Proceedings of the 2023 International Conference on Machine Learning and Automation
DOI: 10.54254/2755-2721/36/20230450

New psychological education: Leveraging the power of ChatGPT and artificial intelligence

Yechao Lin

Department of Software Engineering, Xidian University, Taibai South Road, Xi'an City, Shaanxi Province, China

19030500011@stu.xidian.edu.cn

Abstract. Due to various reasons, the fact is that psychological problems are becoming increasingly serious worldwide. In recent years, Artificial Intelligence (AI) and chatbot have developed rapidly. With the advancement of natural language processing, AI driven chat robots have become an innovative tool that can enhance learning experiences and provide support in various fields. In the field of psychological education, ChatGPT is expected to promote interactive and personalized learning environments. It is possible and necessary to try using them for psychological education. This article analyzes the application of ChatGPT in psychology and how AI is used in psychological counseling. These chat robots can simulate conversations similar to humans, allowing students to participate in the conversation and receive immediate feedback. In addition, their ability to adjust their reactions according to personal needs promotes autonomous learning and cultivates students' autonomy. Subsequently, this article outlines the specific applications of ChatGPT in psychological education, including mental health support, cognitive assessment, and virtual reality therapy. Finally, this article discusses some of the disadvantages of ChatGPT, such as appearing correct but actually having the wrong answer. In summary, this article discusses the potential of ChatGPT and artificial intelligence in psychological education. With interactive and personalized learning experiences, AI driven chat robots can supplement traditional teaching methods and empower students in their educational journey. However, in order to ensure the responsible and effective integration of artificial intelligence in psychological education, careful implementation and continuous evaluation are necessary.

Keywords: artificial intelligence, psychology, ChatGPT, education.

1. Introduction

A crucial component of overall wellbeing, mental health has been shown to considerably increase morbidity and death globally [1]. Years Lived with Disability (YLD) and Disability-Adjusted Life Years (DALY) are primarily caused by mental disorders, with depression and anxiety accounting for the majority of these cases [2]. Although the burden of mental diseases is there throughout life, most conditions start to manifest in adolescence and early adulthood, usually by the age of 24 [3]. As artificial intelligence (AI) advances, more individuals will be able to use it for psychiatric therapy. AI also offers numerous benefits that humans cannot match.

DOI: 10.54254/2755-2721/36/20230450

When it comes to AI, a thoughtful robot comes to mind. AI is a part of the intelligence discipline, which has been widely used in many tasks [4, 5]. It makes an effort to create a brand-new breed of intelligent machine that can react similarly to human intelligence. Robotics, natural language processing, image recognition, and other topics are all being researched in this area. In fact, several movies have shown off AI's capabilities, such as smart buildings, which can control temperature, lighting, and music depending on the people inside [6]. In addition to traditional concepts, the application of artificial intelligence in education has emerged in many places.

For instance, embedded AI, computers, and the robots that help the students learning beginning with the most basic education, early childhood education [7]. In fact, the use of the computers, collaborating with teachers, is being used to teach kids basic skills like spelling and are adapted to the students well. Similarly, online education has evolved from simply searching for materials online, allowing students to download materials and learn to pass exams, to intelligent systems that adjust their learning plans based on their personal level.

Natural language processing (NLP) has made great achievements nowadays because the large language models like the Generative Pre-trained Transformer develop a lot. These models can generate text like written by humans, providing answers to human questions. They are very efficient because they are trained based on a large amount of data.

One important development in the field concerns transformer structures and the underlying attention mechanism [8], which have considerably improved language models' capability to handle long-range interactions in natural-language texts. The transformer architecture explicitly uses the self-attention mechanism to assess the significance of various input components while making predictions. This enables the model to comprehend the connections between words in a phrase regardless of their location.

Large language models like ChatGPT can transform education and support the teaching process [9, 10]. Below are just a few examples of how these models might be useful to teachers:

Teachers can design learning methods suitable for each student with models like ChatGPT. These models are able to evaluate students' status when completing assignments, provide personalized feedback, and provide recommendations for materials that meet students' specific learning requirements. This assistance can free up teachers' time and energy, concentrating on other facets of education, such creating fun, interactive courses.

This paper explores the research methods of ChatGPT and AI in psychological education, as well as their possible specific applications in practice. Finally, it discusses the potential shortcomings of AI and ChatGPT.

