

Exploration on Practice Path and Teaching Reform of Personalized Psychological Education in Colleges and Universities Driven by Data

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ABSTRACT

In the context of the deepening of education digitization and the continuous deepening of smart teaching reform, the psychological education system in universities is in a critical stage of paradigm reconstruction and structural transformation. The traditional homogeneous education model based on experience judgment is difficult to adapt to the dynamic and diverse psychological development characteristics of contemporary college students. Structural problems such as lagging static evaluation, passive intervention mechanisms, and insufficient precision education effectiveness have gradually become prominent, and cannot effectively respond to the high-level education requirements of moral education in the new era. To overcome the bottleneck of "homogeneous supply and extensive implementation" in psychological education in universities, this study takes data empowerment as the core entry point and systematically analyzes the current obstacles and internal causes of personalized psychological education in universities. Research on building a systematic reform path from the perspectives of updating educational concepts, constructing data systems, iterating teaching models, optimizing educational processes, and innovating application scenarios. The research results can help promote the transformation of psychological education in universities from the extensive education paradigm dominated by experience to the intelligent education paradigm supported by data, precise adaptation, and personalized empowerment. It can further enrich the theoretical system of psychological education teaching reform in the digital perspective of education, and provide theoretical references and practical paradigms for the construction of high-quality psychological education in universities in the new era.

Keywords: Data-driven education, College psychological education, Personalized education, Teaching reform.

1. INTRODUCTION

1.1 Research Background

The comprehensive implementation of the digital education strategy has provided a new driving force for the high-quality development of higher education in the new era. The deep integration of artificial intelligence, multimodal perception, and big data analysis technologies with higher education scenarios has reshaped the implementation form, operational logic, and evaluation system of traditional education work, providing solid technical support and

methodological basis for improving the quality, efficiency, and mode innovation of psychological education in universities. As an important component of the ideological and political education system in universities, psychological education is a fundamental project for cultivating positive psychological qualities, fostering a sound personality, and preventing and resolving psychological crises among college students. It plays a guarantee and supporting role in implementing the fundamental task of cultivating morality and talents.

Contemporary college students grow up in a social environment where digital media is highly

prevalent. The psychological development status and causes of psychological distress present complex, differentiated, and dynamic characteristics. Multiple problems such as academic pressure, social barriers, employment anxiety, and emotional adjustment difficulties are intertwined and overlapped, which puts forward more stringent standards for the accuracy, timeliness, and adaptability of psychological education in universities. At present, psychological education work of most colleges and universities still follows the traditional implementation paradigm, with static scale evaluation, unified classroom teaching, homogeneous group counseling, and experiential manual judgment as the main implementation methods. There are practical shortcomings such as lack of dynamic tracking, insufficient identification of individual differences, and weak targeted intervention capabilities, which are difficult to adapt to the personalized psychological development needs of different students. Against the background of digital transformation, relying on data-driven technology to reconstruct a personalized psychological education system and deepen the reform of mental health education has become an inevitable choice for universities to optimize the education system and improve the quality of education.

1.2 Research Significance

The existing academic achievements mainly focus on the application of artificial intelligence technology tools and the development of crisis warning functions. Systematic research on the deep coupling of data empowerment, personalized psychological education, and teaching reform is still relatively scarce, and a mature theoretical framework and logical system have not yet been formed. This study is based on the theories of education digitization and precision education, systematically explaining the internal mechanism, era value, and reform core of data-driven empowerment of personalized psychological education in universities. It fills the gaps in current fragmented research theories and incomplete system construction, further enriches the theoretical dimensions of psychological education teaching reform from the perspective of smart education, and provides a new research perspective for the deepening of intelligent psychological education theory.

This study is based on the practical pain points of psychological education in universities, and constructs a teaching reform path and education system with practicality and replicability, which can effectively solve practical problems such as homogenized supply, insufficient accuracy, lack of dynamism, and imperfect education loop in traditional psychological education. The reconstruction of multi-source data portrait system and the innovation of hierarchical classification teaching mode can promote the transformation of psychological education in universities from extensive "flood irrigation" to refined "precision drip irrigation", continuously enhance the scientific and targeted nature of mental health education, and provide a practical paradigm for the deepening of psychological education reform and the improvement of educational quality in colleges and universities.

