The use of AI tools on future visions of higher education becomes the most-discussed and debated subject because of the opportunities and risks they bring. As Artificial Intelligence tools make their way into higher learning institutions in the future, it has been predicted that these institutions will experience new ways of how students learn, how administrative tasks are run and how research writing can be enhanced. These results have potential in the future and can be applied to various fields as it enhances students' learning and the overall outcome and performance (Wu Yu, 2024). With the assist of AI tools with the use of mechanisms such as machine learning or deep learning AI can provide personalized support to students with the answers to the questions concerning the course schedules, deadlines for completion of the assignments and other related information (Rathore, 2023). In the article by Grassini (2023), the author underlines that the introduction of such applications as ChatGPT in schools and universities can bring a lot of benefits concerning students' learning process and increase the number of academic publications through research and other related activities in and outside the academic environment, 24/7. This is even more applicable today given that intelligent

tools are always available and can help students and academics at any one time, that is helpful especially for students learning and tutors with other commitments or studying online. However, these AI guided agents can be useful in other office related works like as responding to queries about admissions, course enrollment, fees, and appointment scheduling which helps the staff members to divert themselves towards strategic planning and other important projects (Rathore, 2023). Besides enhancing students and academics support and providing effective administration and improved services AI can also enhance the levels of personal learning environments by suggesting appropriate materials to read and appropriate learning journeys based on the student's requirements and learning preferences, as well as feedback on assignments. Data accumulated on students' behavior in class increases an HEI's understanding of interaction levels and performance, and in turn, provide ways to improve the learning process (Kumar et al., 2024; Rathore, 2023; George and Wooden, 2023). In addition, when AI chatbots are implemented within learning management systems, students and instructors can easily gain access to course material, checks, and interactive tools built into personalized course platforms. As current and emerging AI tools are progressively developed and advanced, they can also offer such data as policies of the HEIs, resources of faculties, professional developments for academics, and other procedures or information related to the administration. It is thereby understood that through the coordination of the different types of media tools for both internal and external academic department communication and the improvement of transcendent confidence in information shared across campus units, the academic environment can be made more consolidated and effective. The future trends of IA tools in college include improved learning environments and academic support for students; also, convenient approaches towards personalized learning, easier administrative operations, and valuable academic writing assistance, as well as contributions to the further development of the academic model.

20. Summary of Literature about the research topic

numerous studies demonstrate the huge shift-in-potential of AI in learning but underlined the importance of teachers' readiness and awareness for AI (Frank M. Kehoe, 2023; Veronica W. Salido, 2023). (Erstad, et al. 2022) argue that AI can influence assessment, curriculum, and other teaching learning processes. Teachers who understand and are aware of the benefits of employing AI have the potential to use the applicability of the AI-driven potential on student learning (Nerantzi et al., 2023). However, there are some challenges of AI that must be

focused in education such as over-reliance on writing by artificial intelligence which would reduce the development of critical thinking (Salido, 2023). Furthermore, AI can help teachers in completing lesson plans by availing information on student backgrounds (Ismail Celik, 2022). All in all, these research findings prove that even despite the fact that the majority of teachers are not aware of the existence of AI, its successful implementation should be promoted to bring more value to education.

2. Chapter two
research methodology and data analysis

Table of Contents

2.1 introduction

The current research study is concerned with investigating teachers' awareness and use of AI tools in tertiary education, this chapter introduces the empirical part and demonstrates the steps of the research methodology and design followed to achieve the objectives of the study. This chapter indicates the setting where the study was undertaken and describes the profile of the participants who took part in the research study. In the second part, the research instruments used to gather data are indicated, then the data collection process concerning teachers' questionnaires and interviews are explained in detail. Finally, the data analysis is described to indicate the results of the study.

