Membrane Technology
ISSN (online): 1873-4049

The Factors Influencing the Transfer of Learning Outcomes in College Students' Mental Health Courses Using Data Mining

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Abstract:
This work aims to utilize data mining techniques to analyze the factors influencing the transfer of learning outcomes in college students' mental health courses. It explores the role of self-interpretation in indirectly promoting the transfer of learning outcomes to daily life situations by influencing course satisfaction. Based on social cognitive theory and self-determination theory, a theoretical model is developed to examine the relationships between self-interpretation, course satisfaction, and the transfer of learning outcomes. The work utilizes a questionnaire survey method, randomly selecting 250 university students from multiple domestic universities as the sample. Data are collected using a self-interpretation scale, a course satisfaction questionnaire, and a learning outcomes transfer assessment tool. Statistical software is used for data analysis, including descriptive statistics, correlation analysis, and path analysis to test the hypothesized relationships. The results show that self-interpretation is significantly positively correlated with both course satisfaction and the transfer of learning outcomes. Furthermore, self-interpretation plays a significant mediating role between course satisfaction and the transfer of learning outcomes. Course satisfaction promotes the transfer of learning outcomes through both direct and indirect pathways (by enhancing self-interpretation). Additionally, factors such as gender, age, and academic background are found to moderate these relationships to some extent. This work provides empirical evidence for the design and teaching strategies of mental health courses, emphasizing the importance of cultivating positive self-interpretation skills. The work also offers strategic guidance for educators to enhance course satisfaction and promote knowledge transfer through data mining techniques.

Keywords: data mining; mental health courses; self-interpretation; course satisfaction; transfer of learning outcomes.

INTRODUCTION

Research Background and Motivations

As mental health issues among college students become increasingly prominent, mental health education plays an increasingly important role in the higher education system. In recent years, a growing body of research has shown that mental health courses not only help improve students' mental health levels but also have a positive impact on their academic performance and overall quality of life. However, despite the achievements made by mental health courses in improving the psychological well-being of college students, effectively transferring the learning outcomes from these courses to everyday life remains an urgent issue that needs to be addressed [1-3]. In response, universities have widely implemented mental health education courses aimed at raising students' mental health awareness and teaching coping strategies to support their overall development. However, existing research lacks an in-depth exploration of how students engage in self-interpretation during these mental health courses—that is, how they understand and interpret their inner experiences and external events—and how this self-interpretation influences course satisfaction. Additionally, there is a gap in understanding how these factors further affect the transfer of learning outcomes, meaning the ability to apply classroom knowledge to real-life situations. This work aims to fill this gap by examining the relationships among students' self-interpretation in mental health courses, course satisfaction, and subsequent transfer of learning outcomes. The goal is to provide empirical evidence to enhance the effectiveness of course design and to promote student mental health.

To explore these relationships in depth, this work utilizes data mining techniques to analyze the factors influencing the transfer of learning outcomes from mental health courses among college students. Data mining techniques, through the exploration and analysis of large volumes of educational data, can reveal patterns and trends hidden within the data, thereby providing a scientific basis for educational decision-making. The work collects data using a questionnaire survey method, including a self-interpretation scale, a course satisfaction questionnaire, and a learning outcome transfer assessment tool. A random sample of 250 college students from multiple universities in China is selected. Data analysis employs descriptive statistics, correlation analysis, and path analysis to verify the hypothesized relationships.

Research Objectives

The objective of this work is to construct a theoretical model using data mining techniques to examine the relationships among self-interpretation, course satisfaction, and the transfer of learning outcomes. Specifically, first, analyze the characteristics of university students' self-interpretation in mental health courses. Second, assess the level of student satisfaction with mental health courses. Third, explore how self-interpretation and course satisfaction jointly influence the transfer of learning outcomes. Fourth, provide strategic recommendations for optimizing the design and teaching methods of mental health courses. This work aims to provide empirical evidence for the design and teaching strategies of mental health courses, emphasizing the importance of fostering positive self-interpretation skills. Additionally, the work intends to offer strategic guidance to educators on enhancing course satisfaction to promote knowledge transfer using data mining techniques.

LITERATURE REVIEW

This section aims to review the worldwide relevant research on university students' mental health, self-interpretation theory, course satisfaction, and the transfer of learning outcomes. By examining previous theoretical and empirical findings, it clarifies the theoretical positioning and practical significance of the present study, and identifies gaps in the current research. In recent years, the mental health issues of university students have become a key focus in educational psychology and higher education research [4-6]. Innab et al. (2023) highlighted that academic pressure, interpersonal relationships, and uncertainty regarding future career plans are major factors affecting university students' mental health [7]. Costello et al. (2022) found that university students' psychological distress primarily manifests as anxiety, depression, and a lack of self-efficacy [8]. These studies collectively emphasize the necessity of enhancing mental health education and support systems.

Self-interpretation theory emphasizes how individuals' interpretations of life events influence their psychological states [9-11]. In the field of mental health, self-interpretation is seen as a mediating mechanism that regulates mental health [12-14]. Ostrowski et al. (2023) found a significant positive correlation between positive self-interpretation and lower levels of psychological distress [15]. Lattie et al. (2019) examined the impact of self-interpretation styles on university students' stress responses, indicating that positive self-interpretation could effectively alleviate stress and improve mental health [16].

