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The Issue of Emotional Interaction Deficiency in Online Education from the Perspective of Psychology and its Compensation Solutions

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Abstract: The widespread application of online education is not only reshaping teaching structures and interaction methods, but also triggering a systemic breakdown of emotional maintenance mechanisms in educational relationships. Learners gradually lose the emotional support and interpersonal connections they once had in a virtual environment, leading to multiple psychological dilemmas such as a decline in psychological engagement, weakening of empathy mechanisms, and disruption of motivation systems. From a psychological perspective, this article focuses on the phenomenon of emotional interaction loss in online education, analyzing its characteristics, causal mechanisms, and structural consequences, and further explores the feasible framework for emotional compensation pathways. The research points out that current online education platforms have failed to effectively carry emotional functions in terms of interaction design and feedback mechanisms, while the teacher's role has also become blurred due to technological intervention, limiting their ability to guide emotions. Therefore, institutional repair should be made from three aspects: reconstructing the teacher's emotional guidance mechanism, optimizing the platform's psychological feedback system, and establishing a systematic emotional assessment mechanism. Finally, the article constructs an educational interaction model centered on emotional resonance, aiming to provide theoretical support and practical guidance for the reconstruction of the emotional ecosystem in online education.

Keywords: Online Education; Emotional Interaction; Psychological Engagement; Teacher's Role; Emotional Regulation

1. Introduction

The rapid evolution of information technology has profoundly reshaped the organizational framework of educational spaces and the spatiotemporal logic of knowledge dissemination. As a key outcome of the digital transformation in education, online education has emerged as a central modality, widely applied across various levels of instructional practice. However, alongside the significant enhancement in resource allocation efficiency, the emotional sustainment mechanisms within the teaching process have gradually weakened. The functionalization trend of interaction models has further diminished the emotional exchange and psychological support between the educational agents, leading to a structural erosion of the emotional foundation of the learning relationship. In contrast to the abundant non-verbal cues and immediate feedback present in traditional classroom settings, interactions in virtual teaching environments are compressed into limited channels, resulting in a sharp decline in the frequency of emotional connection between teachers and students. Over time, learners are prone to feelings of alienation and burnout as they navigate a continuous process of information reception, with the lack of emotional lubrication causing educational behavior to become increasingly instrumentalized and alienated.

2. Psychological Characteristics of Emotional Interaction in Online Education

2.1 Emotional Asymmetry in Information Transmission

Online education, through the intervention of technology, has restructured the interactive

framework of the educational domain, thereby disrupting the synchronicity and face-to-face characteristics of emotional exchanges between teachers and students. The interaction process tends to become unidirectional, with significant delays in feedback. Non-verbal information, which is essential for emotional transmission, is compressed and weakened during media transmission, resulting in students' inability to discern the emotional attitudes of their teachers. This asymmetry in emotional input and output leads to a lack of psychological resonance [1]. Over extended periods in the teaching relationship, an environment devoid of emotional responses can result in learner burnout and diminished intrinsic motivation, thereby entrenching a vicious cycle of cognitive load and psychological fatigue. This emotional fracture reflects the erosion of the essence of educational relationships under the technology-first logic of human-machine interactions, underscoring the need to reconstruct emotional expression mechanisms from a psychological perspective.

2.2 The Coupling Relationship Between Learning Motivation and Emotional Regulation

Learning motivation is profoundly influenced by an individual's emotional state, with the ability to regulate emotions directly determining the persistence and goal orientation of learning behavior. In traditional classrooms, teachers effectively stimulate students' emotions through spatial domains and situational atmospheres, thereby enhancing learning motivation. In online teaching environments, however, due to the singular nature of interaction methods and the limitations of media perception, students lack sufficient external emotional stimuli, leading to the gradual proceduralization of learning activities. As a result, the level of emotional engagement diminishes, and the motivational system becomes imbalanced. This imbalance manifests as a decline in learning interest, a blurring of learning objectives, and the inefficiency of strategy application. In online environments, a reciprocal reinforcement mechanism emerges between low mood and cognitive anxiety, where diminished emotional states exacerbate students' cognitive anxiety, further depleting cognitive resources and impairing learning outcomes [2]. Psychological theories on the coupling of motivation and emotion suggest that these two factors interact and jointly influence the investment and performance of learning. Thus, online teaching designs should systematically incorporate elements of emotional regulation, assisting students in managing their emotions, maintaining learning momentum, and enhancing psychological resilience. By guiding emotional regulation mechanisms, students can better cope with emotional fluctuations in learning, sustain a positive learning attitude, and improve learning efficiency and goal attainment, ultimately fostering a more effective learning process.