2.2 research design

The study was related in nature, using mixed-methods research. The Current study follows a quantitative - qualitative method in order to benefit from statistical data concerning the teachers' awareness about AI and to gain new insights and information about teachers' attitudes, awareness and opinions toward the integration of AI in tertiary education. The research design involves collecting data on two variables: ai tools and teachers' awareness

2.3 data triangulation

Data triangulation is the use of multiple sources of data to examine a research question or phenomenon. This can include using a variety of data collection methods, such as surveys, interviews, observations, and document analysis, to gain a more comprehensive understanding of the phenomenon. By using multiple sources of data, researchers can validate their findings and reduce the risk of bias that may occur when using a single method. (Muhammad Hassan ,2024, para.2)

To provide a comprehensive understanding of investigating teachers' awareness and use of AI tools in tertiary education, we used data triangulation by employing both questionnaire and interview. Questionnaire allowed us to collect data from a large population of participants, in the other hand the interview was conducted with the smallest group to gain richer insights into participants' experiences

2.4 Research instruments

The current research work used two collecting data instruments. The first is teachers' questionnaire which was selected due to statistical data concerning the use of AI tools in tertiary education and the second is teachers' interview which was selected to provide for the researcher new insights, opinions, and experiences. The questionnaire was designed to investigate the integration of AI in tertiary education. The questionnaire contains one section and nine (09) questions. The questionnaire was translated into Arabic to make it understandable for the teachers. The questionnaire was followed by an interview, the interview contained six (06) direct questions handed to three (03) teachers, it was used to investigate teachers' awareness about artificial intelligence. Triangulating data through these two instruments ensured the validity and reliability of data obtained. These two data collection tools were used to contribute to enhanced understanding of the topic.

2.5 Population and sampling procedures

A mixed methods approach was employed to data collection and analysis. Quantitative data was conducted through a questionnaire with closed-ended questions and qualitative data was collected through open-ended questions in the questionnaire and the interview. The number of the sample was limited due to recruitment methods, the questionnaire was handed to twenty (20) teachers from ibn Khaldun university department of computer science. The choice of this population was since teachers in this department are more able and receptive to use AI in their teaching methods. Also, the sample was randomly chosen. We collected 20 papers from 25 because of time and they don't have an idea about the topic. Also, the rest of the teachers are not from Tiaret. The interview was conducted to three (03) teachers in the same department.

2.6 analysis of the questionnaire

Question 1: gender

Question 2 : Age

Table 1: respondents' gender and age

Age / Gender	Male	Female
Less than 30	43%	57%
30-35	84%	16%
More than 35	72%	28%

As has been mentioned, the research data was collected from 20 participants, 3 male participants (43%) and 4 female participants (57%) are less than 30 . 5 male (84%) and 1 female (16%) are from 30 to 35 . and the rest of the participants are more than 35 , 5 male (72%) and 2 female (28%) .

Question 3: How familiar are you with the concept of artificial intelligence (AI) in education?
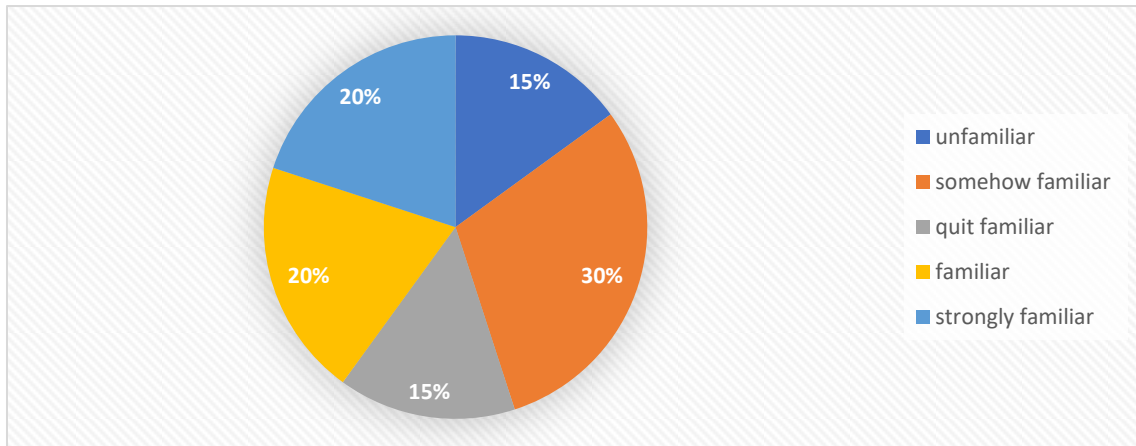
Graph 1 : respondents of familiarity with the concept of AI in education

The results are shown that most of the participants are somehow familiar 30% with the concept of the artificial intelligence AI and 20% are unfamiliar.

