Artificial Intelligence and its Applications in the Fields of Psychology

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Abstract

Artificial intelligence has become a rapidly evolving field, it includes a set of intelligent computer-based programs and systems with the aim of detection, investigation, reasoning, communication and other goals that allowed access to smart knowledge, which have become the important strategies that scientific research seeks to use in various fields and disciplines, including psychology, through the creation of technological means, which may be an alternative to traditional psychological tools in order to invest them to raise efficiency and quality in the development of various fields of this specialty, such as personal and therapeutic tools for various psychological and mental problems and disorders in all age groups of children, adolescents and adults, in addition to improving the methods of care and education of children with special needs and written and spoken language disorders and others, thus improving psychological and mental health.

Keywords: artificial intelligence, psychology, fields of psychology.

1. Introduction

The technological development witnessed by the world has allowed the development of many scientific fields, which has become a need to employ the outputs of research and modern technical sciences in the field of computer media, in particular, artificial intelligence for its knowledge and ideas that serve all fields of scientific research, including psychology in order to design modern tools, whether related to diagnosis, data collection or psychotherapy, and relying on scientific methods that may perhaps be more objective in judgment and the Almighty, where artificial intelligence applications and exits have become an essential resource, which allows the specialist or psychological researcher to enter or change variables and put forward many assumptions according to the nature of the subject of study or the case studied, in addition to the possibility of preparing many programs or means to analyze and address the problem, the psychological disorder or phenomenon, as well as predicting the various facts that can be caught or reached, and this of course can happen by completely dispensing with the specialist or psychotherapist and compensating him with artificial intelligence techniques, as they have become today a reality and

a new means, especially in the field of social sciences in general and psychology in particular, using computer systems and computers, it can be used for the purpose of improving psychological services and practice, improving diagnostic methods and treatment methods, increasing the effectiveness of psychological intervention and raising its efficiency, as this may be done in the least period and even cost compared to classical psychotherapy, this will allow for development and advancement in this field.

This article comes to shed light on the great importance that artificial intelligence has become, not only in terms of experimental or technical sciences, but even the social sciences and humanities, that is, everything related to the individual - the human - and investing in this technique in research and psychological practice, which may be characterized by more accuracy and speed compared to traditional psychological methods and their predominant ability to avoid many of the negatives and gaps of these means.

To study and analyze the topic of this article, we have formulated the following problem:

–How can the applications of artificial intelligence contribute to the development of the fields of psychology?

In addition, and in addressing this problem, many questions have been raised, perhaps the most important of which are:

–To what extent can AI applications contribute to the development of diagnostic methods and psychotherapy?
–What are the pros and cons of these applications in the field of psychology?

To analyze and discuss these questions, we have addressed several elements within this research paper, which are:

2. Definition of artificial intelligence

Since artificial intelligence has become an important turning point for progress and development in the coming years, the social sciences have become obliged to interact with this development in all its journals, including psychology, in view of the psychological, social and educational services provided by these areas to the community, it has become necessary for these disciplines to invest in this development in other fields, especially computer science and software systems as well, in particular, the development of artificial intelligence applications, in order to meet the challenges that the future will pose in these areas.

The term artificial intelligence consists of two words (AI):

The first is artificial and refers to something made and the second is intelligence.

It is a central concept in psychology and refers to the ability to understand or think and learn, and there are many definitions of artificial intelligence (AI), as it includes many purposes and meanings,

scientists agree that artificial intelligence is comparable to human intelligence, MARVIN LEE MINSHY defined him: As building a computer program that engages in tasks that have been done in a manner acceptable to humans, this is because they require high-level mental processes such as education and memory regulation (Amr, Darwish, & Al-Laithy, 2020, p. 68).

