RESEARCH ARTICLE

The Impact of Artificial Intelligence on Educational Psychology

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Abstract
Artificial intelligence (AI) is an extension of computer science that aims to assist humans in various fields and sectors of life. It is a programmed system that incorporates a vast array of data and information. It enables computers or machines to simulate the behavior of individuals by helping them solve complex and interconnected processes and problems, translate them into multiple languages, and quickly decode them. AI includes a group of programs, each according to the specialty for which it was developed, whether in health, education, or other fields. This new revolution has become the foundation for the prosperity and progress of nations today. Accordingly, this study aims to understand the concept of artificial intelligence and explore some of its applications and impacts in the field of educational psychology and the educational process as a whole.

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1. Introduction

The world today is witnessing tremendous and astonishing developments in the field of technological sciences, changing the balance of power, especially with the emergence of what is known as "artificial intelligence." With its intelligent structure consisting of algorithms and learning programs equipped with vast and extensive information and data, and decision-making mechanisms, it has become capable of simulating and interacting with the human mind. This is achieved by infusing logic into the processes of perception, analysis, understanding, thinking, and responding to human behavior, contributing to decision-making and solving complex problems in various aspects and areas of life. Artificial intelligence has impacted an important field in society: psychology, which studies individual behavior. Psychologists have begun using it to diagnose, analyze, and predict intractable psychological conditions, helping them extract, analyze, understand, and interpret results. Artificial intelligence has also played a prominent role in education and machine learning. This intelligent technology can be harnessed to uncover some of the mysteries, based on the vast data provided in this field, educational psychology and the educational process in general. Therefore, this study aims to demonstrate the extent of the impact of artificial intelligence and its importance on the future of psychology in general, and educational psychology in particular. Based on the above, the study's problem

revolves around the following questions: What is artificial intelligence? What are its most important practical applications and impacts on educational psychology?

3. Significance of the Study:

The importance of this study lies in the importance of its variables. The first variable is artificial intelligence, which has become a global topic due to the opportunities it provides in many fields, revealing its importance as an advanced technology. The second variable is psychology, which is concerned with studying, analyzing, interpreting, and predicting individual behavior. The importance of this study also lies in the urgent need to develop a deep understanding of the uses and applications of artificial intelligence in the field of educational psychology, as well as identifying the effects of this technology on the educational process. The Objectives of this study are as follows:

- An attempt to develop a comprehensive and inclusive definition of the concept of artificial intelligence.
- Explain the applications of artificial intelligence in the field of educational psychology and their importance.
- Highlight the impact of artificial intelligence technologies in the field of educational psychology.
- Explain the extent to which psychology benefits from artificial intelligence.

4. The Methodology of the Study:

To answer the questions of this study, we adopted a descriptive-analytical approach. This included describing the topic of artificial intelligence as a phenomenon, and examining its theoretical framework, applications, and implications in the field of educational psychology, through examining and analyzing various scientific literature and studies that have addressed this topic.

5. Structure of the Study:

✓ To answer the questions posed, we divided this study into the following sections:
✓ Definition of Artificial Intelligence and definition of psychology.
✓ Applications of Artificial Intelligence in educational psychology.
✓ Impacts of Artificial Intelligence in educational psychology.
✓ Conclusion

2. Literature review

A. The Concept of Artificial Intelligence:

Before we proceed to explore the term "Artificial Intelligence" and dive into some of its aspects, we should first provide a brief historical overview.

During the period between the 1960s and 1970s, this opened up a philosophical discussion around trying to make computers, or in other words, machines like the human brain, and trying to uncover any differences between them, if they existed. This period was known as "classical AI", but the capabilities were relatively limited at the time.As for the 1980s and 1990s, this problem was overcome by actually building an artificial brain to realize the idea of Artificial Intelligence in practice (Warwick, 2012, p. 6). Generally speaking,The definitions of artificial intelligence vary and differ according to the different fields and specializations of the researchers. Artificial intelligence can be referred to asJohn McCarthy, who is considered the first to introduce the term "Artificial Intelligence" in 1956, held the first academic conference on the subject. where he defined to it as: “the science and engineering of making intelligent machines». According to a definition provided by(OECD,2016) and (UNTD,2017), AI is defined as the ability of machines systems to acquire and apply knowledge, and to carry out intelligent behavior (Hadi, 2023, p. 1). The term Artificial Intelligence ‘AI’ is use by "Thehandbook of Artificial Intelligence ": That part of computer science concerned with designing computer systems that exhibit the characteristics we associate with intelligence in human behavior"Charniak and McDermott define artificial intelligence as “the study of human mental abilities through computer programs that simulate these abilities”(El-Din, 2007, p. 49).Artificial intelligence usually refers to the artificial fabrication of human brains that can learn, plan, perceive or process natural language (Russel& Norvig, 2016). Collins et al. (2021) provided some of the functions that artificial intelligence can perform, which can be included as follows:

✓ AI as Expert Systems
✓ AI as Machine Learning
✓ AI as Robotics
✓ AI as Natural Language Processing
✓ AI as Machine Vision

AI as Speech Recognition (Adam & All, 2024, p. 3).The term "Artificial intelligence" consi²sts of two words, the first is artificial and refers to something made or produced, and the second is intelligence, which is the basic concept in psychology and refers to the ability to understand, think and learn (Drwish & El laithy, 2020, p.68). Artificial intelligence can be categorized into three primary types, spanning from basic reactivity to self-awareness and engagement, as delineated below:

- Narrow or Weak Artificial Intelligence: This form represents the most rudimentary iteration of artificial intelligence, where the AI system is meticulously programmed to execute specific and pre-defined tasks within a given environment. It operates predominantly in a reactionary manner to distinct and defined circumstances.

- Strong or General Artificial Intelligence: Characterized by its capacity to amass substantial volumes of data, conduct comprehensive analyses, and derive insights from encountered scenarios, this category of artificial intelligence is capable of making fully independent decisions. Illustrative examples comprise chatbots, personal assistant applications, and autonomous driving systems.

- Artificial Super intelligent: Artificial super intelligence, which remains within the domain of innovation and experimentation, aims to replicate human cognitive abilities.

This category can be broadly classified into two main types. Type I seeks to comprehend human emotions and feelings associated with human behavior but possesses restricted social interaction abilities. Type II emulates the human mind, endeavoring to anticipate the emotions and attitudes of individuals. These are artificial entities endowed with advanced intelligence capacities (Koutsouleris & all, 2022).

B. **Educational Psychology:**

In this article, we try to define psychology as a basic and important variable before searching for its relationship with artificial intelligence, which makes us search for the meaning of psychology, what this science is interested in to clarify the understanding for the reader. Psychology is considered one of the sciences that deals with a group of fields and overlaps with many sciences that are concerned with the human being, such as sociology, philosophy, medicine and other sciences. Accordingly, researchers differed in finding a unified definition for this term. Therefore,

psychology can be defined according to what some researchers have stated as follows:

The word "psychology" comes from the Greek word psyche meaning "breathe, spirit, soul", and the Greek word logos meaning the study of something (AT). Psychology is the science of mental behavior and the human mind, and the professional application of such knowledge toward the greater good (Gregg, 2011, p. 183). Psychology is also defined as on "the scientific study of mind and behavior" (Wikipidia). From the above, we can extract a simple definition of psychology as follows: Psychology is the science that is concerned with studying human behavior by analyzing and interpreting it for the purpose of predicting everything that comes from it in the future, In short, psychology is concerned with achieving the psychological and mental health of individuals and improving their lives Among its branches, we find clinical psychology, educational psychology, school psychology, and work and organizational psychology. While educational psychology focuses on the study of human thought processes and behaviors associated with formal education, experts in this field examine issues such as the qualities of a good teacher and how classroom design affects student performance (Mishra & All, 2022,p.10) Educational psychology is a branch of psychology that is concerned with studying and interpreting learner behavior and teaching methods and techniques.