Question 4.1: Have you faced any issues related to technology constraints in implementing AI
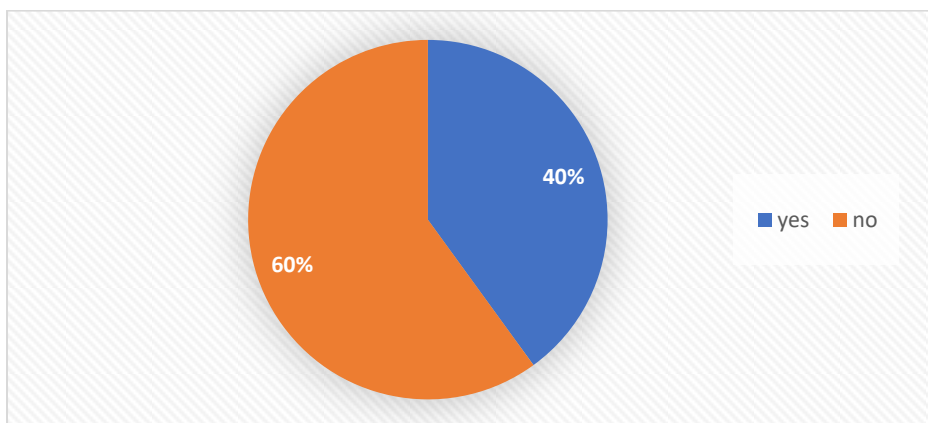
Graph 2: respondents' of facing issues related to technology in implementing AI

According to the teachers' answers, 60% of them don't face any issues related to technology in constraints in implementing AI which means are aware how to use AI.

Question 4.2: If not using AI, do you face any challenges in managing administrative aspects of teaching?
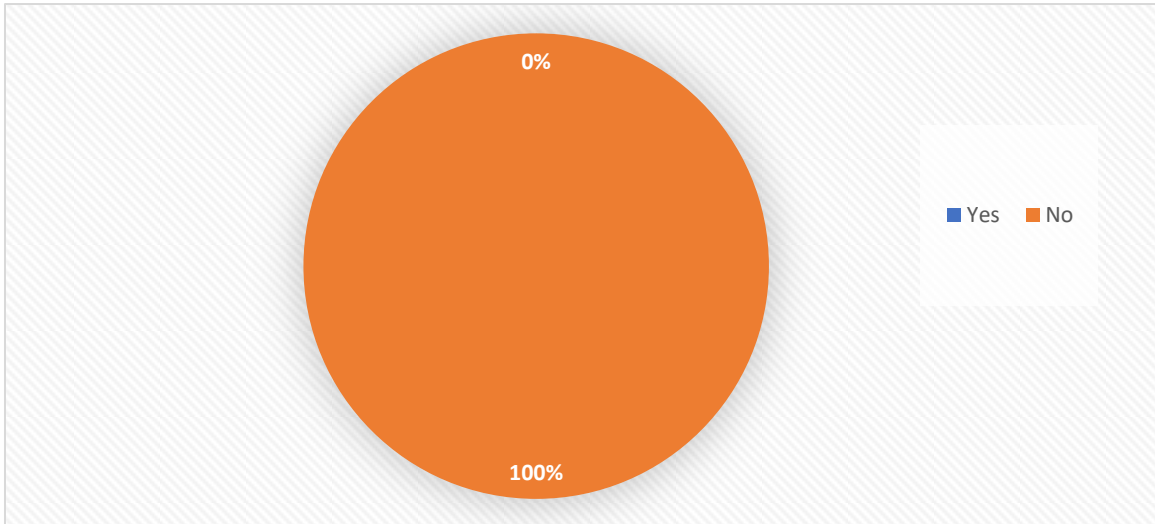
graph 3: respondents' of facing challenges in administrative aspects for not using AI

According to the results of the teachers, 5 participants from 20 don't use AI in their teaching. and the responses of this question if all of them don't face any challenges in managing administrative aspects in teaching.

