



Role of Emerging AI, VR and AR in Mental Health Practices among College Students

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Abstract

The current study is focused on the usage of recent technologies such as AI, VR and AR, in mental health practices among college students. Artificial intelligence (AI) stands for a field of study where attempts are made to develop human-like intelligence, using computer programs such as machine learning. Similarly, virtual reality and augmented reality are the technologies that enable one to create a real-time controlled virtual environment. Analysing the work and personal responsibilities, good mental health practices among college students are the need of the hour as various research has shown the vulnerability of this population. The current study has worked as a bridge, to gain insight into how the above-mentioned technologies can be used in different scenarios to help a counsellor and a researcher to practice mental health care. The review suggests that AI can be used in assessment, as highly programmed machine learning has a significant ability to identify any disorders before they can occur. Similarly, AR and VR technologies can be used in various therapeutic settings, as it enables the counsellor to create and control a virtual environment where the client can work on their issues. Among college students, these technologies can play a significant role because of their adaptability to them. However, the constant usage of AI, VR and AR can make them dependent and alter their sense of reality. Thus, more research needs to be done on a safer way of applying modern technology to mental health practices.

Keywords: *AI, VR, AR, Mental Health, College Students*

Introduction

Technology's growth has made everything much easier than it was several decades ago. Some examples include communication, travel, education, healthcare, entertainment and more. Technological advancements in the field of psychology aren't an exception, starting from many statistical software to help in research to new web-counselling services using Google Meet and other software, technology has made its way. Artificial intelligence (AI), Augmented Reality (AR), and Virtual Reality (VR) are some of the latest names floating over the advancements of technology. Many new findings show their greater applicability in mental health care practices. Artificial intelligence, which stands for man-made human-like intelligence that focuses on reducing human workload using machine learning, and AR and VR, the new tools that alter one's perception of reality by combining the role of retina and lenses.

Some of the instances where one can apply these new technologies are; using new AI models to create new virtual counsellors with programmed professional skills which can reduce the rate of unethical and dangerous practices by several humans, use of VR and AR in visualisation therapies like systematic desensitisation etc. The emergence of AI dates to the year 1956, when two geniuses, Newell and Simon created the "Logic Theorist", also known as the thinking machine (Gugerty, 2006). The purpose behind the creation of artificial intelligence was to create a machine that can think and solve problems like humans, some science fiction movies like *Her* (2013) and *Terminator* (1984) were based on the same principle.

Virtual reality (VR) is a technology that generates simulated worlds that users can explore and interact with. VR is wearing a headset that takes the individual to a distant place or the inside of a video game. It serves as a tool for instruction, training, and amusement. Immersion experiences have been a goal of inventors since the 1950s, and by the 2010s, technological developments had finally made virtual reality headsets available to the public.

AR began in the 1960s when American inventor Ivan Sutherland created the "Sword of Damocles" at the University of Salt Lake City (Svarmony, 2023). On the other hand, the provision of treatment, evaluation, psychotherapy, counselling, or similar activities to individuals, couples, families, or groups for behavioural, cognitive, social, mental, or emotional illnesses, especially those involving interpersonal or private issues, is referred to as mental health practice.

Bell et al. (2020), believed VR is a potentially powerful technology that can help in mental health assessment, their study also listed out some advantages of using VR technology in mental health assessment, i.e., enhancing ecological validity, researcher and counsellor can

control and manipulate the virtual environment, real-time automated data capture, and many more. Modern artificial intelligence (AI), and machine learning in particular, is being utilised to develop prediction, detection, and treatment solutions for mental health care with the emergence of digital approaches to mental health. AI is being used in therapy to improve user experience and maximise individualised mental health care through digital interventions, including web and smartphone apps (D'Alfonso, 2020).