Course satisfaction is an important indicator of educational quality. Factors such as course design, quality of teacher-student interaction, and learning environment are widely considered key determinants of course satisfaction [17-19]. Kryshko et al. (2023) pointed out that the practicality and interactivity of course content were crucial for enhancing satisfaction with online courses. Due to the unique nature of mental health courses, the relevance of the content, innovative teaching methods, and the professionalism of the instructors are considered significant factors affecting student satisfaction [20].

Learning outcomes transfer refers to how individuals apply the knowledge and skills acquired in the classroom to new contexts [21-23]. In the field of mental health education, transferability is especially important as it directly relates to students' ability to convert classroom learning into coping strategies for real-life situations [24-26]. Treloar et al. (2019) found that emotional engagement and practical opportunities were key factors in promoting the transfer of mental health knowledge [27].

Although the aforementioned studies provide a rich theoretical and empirical foundation for understanding university students' mental health, self-interpretation, course satisfaction, and learning outcomes transfer, there are still some gaps in the current research. First, there is a lack of micro-level analysis on the process of self-interpretation in mental health courses, particularly on how course design can promote positive self-interpretation. Next, while the relationship between course satisfaction and learning outcomes transfer is widely recognized, empirical studies exploring self-interpretation as a mediating variable in this relationship are scarce. Therefore, this work aims to fill these gaps through empirical analysis, providing more specific and practical strategies to enhance the effectiveness of mental health courses and promote university students' mental health.

RESEARCH MODEL

This section aims to construct a theoretical model to systematically articulate the hypothesized relationships among self-interpretation, course satisfaction, and the transfer of learning outcomes. It defines the research variables and their expected pathways, providing a theoretical framework for subsequent empirical research.

First, overview of the Theoretical Framework. The research model is based on social cognitive theory, self-determination theory, and learning transfer theory [28,29], considering the cognitive processing, emotional attitudes, and behavioral performance of individuals. It is hypothesized that the design and implementation of mental health courses not only directly influence students' learning experiences and satisfaction but also indirectly affect the transfer of learning outcomes to daily life contexts by promoting positive self-interpretation.

Second, definition of Research Variables. Self-Interpretation: it refers to how individuals understand and interpret their inner experiences and external events, especially when engaging with the learning content and contexts of mental health courses. It involves forming perceptions of one's own abilities, value, and sense of control [30]. Course Satisfaction: it reflects students' overall satisfaction with the mental health course, including evaluations of course content, teaching methods, teacher-student interactions, and other aspects [31]. Learning Outcomes Transfer: it refers to the ability of students to successfully apply the knowledge, skills, and attitudes acquired in mental health courses to their daily lives, thereby improving their personal mental health status and coping strategies [32].

Third, hypothesized Relationships. Table 1 outlines the construction of hypothesized relationships.

Table 1. Hypothesized Relationships Construction

Dimension	Content
H1 (Relationship between Self-interpretation and Course Satisfaction)	Positive self-interpretation is positively correlated with higher course satisfaction. It is expected that when students exhibit positive self-interpretation in mental health courses (such as viewing challenges as growth opportunities), they will have higher identification and engagement with the course content, thereby increasing course satisfaction.
H2 (Relationship between Course Satisfaction and Learning Outcomes Transfer	Higher course satisfaction indicates stronger learning outcomes transfer ability. Based on social cognitive theory, when students are satisfied with the course, they are more likely to actively absorb knowledge, enhance learning motivation, and consequently facilitate the transfer of knowledge and skills.
H3 (Direct Impact of Self-interpretation on Learning Outcomes Transfer)	Positive self-interpretation directly promotes the transfer of learning outcomes. Self-interpretation can influence individuals' choice of learning strategies and self-efficacy, enabling them to more effectively apply mental health knowledge when facing real-life challenges.
H4 (Role of Self-interpretation as a Mediating Variable)	Self-interpretation mediates the relationship between course satisfaction and learning outcomes transfer. This means that course satisfaction indirectly promotes the transfer of learning outcomes by influencing students' self-interpretation. A positive course experience enhances positive self-interpretation in students, thereby improving their ability to apply classroom knowledge to real-life situations.

Fourth, research Model Diagram. This conceptual model diagram visually illustrates the hypothesized paths of H1 to H4, including the direct and indirect relationships among self-interpretation, course satisfaction, and learning outcomes transfer, as shown in Fig. 1 below:

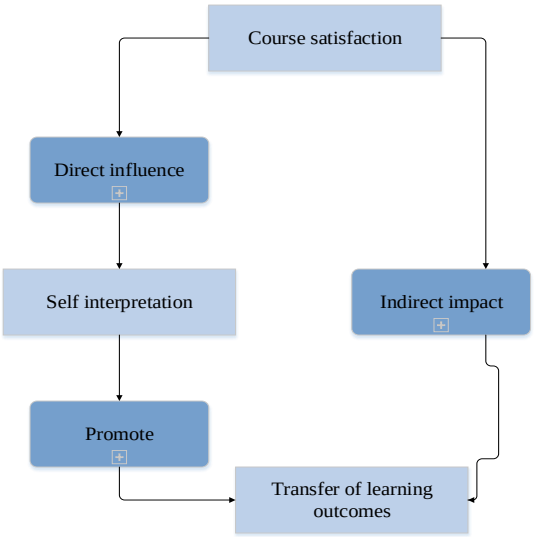

Figure 1. Research Model Framework

EXPERIMENTAL DESIGN AND PERFORMANCE EVALUATION

Datasets Collection

This work aims to comprehensively and accurately collect data on university students' self-interpretation, course satisfaction, and learning outcomes transfer in mental health courses. It designs a comprehensive survey tool comprising three core

components: a self-interpretation scale, a course satisfaction questionnaire, and a learning outcomes transfer assessment tool. The questionnaire's design is based on relevant theories and scales mentioned in the previous literature review, ensuring its scientific validity and effectiveness.

