Exploring the Application of Artificial Intelligence Technology in Adolescent Mental Health Education

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Abstract

Artificial intelligence technology provides an efficient and innovative solution for adolescent mental health education, and effectively builds a safe and private psychological support space by virtue of its accurate and whole-day response. This study discusses three aspects of application timing and scenarios, behavioral norms, and risk prevention and control: (1) the scenarios and timing of using AI technology for mental health education in families, schools, and adolescents need to be treated separately; (2) The behaviors and norms of applying AI technology in adolescent mental health education need to be governed by national laws and industry norms, with clear legal provisions and technical standards to ensure that they meet ethical standards, effectiveness, and safety requirements; (3) AI technology must prevent user dependence and potential harm in its application and requires a corrective mechanism. Additionally, the study points out that technological breakthroughs need to overcome technical bottlenecks such as data quality and emotional understanding, as well as institutional challenges such as privacy ethics and legal regulation. It also looks forward to future development prospects in multimodal integration, universal services, and ecological construction.

Key words: Artificial intelligence technology; Adolescent mental health education; Multi-party synergy mechanism

Adolescent mental health has become one of the most critical issues in the global public health field and has garnered significant attention from government administrators and educators worldwide. The primary approach to addressing adolescent mental health challenges lies in preventive education and early intervention. In September 2021, China's State Council issued *the Outline for the Development of Chinese Children (2021–2030)*, which explicitly emphasizes strengthening mental health education, screening, and intervention, while proposing a collaborative protection mechanism involving the government, enterprises, schools, families, and society. With the rapid development and widespread application of artificial intelligence (AI) technology, generative large language models represented by ChatGPT and vertical-domain models such as DeepSeek are permeating various societal sectors at an unprecedented pace. In education, these AI technologies have not only reshaped traditional teaching methods but also pioneered efficient and innovative pathways for adolescent mental health education. Equipped with powerful natural language processing capabilities, whole-day responsiveness, and deeply customizable interactive features, these AI models provide adolescents with a secure and private space to discuss mental health concerns. Simultaneously, AI systems leveraging big data analytics can identify potential mental health risks through conversational content, offering early warnings to educators and parents. Therefore, the question of how to effectively apply artificial intelligence in youth mental health education merits thorough consideration by every educator.

1. SCENARIOS AND TIMING OF INTRODUCING ARTIFICIAL INTELLIGENCE TECHNOLOGY IN ADOLESCENT MENTAL HEALTH EDUCATION

The main venues for adolescent mental health education include families and schools, with the three key stakeholders being parents, teachers, and children. Determining when and where to introduce AI technology requires distinct approaches and collaborative deliberation among these parties.

For the family and parent. Parents can introduce AI technology to guide adolescent mental health education or solve their mental health problems after typical scenarios arise. Typical scenarios may include post-family conflicts conflict, key developmental stages, interpersonal interaction challenges or other scenarios. There are many manifestations of family conflict, take parent-child conflict as an example, after the conflict, parents use AI technology to analyze the cause of the conflict problem and formulate solutions, try to choose several options given by AI technology, especially the guidance of words and actions, to ease parent-child relationship, and to prevent the resulting mental health problems of the adolescents; there are many key stages of adolescent's physical and mental development, and for unfamiliar or unclear issues, parents can ask the AI model, and the prompts need to clearly mention the age group, main features and landmarks, possible psychological problems and corresponding solutions, etc. Conflicts and frustrations in interpersonal interactions of adolescents are also likely to cause their mental health problems, for example, when conflicts arise in the real world of social interaction, some adolescents experience prolonged self-reproach, withdrawal, and low mood. For example, when there is a conflict in real social life, some teenagers have long time self-blame, withdrawal, low mood, etc. When the situation, parents can use AI technology to seek solutions to channel their emotions, restore their curiosity, and solve their psychological problems.