1.3 Current Status of Research

With the continuous advancement of digital education reform, empowering psychological education in universities with big data and artificial intelligence has become a research hotspot in higher education both domestically and internationally. Chinese research mainly focuses on three major directions: technology application, model innovation, and ethical regulation. Some universities rely on digital platforms to build psychological education management systems,[1] which expand the coverage of psychological education and improve crisis screening efficiency through the establishment of psychological records for all staff, data sharing, and intelligent warning mechanisms. Some colleges and universities are exploring the integration model of "artificial intelligence + psychological assessment"[2] to optimize the accuracy of psychological risk identification, while integrating intelligent interaction and immersive digital technology into classroom scenes, enriching the implementation carrier of mental health education. The academic community generally recognizes the value of digital technology in assisting education, while clarifying that technology cannot replace the humanistic core of psychological education. It is necessary to carefully avoid the alienation and ethical risks of education caused by the abuse of technology[3]. Foreign research focuses on technology implementation and empirical testing, relying on

natural language processing, machine learning and other technologies to develop intelligent psychological accompaniment and emotion prediction models.[4] Based on massive student behavior data, the application effects of intelligent technology in emotional counseling, psychological prediction and anxiety intervention have been verified,[5] forming rich empirical research results.

Overall, existing research has confirmed the practical value of digital technology in empowering psychological education, but there are still significant shortcomings. Most research is limited to shallow and instrumental applications, failing to achieve a deep integration of technology empowerment with personalized education and teaching reform systems. The traditional single data application model is difficult to adapt to the dynamic and differentiated psychological development needs of students. There is a lack of systematic research in the current academic community on the reconstruction of teaching models and the construction of long-term mechanisms for personalized psychological education, which has reserved sufficient research space for the in-depth development of this study.

1.4 Research Ideas and Methods

The research mainly adopts the methods of literature analysis and logical analysis to carry out the research work. By systematically reviewing academic monographs, journal literature, and policy texts related to education digitization, data empowerment, psychological education in universities, and personalized teaching reform, clarifying the connotation boundaries and relevant theoretical foundations of core concepts, summarizing the achievements and shortcomings of existing research, and laying a solid theoretical foundation for this study. Based on the logical analysis method combined with the practical scenarios of psychological education in universities, this study deeply analyzes the internal operating mechanism of data empowerment in education, and combines the current pain points of teaching reform to extract personalized education reform paths that are suitable for the actual operation of universities, ensuring the scientific and practical applicability of research results.

2. THE CURRENT DILEMMA OF PERSONALIZED PSYCHOLOGICAL EDUCATION IN COLLEGES AND UNIVERSITIES

2.1 The Concept of Educating People Being Lagging Behind, and There Being Misconceptions About Technology-Oriented and Homogeneous Approaches

The updating of psychological education concepts in some colleges and universities lags behind the process of digital reform, and traditional homogeneous education thinking has formed a fixed inertia. Most universities still equate psychological education with classroom teaching and scale evaluation, and do not fully pay attention to individual psychological differences of students. The lack of differentiated education awareness leads to insufficient targeted education work. At the same time, some colleges and universities have obvious technology oriented cognitive biases, blindly introducing various intelligent assessment and warning tools, equating the overlapping application of technological equipment with the reform of the education mode, excessively pursuing technological innovation while neglecting the humanistic core of psychological education, and the disconnect between data collection and humanistic care. These have resulted in the separation of technological tool attributes and educational value attributes, forming a practical problem of formal education, and making it difficult to achieve the core goal of personalized education.

2.2 Incomplete Data System, Simple Data Collection, and Low Integration Degree

The completeness and utilization rate of data resources are the core elements that constrain the implementation of personalized psychological education. Currently, colleges and universities have not established a standardized and integrated psychological education data system. The data collection channels of most universities are relatively simple, overly relying on students' subjective psychological scale data, and not including objective behavioral data such as

classroom performance, campus social interaction, academic status, emotional feedback, etc. The data coverage is insufficient and the authenticity is limited. There are obvious data barriers between various departments on campus, and the data resources of the Student Engineering, Academic Affairs, Psychology Center, and Information Technology Department are fragmented, making it impossible to integrate and utilize fragmented data. The lack of specialized algorithm models also makes it difficult to deeply mine and accurately analyze massive amounts of data, and dynamic and three-dimensional psychological portraits cannot be effectively generated. Hidden psychological problems and personalized development needs are difficult to accurately identify.