1) Design of the Self-Interpretation Scale: The self-interpretation scale aims to measure students' thinking patterns when facing learning challenges and achievements in mental health courses [33]. The scale includes dimensions such as attribution styles (internal vs. external attributions), emotional reactions (e.g., optimism, pessimism), self-efficacy, and locus of control. It adopts a 5-point Likert scale ranging from "strongly disagree" to "strongly agree," ensuring sensitivity and discriminative power. The scale design draws from attribution theory and related scales [34,35], with appropriate adjustments made to fit the characteristics of university students in mental health courses.

2) Development of Course Satisfaction Questionnaire: The course satisfaction questionnaire aims to assess students' overall satisfaction with the mental health course, including aspects such as course content, teaching methods, teacher-student interactions, and classroom atmosphere. The questionnaire design follows the satisfaction assessment framework. It employs a mixed-method design that includes closed-ended questions (using a 5-point scale to evaluate various indicators) and open-ended questions (such as "What do you think needs the most improvement in the course?"). This is to gather both quantitative and qualitative data, allowing for specific ratings and genuine feedback and suggestions from students.

3) Development of Learning Outcomes Transfer Assessment Tool: The learning outcomes transfer assessment tool aims to measure the extent and effectiveness of students' application of mental health course knowledge in their daily lives. The assessment tool comprises a self-report scale and situational simulation tests. The self-report scale focuses on aspects such as knowledge application, skill transfer, attitude changes, requiring students to evaluate how they apply course content in specific situations (dealing with exam stress and managing interpersonal relationships). Situational simulations are designed around typical life or study scenarios, prompting students to describe how they would use their learned knowledge to solve problems in these scenarios, thus assessing their actual transfer abilities. The development of this tool draws from learning transfer theory [36] and integrates specific practices from mental health education.

4) Sample Selection and Data Collection: This work plans to select a sample of university students from different regions and types of institutions through random sampling. Questionnaires are distributed using a combination of online platforms (electronic survey platforms) and offline methods (paper-based surveys) to improve response rates and representativeness. Before collecting data, ethical approval is obtained from the school's ethics review committee. All participants are fully informed and participate voluntarily, ensuring the protection of participant privacy and data security.

Experimental Environment

In order to ensure the research representativeness and universality, this work adopts a rigorous strategy in selecting the experimental environment, aiming to cover diverse regions, levels, and scales of higher education institutions, thereby ensuring sample diversity. Specifically, the following points are key elements in the design of the experimental environment:

1) Criteria for selecting sample universities: First, based on the regional distribution of higher education in China, several universities are selected from the eastern, central, and western regions to ensure geographical representation. Additionally, considering that different types of higher education institutions may have varying needs and effects on students' mental health education, the work includes various institutions such as "Double First-Class" universities, regular undergraduate colleges, and higher vocational colleges. It aims to cover student populations with different academic levels and educational goals.

2) Ensuring diversity of student samples: Within each selected university, a stratified random sampling method is employed to ensure balanced distribution of samples across grades, majors, gender, and urban-rural backgrounds. Special attention is given to specific groups (such as ethnic minority students, international students, and economically disadvantaged students) to ensure their voices are reflected in the study, thereby enhancing the comprehensiveness and depth of the research results.

3) Standardization and flexibility in implementation environment: Although the experimental environment spans multiple universities, during the data collection phase, all participating universities adhere to a unified operational process and standards. For example, they use the same questionnaire version, and maintain consistent time windows for questionnaire distribution and collection to ensure synchronicity and consistency in data collection. Meanwhile, considering the specific circumstances of different universities, appropriate adjustments are made to the specific arrangements for data collection, such as distributing questionnaires according to the school's teaching schedule, without compromising data quality and research objectives.

4) Integration of virtual and physical environments: Given the current trend of digital education, this work incorporates both online and offline methods in data collection. Utilizing electronic survey platforms for online data collection is convenient and efficient, reaching a more diverse student population, especially those who cannot physically visit campuses due to various reasons. Simultaneously, traditional paper-based surveys are retained to ensure no omission of respondents due to technological limitations or preferences for traditional methods, thereby ensuring comprehensive sample coverage.