For Schools and Teachers. The National Mental Health Assessment and Development Center of the Institute of Psychology (Institute of Psychology, Chinese Academy of Sciences) released in April 2025 the 2024 Youth Mental Health and Academic Status Survey Report, which shows that academic problems are still one of the most important factors contributing to youth mental health problems. The introduction of AI technology in schools for youth mental health education to solve mental health problems at specific times and in specific scenarios will have better results. Taking the regular enrollment psychological survey as an example, the use of artificial intelligence technology can quickly check and analyze the mental health status of students, and make targeted warnings, give follow-up mental health education guidance content and frequency, and form a systematic monitoring system. Another example is that in some specific scenarios, such as the pre-middle and high school entrance exams and campus bullying, students may have various psychological problems, and teachers can assist in relieving pressure, channeling anxiety and mitigating the impact through artificial intelligence technology. In the face of some introverted students, families and schools can also use artificial intelligence technology to set up virtual chatbots to help students open up psychological venting channels.

For Adolescents Themselves. Adolescents should understand the role of AI technologies and acquire the ability to use them through guided education at home and school. Adolescents' exposure to and initial use of AI technologies can begin in the middle grades of elementary school (ages 9–11) for a number of reasons, including (a) matching cognitive development. According to the Piagetian cognitive stages, late in the concrete operations stage, middle grades students have budding logical thinking, as evidenced by the ability to understand AI interactions. They are also able to understand cause and effect relationships, as evidenced by their understanding of the "question-answer" mechanism, which allows them to make good use of AI technology. (2) Psycho-pedagogical window. The further awakening of self-awareness in middle grades, closer peer interaction, peer pressure, increased emotional complexity, increased academic pressure, and increased ability to read on their own all make the application of AI technology possible. Adolescents can avoid risks and ensure safety through specific models and time constraints when applying AI technology for mental health self-education and problem solving. Governments around the world have, to varying degrees, developed corresponding education programs for AI technology, for example, Singapore's Ministry of Digital Development and Information (MDDI) released a news release stating that it will begin to provide 5-10 hours of AI module education in primary and secondary schools in 2025, making it an early adopter of AI education and application in primary and secondary schools.

2. BEHAVIOR AND NORMS OF APPLYING ARTIFICIAL INTELLIGENCE TECHNOLOGY IN ADOLESCENT MENTAL HEALTH EDUCATION

The behaviors and norms of applying AI technology in adolescent mental health education need to be controlled by national laws and industry norms, with clear legal provisions and technical standards to ensure that they are ethical, effective and safe. The following is an exploration

of the principles of research and development, application and synergy of artificial intelligence technology.

Principles of artificial intelligence technology development. Artificial intelligence technology used in adolescent mental health education, from development to application, should be the core starting point and ultimate goal of safeguarding the rights of adolescents and ensuring their physical and mental health. Therefore, the AI technology used in mental health education needs to be developed based on the characteristics of psychology, pedagogy and other disciplines and relevant research methods, and the generated programs need to comply with national standards and industry norms, while paying attention to the protection of privacy, and collecting only the necessary data. It is also necessary to see that artificial intelligence technology cannot replace human beings, such as professional psychologists, psychological counseling teachers and parents, etc., so the artificial intelligence technology can be positioned as an auxiliary tool for data collection, analysis and prediction.

Principles of Artificial Intelligence Technology Application. Firstly, when different individuals use such technology for mental health education and other behaviors, different models should have different use scenarios, for example, the version used by adolescents and the one used by teachers and parents should have different technical specifications; secondly, in the application of all parties need to pay attention to data security and privacy protection, avoid data leakage, and strictly stipulate the occasions for the secondary use of data, at the same time, the adolescents and the guardians have the right to know and Finally, the application of AI technology needs to be subject to regular review and assessment, such as ethical review of fairness and anti-discrimination, anti-addiction review, etc., to prevent the degradation of young people's ability to think, practice, and socialize caused by over-involvement of AI technology, and to have the personalized education programs provided by professionals reviewed.

Principles of cross-sector collaboration. When utilizing AI technology for youth mental health education, a policy and oversight framework should be established in collaboration with the government, families, schools, and society, with clear responsibilities and review criteria for each party. There is also a need for cross-disciplinary cooperation, such as collaboration between national standards management bodies, technology development companies, educational institutions and medical institutions to optimize AI technology. Finally, there is collaboration between products and users, i.e., schools, families and young people need to be trained and educated to use the appropriate technology appropriately and rationally to achieve the purpose of mental health education.