2.3 Fixed Teaching Model and Insufficient Depth of Personalized Teaching Integration

In the process of promoting smart education reform, there is still a problem of solidification in the teaching mode of psychological education in universities, and the integration level of digital technology and personalized teaching is relatively shallow. The content of psychology courses is still mainly based on a unified system, with a lack of modular and layered content design. It is unable to adapt differentiated teaching content based on students' psychological traits and risk levels, and it is difficult to meet the diverse psychological growth needs of students. The application of intelligent technology is mostly limited to basic tool scenarios such as psychological screening and assessment statistics, and has not yet been deeply integrated into core teaching processes such as classroom teaching, psychological training, and daily counseling. The supply of intelligent immersive education scenarios is insufficient. The teaching implementation method still mainly relies on one-way knowledge imparting and homogeneous group counseling, and the application scope of personalized teaching models such as online intelligent guidance and one-on-one precise assistance is limited, making it difficult to implement the concept of individualized education.

2.4 Lack of Guarantee Mechanism, Incomplete Ethical Risk and Collaborative System

A long-term guarantee system is the fundamental support for the implementation and operation of personalized education empowered by data. Currently, universities have obvious shortcomings in institutional ethics, faculty construction, and collaborative mechanisms. Student psychological and behavioral data have high privacy attributes, and some universities have not yet established sound data management and confidentiality systems. The data storage, use, and sharing processes lack standardized constraints, and ethical risks such as privacy leakage, data abuse, and algorithm bias objectively exist, which can easily cause secondary psychological harm to susceptible students. The existing education faculty has a solid foundation in psychology, but their professional abilities in digital technology application and data analysis are generally insufficient, making it difficult to adapt to the intelligent and personalized new education model. The responsibilities of various education departments on campus are scattered, and there is a lack of linkage mechanism. The connection between data sharing, technical support, and education implementation is insufficient, making it difficult to form a collaborative education force.

3. THE PRACTICE PATH OF PERSONALIZED PSYCHOLOGICAL EDUCATION REFORM IN COLLEGES AND UNIVERSITIES DRIVEN BY DATA

3.1 Conceptual Innovation: Adhering to the Guidance of Values and Eliminating the Misconception of Technology-oriented Education

The deep reform of teaching model needs to be guided by the iterative updating of educational concepts, and the promotion of digital psychological education requires the deep coupling of technological empowerment and humanistic education. Universities need to abandon the traditional education thinking of extensive and homogeneous education, and construct a modern education concept that is people-oriented, precise

empowerment, and personalized adaptation. The core orientation of psychological teaching reform should be to meet students' personalized psychological needs and cultivate positive psychological qualities. The application of technological tools should always serve the core value of psychological education, avoid the formal reform tendency of emphasizing technology over humanities, balance the tool effectiveness of intelligent technology with the humanistic temperature of psychological education, rely on data to accurately identify students' psychological development shortcomings, supplemented by targeted humanistic care and value guidance, and achieve the organic unity of technological empowerment and value education.

3.2 System Reconstruction: Building a Multi-source Fusion Student Psychological Dynamic Portrait System

In response to the current reality of fragmented and one-dimensional data, universities need to reconstruct a dynamic psychological portrait system that integrates multiple heterogeneous data sources to provide data support for personalized teaching reform. By building a multidimensional data collection system that combines subjective assessment with objective behavior, integrating psychological scale data, classroom learning data, campus social data, online emotional feedback data, academic stress data, and psychological counseling records, a comprehensive collection of students' psychological states can be achieved. The establishment of an on-campus data sharing platform can effectively break down departmental data barriers, achieve unified storage, standardized management, and interconnection of various educational data. Relying on artificial intelligence algorithms and machine learning technology to deeply model and analyze multi-source data, dynamically update student psychological profiles, classify student development types based on psychological risk levels, and provide objective data support for hierarchical classification teaching and precise intervention.