Parameters Setting

To ensure the research scientific rigor, effectiveness, and reliability, this work has meticulously planned its parameter settings, covering determination of sample size, selection of sampling methods, and preliminary planning of data analysis. Here are the specific details:

1) Determination of sample size: The determination of sample size is based on statistic power analysis to ensure the statistical significance of the research results. This work draws on experiences from similar studies [37,38]. Moreover, it considers the expected effect sizes between independent and dependent variables, the desired statistical power (typically set at 0.80, indicating an 80% probability of detecting true effects), the significance level (α usually set at 0.05), and anticipated complex relationships among variables. Subsequently, this work preliminarily calculates the minimum required sample size based on these considerations. In addition, considering potential dropout rates (such as incomplete questionnaires or invalid data), the actual sample size is moderately increased by 10% to 20% over the theoretical calculation basis. This adjustment ensures sufficient data support for the final analysis.

2) Selection of sampling methods: A combination of stratified random sampling and cluster sampling methods is employed. Initially, the population is stratified based on characteristics such as university type (first-tier, second-tier, vocational colleges), geographical region (eastern, central, western), student population size, ensuring representation from each stratum. Subsequently, a random selection of a certain number of classes or departments within each stratum serves as the sampling units, followed by random selection of students within the chosen classes or departments for participation in the survey. This composite sampling method ensures sample representativeness while considering practicality and efficiency in operation.

3) Data analysis plan: The data analysis plan consists of several stages including data preprocessing, descriptive statistics, hypothesis testing, and model building and validation: Data preprocessing involves cleaning (removing invalid or outlier values), handling missing values (using methods such as mean imputation or predictive modeling), and standardizing or normalizing data to ensure consistency and quality for subsequent analysis. Descriptive statistics describe basic characteristics of the sample, including frequency distributions, measures of central tendency, and dispersion to understand the sample's profile. Hypothesis testing employs statistical methods like t-tests, ANOVA, chi-square tests, to examine differences between variables and validate research hypotheses. Model building and validation utilize mediation analysis methods to explore relationships among self-interpretation, course satisfaction, and learning outcomes transfer, validating the theoretical model. Model fit is assessed using indicators such as χ^2 test, CFI, RMSEA, among others.

Performance Evaluation

This section assumes data collection has been completed and data analysis has been conducted using SPSS statistical software. Below is an example of how to organize and present analysis results, including hypothesis testing, correlation analysis, and path analysis results.

1) Hypothesis Testing Results: Fig. 2 illustrates t-test results of self-interpretation and course satisfaction.

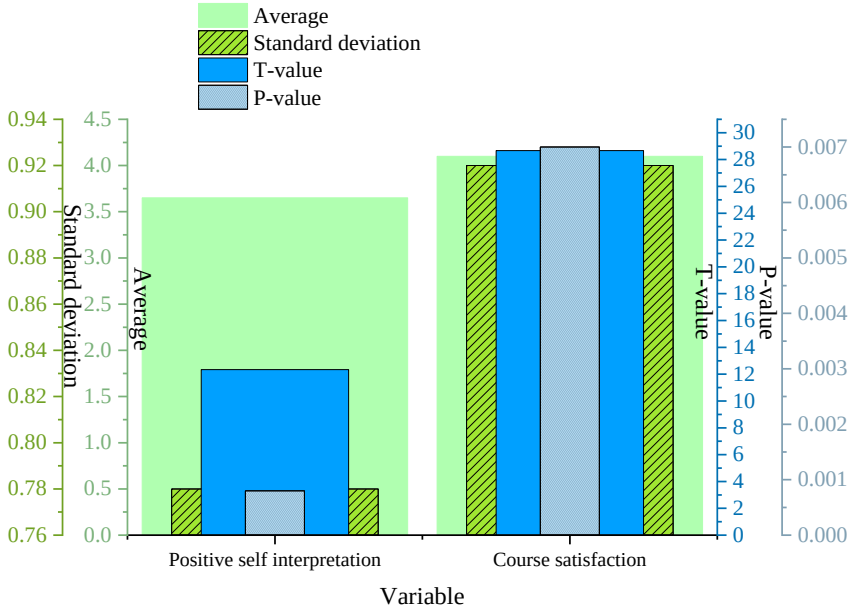

Figure 2. Hypothesis Testing Results

Figure 2 shows that scores of both self-interpretation and course satisfaction are significantly higher than the median, with a significant difference ($p < 0.001$). It suggests that university students in the sample generally exhibit positive self-interpretation attitudes and are highly satisfied with the mental health course.

2) Correlation Analysis. Fig. 3 displays the Pearson correlation coefficients between variables:

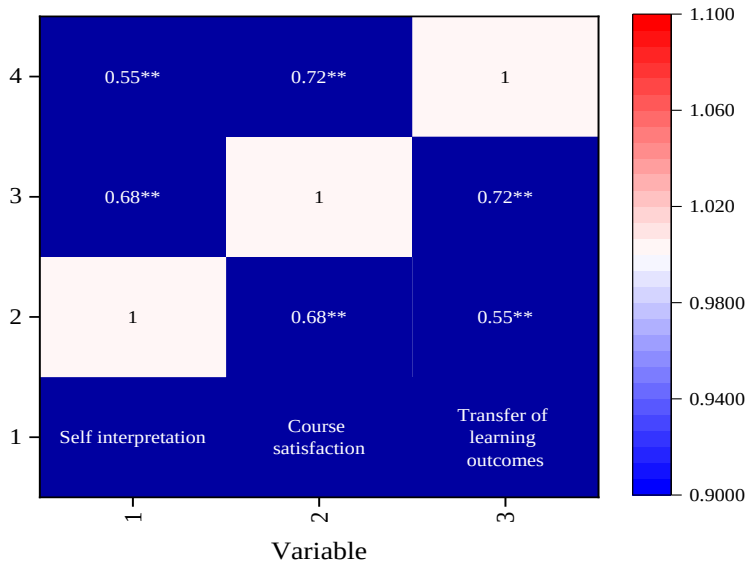

Figure 3. Correlation Analysis Results

Figure 3 reveals that self-interpretation is significantly positively correlated with both course satisfaction and learning outcomes transfer. Moreover, course satisfaction is highly positively correlated with learning outcomes transfer, supporting the direct relationships hypothesized before.

