

Emotional Contagion and Student Burnout: The Role of Extraversion

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Abstract:

In technology-mediated educational environments, both teachers and students face challenges such as ongoing adaptation, multitasking, and engagement with AI-enabled learning tools and digital platforms. These challenges frequently deplete students' energy and increase stress, which can ultimately lead to burnout. The present study examines whether extraversion moderates the relationship between emotional contagion and student burnout. Data were collected from 247 engineering students at private educational institutions using a survey questionnaire. The proposed moderation model was tested through linear regression analysis. Results indicate that emotional contagion is positively and significantly associated with student burnout, while trait extraversion demonstrates a substantial negative relationship with Burnout. Furthermore, extraversion moderates the relationship between emotional contagion and Burnout. This research contributes to the literature by highlighting the critical role of emotional contagion, particularly within AI-supported learning environments. Drawing on Conservation of Resource Theory, Job Demand–Resource (JD-R) Theory of Burnout, and Emotional Contagion Theory, the study's model was empirically tested. The findings offer educators and institutions valuable insights for implementing technology-based interventions that reduce emotional strain and foster a healthier, increasingly sustainable learning environment.

Keywords: Traits, Extraversion, Burnout, Emotions, Emotional Contagion

1. Introduction

The adoption of AI-enabled learning tools and digital platforms has transformed the educational landscape, facilitating a shift toward online and hybrid models that integrate both face-to-face and digital channels. Interactions among teachers, classmates, and peers are fundamental to the learning environment (Pennings et al., 2018), as they significantly influence students' emotional experiences. Human interactions and environmental factors shape emotions, making them a central component of communication (Aldrup et al., 2024). Lei et al. (2018) identified a range of academic emotions, including hope, enjoyment, pride, shame, anxiety, boredom, anger, and hopelessness. Positive emotions such as happiness, hope, and pride promote learning engagement, creativity, and academic success (Camacho-Morles et al., 2021; Zhu et al., 2022), whereas negative emotions contribute to frustration, disengagement, and poor academic outcomes (Abedi et al., 2023). Additionally, anger has been shown to negatively affect emotional development (Morris et al., 2013) and teaching quality (Frenzel et al., 2016). Both teachers and students experience emotions individually and transmit them to others. This process, known as emotional contagion (EC), involves the transmission of emotions between individuals. Unlike earlier physical classroom settings, emotional contagion can now occur through online communication, virtual classrooms, and AI-mediated interactions. However, individuals differ in their influence on others and their susceptibility to emotional contagion. This raises a key research question: which individuals are more likely to experience emotional contagion? Generally, those who are emotionally attentive, capable of comprehending emotions, socially connected, imitative, sensitive to internal cues, and emotionally reactive are more likely to perceive and absorb others' emotions.

Students in higher education face social, physiological, and psychological challenges, which, in turn, affect their psychological well-being (Akyol & Demir, 2019). Similarly, academic overload and peer

competition have become more common, placing substantial emotional pressure on students (Lönngren et al., 2023) and intensifying them further in technology-enabled learning environments. The rising reliance upon technology and self-directed learning environments may further intensify these problems by demanding continual engagement and accommodation. If not managed effectively, these pressures may lead to serious consequences, including psychological distress, life dissatisfaction, exhaustion, depression, and anxiety (Newman et al., 2011; Rogers & Maytan, 2019). Prolonged exposure to such stressors increases the likelihood of academic Burnout (Yang, 2004). Evidence suggests that Burnout reduces academic success (Salmela-Aro et al., 2008), hinders professional development (Backović et al., 2012), and increases dropout rates (Meier & Schmeck, 1985). Given the influential nature of affective interactions in both physical and digital classroom settings and their impact on behavioral outcomes, this work examines the effect of emotional contagion on student burnout in the learning environment. Although numerous researchers have extensively examined Burnout among professionals such as teachers, healthcare workers, and service employees (Chang et al., 2000; Seibert et al., 2017), research focusing on non-medical students remains limited.