Artificial intelligence is a means of making and developing a person that can help him in various and multiple areas of his life by giving the computer the ability to develop intelligent models that do some work such as solving problems, learning new information, understanding language, education and creativity, thus, it has the ability to possess the advantages of human intelligence, and here both BARR and FEIGENBUM knew Artificial intelligence as: The field of computer science interested in designing intelligent computer systems, computer systems that display the characteristics of intelligence in behavior (Yassin, 2009, p. 184).

Artificial intelligence is also defined as the field that seeks to understand the nature of human intelligence by creating programs on the computer that imitate intelligent actions, actions or behaviors (Al-Obaidi, 2015, p. 38).

The term artificial intelligence is also given to a set of new methods and methods in programming computer systems, which can be used to develop systems that mimic some elements of human intelligence, it allows it to make inferences about minutes and laws that are represented in the computer's memory, the modern concept of artificial intelligence means building machines that perform tasks that require a degree of human intelligence when performed by humans, they are also programs that allow the computer to simulate some functions and mental abilities in a specific way (Al-Yaziji, 2019, p. 266).

Artificial intelligence also includes all algorithms and methods, both theoretical and applied, which are concerned with completing the decision-making process in place of humans, whether in a total or partial way with the human being with the ability to adapt, predict or quote, AI is defined by the system's ability to operate in a flexible and purposeful manner and learn in a complex and partially unpredictable environment (Rous, 2019, p. 27).

The applications of artificial intelligence and its uses are no longer confined to one field, but are employed in several sectors such as industry, agriculture and health, in addition to several other disciplines such as psychology, educational sciences, orthophonia, sociology and others, artificial intelligence represents efforts based on the development of computer-based systems to give it the ability to perform functions that simulate what the human mind does in terms of learning languages, completing administrative skills, the ability to think and apply meaning, the concept of artificial intelligence is related to multiple fields such as: computer science, mathematics psychology, linguistics and knowledge engineering (Abu Kishk, 2015, p. 53).

Through our definitions, we conclude that artificial intelligence is a term associated with the development of technological capacity based on mathematics rules, machine learning systems,

programming and data analysis, to carry out many tasks that are similar to human intelligence in absorbing and analyzing information and making decisions.

3. The historical development of artificial intelligence

The emergence of the term artificial intelligence dates back to the fiftieth decade of the twentieth century, specifically in 1950, specifically when the scientist Alan Turing (Turing test) presented what is known as the Turing test, which is concerned with evaluating the intelligence of the computer and classifying it intelligently if it is able to simulate the human mind.

One year after the emergence of the Turing test, Christopher Strachy, who was the head of programming research at the University of Oxford, created the first program using artificial intelligence, he was able to run checkers via a computer and develop them, Antonny Otanger then measured the ability of computers to teach and it was the first successful experiment with machine learning.

The concept of artificial intelligence was officially announced in 1956 at Dartmot College, but it has not made any progress in twenty years, perhaps because of the specific computing capabilities that were available at the time. In 1979, the first Stanford vehicle was built; it is the first computer-driven vehicle.

In 1997, the first computer was able to beat a human rival in chess. The pace of popularization in the science of artificial intelligence began at the beginning of the twenty-first century until interactive robots became available in stores, it has even gone beyond that to become a robot that interacts with different emotions within facial expressions and other robots that have become difficult tasks, such as the robot (nomad), which performs the task of searching and exploring remote places in the South Pole (Meera, 2019, pp. 298-299).

4. Characteristics of artificial intelligence

Artificial intelligence is characterized by a set of characteristics, the most important of which are:

1. Learning ability: The ability to acquire knowledge and modify behavior based on previous experiences.
2. Linguistic thinking: The ability to think, reason, and express using natural language.
3. Deductive thinking: the ability to infer new information based on available information.
4. Interaction with the environment: the ability to deal and interact effectively with the surrounding environment.
5. Planning and Execution: The ability to develop and implement plans to achieve specific goals.
6. Voice and image recognition: Ability to recognize patterns, images and sound. (Zaidan , 2023, p. 390)