3) Path Analysis and Model Fit Results. This work analyzes the results of path analysis and model fit. Figs. 4 and 5 present the results.

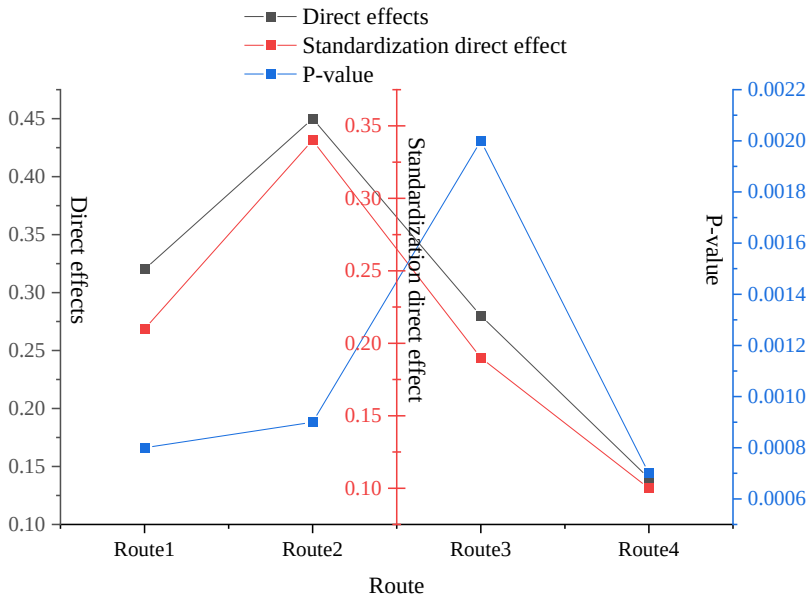

Figure 4. Path Analysis Results (Route1: Course Satisfaction → Self-Interpretation; Route2: Self-Interpretation → Learning Outcomes Transfer; Route3: Course Satisfaction → Learning Outcomes Transfer (Direct); Route4: Course Satisfaction → Learning Outcomes Transfer (Indirect through Self-Interpretation))

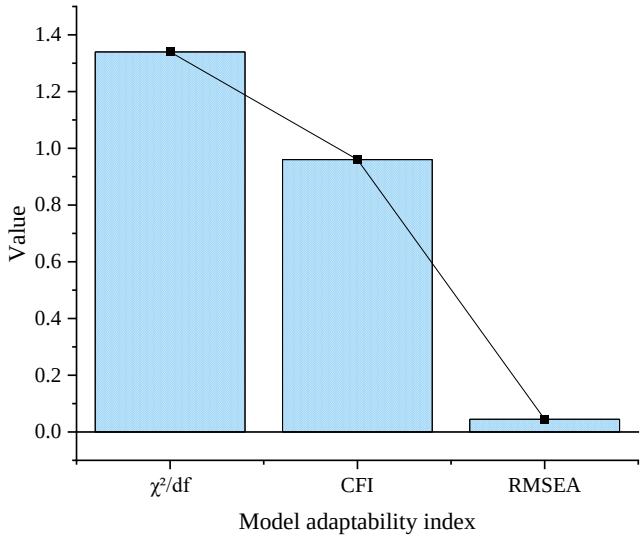

Figure 5. Model Fit Results

Figure 5 displays that path analysis reveals both direct and indirect effects. Specifically, course satisfaction not only directly promotes learning outcomes transfer (direct effect) but also indirectly enhances learning outcomes transfer by improving the level of self-interpretation (indirect effect). This confirms the mediating role of self-interpretation in the process. Model fit indices indicate that the theoretical model constructed aligns well with the empirical data.

4) Basic Demographic Statistics of Survey Participants. This work conducts statistical analysis on the basic demographic characteristics of survey participants. Fig. 6 presents the results.