**Question 5:** On a scale of 1 to 10, how comfortable are you with the idea of incorporating AI in your teaching methods?
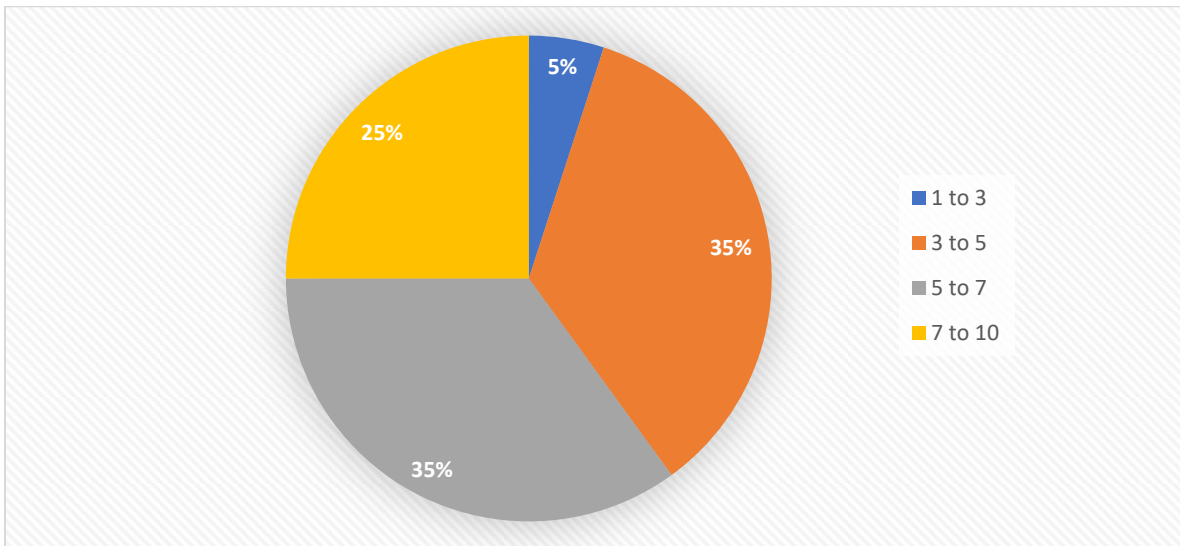
Graph 4: teachers' comfortable with the idea of incorporating AI in their teaching methods

The answers of this question were different from one teacher to another. most of the answers was between 5-7 and 7-10 which means most of the teachers agreed with the idea of incorporating AI in their teaching methods.

Question 6: Have you noticed any improvement in student engagement or learning outcomes using AI tools?
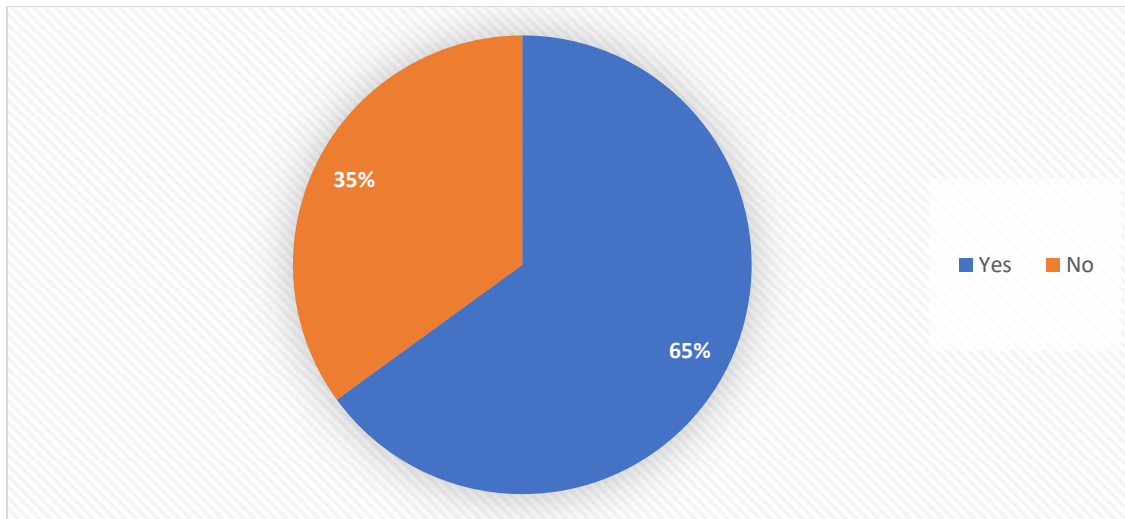
graph 5: improvement of students while using AI in teaching