2. Method

2.1. Preliminaries of ChatGPT

Bhattacharyya, R et al. employed ChatGPT, an AI language model, to analyze psychological issues [11]. The methodological process involved the following steps: 1) Data collection: gathering a dataset of anonymized conversational transcripts related to various psychological problems. This dataset served as training data for ChatGPT to learn patterns and responses. 2) Fine-tuning: To tailor ChatGPT specifically for psychological analysis, this study fine-tuned the pre-trained model on our dataset. This step helped optimize the model's understanding and generation of relevant responses in the context of mental health. 3) User Interaction: Participants engaged in text-based conversations with the ChatGPT system, discussing their mental health concerns, symptoms, triggers, and emotions. The system prompted users with appropriate questions to gather additional information when necessary. Response Analysis: Using natural language processing techniques, this study analyzed the responses generated by ChatGPT. This study examined sentiment, identified keywords, and characterized the system's understanding of users' psychological problems. 4) Comparison with Expert Evaluation: To assess the validity and accuracy of ChatGPT's analysis, this study compared its output with evaluations conducted by expert psychologists. This step allowed to measure the system's performance and identify any discrepancies or areas for improvement. 5) Risk Assessment: This study integrated algorithms within

DOI: 10.54254/2755-2721/36/20230450

ChatGPT to assess the severity of psychological issues expressed by users. These algorithms flagged high-risk situations, such as indications of self-harm or suicidal ideation, prompting immediate intervention from human professionals. 6) Ethical Considerations: Throughout the process, this study prioritized user privacy, consent, and confidentiality. All data were anonymized and securely stored, adhering to ethical guidelines and regulations.

By employing ChatGPT in this manner, this study aimed to provide a preliminary analysis of psychological problems, aiding individuals in understanding their concerns and guiding them towards appropriate resources or professional assistance. However, it is essential to note that ChatGPT's analysis should always be complemented by human expertise, and users should be encouraged to seek comprehensive evaluations from qualified mental health professionals.

2.2. Chatting in analyzing mental problems

Using AI for personalized psychological counseling involves utilizing various technologies and approaches to tailor support for individuals. Lee J et al. provides a step-by-step guide on the strategy designing for implementing AI in personalized mental health counseling [12]: 1) Data Gathering: Collect comprehensive data about the individual, including their background, preferences, and specific concerns through assessments, questionnaires, and interviews. This information forms the basis for personalization. Natural Language Processing (NLP): Implement NLP algorithms to analyze user input, enabling AI systems to understand and interpret text-based conversations with clients. NLP helps identify emotions, sentiment, and specific areas of concern. 2) Personalized Intervention: Develop an AI system that can generate tailored interventions based on user data and identified needs. This can include providing psycho-education materials, suggesting coping strategies, or recommending specific therapeutic exercises. 3) Adaptive Feedback and Support: Utilize AI to provide real-time feedback and support based on client interactions. The system can offer encouragement, validate emotions, and suggest alternative perspectives to help individuals explore their thoughts and feelings in a supportive environment. 4) Virtual Role-Playing: Integrate virtual reality or chatbot technologies to simulate interactive role-playing scenarios. This enables individuals to practice challenging situations, such as assertiveness or conflict resolution, in a controlled and safe environment. 5) Progress Tracking: AI can track and analyze client progress by comparing their current state to previous sessions or benchmarks. It can generate visualizations or reports to help both the client and counselor monitor improvements over time. 6) Continuous Learning and Adaptation: AI models should continuously learn from user interactions and feedback to improve their performance. By updating algorithms and incorporating new research and practices, the system can enhance its ability to deliver more effective and personalized support. 7) Ethical Considerations: Ensure proper privacy measures are in place to protect client data. Establish clear guidelines regarding the limitations of AI counseling and inform clients about potential risks, encouraging them to seek human intervention when necessary. 8) Human Oversight: While AI can provide personalized counseling, human professionals should be involved for critical decision-making and complex cases. They can review AI-generated interventions, provide supervision, and step in if any ethical or clinical concerns arise.

It is essential to continuously evaluate the effectiveness and ethical implications of using AI in personalized counseling. Regular client feedback, ongoing research, and collaboration between AI developers and mental health professionals are vital for responsible and effective implementation.

3. Applications and discussion

3.1. Mental health support

In today's digital age, chatbots equipped with natural language processing capabilities can be designed to provide basic mental health support and counseling services. These AI-driven chatbots are programmed to engage in conversation with individuals, ask relevant questions, and offer suggestions for coping with stress, anxiety, or depression symptoms. They can provide a safe and confidential space for users to express their thoughts and emotions. Additionally, these chatbots can be available at any

DOI: 10.54254/2755-2721/36/20230450

time [13], ensuring immediate assistance and reducing the stigma associated with seeking help. While they are not meant to replace human therapists, they can act as a first point of contact, providing valuable resources and support until a professional can be engaged.