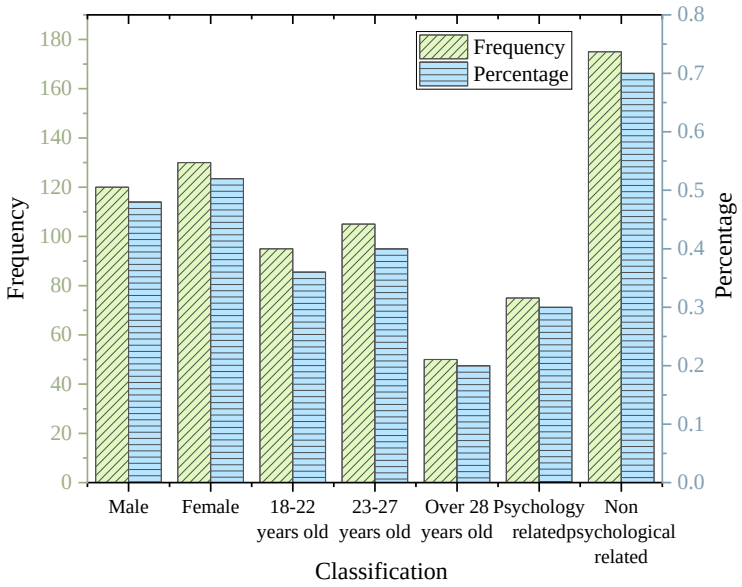

Figure 6. Basic Demographic Statistics of Survey Participants

Figure 6 displays the following demographic breakdown: Gender distribution shows a slight majority of females among survey participants, comprising 52%, while males make up 48%. Age distribution reveals that the majority fall within younger age groups, with 18-22 years old and 23-27 years old together accounting for 80% of the sample, indicating that the sample primarily consists of young undergraduate or graduate students. Participants aged 28 years and older constitute a smaller proportion, at 20%. Regarding academic backgrounds, 70% of participants are from non-psychology-related majors, whereas 30% are from psychology-related majors. This distribution aids in analyzing whether there are differences in self-interpretation, course satisfaction, and learning outcomes transfer across different academic backgrounds.

Discussion

The research findings indicate that positive self-interpretation not only directly impacts learning outcomes transfer but also serves as a mediator between course satisfaction and learning outcomes transfer, highlighting its crucial role in facilitating knowledge application. This discovery aligns with other studies, such as Eccles et al. (2023), who found a correlation between positive self-interpretation and lower levels of psychological distress, indirectly supporting the positive effects of self-interpretation on learning outcomes [39]. This work further clarifies that through positive self-interpretation, students can more effectively transform classroom knowledge into practical applications, providing a new perspective for educational interventions. By cultivating students' habits of positive self-interpretation, their adaptability and creativity in facing learning challenges can be enhanced.

Both the direct and indirect impacts of course satisfaction on learning outcomes transfer have been confirmed. It indicates that enhancing course quality not only directly enhances students' learning effectiveness but also further promotes knowledge transfer and application by stimulating positive self-interpretation among students. Mohamad et al. (2023) emphasized the importance of course design [40]. However, this work goes further to reveal the mediation mechanism between satisfaction and learning transfer, offering more refined guidance for course design and teaching strategies. Particularly, enhancing students' identification with and engagement in course content can effectively promote their self-efficacy and learning motivation, which has been less emphasized in foreign research. The findings of this work hold profound implications for educational practice. Drawing on the theories of Reis et al. (2023), Caban et al. (2023), and Salvane et al. (2024) [41-43], targeted modules for self-interpretation training can be developed and integrated into mental health courses to enhance students' self-efficacy and sense of control.

CONCLUSION

Research Contribution

This work reveals the critical role of self-interpretation in mental health education, demonstrating its direct promotion of learning outcomes transfer and its significant mediation between course satisfaction and transfer. Theoretically, it expands the application

scope of self-interpretation and deepens understanding of learning transfer mechanisms. In practice, it provides a basis for course design and emphasizes the importance of enhancing students' self-interpretation abilities and course satisfaction. It guides educators to adopt interactive teaching methods to enhance the practicality of content and teaching interaction. Furthermore, the work utilizes data mining techniques to analyze a large amount of data, providing more precise conclusions and guidance. It offers a localized perspective for cross-cultural mental health education strategies, fostering educational innovation from an international viewpoint.

Future Works and Research Limitations

Although this work has made significant progress in exploring the relationships among self-interpretation, course satisfaction, and learning outcomes transfer, it still has certain limitations that leave ample room for future research. First, the sample is limited to specific universities in a particular region. Future studies could broaden the sample scope nationally or even internationally to enhance the generalizability of conclusions and deepen cross-cultural comparisons. Then, while the measurement tools used are based on existing theories, future research could further validate the reliability and validity of these tools or develop more targeted scales to accurately capture subtle differences in mental health education. Additionally, the work employs a cross-sectional design, which does not track changes in learning outcomes over time. Future research could adopt longitudinal designs to explore the dynamic relationships among these variables over time and investigate differences among various student groups (such as different academic backgrounds, grades, genders). This would provide a basis for developing personalized mental health education strategies. By overcoming these limitations, future explorations can comprehensively reveal the underlying mechanisms of mental health education, thereby promoting continuous optimization and innovation in educational practices.

REFERENCES

[1] G. Wilcox and D. Nordstokke, “Predictors of University Student Satisfaction with Life, Academic Self-Efficacy, and Achievement in the First Year,” Can J High Educ, vol. 49, no. 1, pp. 104-124, 2019.

[2] A. Peipert, N. Rodriguez-Quintana, and L. Lorenzo-Luaces, “Outcomes of student trainee-delivered cognitive behavioral therapy (CBT) on internalizing symptoms, CBT skills, and life satisfaction,” Int J Cogn Ther, vol. 15, no. 1, pp. 94-113, 2022.