2.3 The Mechanism of Empathy Activation in Virtual Scenarios

Empathy, as the core mechanism of emotional interaction, relies on the accurate identification of and timely response to the emotions of others. In virtual teaching contexts, however, the perception channels are constrained, interrupting the normal functioning of this psychological process. Due to the compression of visual and auditory signals in online teaching, non-verbal communication between teachers and students is significantly weakened, making emotional recognition both ambiguous and transient. Teachers are unable to detect subtle emotional fluctuations in students, leading to delayed emotional feedback. Students, in turn, fail to receive psychological comfort and emotional responses, which causes the interaction to lack emotional warmth, hindering the formation of emotional connections. The obstruction of the empathy mechanism not only undermines the depth of educational relationships but also diminishes teachers' ability to effectively judge and respond to intervention opportunities during the teaching process. Despite the continued presence of empathy motivation in teachers, its effectiveness is compromised by the limitations of the virtual environment. Emotional responses become sluggish and inaccurate, and students do not receive timely emotional support, which can lead to feelings of isolation and emotional distress. This emotional bottleneck is a widespread phenomenon in virtual education, further exacerbating learners' psychological pressure and cognitive fatigue, thereby impacting their enthusiasm for learning and sense of participation. The question of how

to effectively stimulate and restore the empathy mechanism in virtual teaching remains a key issue that current educational platforms must address.

3. Main Issues Regarding the Lack of Emotional Interaction in Online Education

3.1 Decline in Psychological Engagement and Increased Social Isolation Among Students

While online education has shattered the constraints of time and space, it has simultaneously restructured the interactive patterns of traditional teaching activities, leading students to gradually detach from the social connectivity mechanisms inherent in real-world environments, thereby resulting in a continuous decline in their psychological engagement. In virtual environments, students struggle to attain a sense of belonging through collective interactions, as the channels for emotional expression and resonance are severely compressed. The absence of social interactions significantly reduces emotional feedback [3], leaving self-regulation as the primary means for students to sustain their learning states. This isolated learning mode exacerbates the co-occurrence of psychological suppression and cognitive fatigue. In such an environment, students' emotional feedback channels are constrained, preventing them from receiving timely emotional support from both teachers and peers. Prolonged online isolation causes students to gradually lose their ability to perceive the emotional states of teachers and peers. The lack of emotional exchange weakens students' emotional investment in the learning context. The cumulative emotional vacancy gradually erodes their sense of participation and identity, leading to a marginalized learning experience. Without effective emotional interaction and feedback, students experience greater loneliness and detachment in the face of learning content, further impacting learning outcomes and mental health, creating a vicious cycle. This situation calls for platforms and teachers to provide more human-centered emotional support mechanisms.

3.2 The Weakening and Blurring of Teachers' Emotional Support Roles

In online teaching environments, the role of teachers has gradually shifted from interactive facilitators to mere executors of processes. The high degree of standardization and formalization inherent in technological platforms has led to the marginalization of teachers' emotional regulation responsibilities. This shift results in a significant reduction in teachers' non-verbal communication, emotional guidance, and psychological intervention capabilities during the teaching process, making it difficult to perceive and effectively intervene in students' emotional states in a timely manner. Due to the reliance on data-driven interfaces and fixed teaching rhythms, teachers find it challenging to establish an intuitive judgment system for students' emotional states. The absence of emotional information restricts the intervention pathways for teachers, preventing them from providing personalized adjustments based on students' psychological states, which substantially reduces the efficiency of emotional feedback [4]. The absence of emotional input not only impacts teaching quality, diminishing students' learning experiences but also weakens teachers' professional enthusiasm and self-identity. Teachers in this system often feel the absence of emotional interaction, struggling to obtain effective emotional feedback and support, which leads to feelings of professional burnout. This creates a negative feedback loop, reducing teachers' work motivation and teaching investment, ultimately diminishing the overall effectiveness and humanistic value of online education.

3.3 Over-Simplification of Emotional Communication Pathways by Technological Platforms

The prevailing logic of current online education platforms overly prioritizes content delivery and learning efficiency, relegating emotional interaction to a subsidiary function. Within the frameworks of standardized design and algorithmic logic, learners' emotions are quantified into fixed options, failing to provide genuine space for emotional expression and feedback mechanisms. Such a design marginalizes emotional interaction, lacking sufficient attention and implementation pathways, resulting in unmet emotional needs within the educational process [5]. Teachers within this framework face functional limitations, with their ability to recognize

emotions constrained by the platform's structure, making it difficult to detect shifts in students' emotional states and psychological conditions. The emotional dimension of educational interaction is thereby weakened. Students' emotional needs are deprived of timely feedback and support, leading to a rupture in educational relationships and the disruption of feedback loops. The reduction of emotional pathways not only drains the educational process of its human warmth but also pushes teaching behaviors toward increasing quantification and functionalization, neglecting the emotional connection function that education is supposed to embody. In the end, students' emotional needs are not effectively met, and the core values of education and humanistic care are gradually sidelined, undermining teaching effectiveness and the holistic development of students.