Research indicates that individual differences, including personality and attitude, play a pivotal role in shaping learning outcomes. Stajkovic et al. (2018) emphasized that personality influences how individuals perceive and respond to stress and environmental demands. Previous studies have highlighted the significance of personality traits in understanding Burnout (Yusof et al., 2016; Majerníková & Obročníková, 2017) and have underscored the importance of coping mechanisms in stressful situations (Bolger & Schilling, 1991). Gustafsson et al. (2009) noted that individuals with dominant personality traits often exhibit higher stress tolerance. Additionally, Lazarus (2006) identified connections among emotions, stress, and Burnout. The Job Demand–Resource (JD-R) model (Demerouti et al., 2001) posits that emotions serve as precursors to Burnout, while Hobfoll's Conservation of Resources (COR) theory suggests that burnout results from the loss or depletion of personal resources. Extraversion is considered a valuable personal resource that can mitigate stress and Burnout, particularly in technologically intensive environments. Building on this foundation, the present study examines the relationships among extraversion, emotional contagion, and Burnout to enhance understanding of their interconnections. Addressing the identified research gap, this study investigates the influence of emotional contagion on Burnout and explores the moderating role of extraversion in this relationship. The study model is grounded in COR, JD-R, and Emotional Contagion theories and is tested within AI-enhanced academic settings.

2. Background and Framework

Emotional Contagion and Burnout

Freudenberger (1974) defined Burnout as "to fail, to wear out, or become exhausted by making excessive demands on energy, strength, or resources" (p. 159). Burnout was conceptualized as a three-dimensional construct comprising exhaustion, cynicism, and reduced personal efficacy (Maslach et al., 1986). Researchers describe Burnout as a syndrome experienced by employees in people-oriented professions such as social services, education, and medicine (Schaufeli et al., 1993). However, in the scholarly context, exhaustion occurs at the personal level, strain results from overloaded academic tasks, and students experience fatigue through engagements with peers and teachers. Additionally, students are susceptible to affective influences as they constantly engage online and collaborate virtually with their co-students and instructors, which may lead to technology-driven academic demands. Sutton (2004) emphasized that educators should develop emotion management skills,

especially in managing digital classroom relations. However, repeated exposure to negative emotions—whether in physical or digital settings has been shown to contribute to Burnout (Davis et al., 2005; Petitta et al., 2017). Earlier research highlighted that the impact of affective experiences varies across individuals depending on their emotional sensitivity, awareness, and the rate and intensity of emotional exposure (Morris & Feldman, 1997; Reis & Sprecher, 2009). Previous research suggests that a greater understanding of students' affective reactions enables educators to promote positive learning environments and effectively guide student behavior (Bidjerano & Dai, 2007). Emotions and stress are the key determinants of individual behavior, particularly in high-interaction environments such as classrooms and digital education platforms (Bunk & Magley, 2013; Smet, 2020). Notably, most affective exchanges within learning environments occur nonverbally through gestures, facial expressions, tone of voice, and body language (Mottet & Beebe, 2000). In virtual learning environments, instructors and learners communicate these signs using digital formats such as video, text, and emojis. Such unconscious mimicry of emotional expressions, whether physical or digitally conveyed, establishes the basis for emotional contagion (Hatfield et al., 1993). Empirical evidence further suggests that students can influence one another through anxious communication during presentations or online interactions (Behnke & Sawyer, 1994). Thus, emotional contagion refers to the process by which individuals transmit emotions through both physical and digital interactions.

Van Katwyk et al. (2000) argued that work-related stress is closely associated with emotions. In a similar vein, Bakker & Schaufeli (2000) emphasized that individuals who are more susceptible to others' emotions are more likely to experience Burnout. Existing works have consistently established a strong association between emotional experiences and Burnout (Lee & Ashforth, 1996). Individuals who are more vulnerable to emotional contagion experience higher levels of Burnout, particularly in service-oriented professions (Omdahl & O'Donnell, 1999). Similarly, Studies have consistently identified emotional susceptibility as a key antecedent of Burnout. Le Blanc et al., 2001; Turan et al., 2025; Feng & Cui, 2024), and people who are more vulnerable to emotional contagion are more likely to experience Burnout (Totterdell, 2000). In modern educational settings, continuous digital connectivity and exposure to collective emotional cues across online platforms can further intensify this vulnerability. Interactions contribute to shared emotional experiences, underscoring the importance of studying emotions to understand students' behavioral and psychological outcomes. These insights indicate that emotional contagion strongly influences burnout levels, particularly in increasingly hybrid, technology-based learning environments. Based on the above discussion, this study suggests that students with higher levels of emotional contagion are more likely to experience greater Burnout.

H1: Emotional contagion will be positively related to Burnout.