Application of Artificial Intelligence (AI):

The emergence of artificial intelligence (AI) has paved the way for a new approach to understanding and interpreting human behavior and direct visual perception. This development has had a profound impact on the field of psychology, particularly educational psychology, by offering a wide range of applications. AI applications in education include student assessment and adapting course content to their learning needs (Mahalakshmi & All, 2022). Psychology has also been able to capitalize on the opportunities offered by AI by opening up a wide range of applications. AI methodologies are used to model and understand individual cognitive processes, including replicating brain functions through artificial neural networks. Furthermore, AI has found its place in clinical psychology, contributing to the creation of decision support systems aimed at diagnosing various psychological disorders. In short, AI has opened up 2018new possibilities for discovering and understanding human behavior and cognition, driving advances in both theoretical psychological frameworks and practical applications. Examining the evolution of AI, it becomes clear that the focus in software design, implementation, and explanation has consistently revolved around aspects of human psychology. These assumptions about cognitive processes were derived from the introspective analysis of AI developers and innovators, rather than empirical research. It is worth noting that significant programs have been developed, used, and evaluated without incorporating randomization or conducting correlational studies on human performance (Tahan, 2018). Therefore, in this simple introduction, which falls within the applications of AI in this important field of educational psychology, we can list some of them as follows:

- **AI Applications in Education**

Artificial intelligence has revolutionized education, from primary school to advanced levels, by providing a range of smart solutions for learning in general and self-learning in particular. This is achieved through the provision of a vast number of educational platforms, automated teaching, automated assessment, and smart administrative tasks. AI enables students to plan, organize, compare, and synthesize diverse resources, as well as create new materials such as computer programs, art, and personalized study schedules. Nonetheless, with the potential benefits of AI, there are also risks, such as students being able to bypass genuine educational experiences. Thus, educators must grapple with the question of how much AI support is considered "too much" and how to effectively teach and assess knowledge (Sandford & All, 2024, p. 5). Also Artificial intelligence, through its diverse applications, has enabled humanity to engage in self-directed learning and interact with different languages via instantaneous and accurate machine translation. This has provided the opportunity for communication with various cultures at minimal effort and cost, all with the press of a button, To understand the role that artificial intelligence plays in improving the educational process and assisting researchers in translating texts and articles, we need to highlight the most important AI systems and applications that contribute to providing instant and accurate translations from the original natural language to any language we desire.AI offers professors a valuable tool to save time on daily managerial tasks, giving them more hours to focus on teaching and student engagement. With creativity, AI can bridge gaps students, interactive learning experiences. Accordingly, we find among the applications of artificial intelligence in the field of educational psychology, to name a few:

- **Changing the Cheating Narrative :** Students often misuse AI due to time constraints, frustration, or a lack of

understanding. By reframing AI as a problem-solving tool, you can empower them to use it responsibly Faulkner University News – The Future of Learning: Positive Applications of AI in Education.

- **Intelligent tutoring systems:** AI tutor systems can provide adaptive, accessible learning experiences, offering immediate feedback and corrective guidance based on student performance. These applications of modern educational technology are helping to close learning gaps, improve conceptual understanding, and free up teacher time by handling routine instructional tasks and providing detailed data on the student's learning process The Role of AI in Modern Education.

- **Application of AI in Classroom Discipline Management :** In the process of college education and teaching, it is particularly critical to ensure the effectiveness of classroom discipline, and for the vast majority of college teachers, this is also a problem that they should focus on in teaching (Zheng & Tuyatsetseg , 2022, p. 76).

- **Smart Tutor System The intelligent tutor :** system is one of the adaptive learning systems. It is precisely because of the emergence of this system that the one-way instillation mode of teachers to students under the traditional teaching mode has been changed to a large extent, and better teaching results can be obtained (Zhengyu, Yingjia , & Jinming , p. 330)

- **Translation using ChatGPT:** ChatGPT is considered one of the leading artificial intelligence tools for translation available today. It is an automated conversation system that utilizes AI and advanced natural language processing (NLP) techniques to generate textual content and respond to inquiries, leveraging a vast integrated database. https://gptinarabic.com/best-translatin-tools-with-ai/

- **Translation of Smartling:** The translation tool developed by Smartling is considered one of the leading AI-powered solutions in this field, offering exceptional cloud translation services. The tool is renowned for its advanced Translation Management System (TMS), which helps automate the content creation process efficiently. Smartling also has the capability to translate content into over 150 languages using AI technologies, https://gptinarabic.com/best-translatin-tools-with-ai/

- **Application of AI in Security Assistance Management:** Today, among many network cyber defense technologies in China, firewall technology is a relatively common defense technology. However, this method is also divided into many types, and only a few methods can play a role in practical applications (Zheng & Tuyatsetseg , 2022, p. 75).This demonstrates that AI systems and applications in educational psychology are not limited to reducing academic stress for both teachers and students, but rather extend beyond that by developing and implementing smart methods to protect data and information by limiting the extent of security access to them using firewalltechnology.