3.3 Teaching Reform: Creating a Layered and Classified Personalized Psychological Teaching Model

Based on the classification results of dynamic psychological profiling, colleges and universities can promote the hierarchical reform of the psychological curriculum system and construct customized and differentiated personalized teaching models. By reconstructing the traditional unified curriculum content and setting up modular teaching units such as emotional management, stress adjustment, interpersonal communication, setback response, employment psychology, crisis prevention, etc., universal psychological literacy education is carried out for all students, targeted adjustment teaching is carried out for groups with psychological fluctuations, and one-on-one special assistance is provided for students with high-risk psychological states to achieve precise adaptation of teaching content. By relying on VR immersive technology, AI intelligent sand table, and generative AI technology, it is aimed to create experiential and interactive intelligent education scenarios. Through innovative forms such as AI empathy training, immersive psychological counseling, and intelligent narrative therapy, we aim to optimize the traditional classroom's single teaching model. The hybrid education model combining online intelligent guidance and offline precise assistance can achieve personalized psychological education services 24/7 and full coverage, effectively implementing the educational philosophy of teaching students according to their aptitude.

3.4 Process Optimization: Establishing a Full-chain Education Mechanism of "Screening - Warning - Intervention - Feedback"

The application of digital technology can optimize the implementation process of traditional psychological education, construct a closed-loop and dynamic full chain education mechanism, and solve the practical problem of passive and lagging traditional education. Normalized dynamic monitoring can replace periodic static screening, relying on multi-source data to capture students' psychological fluctuations and abnormal states in real time. The intelligent algorithm model can

complete the grading and automatic warning of psychological risks based on preset thresholds, and generate risk analysis reports in a timely manner. Teachers can develop differentiated intervention plans based on students' psychological profiles and risk levels, carry out normalized literacy cultivation for low-risk students, implement targeted psychological adjustment for medium risk students, and implement specialized intervention measures such as professional counseling, home school linkage, and medical referral for high-risk students. Continuous psychological state tracking can achieve dynamic feedback on intervention effects. It is necessary to update students' psychological profiles and education plans in real time, and form a complete education closed-loop system.

3.5 Scenario Innovation: Enriching Data to Empower Personalized Education Practice Scenarios

Relying on the innovative advantages of smart education technology and combining with the practical needs of psychological education reform, there is a must to diversify and expand the scenarios of data empowerment for education. The AI empathy training sandbox built based on micro expression recognition and speech emotion analysis technology can provide customized ability training for personalized problems such as weak interpersonal communication and insufficient emotional expression ability of students, and enhance their emotional management and social adaptation abilities. The psychological growth digital twin system can fully record students' psychological development trajectory, and combine dynamic data to push personalized growth tasks and psychological training plans, guiding students to complete independent psychological adjustment. Generative AI technology can customize personalized chemotherapy recovery plans and psychological narrative content based on students' emotional states, combined with VR immersive experience scenes to alleviate negative emotions such as anxiety and stress, achieving precise education effects for thousands of people.

4. CONCLUSION

In the process of digital transformation of education, data-driven approach has become the core lever for the reform of psychological education

in colleges and universities, and is the key path to solving the dilemma of homogenization, statics, and inefficiency in traditional psychological education. This study systematically reviews the current development status of personalized psychological education in colleges and universities and finds that the core factors restricting the implementation of precise education are the solidification of educational concepts, incomplete data systems, single teaching models, and inadequate guarantee mechanisms. Based on the perspective of higher education management and teaching reform, this study combines the four-dimensional operation logic of data empowerment, and builds a comprehensive reform path from the aspects of conceptual innovation, data system reconstruction, personalized teaching reform, education process optimization, and scenario innovation. It can effectively promote the transformation of psychological education in universities from an experience driven paradigm to a precision education paradigm empowered by data. The relevant research results can effectively improve the teaching reform system of psychological education under the digital background, providing theoretical support and practical reference for the high-quality development of psychological education in colleges and universities in the new era. In the future, empirical research can be conducted in conjunction with the practice of educating students in universities, continuously optimizing personalized education reform plans, relying on cutting-edge digital technology to iteratively upgrade education models, and continuously improving the scientificity, accuracy, and effectiveness of psychological education in universities.

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