The moderating effect of the Extraversion trait

This study suggests that the extraversion trait serves as a moderator in the relationship between emotional contagion and Burnout for the following reasons.

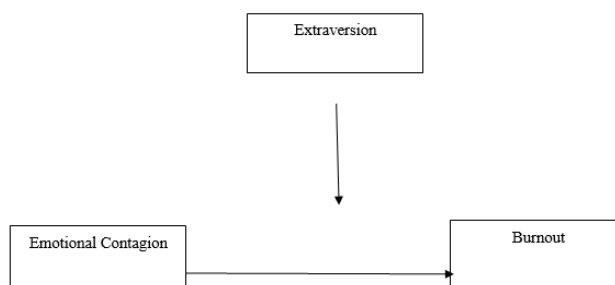
First, it is important to consider individual personality differences, as dominant personality traits are often associated with higher stress tolerance. Previous research has highlighted the importance of examining specific personality traits to understand better behavioral outcomes (Jacobs & Dodd, 2003; Sukenik et al., 2018). While prior studies have examined the relationship between personality and Burnout among both working and non-working populations (Armon et al., 2012; Le Vigouroux et al., 2017), the present study expands the literature by focusing specifically on extraversion as a key

personality trait. Individuals with high levels of extraversion exhibit cheerfulness, sociability, optimism, communication, self-confidence, dominance, activity, and a tendency toward excitement-seeking behavior (Costa & McCrae, 1992). Extraverts tend to enjoy interpersonal interactions, actively engage in social environments, adopt effective coping strategies, and seek social support when dealing with challenges (Dorn & Matthews, 1992). Given that students are generally energetic, socially active, and interaction-oriented (Klinkosz et al., 2006), the relevance of extraversion in the academic context becomes important. Extraverted students actively engage and communicate, consequently enhancing their ability to cope with academic and emotional demands. Extraverts tend to uphold a positive outlook, perceive their environment more favorably, and thereby have lower levels of stress (Sulea et al., 2015). Empirical studies have consistently reported a negative relationship between extraversion and Burnout (Maslach, Schaufeli, and Leiter, 2001; Alarcon et al., 2009). Furthermore, the relationship between emotional contagion and Burnout has been well recognized in prior research (Omdahl & O'Donnell, 1999; Petitta et al., 2017). Taken together, extraverts, due to their social orientation and adaptive coping mechanisms, are well prepared to manage emotionally charged situations and are therefore less susceptible to Burnout.

Notably, the proposed moderation model is grounded in the following theoretical frameworks. The Emotional Contagion model (Hatfield et al., 1993) theorizes that individuals tend to automatically and unconsciously absorb others' emotions. The Job Demand–Resource (JD-R) model of Burnout (Demerouti et al., 2001) proposes that emotional demands act as stressors that may lead to emotional exhaustion. Similarly, Conservation of Resources (COR) Theory (Hobfoll, 1989) argues that individuals are less likely to experience Burnout when they possess adequate personal resources. In digital environments, access to technological resources, peer networks, and AI-supported learning tools can further strengthen personal resources. The trait extraversion can be considered as a valuable personal resource (Hobfoll et al., 2018; Penney et al., 2011). Based on the theoretical foundations above, the present study proposes that extraversion acts as a buffering mechanism, weakening the positive relationship between emotional contagion and Burnout, thereby reducing the likelihood of Burnout among students.

H2: Extraversion will moderate the positive relationship between emotional contagion and burnout, such that the positive relationship will be weaker for individuals with a high level of extraversion.

Conceptual Framework



3. Methods

Participants

The sample consisted of 104 female (42.1%) and 143 (57.9%) male students. The age ranged from 17 to 24 years ($M=18.41$; $SD=1.34$). Edberg (2009) stated that the characteristics of the adolescent

developmental stage can persist until 24 years of age—approximately 85% of the students enrolled in undergraduate courses, while 14.9% pursued postgraduate studies. The survey participants included engineering students ($n=247$) from various private colleges in and around Chennai, a metropolitan city in southern India. The researcher obtained permission from the respective educational institutions to survey students who were willing to participate. According to Zikmund (2000), the self-administered questionnaire plays an important role in data collection in management research. The researcher distributed self-administered questionnaires to respondents during their leisure hours and explained the measures clearly. The researcher designed the survey to take approximately 10–15 minutes to complete. They employed convenience sampling, selecting readily available participants. Before collecting the data, the researchers obtained informed consent from all respondents and assured them that their responses would remain confidential. The researcher distributed 320 questionnaires to the respondents, and 273 were returned (85% response rate). The returned questionnaires underwent initial data screening to avoid missing data, and the final respondents reached 247 after data screening.