[3] M. Díaz-Millón, I. Rivera-Trigueros, and J. Gutiérrez-Artacho, “Student satisfaction with a micro-learning approach in distance translation and interpreting training: an empirical investigation,” Interpret Transl Tra, vol. 17, no. 3, pp. 434-453, 2023.

[4] J. Ellinger, F. Mess, S. Blaschke, et al., “Health-related quality of life, motivational regulation and Basic Psychological Need Satisfaction in Education Outside the Classroom: an explorative longitudinal pilot study,” BMC Public Health, vol. 22, no. 1, pp. 49, 2022.

[5] S. I. Shattla, N. E. Sabola, H. M. Shereda, et al., “Impact of clinical simulation on Student's Levels of motivation, satisfaction and self-confidence in learning psychiatric mental health nursing,” Int J Spec Educ, vol. 37, no. 3, pp. 6214-28, 2022.

[6] E. A. Santi, G. Gorghiu, and C. Pribeanu, “Perceived Self-Efficacy and Course Satisfaction in Students Preparing for Teaching Careers,” Probl Educ 21st Cent, vol. 81, no. 5, pp. 687-701, 2023.

[7] A. Innab, F. Aldawood, N. O. Abdali, et al., “The Influence of Satisfaction with E-Learning on the Psychological State of Nursing Students,” Perspect Psychiatr C, vol. 2023, no. 1, pp. 7173412, 2023.

[8] M. A. Costello, A. G. Nagel, G. L. Hunt, et al., “Facilitating connection to enhance college student well-being: Evaluation of an experiential group program,” Am J Commun PsychoL, vol. 70, no. 3-4, pp. 314-326, 2022.

[9] C. Wang, H. J. Cho, B. Wiles, et al., “Competence and autonomous motivation as motivational predictors of college students’ mathematics achievement: From the perspective of self-determination theory,” Int J Stem Educ, vol. 9, no. 1, pp. 41, 2022.

[10] S. Janke, L. A. S. Messerer, and M. Daumiller, “Motivational development in times of campus closure: Longitudinal trends in undergraduate students' need satisfaction and intrinsic learning motivation,” Brit J Educ Psychol, vol. 92, no. 4, pp. 1582-1596, 2022.

[11] M. Fearnley, C. Malay, and J. N. Fabia, "Factors affecting student satisfaction, perceived learning and academic performance in an emergency online science course," International Journal of Information and Education Technology, vol. 12, no. 12, pp. 1354-1362, 2022.

[12] T. Chen, H. Luo, Q. Feng, et al., "Effect of technology acceptance on blended learning satisfaction: The serial mediation of emotional experience, social belonging, and higher-order thinking," International Journal of Environmental Research and Public Health, vol. 20, no. 5, pp. 4442, 2023.

[13] S. C. Grace, J. M. Mejia, M. Inhofe Rapert, et al., "Emotional awareness in time of disruption: The impact of tolerance for ambiguity, worry, perceived stress, helpful communication, and past experience on student satisfaction," Marketing Education Review, vol. 31, no. 3, pp. 226-240, 2021.

[14] M. An, X. Ma, and H. Wu, "Medical students' academic satisfaction: Social cognitive factors matter," Medical Education, vol. 57, no. 12, pp. 1239-1247, 2023.

[15] J. L. Ostrowski, B. Durics, J. Vallorosi, et al., "Frequency of, confidence in, and educational satisfaction with mental illness recognition and referral among certified athletic trainers," J Athl Training, vol. 58, no. 1, pp. 71-78, 2023.

[16] E. G. Lattie, E. C. Adkins, N. Winquist, et al., "Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students: systematic review," J Med Internet Res, vol. 21, no. 7, pp. e12869, 2019.

[17] C. H. Liao, C. T. Chiang, I. C. Chen, et al., "Exploring the relationship between computational thinking and learning satisfaction for non-STEM college students," Int J Educ Technol H, vol. 19, no. 1, pp. 43, 2022.

[18] K. R. Sibbald and D. E. MacKenzie, "Sequential simulations during introductory part-time fieldwork: Design, implementation, and student satisfaction," The Open Journal of Occupational Therapy, vol. 11, no. 3, pp. 1-12, 2023.

[19] H. Sharif Nia, J. Marôco, L. She, et al., "Student satisfaction and academic efficacy during online learning with the mediating effect of student engagement: A multi-country study," Plos one, vol. 18, no. 10, pp. e0285315, 2023.

[20] O. Kryshko, J. Fleischer, C. Grunschel, et al., "University students' self-efficacy for motivational regulation, use of motivational regulation strategies, and satisfaction with academic studies: Exploring between-person and within-person associations," J Educ Psychol, vol. 115, no. 4, pp. 571., 2023.

[21] K. Tzafilkou, M. Perifanou, and A. A. Economides, "Factors affecting teachers' transfer of ICT training: Considering usefulness and satisfaction in a PLS-SEM transfer training model," J Adult Contin Educ, vol. 29, no. 1, pp. 86-105, 2023.

[22] P. Warfvinge, J. Löfgreen, K. Andersson, et al., "The rapid transition from campus to online teaching–how are students' perception of learning experiences affected? , " Eur J Eng Educ, vol. 47, no. 2, pp. 211-229, 2022.