The question results show a mixed response from teachers regarding the impact of AI tools on student engagement and learning outcomes. With 10 teachers reporting positive effects, this suggests that AI tools can be effective in these areas. and 5 reporting no improvement, this emphasizes the necessity of more research and development of AI tools to ensure their broader efficacy.

Question 7: How did you decide to adopt AI in your teaching methods, if applicable?

Teachers reported a variety of reasons for integrating AI into their classrooms. Some found AI platforms that directly assisted with their teaching methods. Others were drawn to the time-saving and effort-reducing capabilities of AI. Additionally, several teachers valued AI's ability to collect data effectively, which could result in better instructional techniques. It

is interesting to note that some saw AI as a tool to enhance learning speed and even correct language usage. Overall, the benefits of AI ranged from accelerating workload and increasing the usefulness of teaching materials to providing effective methods for explaining concepts and boosting student understanding one of the teachers said "ai gives effective ways to transform concepts to students to enhance their understanding of the concepts ". Finally, a few teachers saw AI as a valuable tool for planning and preparing courses, including creating a wider range of exercises. For instance, some even viewed AI as a guide or starting point for their teaching endeavors, while others found it particularly helpful in creating and improving presentations.

Question 8: For those using AI, how has it influenced your pedagogical strategies and lesson planning?

According to the answers given by teachers, the influence of AI on teachers' pedagogy and lesson planning is multifaceted. Several teachers utilize AI tools like ChatGPT for lesson planning itself. Others use AI to improve existing lessons, possibly by identifying areas for enhancement. Interestingly, some teachers include AI research tools like Gemini AI and Google into their planning process. Furthermore, AI seems to be particularly helpful in crafting presentations. as it can collect comprehensive data   Perhaps the most impactful benefit is the improvement in course quality. One teacher described how AI helps organize their ideas into structured chapters and sections. While all teachers emphasize the importance of their own knowledge, many acknowledge AI's assistance in creating effective teaching plans and pedagogical strategies. For some Even their approach to teaching has fundamentally changed because of AI.

Question 9: have you notice any improvement in student engagement or learning outcomes through the use of AI tools?

According to the responses, there's a clear difference in perspectives regarding the impact of AI tools on student engagement and learning outcomes. On one hand there's a negative view concerning AI tools. some teachers said that students may become overly dependent on AI, also it could result the reducing in problem solving skills .one of the teachers said "ai reduce cost time and efforts for students to solve problems, the time consumed for easy tasks should be used for more complicated and

advanced tasks". there's also an ethical consideration concerns the misuse of ai tools in learning for instance cheating. on the other hand, some there are positive opinions about ai in education. it includes improved student engagement, efficiency benefits in problem-solving, and the facilitation of quick understanding of concepts. moreover, AI is seen as a tool for providing personalized guidance and feedback to students.

2.7 analysis of the interview

Question 1: Good day! Thank you for agreeing to participate in this interview. We are researching teachers' awareness and use of AI tools in tertiary education. Could you please introduce yourself and share your role in the education field?

Questions 1 is to get the general information about the teachers and their role in the education field, 2 of the teachers hold a Magister degree while 1 hold Phd .

Question 2: That's wonderful. Given your expertise, we believe you have valuable insights. Let's dive into the topic. In your experience, how aware do you think teachers are of AI tools in tertiary education?

teacher 1: not too much most of them are not aware

teacher 2: it depends on the fields, for example in tech fields like computer science most of the teachers use AI in planning and grading but in other fields in non-tech areas might not even know what AI stands for. and here we notice that there's a big gap.

teacher 3: as a teacher in computer science, I can't speak for all the teachers; however, the usage of ai tools in tertiary education is spreading out rapidly and many faculties and universities are investigating ai tools in their teaching system.

