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Effectiveness of psychology based on artificial intelligence on mental processes and treatment of learning disorders of children with anxiety disorders

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Abstract
In the modern world, the need for psychotherapy services is increasing, but access to qualified professionals is limited. This is the need to search for new treatments for mental disorders. The use of artificial intelligence (AI) in psychotherapy can answer these challenges. Artificial intelligence can develop intelligent treatment systems that adapt to individual patient needs and provide continuous support. Artificial intelligence is increasingly integrated into various aspects of human life, including the fields of psychology and psychotherapy. This technology can significantly help improve psychotherapy services and support patients. One of the disorders that children are involved with is learning disorders. On the other hand, anxiety in educational environments is a complex phenomenon that is related to the deep concerns of students. In this research, the effectiveness of psychology based on artificial intelligence on the mental processes and treatment of children with anxiety disorders has been investigated.

Keywords : learning disorders, children's anxiety disorders, artificial intelligence

Introduction

Psychology is a constant exploration in the mysterious depths of the human mind, a creature whose infinite complexities make scientists admire and wonder. This amazing mind is like a deep and dark ocean, the more one looks into its depths, the more secrets are revealed. The limitations of scientific tools and the unique complexities of the human psychological structure make it difficult to fully understand this field. Each interpretation and understanding illuminates only a small corner of this complex puzzle, and thousands of unanswered questions are still waiting to be discovered. Psychologists continue to explore this complex world with indescribable passion, knowing that every step opens a new door to a deeper understanding of the secrets of the human mind. But artificial intelligence (AI) is a powerful force that promises to shed light on these hidden complexities. Huge amounts of information such as speech patterns, facial expressions and even physiological indicators can be analyzed and processed with remarkable accuracy and objectivity by artificial intelligence algorithms. Artificial intelligence has opened a new window to understand the complex structures of the brain by accurately simulating human cognitive processes. This innovative approach provides a strategic window for designing targeted interventions in the field of mental health. However, maintaining a delicate balance between technological capabilities and subtleties of human communication is the key to ethical success (Bajotra & etal, 2004) and practicality of this technology.

One of the disorders that children are involved with is learning disorders. The number of people with learning disabilities worldwide has reached 79.2 million people and is still increasing. 2021 UNICEF) Learning disabilities affect children's listening, thinking, speaking, scientific reasoning, reading, writing, spelling, and mathematics abilities and have created significant needs for special education. In the United States, more than 15% of public school students (approximately 2.3 million) receive special education services because of learning disabilities. In countries with lower economic and social development, this need is even greater (National Center for Education Statistics, 2022) due to limited resources and the lack of sufficient educational facilities. Difficulties in reading, writing or solving math problems cause this group of students to face more obstacles in the learning process and have fewer opportunities to succeed and progress in learning than their peers. This is evident from their lower results in reading science, mathematics and other educational subjects. Asghar et al. 2017. It affects students' academic skills but also their emotions and social relationships, self-confidence and social interactions" (Ouberron et al. 2019).

On the other hand, anxiety in educational environments is a complex phenomenon that is related to the deep concerns of students. This state

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of mind usually stems from intense fear about academic performance, fear of failure, and apprehension about school assessments and social interactions.

This anxiety appears in different forms such as exam anxiety, social anxiety or general anxiety towards educational activities. Students with high levels of anxiety experience several symptoms, which include:

- Constant restlessness
- Abnormal fatigu
- Lack of concentration
- High irritability
- sleep disorders

These symptoms directly affect students' participation and academic performance and can challenge their academic progress (American Psychiatric Association, 2013).

The causes of anxiety are multifaceted and genetic, environmental and psychological factors are involved. Genetic predispositions can affect a person's vulnerability to anxiety, while environmental factors such as stressful life events, family relationships, and school pressures can stimulate or intensify the feelings of an anxious person.

Psychological aspects, including coping skills, self-esteem and cognitive styles, also play an important role in creating and maintaining anxiety (Stein & Craske, 2016).