5. Artificial Intelligence Features

The most important characteristic of artificial intelligence is that we mention (Zaidan , 2023, p. 391):

1.   Processing speed: Ability to process data and perform calculations quickly and efficiently.
2.   Accuracy: the ability to perform tasks with high accuracy and obtain accurate results.
3.   Continuous learning: The ability to learn from past data and experiences to improve performance over time.
4.   Handling Big Information: The ability to handle, analyze and extract information from large sets of data.
5.   Diagnosis and problem solving: Ability to analyze multiple problems and propose effective solutions.
6.   Ability to interact with humans: The ability to interact with humans naturally and effectively.

6. Types of artificial intelligence

Artificial intelligence can be classified according to its capabilities into three different types as follows:

6.1. Limited or narrow artificial intelligence

In this type, limited and clear tasks are carried out, such as self-driving cars, or even image and speech recognition programs, or chess on smart devices, which are more common and available today.

6.2. General Artificial Intelligence

This type can work with a capacity similar to the ability of humans in terms of thinking, as it focuses on making the machine able to think and plan on its own and in a similar way to human thinking, however, there are no practical examples of this type, all that exists is just studies that need a lot of effort to develop and turn them into reality, the artificial neural network method is one of the methods of studying general artificial intelligence, it means that the system of neural networks of a machine is similar to that contained in the human body.

6.3. Super Artificial Intelligence

It is the one that exceeds the level of intelligence of human beings, who can do tasks better than a specialized and knowledgeable human being, and this has many characteristics that it must include, such as the ability to learn, plan, communicate spontaneously and make judgments, however, the concept of superintelligence is a hypothetical concept that does not exist in our time (Meera, 2019, pp. 299-300).

7. The importance of artificial intelligence

Artificial intelligence may be the future of the evolution and quality of human life, this is through the development that will be witnessed by all sectors such as industry, the development of manufacturing and production machines, in addition to the medical fields, through clinical improvement and the development of early detection and diagnosis of diseases, in addition to other service sectors such as education, agriculture and others, this leads to increased production efficiency.

–In addition, this technological transformation may allow for an increase in investment projects, ensuring the ease of the requirements of an individual's life through invention and innovation.
–Artificial intelligence will also provide quick access to information or benefit from services through the development of systems and management and the services it provides.
–Artificial intelligence in the scientific field also allows the transition from traditional research to the use of modern means that are more rapid and accurate in analysis, investigation and finding appropriate solutions to many phenomena (natural, psychological, social. . . .).

In our time, artificial intelligence has become a strategy with scientific and civilized specificity that serves humans in various fields and contributes to improving their standard of life, and this will open new horizons for them in the future.

These modern technological developments will inevitably contribute to the development of scientific research methods in many fields and disciplines, where the problem raised in this article revolves around the contribution of artificial intelligence applications and its most important pros and cons in the fields of psychology, which we will address its definition and the most important of these fields.

8. Definition of psychology and its most important fields

The emergence of psychology extends to a long history of the development of human thought; it became an independent science after its separation from the philosophy that contributed to its development, in addition to other sciences such as medicine, biology, physiology and education, this led to the emergence of many schools and thus theories such as psychoanalysis, and behavioral and cognitive theory, Gestalt and others, and the emergence of these schools is not strange given the interest of this science in man, which is a highly complex organism with multiple aspects of thoughts, emotions, and behaviors, it is a science that conducts the systematic scientific study of all the activity or behavior issued by man in its various physical, mental and cognitive manifestations, emotional and subconscious in normal and pathological states through the process of interaction of the individual with his environment and trying to achieve compatibility, whether with himself or with or with others.