LINA, an augmented reality (AR) smartphone-based serious game, seeks to improve peer interaction, school climate, and student-teacher engagement while providing a safe environment for reflection on mental health (MH) and external stressors related to family circumstances. The entire class (age 10+) plays LINA in the classroom with their teacher. Through an iterative co-development process with young people, an interdisciplinary team of dramatists, software developers, psychologists, and artists produced LINA. Based on data from qualitative focus groups and the Game User Experience Satisfaction Scale (GUESS-18), the game was found to have good acceptability and preliminary efficacy. One way to use adolescents' propensity for digital technology is to use AR, cooperative gaming in a shared physical environment, and a shared immersive story to enhance SB and real-world social connections among teenagers (Mittmann et al., 2022).

Artificial Intelligence and Mental Health

According to Graham et al. (2019), “Artificial intelligence (AI) technology holds both great promises to transform mental healthcare and potential pitfalls.” Similarly, Lee et al. (2022) said, “The use of AI in mental healthcare and neurobiological research has been modest. Given the high morbidity and mortality in people with psychiatric disorders, coupled with a worsening shortage of mental healthcare providers, there is an urgent need for AI to help identify high-risk individuals and provide interventions to prevent and treat mental illnesses”. “Also, the COVID-19 pandemic has increased the risk of further erosion of the mental well-being in the population. Therefore, it is relevant to assess the current status of the application of AI toward mental health research to inform about trends, gaps, opportunities, and challenges.” (Tornero-Costa et al., 2023).

A study by Straw and Callison-Burch (2020), tell us about a Psychiatric model of natural language processing (NLP) that studies how biases emerge from a clinical, data science, and linguistic perspective by methodically assessing each step of model creation. By carefully evaluating each stage of the model-building process, psychiatric models of natural language processing (NLP) investigate how biases arise from a clinical, data science, and linguistic

perspective. Biases present in these technologies and offer suggestions for preventing similar negative effects in the future. The difficulties and potential paths in artificial intelligence for mental health care are ever-changing and complex. To fully utilise artificial intelligence (AI) in bettering mental healthcare, it is imperative to engage in ongoing research and development, ensure model validation and transparency, and establish strong regulatory frameworks. These initiatives will be crucial in determining how mental health therapy develops in the future and making it more ethical, practicable, and accessible for people as AI technologies advance said Olawade et al. (2024).

Virtual Reality and Mental Health

Greg and Tarrier (2007), states that “The main focus of VR is interaction, and it may be assumed that as the technology improves and enables greater interaction that the effectiveness of VR as a therapeutic tool should also increase.” “Initially designed for the treatment of phobias, the use of virtual reality in phobic disorders has expanded to other mental health disorders such as posttraumatic stress disorder, substance-related disorders, eating disorders, psychosis, and autism spectrum disorder.” (Emmelkamp & Meyerbröker, 2021).

Virtual reality possesses the capacity to revolutionise the evaluation, comprehension, and management of mental health issues. Only when the most immersive VR technology is paired with focused translational interventions, with the user experience at the centre of design, can the therapy potential be realised Virtual reality's ability to imitate reality has the potential to expand access to psychological therapy significantly, and its capacity to construct new realities may improve treatment outcomes. VR might be worthy of the same consideration as neuroimaging. An extensive analysis of empirical research was carried out. A total of 285 papers were found, of which 154 dealt with therapy, 45 with theory development, and 86 with assessment. Anxiety (n = 192), schizophrenia (n = 44), substance-related disorders (n = 22), and eating disorders (n = 18) were the primary disorders that were studied.

There are several useful applications for mental health. Though there are several promising research and treatment paths, the most well-established discovery is that VR exposure-based treatments can alleviate anxiety disorders (Freeman et al., 2017). Since digital technology now permeates every aspect of our lives, therapies benefit from being included in these innovative technological advancements. Virtual reality is becoming more widely available, and in the upcoming years, systems for walking-in-place navigation like the Virtux OMINI, as well as immersive 3D head-mounted displays like the Oculus Rift or headsets that can be used with a mobile phone as Unofficial Cardboard VR, will all be available (Valmaggia

et al., 2016). Virtual reality (VR) has demonstrated its ability to elicit genuine responses to feared stimuli, especially in the case of anxiety. It has also demonstrated that VR's immersive qualities make it a perfect tool for pain management. The paucity of research on stress and depression, however, draws attention to the gaps in the body of knowledge. When paired with health information, virtual settings that encourage positive stimuli may prove to be a useful tool for mental and public health. The present body of research emphasises how crucial VR treatments' nature and content are for promoting mental health (Jerdan et al., 2018).