This question attempts to check teachers' awareness of AI tools in tertiary education, the answers indicate a mixed situations in terms of teachers' awareness and use of ai tools. Tech-oriented fields like computer science have made a significance advance meanwhile other fields are struggling in using these advancements.

Question 3: That's interesting. What factors do you think contribute to the varying levels of awareness among teachers?

Teacher 1: there is many factors for example some teachers have better ability and passion to research in the field of artificial intelligence than other teachers

Teacher 2: In this point we back to the previous question, factors also depend on the fields for example in computer science faculty, they provide resources for exploring AI tools, teachers will be more likely to be aware of them, also some teachers might be just curious on their own.

Teacher 3: factors that contribute to the varying level of awareness among teachers depends on the age and experience of the teachers; for example, old teachers follow a way of teaching but novice and Yong teachers find a creative way of teaching with ai tools and are more aware of artificial intelligence

The question was asked to figure out the factors that contribute to the varying levels of awareness among teachers. the responses highlight a complex relationship between teachers' awareness and use of ai tools in high education which is affected by personal characteristics one of the teachers provide an example he said "old teachers follow a way of teaching but novice and Yong teachers find a creative way of teaching with ai tools and are more aware of artificial intelligence", administrative factors, and overall social development.

Question 4: That makes sense. Moving on to the use of AI tools, how do you perceive teachers' adoption of these tools in their teaching practices?

 Teacher 1: it depends on the teachers if the teachers are aware of the ai in teaching they will adopt it in their teaching but if they are not aware they could not adopt these tools in teaching practices, for me I don't adopt ai tools in my teaching 100% I use it just as assistant

Teacher 2: I think that adoption depends on how aware the teacher is, their comfort level with technology. some teachers are actively integrating AI in their teaching practices

Teacher 3: I think that the adoption of these tools in teaching methods depends on the teacher's method and the ability to adopt new tools and methods as I said a novice teacher is more able to adopt and integrate creative and fun way of teaching in class

80% of the teachers see adoption of ai tools depends on their awareness, The responses indicate the complex factors that influence the teachers' adoption of ai tools in their teaching practices. such as

awareness, teaching styles, being familiar with technology. In order enhance teaching and learning outcomes, teachers can effectively integrate AI tools through being aware and addressing these factors.

Question 5: What are the potential benefits and challenges that teachers may encounter when using AI tools in tertiary education?

Teacher 1: First, misuse of ai tools can be one of the challenges, also teachers will rely 100% on ai tools and that reduces the capabilities of the teachers, for the benefits ai can help in administrative tasks like grading exact ….

Teacher 2: for the benefits I see that AI can facilitate tasks like grading also there are AI tools and games that create engaging learning experiences that improve understanding. and for the challenges can be more that the benefits it is necessary that Teachers navigate ethical concerns like data privacy, algorithmic bias also the lack of awareness may be a challenge

Teacher 3: ai can offer new possibilities and also improve productivity, it also saves time and for the challenges, internet connection can be a challenge because not all the universities have access to internet

The results highlight to a number of possible benefits as well as challenges that come with teachers use AI tools in higher education, such as concerns about facilities ethics, overreliance, awareness, and productivity. The beneficial effects of AI on teaching and learning outcomes can be enhanced by creating a balance between these factors while successfully overcoming barriers.

Question 6: Thank you for sharing those insights. Lastly, in your opinion, what steps can be taken to promote teachers' awareness and effective use of AI tools in tertiary education?

Teacher 1: I think to promote teachers' awareness. workshops, seminars and study days can be an effective way also YouTube videos can be a solution like tutorials how to use ai tools

Teacher 2: to make teachers more aware we can provide workshops or training sessions also sharing ideas can be a good way to develop information about AI

Teacher 3: teachers can make meetings and workshops to share techniques and ai tools.