Figure (1) illustrates artificial intelligence in education.

5. The impact of artificial intelligence in psychology:

Before we discuss the effects of artificial intelligence in psychology, we must first understand that both are considered sciences. However, the interests of psychology focus on the human psychology and how to achieve psychological and mental health, while the science of artificial intelligence is concerned with all fields and specializations by integrating smart machines, robots, and software into them, and it is considered a science. The psyche is one of the areas in which artificial intelligence has brought about significant change and progress. Where the researchers see that, the psychology is concerned with human competition, cognitive functions and relationships with everyone who enters. She adopted a scientific application to develop training and cognition, but also integrated the results of disciplines such as biology, neurosciences or sociology. This part, the intelligence artifice, adventure in the creation of machines capable of intelligence - or the touch patterns that have a habitual effect on people - thanks to the algorithms and the automatic application to tire a donation sense, It also applies to information proven in various sectors, noting the information, the mathematics and the writing (Kelechi & All,2023) .AI also helps students develop learning plans and review lessons, saving them time and simplifying the learning process. It also enhances their motivation for self-learning. For example, the "Homework Help" learning program uses AI to analyze students' problems and then develop a lesson review plan that suits them, without wasted time or effort. AI tools and methods used in learning processes have also become an important factor in improving the quality of teaching for teachers and learning for students.The process of learning, through the integration of artificial intelligence technologies into the teaching and learning process, has been able to achieve a kind of psychological well-being, which is a type of positive feelings that instill in the psyche of the teacher and even the learner, immersed in life satisfaction and expressing the quality of performance and control, far from negative interactions accompanied by anxiety and tension. These feelings may accompany students as a result of their interaction in an educational environment enhanced by artificial intelligence. The effects of artificial intelligence in educational psychology also appear in improving information retention due to the adaptive nature of artificial intelligence in the educational process, By facilitating spaced repetition and revisiting key concepts at

optimal intervals based on individual student data, AI systems ensure that knowledge is reinforced and retained(Velastegui&All, 2023).The pedagogical model system manages the delivery of educational materials to the student through an interactive and adaptive user interface. These systems have traditionally adopted a knowledge-based approach, now known as "gofai" (traditional artificial intelligence). These systems have achieved considerable success in relatively limited and clear-cut fields, such as mathematics and physics. Because student behavior and learning in ITS environments can be monitored with great precision, smart teaching environments have also been an important source of data for learning research (Tuomi & Ilkka, p. 27). In this regard, the results of the (Hamouche & Messlem.2024) study revealed varying opinions among professors regarding the role of artificial intelligence in improving the quality of educational outcomes at the secondary level, based on statistical analyses, theoretical references, scientific articles, and studies conducted by major international companies. These results confirm that its use rate is estimated at 98% by the beginning of 2025. They also confirm its effective role in enhancing the professional competence of graduates, helping specialists in this field make quick decisions, and saving time and effort. Furthermore, it provides graduates with various technical programs that enable them to learn independently through a distance learning strategy, in addition to the continuous development of assessment techniques and tools using artificial intelligence, taking into account individual differences (Mazouz & Hamouche, 2024) Accordingly, in this study, we tried to shed light on the most important positive impact of artificial intelligence on educational processes, which lies in helping individuals, teachers and learners, in directing their behavior and cognitive and non-cognitive skills towards adopting smarter methods and means to facilitate the educational process.

6. Conclusion

Finally, we can note that artificial intelligence is no longer just a tool to assist humanity, but rather an important partner in developing the educational process from a psychological and educational perspective. Educational psychology has begun to utilize the latest trends through adaptive learning brought about by artificial intelligence, meaning adapting educational content to students' educational level and their psychological and cognitive needs, in addition to helping them develop their behavior and skills, such as solving complex problems and their critical thinking skills. It has also been able to help education specialists predict school dropout rates and success rates among learners, among other positives that help improve and enhance the educational process. Despite the positive opportunities that artificial intelligence has provided for educational psychology, it remains a complementary and not an alternative means for this science (educational psychology), as the human touch remains the essence of science, which smart technology cannot imitate because it is created by the Creator.

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