Measures

Emotional contagion was measured using a scale developed by Doherty (1997). It consists of 15 items measuring five emotion subscales: Happy, Love, Anger, Fear, and Sad. An example of the items includes 'If someone I'm talking with begins to cry, I get teary-eyed'. Respondents indicated their susceptibility level on a 4-point Likert scale ranging from 'Never' (1) to 'Always' (4). The scale's reliability was $\alpha = 0.75$, satisfying the desirable criterion of 0.7.

The study measured the extraversion trait using Goldberg's International Personality Item Pool (IPIP-50) scale, which is freely available under the public domain at the following website: <http://ipip.ori.org/newPermission.htm>. It consists of 10 items (Sample item includes 'I am the life of the party'). Respondents were requested to indicate their level of agreement using a five-point Likert scale ranging from 'Strongly disagree'(1) to 'Strongly agree'(5). The reliability of the scale ($\alpha = 0.88$).

This study assessed Burnout using the Copenhagen Burnout Inventory (CBI) (Kristensen et al., 2005), a 19-item questionnaire measuring three burnout dimensions: Personal Burnout, Work Burnout, and Client Burnout. In this study, classmates, friends, and teachers are considered clients. The sample item includes 'How often do you feel tired?' Respondents indicated their burnout level on a five-point Likert scale ranging from 'Never' (1) to 'Always' (5), with higher scores indicating higher Burnout. The scale's reliability was $\alpha = 0.89$, satisfying the criteria.

Control variables

This study considered gender as a control variable, as previous research has shown that gender is related to Burnout (Purvanova & Muros, 2010; Erickson & Ritter, 2001). The study coded gender as male = 0 and female = 1.

Common method bias

As this study employed a self-administered questionnaire, we conducted Harman's one-factor test to assess the presence of common method bias. We loaded all 44 items onto a single unrotated factor, and the extracted factor accounted for only 16.84% of the total variance. Since this value is below the 40% critical threshold, the results indicate that common method bias did not pose a significant threat to the study's data (Podsakoff et al., 2003).

ANALYSIS

The data were analyzed using SPSS version 27.0. Descriptive statistics were analyzed, followed by linear regression analyses to test the simple moderation model of the study. Further, centering procedures recommended by Aiken et al. (1991) were used to analyze the interactional relationships.

4. Results

Table 1 presents the descriptive statistics and the correlations among all variables. i.e., emotional contagion, extraversion, and Burnout. The results reported that all the study variables were significantly correlated. Further, emotional contagion showed a significant positive association with Burnout ($r = 0.285$, $p < 0.01$). Moreover, the extraversion trait showed a significant negative correlation with Burnout ($r = -0.273$, $p < 0.01$).

Table 1: Descriptive statistics and correlations of study variables

Variables	M	SD	1	2	3
1. Emotional contagion (EC)	3.62	0.62	1		
2. Extraversion	2.93	0.87	0.004	1	
3. Burnout	3.26	0.68	0.285**	-0.273**	1

** $p < .01$, M = mean; SD = standard deviation

Hypotheses testing

Table 2 presents the results of the linear regression analyses for the simple moderation model. The first step is to enter gender as a control variable in model 1. Next, the independent variable, i.e., emotional contagion, was included in model 2. Then the moderator variable, i.e., extraversion trait, was added in model 3, and finally, the interaction terms obtained by multiplying the moderator and the independent variable were entered in model 4. The analyses revealed that gender was not significantly related to Burnout.

The results of model 2, displayed in Table 2, strongly deciphered that emotional contagion has a significant positive relationship with Burnout ($\beta = 0.284$, $p < 0.001$), thereby supporting Hypothesis 1. Also, the results of model 3, displayed in Table 2, indicated that extraversion has a significant and negative relationship with Burnout ($\beta = -0.251$, $p < 0.001$). The results of model 4, shown in Table 2, deciphered that the interaction effect of emotional contagion and extraversion on Burnout is significant ($\beta = 0.146$, $p < 0.05$), thus supporting hypothesis 2. It is also evident from the interaction plot (Figure 1) that significant interaction effects were present, indicating that individuals with higher extraversion are likely to dampen the positive relationship between emotional contagion and Burnout.

