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Research on the Teaching Design of Mental Health Courses for Science and Engineering College Students from the Perspective of Positive Psychology

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Abstract: The application of positive psychology in mental health education courses in higher education has become an inevitable trend. This article, considering the psychological characteristics of contemporary science and engineering college students, analyzes the existing problems and deficiencies in current courses, and proposes strategies for course improvement such as optimizing teaching objectives, innovating teaching methods, enriching course content, and integrating teaching resources. The aim is to enhance the teaching effectiveness of these courses to meet the mental health needs of science and engineering students, promote their overall development, and lay a solid foundation for the country to rapidly cultivate excellent engineering and technology talents. The positive psychology movement began in the United States in the 1990s, emphasizing the focus on human strengths rather than abnormalities or diseases, exploring and fully utilizing individual potential, advocating for positive interpretation of problems, and believing that individuals or society can gain positive meaning from them. In the early 21st century, positive psychology theories were introduced domestically, sparking a wave of reform in mental health education models.

1. Background of Positive Psychology's Application in University Mental Health Education

Since 2006, the application of positive psychology has increasingly focused on psychological counseling and the dissemination of educational concepts. A search for the keywords "positive psychology," "universities," and "mental health education" in CNKI yielded 495 relevant papers. Through literature analysis, it is evident that recent research trends have shifted toward the study of learning processes, group psychological counseling, life education, and psychological capital[1]. Scholars such as Ma Xia[2] and Li Jingjing[3] have integrated positive psychology into educational practice through group counseling, resulting in increased scores in psychological resilience and perceived social support. With ongoing theoretical advancements, positive psychology is undergoing a transformation from PP1.0 to a new paradigm, PP2.0, which emphasizes a more holistic approach. This new paradigm not only focuses on positive experiences but also delves into life’s contradictions and negative situations, striving to reveal the intertwined nature of happiness and meaning[4].

Traditional science and engineering universities emphasize specialization, logical reasoning, standards, and technical applications. These institutions often have rigorous curricula and heavy academic workloads, which may result in weaker development of students' humanities, emotional expression, and interpersonal interaction skills. Compared to the national average among university students, science and engineering students exhibit more pronounced symptoms of somatization, compulsion, anxiety, hostility, phobia, and psychoticism[5], and they are more likely to display rigid and extreme personality traits[6]. With the advent of a new industrial era and in response to the Ministry of Education's "New Engineering" initiative, universities must proactively plan for future-oriented new engineering development. This requires breaking disciplinary boundaries, fostering interdisciplinary integration, and cultivating high-quality, versatile talents who can adapt to complex and rapidly changing environments, with strong innovation, creativity, and critical thinking skills.

Mental health education courses represent the forefront of psychological well-being initiatives in universities, and teaching interventions are the primary means of enhancing students' mental health literacy. Given the psychological characteristics of science and engineering students and the talent needs of the New Engineering initiative, it has become imperative to systematically restructure the "College Student Mental Health Education Course" to more comprehensively and effectively support the psychological development and maturity of science and engineering students in terms of teaching objectives, organization, and methods.

2. Analysis of Current Issues in University Mental Health Education Courses

2.1 Students' Misconceptions about the Importance of the Course

Research shows[7] that a significant proportion of university students exhibit a tendency toward academic disengagement, with over 91.9% being influenced by factors such as personal planning, life arrangements, teacher appeal, social values, and course design. Compared to liberal arts students, science and engineering students generally have lower learning motivation, which may be related to the difficulty of their subjects, study methods, and assessment styles. As a general public compulsory course, the goals of the mental health education course are deep-rooted; it is not only about resolving confusion and improving mental health but also about enhancing students' overall quality. Typically offered in the first year, the course often involves large classes with numerous students from diverse backgrounds, limited instructional hours, theory-heavy content, and minimal practical components. As a result, student engagement in this course is significantly lower than in their specialized and foundational courses[8]. Other research indicates[9] that while 69% of students recognize the importance of this course, the remaining 31% are unclear about its value, with some students even perceiving it as a "superficial" course, reflecting certain cognitive biases.