Anxiety can negatively affect various aspects of learning and academic performance. The cognitive load imposed by anxiety can reduce working memory capacity and cause students to have difficulty processing and retaining new information, problem solving, and comprehension. Specifically, test anxiety, Eysenck, Derakshan, Santos & Calvo, 2007 (Eysenck, Derakshan, Santos & Calvo, 2007), can impair performance on exams and lead to lower scores that accurately reflect the student's knowledge or abilities.

is not In addition, anxiety can lead to avoidance behaviors where students may be absent from classes, refuse to participate by not doing homework to escape from anxiety-provoking situations. This avoidance can further disrupt learning and academic progress. Social anxiety can also affect group work and class participation and limit opportunities for learning and social growth.

Therefore, psychometric evaluations play a vital role in understanding the social, emotional and mental health of students, which can have a significant impact on learning and academic performance. Standardized measures of anxiety such as the Screening for Emotional Disorders Related to Anxiety in Children (Binmaher, SCARED et al., 1990) or the Multidimensional Anxiety Scale for Children (MASC 2, March 2013) can help identify students who experience anxiety and may interfere with their learning.

To create a comprehensive psychometric test, we must first identify the key constructs that fuel learning problems. Inspired by the top-down approach that is mentioned in the article Assessing General Artificial Intelligence with Psychometrics (Wang & etal, 2023), we can use existing theories and the knowledge of experts to determine these constructs. For example, Kettlehorn Kroll's theory of cognitive abilities provides a well-established framework for understanding different cognitive abilities such as reasoning, fluidity, short-term memory, and processing speed, which are essential for learning. In addition, we can consider constructs related to academic skills such as reading comprehension, mathematical problem solving, and written expression, as well as constructs related to motivation and self-regulation.

Research method

The research method in this research is library-based and valid and new articles have been used.

Findings

In today's world, the increasing demand for psychotherapy services and the limited availability of qualified professionals necessitates the search for new treatments for mental disorders. The use of artificial intelligence (81) in psychotherapy offers the potential to deal with these challenges, especially through the development of intelligent treatment systems that can adapt to the patient's individual needs and provide continuous support. Artificial intelligence is increasingly integrated into various aspects of human life, including the fields of psychology and psychotherapy. The use of artificial intelligence in this field opens new

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opportunities to expand access to psychotherapy services and improve their effectiveness (2024 - Mosquera & etal) One of the promising areas is the creation of intelligent treatment systems that can provide more individualized treatment and solve the problem of the lack of qualified specialists. Modern studies confirm that the use of artificial intelligence is effective for diagnosing and treating mental disorders (Prescott & et al., 2024, Pandey & et al., 2024). The use of chatbots in psychotherapy has grown significantly in the last five years. Lee and colleagues conducted a systematic review and meta-analysis and showed that AI-based conversational agents can effectively promote mental health and well-being. Their study shows that chatbots provide timely support and personalized advice that can significantly reduce anxiety levels and improve psycho-emotional well-being, especially among students. Continuous advances in technology have brought computing power to many aspects of our daily lives. Across the education sector there has been an increasing trend to increase access to education. A large amount of research currently deals with the use of computers in education in order to develop learning environments that support the learning process in different environments (Li & Cal, 2023).

Artificial intelligence (AI) is an advanced research field with more than five decades of history and studies and develops intelligent information agents that are able to understand their environment and take good strategic actions (Nanni & etal., 2008).

This technology appears in two main forms

Physical devices such as humanoid robots

Intellectual capacity software such as virtual avatars

Over time, the concept of artificial intelligence in education (ALE) emerged as an independent research community (Buchanan, 2007). This new approach claims to create powerful and interactive learning environments and enhance positive and unique experiences for all students.

The main applications of artificial intelligence in education include

- Representation of knowledge and information
- Smart and flexible training
- Natural and adaptive language processing
- Independent and autonomous operating systems

The benefits of artificial intelligence in education have been recognized for many years. However, in the last decade, one of the AI research communities in education has been dealing with the intersection of AI and special education (Russell and Norvig, 2003). The field of special educational needs covers many problems and can cause problems during the learning process. Although different conditions for special educational needs have been proposed in the past years, experts in this field have not yet reached a complete agreement. Terms such as learning difficulties or learning disorders are also widely used (Wu (& ctal, 2006).