Table 2: Results of the linear regression analysis

Variables	Model 1 B	Model 2 B	Model 3 B	Model 4 B
Step 1 Control				
Gender	-0.076	-0.072	-0.053	-0.048
Step 2 Independent				

Emotional contagion(EC)		0.284***	0.263***	0.197
Step 3 Moderator				
Extraversion			-0.251***	-0.254***
Step 4 Interaction terms				
EC× Extraversion				0.146*
R ²	0.006	0.086	0.159	0.191
Adjusted R ²	0.002	0.079	0.149	0.178
F	1.409	11.54	15.37	14.32

* $p < .05$; *** $p < .001$

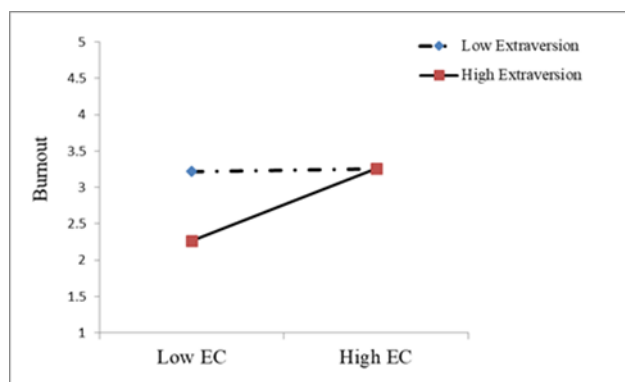


Figure 1. Interaction between emotional contagion and extraversion on Burnout

5. Discussion

This study examines the direct relationship between emotional contagion and Burnout. It investigates the moderating role of extraversion in this relationship, providing deeper insights into the effects of emotional contagion and identifying potential coping mechanisms to reduce Burnout. In contemporary educational contexts, educators and institutions are increasingly integrating AI-enabled and digital learning platforms, where virtual tools mediate communication. Consequently, understanding emotional dynamics is essential, as emotional cues may be amplified or misinterpreted in these environments.

The study's findings are consistent with earlier work (Omdahl & O'Donnell, 1999; Petitta et al., 2017), which demonstrates that emotional contagion is a significant predictor of, and positively related to, Burnout. Higher susceptibility to emotional contagion increases emotional vulnerability, allowing negative emotional influences from others to deepen burnout levels (Snyder, 2009; Le Blanc et al., 2001). In modern academic settings, students engage in both physical and AI-supported virtual environments, such as online classes, discussion forums, and collaborative tools, where they exchange emotionally infectious signals through direct and digital interactions. These interactions may heighten students' susceptibility to emotional contagion and ultimately contribute to Burnout. Students with high emotional susceptibility tend to experience greater exhaustion across personal, academic, and group-related activities. They may also hesitate to seek clarification in classroom or virtual settings, further increasing emotional strain. Additionally, such students may resist change and face challenges

during transitions. Supporting this argument, Bakker and Schaufeli (2000) observed that individuals highly susceptible to others' emotions are more prone to Burnout than those less empathetic.

Furthermore, Lee and Ashforth (1996) highlighted that the adverse effects of emotional contagion can negatively affect performance by increasing Burnout. Negative emotional effects in traditional and AI-mediated learning environments increase students' susceptibility to Burnout, leading to lower academic performance and adversely affecting the overall educational system. These outcomes emphasize the need to effectively manage emotions in both physical and digital classroom settings (Roberts & Smith, 2002). In line with this, the present study's findings show that higher levels of emotional contagion are associated with greater Burnout. Hence, Hypothesis 1 is supported.

The study also reveals the moderating role of extraversion in the relationship between emotional contagion and Burnout. Extraversion, characterized by enthusiasm, sociability, and active engagement, is associated with lower levels of Burnout. The findings show a significant negative relationship between extraversion and Burnout. Drawing from the Conservation of Resources (COR) theory, individuals possessing greater personal resources are less likely to experience Burnout. In this context, extraversion can be considered a valuable personal resource. Students with extraversion traits tend to actively participate in classroom and digital interactions, engage in discussions, and build strong social connections with peers and instructors, even in technology-enabled environments. Those interactions help restore emotional energy, reduce stress, and increase focus on academic activities.