2.2 Varied Levels of Professionalism among Course Instructors

Statistics show that the ratio of full-time mental health educators to students in Chinese universities ranges from 1:1,000 to 1:7,000[9], with over half of the institutions in certain regions having a student-teacher ratio below 1:4,000, and more than a quarter of universities having only one or no full-time instructors[10]. The shortage of professional staff inevitably affects the scale of instruction and directly reduces the feasibility of small-class teaching. Currently, university mental health education course instructors primarily fall into three categories: psychology professionals, ideological and political education counselors, and administrative personnel. This team is characterized by a trend toward younger, lower-ranked, less specialized, and less dedicated professionals[11]. Given that mental health education involves multidisciplinary knowledge in psychology, education, and psychiatry, instructors must possess high levels of theoretical knowledge and practical experience. However, due to

professional limitations and a weak research foundation, many instructors are confined to traditional teaching methods, unable to approach, analyze, and solve educational issues with a researcher's perspective or apply research findings to guide teaching practice.

2.3 Insufficient Innovation and Effectiveness in Teaching Content and Concepts

In recent years, the exploration of university mental health education courses based on positive psychology has become a general educational consensus, emphasizing a shift from problem-oriented to development-oriented approaches. However, issues such as a single-dimensional course evaluation system[12], inconsistent quality in textbook compilation, and a lack of flexibility in course models[13] remain significant challenges affecting teaching quality. Most course content is rigidly structured, with little attention given to the impact of social changes and cultural trends on students' psychological mechanisms and coping strategies. There is also a lack of sensitivity to the latest research findings in relevant disciplines, resulting in a clear trend towards academicization[14]. The "Internet+" approach has removed time and geographical constraints, allowing students to access a wealth of cutting-edge educational resources anytime and anywhere, leading to complaints about course content being dull, outdated, and disconnected from reality. Moreover, different student groups face varying developmental challenges. For instance, first-year students, who are newly adapting to the university environment, generally exhibit lower adaptability, while fourth-year students are more concerned with job search and graduation pressures[15]. For liberal arts students, the educational focus should be on interpersonal relationships, whereas for science students, emotional management should be prioritized[16]. Empirical research indicates[17]that current university mental health education courses still fall short in guiding students' practical psychological health abilities, and the effectiveness of teaching practice is not as ideal as expected.

3. Course Design Strategies Based on Positive Psychology Theory

As the post-pandemic era unfolds, societal topics such as "Buddhist youth," "lying flat," "involution," and "fragile university students" have emerged, indicating increasing challenges in university mental health education. To adapt to the complex realities of the environment and the localization of positive psychology, the following improvement strategies are proposed for university mental health education courses.

3.1 Optimize Teaching Goals to Cultivate Dialectical Thinking

Positive Psychology 2.0 posits that the positive and the negative are dialectical and can transform into one another, emphasizing the importance of being vigilant even while focusing on positive qualities. Research indicates that the standard scores for depression and anxiety among science and engineering students are higher than the norm, with detection rates of 23.11% for depression and 10.05% for anxiety, reflecting certain emotional health issues within this group[18]. In the course, instructors should help students recognize that they are the primary stewards of their own health, not sheltered within an idealistic ivory tower. Appropriately addressing stress can help students cultivate resilience, leading them to become more confident in their own strength after overcoming setbacks, develop closer relationships with family and friends, and experience post-traumatic growth. For example, "defensive pessimism" is seen as a positive strategy for adapting to society[19]. Beyond focusing on individual emotions and behaviors, teaching goals can also shift from self-centeredness to an emphasis on others, helping students achieve lasting happiness, sparking their interest in mental health education, and fostering dialectical thinking to face challenges and setbacks with equanimity.