Augmented Reality and Mental Health

AR has become a helpful tool for diagnosis, treatment, and management in the mental health area due to its flexibility and increased accessibility. It can be conveniently delivered through various platforms, including smartphones and tablets (Bakır et al., 2023). Lundin et al. (2022) mentioned in their paper that, "Substantial unmet need for treatment for mental disorders arises from problems of access, efficacy, and tolerability of conventional treatments. These limitations have prompted the development and evaluation of novel interventions, including those based on virtual reality (VR) and augmented reality." The use of VR/AR technologies became popular as an alternative to or adjunct to traditional therapy in mental health practice. The rapid increase in research publications in recent years suggested that AR and VR technologies were both acceptable and simple to use (Sweileh, 2023).

Certain features of current treatments can be enhanced by virtual and augmented reality. As previously indicated, the assessment's ecological validity may even surpass "in vivo" treatment. First, the therapist has complete control over the computer program's virtual scenarios and aspects, including the creation of stimuli and their amount and sequence of appearance. This is especially true with AR and VR. Second, because events that patients fear will occur in the real world cannot occur in AR and VR (without consent and forethought), they can help patients feel more secure throughout therapy (Ventura et al., 2018).

Review of Literature

Dekker et al. (2020) proposed a narrative review, where it suggests combining research on a life-crafting intervention that employs an inclusive curriculum-wide approach with the existing literature on chatbot interventions targeted at students' mental health. Academic and mental health issues can be avoided when a chatbot asks students to rank their priorities for social, health, and academic goals and offers customised follow-up coaching. These issues are frequently linked. Appropriately timed delivery and customised follow-up inquiries augment

the outcomes of the two -originally divided- intervention kinds. Research on this novel combination of treatments should track participants' adoption of the device and apply design concepts that improve usability.

Incorporating ChatGPT into the educational process can widen the conventional learning environment and encourage the reform of conventional teaching methods, all while encouraging college students to engage in physical activity and improving their mental health. Nevertheless, there are difficulties and barriers in using ChatGPT in physical education. Wearable technology and sporting goods can be paired with ChatGPT to optimise its use in physical education by improving user interactions. It is very necessary to implement pertinent policies to prevent the misuse of user data (Zhang & Liu, 2024).

A study was conducted by Fulmer et al. (2018) to explore whether integrative psychological artificial intelligence “Tess” may effectively reduce college students' symptoms of anxiety and despair. A total of seventy-five participants participated in the research programme. There were 50 individuals in total across the 2 test groups, who were randomised to either receive unrestricted access to Tess for 2 weeks ($n = 24$) or 4 weeks ($n = 26$). Based on the PHQ-9, group 1 who received treatment reported a significant reduction in depressive symptoms ($P=.03$), while group 2 did not report any such reduction. The results showed a statistically significant difference between the two groups. This study provides proof that AI can be used as an accessible and affordable curative agent. However, it cannot replace the role of trained therapist.

Sinha (2020) suggests that to help students effectively deal with academic and social obstacles, there is an urgent need to reach out to emerging technologies considering the exponential rise in mental health issues among university students. It is critical to expand the use of virtual reality (VR) in university counselling settings, including the initial assessment, diagnosis, and treatment strategies to help students effectively address any mental health challenges, given the growing accessibility and usefulness of VR use in mental health. The usage of VR in counselling settings at universities cannot be possible without implications and challenges.

A literature review was done by Wan and Lam (2019) to measure the effectiveness of virtual reality-based simulation in fostering health profession students' empathy for mental illness. The results indicated a strong correlation between VR simulation and an improvement in users' attitudes, empathy, and knowledge of mental illness. There is potential for the development of VR simulations on empathy and attitude in healthcare education because of their distinctive experiential learning feature. Additionally, compared to users without a

healthcare background, individuals with a background in healthcare are observed to be more sensitive to VR stimulation. Future research focused more intently on the impact of training a wider variety of mental health skills and on the particular of empathy and attitude of those with healthcare backgrounds.