These suggestions of the teachers underline how crucial it is to provide teachers access to organized training programs, facilitate sharing of knowledge, and make use of digital platforms in order to increase their level of awareness and assist them in use AI tools in higher education. Universities may allow teachers to fully use AI to improve the teaching and learning process by funding professional development programs and encouraging a collaborative and creative environment.

2.8 Discussions

Our study is concerned with investigating teachers' awareness and use of AI tools in tertiary education. The findings of this research indicate a gap between teachers' awareness and AI adoption in higher education. In the first answer of the interview, There's a mix of awareness and use of AI tools among teachers. While some readily adopt them, others are unfamiliar probably because of the rapidly changing in ai technologies and tools. As already mentioned in the results of the interview, factors like age, teaching style may influence this gap. According to 6 and 7 responses from the questionnaire , ai provides to teachers various positive aspects such as improving lesson planning , saving time and efforts , and suggesting new approaches .these findings are supported by the studies of (Frank Kehoe, 2023) and (Ismail Celik et al.,2022) .ai increase efficiency for teachers because it saves time and efforts on tasks like administrative duties . Furthermore, teachers in the 6 and 8 provide different perspectives regarding the impact of AI tools on student engagement and learning outcomes. They found that AI provides multiple benefits for students such as personalized learning, improved engagement, enhanced learning. These findings were reported in other studies such as (Laxmi Mustika Cakrawati,2017) and (Veronica Salido,2023). Moreover, the most important point is that the results of the questionnaire and the interview provide some challenges of AI in higher education for students and teachers. First Over-reliance on AI, students become dependent on AI and this reduces their critical thinking. If students were more familiar with AI in problem solving and providing information, they might not be able

to do tasks like analyzing data. Second, these findings brought a number of ethical considerations such as cheating and lack of fairness in assessments. If students don't understand the reason behind ai's result, it can be difficult to assess its efficiency and learn from it. These findings also seem to support (Veronica Salido,2023) observations. As already noted in the analysis's section, the teachers had serious issues which is teachers training. It's difficult for teachers in higher education to keep up with the traditional and old advancements because of the new advancement and educational tools and find time to train and study about new technologies. policy makers need to provide ongoing opportunities, new resources to encourage teachers and effectively integrate AI in their system.

2.9 limitations of the study

Similar to any academic research, this research may have some drawbacks. Obviously, the effort was difficult, given the multiple challenges we faced. First, the group of participants was smaller than expected, potentially due to recruitment methods. In addition, not all the participants who agreed to participate finish and give back the questionnaire because of time or they don't have an idea about the topic. Furthermore, we were obliged to translate the questionnaire and the interview into Arabic in order to make it understandable and to make it accessible for a wider audience. These limitations influenced the applicability of our findings. Also, we had some difficulties with the old teachers because they are not well known with the term artificial intelligence. Also, most of the teachers are not from Tiaret so we had to work with the temporary teachers from Tiaret.

2.10 recommendations   of the study

The rapid progress of artificial intelligence (AI) in recent years has brought about a revolution in several areas, gains a popularity in the field of education. For the sake of encouraging teachers to be more aware about AI tools in their teaching, the following are some practical tips that Algerian tertiary education could adapt.

First, there must be a direct strategy by the policy makers to promote the use of AI in tertiary education. This policy should focus basically on generalizing the teaching of Artificial Intelligence courses for all the teachers to be more aware. Practically, Algerian higher education is supposed to collect objectives for the sake of popularizing AI through Creating online resources, such as tutorials, videos, and articles, that explain AI concepts in a clear and concise way.

Second, creating new developed workshops, seminars, and conferences with modern tools. By doing so, Algerian scholars and researchers, especially in scientific streams like computer science will be more aware about ai. Besides, the Algerian authorities need to develop and install training centers which are specialized in AI and how to use AI tools. These centers allow teachers and scientists to develop their technical expertise concerning the integration and the use of AI to facilitate their teaching skills. definitely, providing the suitable atmosphere that welcomes new creative ideas.