3.2 Innovate Teaching Methods with Embodied Experience

The task of liberal education in science and engineering universities is to promote the comprehensive development of students, preparing them for the quality demands of future society on technological talents. This education focuses on cultivating students' holistic qualities in "how to be and act," rather than emphasizing knowledge in the humanities and social sciences. Learning should take place within a specific context related to the object of knowledge, so that the acquired knowledge holds practical value for solving real-world problems[20]. Instructors can fully engage students' physical agency by promoting mental health through physical activities and aesthetic experiences. By incorporating sensory experiences such as seeing, hearing, speaking, and touching, the course can be made more engaging, aiding in the internalization of knowledge. The more vivid and realistic the learning scenarios, the more they can stimulate embodied experiences in students. When labor is creatively linked with feelings, experiences, reflection, and imagination, students can derive genuine happiness and find meaning and value in life[21], sharpening their minds, integrating hand and brain interaction, and promoting harmonious development of body and mind.

3.3 Enrich Teaching Content with Local Cultural Characteristics

China's excellent traditional culture is a vital foundation for the ongoing localized innovation in mental health education. The most distinctive feature of mental health education in Chinese universities is the emphasis on the integration of mental health education with ideological and political education, focusing on nurturing both the heart and virtue[22]. Unlike the individualism prevalent in the West, Chinese science and engineering students, who have been immersed in traditional culture for a long time, place greater value on family, collective, and societal connections. By transcending self-interest, they can explore the meaning of life and align personal development with altruism, social contribution, and value realization. Incorporating ideological and political education into mental health courses can allow students to appreciate the essence of traditional culture, build cultural confidence, and effectively use political elements to help students realize themselves, deeply root their love for the country, and merge their personal aspirations with the greater good.

3.4 Integrate Teaching Resources to Enhance Educational Effectiveness

In the "screen media era," university students are increasingly addicted to short videos[23][24], and the advent of artificial intelligence is transforming the ways students learn and interact with their learning environments. We must grasp the deep structure of learning, make full and rational use of media and technology, enhance communication accessibility with machines[25], and strive to cultivate students' qualities like aesthetics, empathy, and creativity, reducing the likelihood of them being replaced by artificial intelligence and seizing the initiative in the future of education. By flexibly using multimedia, short videos, and other teaching media or platforms, selecting standardized reference materials, implementing diverse seating arrangements, ensuring sufficient instructional time, and appropriately reducing class sizes, the emphasis on student participation can be highlighted. Improving the class-teaching system, developing a "service-learning" model unique to mental health education, and organizing students to engage in activities that meet social needs while reflecting on these experiences can deepen their understanding of course content and foster a broader appreciation for the subject, enhancing their sense of responsibility[26].

3.5 Coordinate the Teaching Team and Improve the Evaluation Mechanism

Mental health educators should possess well-rounded, mature personal qualities, particularly in

cultivating positive psychological traits, which can benefit students through observational learning and foster a more scientific awareness of mental health. To achieve this, it is necessary to establish a comprehensive system for the entry, training, evaluation, and reward/punishment of mental health educators. This includes strengthening systematic and professional pre-job training, establishing clear criteria for technical title evaluations, reducing the professional level gap between full-time and part-time teachers, improving teaching abilities, expanding knowledge reserves, promoting professional development, inspiring work enthusiasm, and enhancing course effectiveness.

The trend of shifting from an educational to a service-oriented model in school mental health work in China is becoming increasingly apparent[27]. Psychological quality is a dynamic indicator that requires the introduction of a three-dimensional process evaluation. This can be achieved by using scientific and effective measurement tools and big data technology to assess and provide feedback on students' psychological quality at different stages of the course. This approach helps assess the achievement of teaching goals at each stage, promptly identify issues, and offer feasible suggestions for teaching adjustments. However, caution must be exercised regarding the ethical risks of data labeling and privacy breaches. Meta-evaluation can be employed to understand students' authentic feedback on teaching, organizing the knowledge system according to students' physical and mental development characteristics, and addressing the most pressing issues they face.

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