Moreover, extraverted individuals are more likely to adopt efficient coping strategies, seek social support, and maintain positive emotional states. In AI-supported learning environments, such students may better leverage communication tools, collaborative platforms, and interactive technologies to stay engaged and emotionally balanced. These characteristics reduce their susceptibility to emotional exhaustion and Burnout. The findings correspond with previous studies (Rothmann & Storm, 2003; Kim et al., 2007; Alarcon et al., 2009), strengthening the protective role of extraversion. Overall, the study shows that extraversion weakens the positive relationship between emotional contagion and Burnout, thereby acting as a buffering mechanism. The interaction effect further confirms that students with higher levels of extraversion are less likely to experience Burnout. Hence, Hypothesis 2 is supported. While the study primarily focuses on extraversion, it is important to acknowledge that individuals with lower levels of extraversion (introverts) may be more vulnerable to emotional contagion and Burnout, particularly in digitally intensive or less interactive environments. However, an in-depth examination of introversion falls beyond the scope of the present study. Overall, supported by the Conservation of Resources (COR) theory, Job Demand–Resource (JD-R) theory, and Emotional Contagion theory, the findings highlight the significant moderating role of extraversion in reducing Burnout, especially within evolving AI-integrated teaching contexts.

6. Implications

This study provides educators with important insights into students' emotional susceptibility and its impact on Burnout. However, certain personality traits help students cope with emotional challenges; educators need to identify students' varying levels of emotional vulnerability and address them effectively. In the present setting, the increasing use of AI-enabled learning platforms and digital tools shapes students' emotional experiences, pointing to the need to monitor both human- and technology-mediated interactions. Understanding the mechanism by which emotional contagion influences Burnout enables educators to establish a supportive, emotionally balanced classroom environment. Instructors can strengthen teacher–student relationships and encourage constructive student behavior by fostering positive emotional interactions. At the same time, they can leverage AI-powered tools,

such as adaptive learning systems and virtual learning environments, to customize learning experiences and reduce academic stress, thereby complementing emotional support mechanisms. The findings also emphasize that emotions are contagious in the learning environment, influencing students' psychological energy and potentially affecting teaching effectiveness. Given that students spend significant time in both physical and digital academic settings, it becomes crucial for educators to acknowledge and manage emotional dynamics to enhance learning outcomes. This study highlights the need for teachers and educational institutions to collaborate to create a conducive environment that supports students' emotional well-being. Integrating AI technologies with empathetic teaching practices can help identify early signs of emotional distress and Burnout. Encouraging positive emotional contagion—both in traditional classrooms and on digital platforms—can help mitigate Burnout and improve overall academic engagement.

7. Limitations

This study has certain limitations. The use of a cross-sectional design confines the ability to establish causal relationships. Furthermore, the sample was limited to students from a metropolitan city, which may affect the generalizability of the findings. In the current era of AI-enabled and digitally mediated learning environments, these findings may also vary across different modes of learning, such as online, hybrid, or technology-supported classrooms. Future research can adopt longitudinal designs to better understand the dynamic nature of emotions and Burnout over time, especially in evolving digital learning contexts. The present work focuses primarily on the degree of emotional contagion; future studies may therefore explore additional emotions, including those arising from virtual and AI-assisted interactions, to provide a more comprehensive understanding. Future research can extend the model to investigate additional outcomes, including learning styles and academic performance, in technology-integrated environments. Although this study focuses on extraversion, future research may consider other Big Five dimensions in relation to digital learning adaptability. Moreover, researchers can examine emotional contagion not only from the receiver's perspective but also from that of individuals who transmit emotions, including those who interact through AI tools, virtual classrooms, and online collaborative platforms.

8. Conclusion

This study offers important insights into how individual differences influence students' emotional development. As AI-driven technologies become more prevalent in education, higher education systems must acknowledge the impact of emotional dynamics on student behavior and performance. The findings demonstrate that students with higher levels of emotional contagion are more likely to experience Burnout, while those with higher levels of extraversion are less susceptible. Although it is not possible to eliminate students' susceptibility to emotional influences, identifying vulnerability factors and equipping students with effective coping strategies remain essential. In this regard, AI-enabled learning platforms and analytics can help educators identify early signs of emotional distress and Burnout, enabling timely interventions. Overall, this study contributes to the understanding of student psychology and offers practical implications for educators, supporting the effective use of technology to enhance the quality and resilience of educational practices.

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