3.2. Cognitive assessment

Traditional cognitive assessments often involve lengthy paper-and-pencil tests, which can be time-consuming and subject to human error. However, AI algorithms can be used to develop computerized cognitive tests that assess various aspects of cognitive functioning in a more efficient and accurate manner. These tests can be administered remotely, allowing individuals to complete them at their own convenience. AI-powered cognitive assessments can measure different cognitive domains, such as memory, attention, and problem-solving skills, providing objective and standardized results [14]. These assessments aid psychologists in diagnosing cognitive impairments, tracking cognitive changes over time, and designing personalized intervention strategies tailored to individual needs.

3.3. Discussion

Although the use of AI and GPT has many benefits for psychological therapy, it still has some drawbacks. ChatGPT would give incorrect responses sometimes, and they are nonsense but seems plausible, which is called “hallucination”. The goal of ChatGPT may be compromised by an overly optimized reward scheme. Instead of giving short, concise answers, the evaluation prompted lengthy responses. During training, there may be a probability of algorithm bias. English performs better than other official languages around the world for the ChatGPT service.

4. Conclusion

This article introduces the importance of psychology in today's world, while also highlighting the prospective utility emanating from the rapid advancement of ChatGPT and AI for the realm of psychological education. Psychological patients can analyze their psychological symptoms through ChatGPT and ultimately receive advice that is suitable for them. The combination of artificial intelligence and cognitive assessment has completely changed the way cognitive function is evaluated. Remote managed computerized testing not only saves time and reduces errors, but also provides standardized results to facilitate psychologists in diagnosing cognitive impairment and tracking changes over time. This allows for personalized interventions and tailored treatment plans. As AI technology continues to advance, its potential impact on the field of psychology is vast. Ethical considerations, such as data privacy and the need for human oversight, must be addressed. However, the integration of chatbots and AI has the potential to revolutionize mental health support, improve assessment accuracy, and enhance therapeutic interventions, ultimately contributing to better overall psychological well-being for individuals worldwide.

References

[1] Baxter A Vos T Scott K Ferrari A & Whiteford H 2014 The global burden of anxiety disorders in 2010 Psychological Medicine 44 (11) 2363-2374. doi:10.1017/S0033291713003243.

[2] Ferrari A J Charlson F J Norman R E et al 2013 Burden of depressive disorders by country, sex, age, and year: findings from the global burden of disease study 2010 PLoS medicine 10(11): e1001547.

[3] Gore F M Bloem P J N Patton G C et al 2011 Global burden of disease in young people aged 10–24 years: a systematic analysis The Lancet 377(9783): 2093-2102.

[4] Qiu Y Wang J Jin Z et al 2022 Pose-guided matching based on deep learning for assessing quality of action on rehabilitation training Biomedical Signal Processing and Control 72: 103323.

[5] Park S H Han K 2018 Methodologic guide for evaluating clinical performance and effect of artificial intelligence technology for medical diagnosis and prediction Radiology 286(3): 800-809.

DOI: 10.54254/2755-2721/36/20230450

[6] Farzaneh H Malehmirchegini L Bejan A et al 2021 Artificial intelligence evolution in smart buildings for energy efficiency Applied Sciences 11(2): 763.
[7] Zhang C Lu Y 2021 Study on artificial intelligence: The state of the art and future prospects Journal of Industrial Information Integration 23: 100224.
[8] Chowdhery A Narang S Devlin J et al 2022 Palm: Scaling language modeling with pathways arXiv preprint arXiv:2204.02311.
[9] Wu T He S Liu J et al 2023 A brief overview of ChatGPT: The history, status quo and potential future development IEEE/CAA Journal of Automatica Sinica 10(5): 1122-1136.
[10] Deng J Lin Y 2022 The benefits and challenges of ChatGPT: An overview Frontiers in Computing and Intelligent Systems 2(2): 81-83.
[11] Bhattacharyya R Chakraborty K Neogi R 2023 ChatGPT and its application in the field of mental health. Journal of SAARC Psychiatric Federation 1(1): p 6-10.
[12] Lee J Lee D Lee J 2022 Influence of Rapport and Social Presence with an AI Psychotherapy Chatbot on Users' Self-Disclosure International Journal of Human–Computer Interaction 1-12.
[13] Ahmed A Hassan A Aziz S et al 2023 Chatbot features for anxiety and depression: A scoping review Health Informatics Journal 29(1): 14604582221146719.
[14] Natheir S Christie S Yilmaz R et al 2023 Utilizing artificial intelligence and electroencephalography to assess expertise on a simulated neurosurgical task Computers in Biology and Medicine 152: 106286.