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Based on the above, psychology is the science that takes the behavior and the components of the soul and what is inside it as a subject of its scientific study, following the scientific method with its various tools of observation, Workout and interview... In order to correctly conclude or reach accurate knowledge about the phenomenon under research, its history, how it originated, developed, understood and interpreted . . . Psychology is also concerned with the study of psychological phenomena in a specific field in which it specializes, and therefore there are many branches, fields and schools of psychology (Ghanem , 2008, p. 17). Among the most important areas of psychology, we mention:

–Clinical psychology, which is concerned with the study of methods of diagnosis, rehabilitation and treatment.

–Educational and school psychology, which are two applied fields, the first is concerned with the study of learning and teaching methods, pedagogical problems and school administration, the second is concerned with improving working conditions in the school, the curriculum, and the application of psychological and personality tests for educational difficulties.

–Industrial and organizational psychology: It is a field concerned with the study of problems of a psychological nature that arise within organizations and the field of work and production, in addition to paying attention to conditions that improve and increase production.

It is not possible to address all areas because they are numerous, so we will mention them briefly, where we also find: social psychology - criminal - family - engineering - linguistic - commercial - sports - environmental - psychometrics and other fields.

9. Applications of artificial intelligence in the field of psychology

Artificial intelligence is defined as the design of intelligent systems and programs that compete with human intelligence in its abilities to learn infer and react, this qualifies them to produce intelligent behavior because they use neural networks that work similar to the work of the human brain.

Since psychology is a field that treats the human being as a unit of behavior, thoughts and emotions, which he studies in their normal and pathological states. How can artificial intelligence applications be used in this field in light of the wide spread of several applications such as: CHAT: GPT?

In fact, when some project ideas for innovation using artificial intelligence applications in the field of psychology were put forward, it was surprising, whether we have professors or even students of this specialization, but in fact, artificial intelligence has broken into this discipline and its applications have become providing tremendous services, especially since psychology in an important part of it is concerned with higher mental abilities or what is known as cognitive psychology, which is concerned with the field of intelligence, memory, cognition and others, which met with other fields is neuropsychology, where this development gave the emergence of new

trends and psychology moved away from the rigidity of research that characterized classical psychological schools such as Freudian psychoanalysis and behaviorism, this is what made psychology organize for other sciences that have employed and will employ artificial intelligence.

Among the psychological areas, that artificial intelligence and its applications have contributed to and will contribute to the development of the following:

–Artificial intelligence platforms help in the areas of collecting data and information about the customer and facilitating its retention, i.e. the creation of so-called electronic health or psychological records.

–As we know that one of the most important means of psychology is the clinical observation of behavior and everything that comes from the client, it is possible to use artificial intelligence to record the behavior of the customer, their voice, or so-called symptoms to facilitate their analysis later.

–Artificial intelligence will inevitably revolutionize the field of psychometrics by facilitating the process of preparing the application, evaluation and interpretation of psychological tests, analyzing conclusions and determining accurate details of these responses, this will ensure proper diagnosis of mental disorders; it enhances the accuracy of the selection and construction of treatment plans and programs.

–Artificial intelligence can also contribute to the treatment of many problems that children suffer from, such as hyperactivity disorder, through applications that include games designed to improve the attention and concentration of these children, this is, of course, under the supervision and follow-up of specialists in this field.

–Artificial applications can also be used in the field of orthophonia and the diagnosis and treatment of speech and speech related disorders, these applications will facilitate these individuals to communicate with others, and overcome the difficulties they face in expressing their thoughts and feelings.