[23] S. Yoon, S. An, D. H. Noh, et al., "Effects of health education on adolescents' non-cognitive skills, life satisfaction and aspirations, and health-related quality of life: A cluster-randomized controlled trial in Vietnam," PloS one, vol. 16, no. 12, pp. e0259000, 2021.

[24] H. E. Frank, E. M. Becker-Haimes, and P. C. Kendall, "Therapist training in evidence-based interventions for mental health: A systematic review of training approaches and outcomes,". Clin Psychol-Sci Pr, vol. 27, no. 3, pp. 20, 2020.

[25] A. Alam and A. Mohanty, "Happiness Engineering: impact of hope-based intervention on life satisfaction, self-worth, mental health, and academic achievement of Indian school students," Cogent Educ, vol. 11, no. 1, pp. 2341589, 2024.

[26] C. Du, C. Liu, P. Balamurugan, et al., "Deep learning-based mental health monitoring scheme for college students using convolutional neural network," International Journal on Artificial Intelligence Tools, vol. 30, no. 06n08, pp. 2140014, 2021.

[27] A. Treloar, M. McMillan, T. Stone, et al., "Developing criteria for the selection of contemporary stimulus material in mental health nursing education: Engaging students and meeting curriculum goals-part 1: Critical analysis of simulation and stimulus material in mental health nursing education," Journal of Problem-Based Learning, vol. 6, no. 1, pp. 10-20, 2019.

[28] A. Padmanabhanunni and T. B. Pretorius, "Job satisfaction goes a long way: The mediating role of teaching satisfaction in the relationship between role stress and indices of psychological well-being in the time of COVID-19," International Journal of Environmental Research and Public Health, vol. 19, no. 24, pp. 17071, 2022.

[29] K. Kaspar, K. Burtniak, and M. Rüth, "Online learning during the Covid-19 pandemic: how university students' perceptions, engagement, and performance are related to their personal characteristics," Current Psychology, vol. 43, no. 18, pp. 16711-16730, 2024.

[30] L. Orsolini, S. Pompili, V. Salvi, et al., "A systematic review on telemental health in youth mental health: focus on anxiety, depression and obsessive-compulsive disorder," Medicina, vol. 57, no. 8, pp. 793, 2021.

[31] E. J. Thandevaraj, N. A. N. Gani, and M. K. M. Nasir, "A review of psychological impact on students online learning during covid-19 in malaysia," Creative Education, vol. 12, no. 6, pp. 1296-1306, 2021.

[32] G. A. Nagy, C. M. Fang, A. J. Hish, et al., "Burnout and mental health problems in biomedical doctoral students," Cbe-Life Sci Educ, vol. 18, no. 2, pp. ar27, 2019.

[33] A. Safak-Ayvazoglu and F. Kunuroglu, "Acculturation experiences and psychological well-being of Syrian refugees attending universities in Turkey: A qualitative study," j divers high educ, vol. 14, no. 1, pp. 96, 2021.

[34] D. Hammoudi Halat, A. Soltani, R. Dalli, et al., "Understanding and fostering mental health and well-being among university faculty: A narrative review," Journal of clinical medicine, vol. 12, no. 13, pp. 4425, 2023.

[35] S. Pradhan, "Satisfaction With Life and Psychological Well-Being in TA Trainees," Transactional Analysis Journal, vol. 54, no. 2, pp. 164-179, 2024.

[36] S. Bhargava and R. Sharma, "Student engagement through teamwork skills: the mediating role of psychological well-being," High Educ Skill Work, vol. 14, no. 2, pp. 271-292, 2024.

[37] E. Çınar-Tanrıverdi and A. Karabacak-Çelik, "Psychological need satisfaction and academic stress in college students: mediator role of grit and academic self-efficacy," European Journal of Psychology of Education, vol. 38, no. 1, pp. 131-160, 2023.

[38] A. Mustafa, N. Y. Shafeeq, "Mental Health And Job Satisfaction As Predictors Of Teacher Effectiveness Among Secondary School Teachers," Journal of Positive School Psychology, vol. 6, no. 9, pp. 5260-5271, 2022.

[39] F. J. R. Eccles, N. Sowter, T. Spokes, et al., "Stigma, self-compassion, and psychological distress among people with Parkinson's," Disabil Rehabil, vol. 45, no. 3, pp. 425-433, 2023.

[40] N. I. Mohamad, A. Mokhtar, I. A. Rahman, et al., "Development of a structural model for sustainable environment training and knowledge transfer," SUSTAINABILITY-BASEL, vol. 15, no. 3, pp. 2322, 2023.

[41] A. Reis, V. Nguyen, R. Saheb, et al., "Improving university students' mental health literacy using experiential learning opportunities," Health Education Journal, vol. 82, no. 2, pp. 184-199, 2023.

[42] S. Caban, S. Makos, and C. M. Thompson, "The role of interpersonal communication in mental health literacy interventions for young people: a theoretical review," Health communication, vol. 38, no. 13, pp. 2818-2832, 2023.

[43] C. F. Salvane and M J. Orongan, "Performance, Conceptual Understanding, and Self-Efficacy of Students via Contextualized Self-learning Modules in Junior High School: Performance, Conceptual Understanding, and Self-Efficacy of Students," International Journal of Curriculum and Instruction, vol. 16, no. 1, pp. 107-1