Finally, universities should bridge the gap between the AI tools and the teachers. Furthermore, recognize teachers' anxieties about AI replacing them. Highlight that AI can be a precious helper and aid, creating more time to meet the specific needs for each student

2.11 conclusion

To conclude, Since the main objective of the study was to figure out teachers' awareness and the use of AI tools in tertiary education, this chapter provides key findings of the practical side of the research. the results obtained from this research will provide valuable insights for educators, policymakers to investigate ai in higher education, the researcher in this study state the limitations respectfully and provide some suggestions for future researchers

General conclusion

General Conclusion

To conclude, technological innovation is rapidly transforming higher education. Among all technologies that are currently in use, Artificial Intelligence (AI) has been prophesied to bring great changes in teachers teaching and students' learning process. Ai tools offer and create many advantages and benefits for educators and for students. However, the use and adoption of these tools in higher education may face some challenges such as teachers' awareness, ethical considerations and data privacy. This research delves into this gap by focusing on teachers in higher education.

The purpose this study is to examine teachers' awareness and adoption of AI tools in tertiary education, analyze the factors that motivate them toward the incorporation and use AI tools in their teaching, and evaluate the effect of AI tools on teachers' teaching practices and students learning gains.

The findings revealed that Factors like age and teaching style may provide a gap between teachers' awareness and adoption of AI. Also, it offers benefits for both teachers (improved planning, efficiency) and students (personalized learning, engagement). However, challenges exist, such as student over-reliance and ethical concerns around assessments.

These results from this study are therefore helpful to educators, policymakers to further examine AI in higher education.

Teacher engagement and knowledge are critical for the effective integration of AI into Algerian higher education. There are a few methods that this can be achieved.
First, policymakers need to create a clear strategy that gives teacher AI education first priority. To provide people an understanding of AI concepts, this involves requiring AI classes and creating easily available online materials.
Secondly, the authorities in Algeria have to allocate resources towards comprehensive training programs, as seminars, workshops, and specialized institutions. The technical proficiency of educators and researchers in integrating and applying AI tools will be strengthened by these initiatives.
Finally, universities play a crucial role in helping fill the knowledge gap between educators and AI. Universities may create a collaborative environment where AI functions as a useful teaching aid by providing them with appropriate tools and reducing any worries they may have about AI taking over their jobs. This would ultimately improve Algerian students'

educational experiences. This comprehensive strategy will set the stage for a day when artificial intelligence (AI) transforms higher education in Algeria.

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Summary

This study examines teachers' awareness and adoption of AI tools in higher education, finding that factors like age and teaching style impact the gap between awareness and use, even as AI offers benefits such as improved planning and personalized learning for both teachers and students. 72However, challenges remain, including student overreliance and ethical concerns around assessments, necessitating a comprehensive strategy from policymakers, funding providers, and universities to prioritize teacher AI education, training programs, and collaborative integration environments, while also cautioning against the risks of AI tools leading to teacher disempowerment and loss of autonomy through overreliance.

الملخص

تبحث هذه الدراسة في مدى وعي الاساتذة بأدوات الذكاء االصطناعي في التعليم العالي وتبنيهم لها. في حين يقدم الذكاء االصطناعي فوائد مثل التخطيط المحسن والتعلم الشخصي، فإن عوامل مثل السن بالنسبة للمعلين وأساليب التدريس لديهم تخلق فجوة. وال تزال التحديات قائمة، بما في ذلك العتماد المفرط على هذه االدوات التكنولوجية الذكية والمخاوف األخالقية. هناك حاجة إلى استراتيجية لتدريب المعلمين والتكامل التعاوني للذكاء االصطناعي، مع البقاء يقظا بشأن المخاطر مثل فقدان استقاللية المعلم واإلبداع واالبتكار البشري.

Résumé

Cette étude examine la sensibilisation et l'adoption des outils de l'intelligence artificielle par les enseignants dans l'enseignement supérieur. Bien que l'IA offre des avantages comme l'amélioration de la planification et l'apprentissage personnalisé, des facteurs comme l'âge et le style d'enseignement créent un écart. Des défis persistent, notamment la dépendance excessive des étudiants et les préoccupations éthiques. Une stratégie est nécessaire pour la formation des enseignants et l'intégration collaborative de l'IA, tout en restant vigilant sur les risques tels que perte d'autonomie des enseignants, la création et l'innovation humaine pure.