Since the process of learning and teaching is a field of psychology, it is a fact that this field has benefited from artificial intelligence in managing the education process, the assessment process and the development of the necessary skills, and may face some of the difficulties faced by the learner through the curriculum and the methodology of traditional education, where we have come to notice that printed textbooks and fixed lessons in school, it has become unable to achieve the goals of the educational process on its own, perhaps by creating textbook content through an application and a smart guide that includes summaries of lessons, for example. This is with regard to regular education, but artificial intelligence has proven effective even in the field of special education, which cares for a group of children with special needs such as the mentally retarded and gifted, in addition to children with learning difficulties, whether academic or developmental, in this regard, Zahran and Al-Tayah (2016) pointed out that there is a problem in the availability of algorithms that contribute to the diagnosis of people with special needs according to e-learning, they pointed to the need to develop new concepts for diagnosing people with special needs according to artificial

intelligence applications and algorithms instead of relying on traditional methods (Al-Zahran & Al-Taya, 2016, p. 440), These apps will undoubtedly add a kind of fun to the tutorials of this category. Helping children achieve the goals of the learning process by achieving adaptation to the curriculum, through smart applied methods that raise motivation and attention.

In general, based on the above, artificial intelligence may contribute to improving mental health through early detection and accurate diagnosis of mental and mental disorders, these applications will also facilitate the suggestion of appropriate psychological treatment for the specialist with his client, and among these smart applications we mention:

–Wayza: An application that provides immediate support to individuals in need of emotional support by creating optimism and reformulating thoughts (cognitive behavioral therapy).
–YOUPER app: The natural conversation with individuals to measure their mental state and provide them with a therapeutic service.
–WOE BOT app: This application provides therapeutic services based on the principles of cognitive behavioral therapy, through chat and language, the therapist understands the application user and provides guidance and support.
–MOODPATH app: It is an app for diagnosing anxiety, depression and stress, which includes a range of assessment tools and provides analysis and support to individuals.

10. Pros and cons of artificial intelligence in the field of psychology

10.1. Its advantages

Through our treatment of a group of references and studies on this subject, we found that the increasing technological innovations in the field of programming and electronics allowed the development of many tools and means in terms of psychology, and this was highlighted through:

–Developing sources of data and information collection.
–Early and accurate diagnosis of psychological, mental and even language disorders, relying on accurate means of measurement and psychological evaluation.
–Preparing applications for psychotherapy and their ease of use by individuals, even from smartphones.
–The contribution of artificial intelligence applications in developing curricula for children with special needs.
–Of course, these smart applications have a major role in the field of work psychology and organization in improving, organizing and running institutions, whether industrial or service, and increasing production and worker profitability.

10.2. Its disadvantages

Among the most important potential negative points of employing the application of artificial intelligence in the field of psychology are:

–The high financial cost with which these smart applications can be introduced.

–Since psychology depends on the confidentiality of personal information and data, which is one of the important items in the code of professional ethics in psychology, many problems may arise in this aspect.

–The basic problem in psychology, it is the overlap of symptoms that are specific to some disorders, as well as the factor of individual differences, which these applications cannot take into account.

–Completely dispensing with the human relationship during psychological practice, it is among the main factors that benefit the diagnostic process, especially with regard to clinical observation, this also means dispensing with the psychologist or the human factor; this is linked to another aspect that affects the economic sector, which is the problem of unemployment for these specialists.

–Creating social differences between the classes of society, these applications may only benefit the economically well-off or the rich.

–What is strongly proposed are the equipment for these applications, in the sense of infrastructure, is it present in all health institutions or psychiatric counselling?

–The problem related to these applications is the language in which these applications are presented and how to translate them into the mother tongue correctly and accurately. Can all individuals understand this language, especially for illiterate individuals or those who only use the vernacular language (and this is in the case of Algerian society).

Conclusion

Technological development has dominated all aspects of life, today; man dispenses with his intelligence and compensates him with systems and programs to reach his goals in light of the disadvantages of relying on traditional means, these applications allowed to find new sources of psychological practice, and change many concepts and ideas and solve many complex psychological issues and phenomena, but this is of course related to the extent to which the digital environment is employed positively, and take advantage of technical and information progress and smart applications in the field of psychology and other sciences to enhance the means and methods of psychological services, to promote the sustainable development of the individual and society, by making the correct, legal and moral use to guarantee the rights of the individual, this is in line with the state's policy of modernizing social services and its orientation towards digitization.

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