According to the code of practice of SEN in 2001, the areas of need are communication and interaction, cognition and awareness, behavior and emotional and social, sensory or physical development. In addition, the code of practice highlights the fact that all children do not progress at the same speed and each child is an individual with different strengths and needs. The recent development in the field of artificial intelligence and special education may enable the development of collaborative interactive environments and facilitate the lives of people with special educational needs and the people around them. Due to the strong characteristics of learning difficulties and the coexistence of their symptoms, artificial intelligence assessment tools may be one of the ways to improve the abilities of teachers or parents when assessing a child. These tools can help them to observe the child's academic level and, if necessary, take appropriate decisions to consult with a specialist if there are any problems. Artificial intelligence educational interventions are an important part of teaching children with special educational needs because they can integrate student freedom of action with more explicit control and guidance. In a classroom, there is a huge difference in the reading, writing and spelling skills of students.

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Each student needs support at their own level and for their specific needs. These types of problems are diagnosed when children reach school age. Since in most institutions there are no specialists in diagnosing learning problems, it is desirable that teachers have access to some diagnostic and intervention tools to take better care of students' problems. (Roberts and (McDougall, 2003

The term ADD refers to a wide range of problems that manifest at some developmental stage in a child's life. They are usually characterized by a combination of behavioral problems such as inattention, hyperactivity, and impulsivity. These problems usually manifest themselves in early childhood and specifically must be present before the age of seven to be diagnosed using intelligence applications (World Health Organization, 1993, American Psychiatric Association, 1994). Artificial intelligence has provided some improved diagnostic and intervention tools for these behavioral problems.

In 2004, Raylodo Mendez and Freitas introduced the Neurosky Mindset (MS), which is capable of detecting the level of attention in an assessment activity, and it does this by combining performance data with data generated by the user during interactions. The NeuroSky device consists of a headset that has three electrodes, one under the ears and one on the forehead. The electrical signals recorded at these points are used as inputs to the NeuoSky system to assess the user's level of attention. An artificial intelligence-based virtual avatar is also designed to ask questions and interact with users in a low-cost, non-medical, and easy-to-use tool for leisure time (Mender

(and Freitas, 2008, Mendez & etal,2009
Aguilar et al. (2010) designed a fuzzy training scheduler that models the trainer module in an Intelligent Training System (ITS). It is an interactive educational method that uses a combination of audio and video graphic text presented by Athanasius S. Drigas and Rudy Yanid in the learning process. This method is especially useful for students in distance learning

Resources

situations. The fuzzy training scheduler consists of a rule base, an inference engine, a fuzzification interface and a non-fuzzification interface. The aim of this system is to imitate the behavior of a teacher who is able to manage the learning process satisfactorily. Input information is extracted from human experts who have provided specialized linguistic information. The intelligent educational system (ITS) is a flexible system that adjusts the teacher's rules according to the student's performance and in Various applications have shown their efficiency with promising results (2000, Aguilar & etal).

Carpenter et al used a decision tree algorithm to test whether Preschool Psychiatric Assessment (PAPA) items could predict whether a child had generalized anxiety disorder (GAD). They used the decision tree to identify children with anxiety disorder and their results showed that the decision tree can be up to 96% accurate.

(Carpenter & etal, 2016).
Discussion and conclusion
Applied artificial intelligence tools have been successfully used to solve problems in the field of special education. Based on the studies presented in this work, it was concluded that there is a need to support teachers, parents and therapists in the proper care of students with special educational needs, especially in assessment and treatment methods, saving time and money, obtaining more treatment time, increasing early diagnosis and the effectiveness of intervention by creating more efficient learning environments are major benefits. which provides us with artificial intelligence computing tools. However, due to the wide range of difficulties and various needs of each person, there are still many issues that must be covered in special education. Further research on types of learning difficulties and nationally regulated adaptations of diagnostic tools should be addressed to reduce the workload of teachers and parents. Nevertheless, AI is considered as a promising educational aid tool for all children who require a universal and collaborative approach to service delivery.

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