Kaplan-Rakowski et al. (2021) did an empirical, quantitative, between-subjects study which had two goals i.e., first was to test scores which were further used to compare the efficacy of virtual reality and video meditation instruction. Secondly, the research offered valuable perspectives on the application of virtual reality or video meditation as a means of enhancing overall wellbeing. Virtual reality meditation proved to be substantially more helpful than video meditation, according to a t-test analysis. Students stated that they felt less anxious before exams after receiving meditation instruction through any means. This research provides evidence of the positive effects of virtual reality meditation on students' anxiety levels and exam performance, with practical consequences.

The current study done by Perera et al. (2021) assessed the efficacy of progressive muscle relaxation and mindfulness-based Augmented Reality aided stress reduction therapies. Individuals who mostly expressed psychological stress engaged in a 5-minute AR-based mindfulness exercise, whereas those who primarily expressed physiological stress engaged in a carefully planned AR-based progressive muscle relaxation session. The experimental group's stress levels decreased after the interventions, according to the experiment's findings. Participants who had been categorised as “High” in terms of stress before the session demonstrated noteworthy reductions in stress and were categorised as “Optimal” in terms of stress after the intervention. This research offers preliminary proof of AR's efficacy.

A study was done with the goal to learn more about the new uses of VR and AR in mental health interventions and how they might affect patient outcomes. The review's conclusions add to our knowledge of the state of VR/AR technology in the field of mental health and point to possible future developments in this quickly developing area. According to current studies, VR/AR exposure treatment is beneficial in treating anxiety disorders, and interventions have the potential to help those who work with patients' social skills.

A review of the literature on mental health and technology, specifically, augmented, and virtual reality was done by Contreas et al. (2024). Originating during World War II, virtual reality has had a favourable impact on the recovery of mental health and has contributed significantly to scientific and technological breakthroughs in the field of health science.

Conclusion

It is incredible to witness how much the world is changing and advancing in technology, just a few decades ago one would have never imagined the technologies that are available today. Several technologies that have grown in recent times are in the domains of artificial intelligence, virtual reality, and augmented reality.

Artificial intelligence implies a vast branch of research that focuses on creating computer systems capable of carrying out tasks that normally call for human intellect. Artificial intelligence (AI) gives machines the ability to learn from their mistakes, adapt to new inputs, and carry out human-like tasks including decision-making, reasoning, problem-solving, speech recognition, and pattern recognition.

On the other hand, virtual reality is a three-dimensional, computer-generated world that users may engage with in real time. VR creates a realistic experience that immerses users in their environment through technology and software. Many gadgets can be used to access virtual reality including VR headsets. Similarly, augmented reality is an interactive experience that uses perceptual data provided by computers to improve the real world.

Augmented reality is the process of superimposing digital content—such as apps, software, and hardware like AR glasses—onto actual locations and things. The current review study is designed to seek out the relation between these above technologies and mental health practices among college students. With the emergence of a wide necessity of mental health care in recent times, most notably since post-COVID, it is important to make use of each piece of advanced technology that we have today in mental health care for college students. And the above-described technologies share a great deal of usage. Reviews from different studies showed the use of AI, VR and AR, in mental health care practices, including the use of AI as an advanced assessment tool and for early detection of any mental health problems by machine learning algorithms to find minute variations that could be signs of mental health issues like anxiety or depression.

Use of VR and AR in a real-time virtual environment, by being able to control the environment and have more ecologically validated data. These techniques can also show significant results because college students are more habituated to new technological developments than any other generation. Thus, it will be easy to work with them using these technologies because of their fast adaptability. However, there are also lists of disadvantages to using these technologies, for instance, using virtual technology more often can jeopardise one physical health and their sense of reality, thus, to overcome this limitation, more thorough research is important.

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