4. Optimization Strategies for Emotional Interaction in Online Education

4.1 Teacher Emotional Guidance Strategies Based on Psychological Resonance

In virtual teaching environments, teachers are not only responsible for knowledge transmission but must also assume the role of emotional support providers. To effectively convey positive psychological signals, teachers should master multimodal expression techniques, utilizing language emotional intensity, facial expression management, and interactive rhythm adjustment, among other strategies, to enhance emotional communication. This emotional expression can not only help students better understand the course content but also provide emotional support and a sense of recognition. In course design, emotional regulation mechanisms should be embedded, and regular interactive and emotional feedback sessions should be incorporated to strengthen students' emotional connections, allowing them to experience not only the transmission of knowledge but also emotional resonance and support during the learning process. Teachers can utilize platform-based audio and video analysis tools to assist in identifying students' emotional states, enabling more timely and personalized psychological responses. By analyzing students' emotions in real time, teachers can adjust their interaction strategies to help students better regulate their emotions, thereby improving learning outcomes [6]. Emotional support from teachers should not be limited to classroom hours; after-class care and ongoing psychological support are equally important. By establishing a stable emotional response mechanism, teachers can provide continuous emotional care throughout the learning process, helping students achieve dual growth academically and psychologically, thereby better navigating the challenges posed by virtual teaching.

4.2 Enhancing the Psychological Feedback Function and Humanistic Design of Interactive Platforms

In the process of platform development, it has become evident that merely relying on technical functions is insufficient to meet the educational needs. There is an urgent need to optimize the psychological feedback mechanisms for students. Platforms should integrate features such as emotional tagging, mood tracking, and intelligent response functionalities, providing students with spaces to express emotions and record psychological states. Through these features, students can feel that their emotions are being acknowledged and responded to during the learning process, thus enhancing their sense of participation and belonging. The system should develop precise psychological state models based on students' behavioral data, using analysis of students' emotional fluctuations and learning rhythms to intelligently adjust learning tasks and interaction methods, achieving an accurate match between emotional needs and learning demands, and improving psychological adaptability [7]. Platforms should break away from traditional teaching framework limitations, setting up free communication channels that allow students to engage in more flexible and open exchanges with teachers and peers. This freedom of communication not only promotes interpersonal fluidity but also enhances students' emotional resilience and emotional regulation capabilities. Through these optimization measures, the platform transforms from a mere knowledge transmission tool into a medium for psychological care and emotional interaction, offering vital support for students' holistic development.

4.3 Establishing a Systematic,

Multidimensional Emotional Assessment and Incentive Mechanism

Relying solely on individual regulation is insufficient to effectively compensate for systemic emotional deficiencies; thus, establishing an emotion assessment system based on psychological metrics is critically important. This system should encompass multiple dimensions, including emotional expression frequency, interaction activity, and social perception, while dynamically modeling students' psychological profiles based on platform behavioral data. The results of this evaluation should inform teaching adjustments, course optimization, and institutional feedback, creating a virtuous cycle of continuous improvement [8]. Within this system, it is essential to clarify the weight of emotional participation and guide students to recognize the importance of regulating their psychological states throughout their learning process. This approach not only helps students better understand their emotional fluctuations but also encourages them to actively engage in emotional regulation during learning. To incentivize students' emotional participation and interaction, diverse emotional motivation paths should be designed, incorporating psychological theories and behavioral data, such as growth records, emotional regulation training, and psychological points systems. These incentive mechanisms not only strengthen students' emotional engagement but also effectively enhance their self-regulation capabilities, thereby improving learning outcomes and emotional health. Through this comprehensive emotional assessment and incentive system, students can receive more holistic and systematic psychological support, fostering their overall development.

5. Conclusion

Online education, as a pivotal form in the evolution of modern education, has not only facilitated the advancement of educational equity and resource sharing but has also unveiled systemic deficiencies in emotional interaction mechanisms. These deficiencies have emerged as a critical constraint on both the quality of teaching and the sustainability of learning. From a psychological perspective, this paper identifies core issues such as emotional asymmetry, empathy barriers, and motivational disarray that pervade online learning environments. It further underscores the essential roles played by educational platforms, the evolving roles of teachers, and institutional frameworks in the construction of emotional compensation systems. Moving forward, it is imperative to adopt a multi-level, multi-scenario approach that integrates psychological regulation mechanisms with human-centered technological design. This approach aims to establish a holistic emotional ecosystem encompassing perception, feedback, and motivation, thereby facilitating a deeper connection within the teaching process and a reversion to emotionally enriched educational relationships.

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