3. PROTECTING AGAINST DEPENDENCE AND HARM FROM ARTIFICIAL INTELLIGENCE TECHNOLOGY IN ADOLESCENT MENTAL HEALTH EDUCATION

Youth mental health education to prevent the dependence and harm of artificial intelligence technology is mainly to prevent adolescents in the long-term use of overdependence and generation of erroneous programs and guidance to produce harm, followed by other applications of the main body of the overdependence generated by the awareness of the review of the contempt, in order to avoid the emergence of such a situation, it is necessary to make preventive measures in advance.

Clarify the position of AI technology in mental health education as an assistive tool. Artificial intelligence technology can be used as a conversation or confiding object, but cannot replace human communication. Artificial intelligence technology can collect data, analyze data but cannot replace professionals as a decision-making tool. Therefore, all the conclusions or programs generated by AI need to be evaluated by professionals and supervised and corrected by professionals while being implemented.

Cultivate adolescents' autonomy and social skills. Due to their physical and mental development stages, teenagers need some emotional AI models to chat and confide or rational AI models to reason and analyze, and their long-term use may create dependence and addiction problems, thus affecting normal judgment and social interaction. It is necessary to educate young people to understand the limitations of AI technology, cultivate their critical thinking, develop their independent judgment and promote realistic social skills.

Dual protection of policy and technology and multi-party synergistic cooperation. At the level of laws and industry norms, AI technologies are constrained to have anti-dependence designs, to alert teenagers or other users with corresponding dependence tendencies according to algorithms, and to have parental authorization mechanisms to prevent dependence and other injuries. At this time, it is also necessary for parents and schools, enterprises and other collaborative cooperation, from the use of supervision, dependence warning and the use of norms to prevent the emergence of such problems and harm.

Designing corrective mechanisms. Although much of the harm avoidance can be accomplished through appropriate measures, there is still a need to devise mechanisms for correcting such problems once they arise. The first step is to assess the problem, such as addiction, reduced social skills, introversion and autism, etc.; then the professionals will formulate solutions, such as limiting exposure, controlling the duration of use,

restoring socialization, etc., which will be implemented and observed in the family and the school, etc.; and finally evaluate the effect of correcting the problem, to make sure that the impact has been eliminated or to proceed to the next stage of the corrective process. The entire error correction process is summarized to form a typical case for reference by AI technology developers and educators.

4. CHALLENGES AND PROSPECTS OF APPLYING ARTIFICIAL INTELLIGENCE TECHNOLOGY IN YOUTH MENTAL HEALTH EDUCATION

Children embody the future of humanity, and adolescence marks a critical developmental stage where physical and mental well-being constitute the foundation of healthy growth, with psychological health being paramount. Although the application of AI technology in adolescent mental health education faces substantial challenges, its transformative potential remains immense.

The application of AI technology in adolescent mental health education faces three primary challenges. First, technical limitations dominate: including (1) complex model architecture design, (2) inadequate data quality combined with limited dataset scales, and (3) algorithmic deficiencies in comprehending the nuanced interplay between human emotions and behavioral patterns – all demanding sustained research efforts. Second, privacy and ethical dilemmas emerge through (1) improper data handling (ranging from excessive to insufficient data collection), (2) ambiguous accountability frameworks for AI-assisted decision errors, and (3) delayed manifestation of technology-induced psychological harm requiring proactive mitigation. Finally, regulatory gaps persist as policymakers must accelerate legal adaptations to govern this emerging field, ensuring AI deployment aligns with human-centric ethical benchmarks.

Prospects of applying artificial intelligence technology in adolescent mental health education. We should always believe that artificial intelligence technology will have a bright future in all fields, including the field of adolescent mental health education. The first is the breakthrough of technological innovation. It is believed that future AI technology models can integrate multimodal enhancement of emotional sentiment recognition and output to enhance personalized services and protect privacy, for example, when adolescents use AI technology for psychological debugging, the AI model can go from a listener to an active warner, guide, and social mediator. The second is the breakthrough of upgrading the service model. This is conducive to the establishment of early warning and prevention networks in schools and families, completing universal coverage and compensating for regional development imbalances. Finally, there are breakthroughs in policy and ecological construction. These breakthroughs include the construction of policies, regulations and industry standards, the construction of school-family social networking support linkage system and the construction of whole-person system.

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