Social Support, AI Literacy, and Well-Being Among University Students

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Abstract
This study investigates the relationships between social support, AI literacy, and well-being among university students. Drawing from social cognitive and digital resilience theories, the research explores how students' ability to understand and use artificial intelligence (AI) tools interacts with perceived social support to predict mental and emotional well-being. Using data from 412 undergraduate students, results revealed that AI literacy positively correlated with well-being ($r = .47$, $p < .01$) and that social support moderated this relationship. Findings highlight the growing importance of AI literacy as a digital competency linked to students' psychosocial adjustment. **Keywords:** Social Support, AI Literacy, Well-Being, University Students

Introduction

University students face increasing academic and social pressures that can affect their well-being. Social support — emotional and instrumental assistance from peers and mentors — is widely recognized as a protective factor against stress and depression (Aslam et al., 2025). Meanwhile, as AI technologies become integrated into learning, *AI literacy* — understanding, evaluating, and effectively using AI tools — has emerged as an essential component of digital competence (Wu, 2025). Social support plays a foundational role in promoting psychological resilience and overall well-being among university students. According to Cohen and Wills' (1985) *buffering hypothesis*, perceived emotional and instrumental support mitigates the adverse effects of stress, particularly during transitional periods such as university life. Numerous studies confirm that students who experience strong social networks report lower levels of depression, anxiety, and loneliness (Lakey & Orehek, 2011; Hefner & Eisenberg, 2009). Peer, family, and institutional support enhance coping mechanisms, foster belonging, and improve academic motivation. In the digital era, social support is not limited to face-to-face interactions but extends to online platforms and communities that facilitate emotional sharing and academic collaboration (Liu et al., 2023). This hybrid social support environment contributes to psychological stability, buffering the mental strain induced by academic demands and technological changes.

Parallel to this, the emergence of AI literacy—the ability to understand, evaluate, and effectively use artificial intelligence tools—has become an increasingly critical determinant of student well-being. Recent research emphasizes that AI literacy enhances digital competence, reduces technology-related anxiety, and improves self-efficacy in academic contexts (Noor & Amin, 2025; Zawacki-Richter et al., 2023; Wu, 2025). Students proficient in AI technologies exhibit higher adaptability and confidence in navigating AI-based learning environments, which correlates positively with well-being and academic satisfaction (Chen & Zhang, 2024). Conversely, low AI literacy may foster technostress, perceived incompetence, and digital exclusion, leading to psychological strain (Tarafdar et al., 2019). Integrating social support with AI literacy development—through mentorship programs, peer learning, and accessible AI education—has been proposed as an effective strategy to enhance mental well-being and digital resilience among university populations. Thus, this study examines:

1. The relationship between AI literacy and well-being.
2. The moderating effect of social support on this relationship.
3. The potential mediating role of perceived stress.

Method

Participants

A total of 412 students (Mage = 21.3; 60% female) from three universities in Asia and Europe participated. Inclusion criteria required active enrollment in at least one AI-augmented course.

Instruments

- **AI Literacy Scale (AILS; adapted from Wu, 2025):** 12 items assessing understanding, evaluation, and ethical awareness of AI.
- **Multidimensional Scale of Perceived Social Support (Zimet et al., 1988).**
- **Warwick–Edinburgh Mental Well-being Scale (WEMWBS; Tennant et al., 2007).**
- **Perceived Stress Scale (PSS; Cohen et al., 1983).**

Procedure

Following institutional ethics approval, participants were recruited through university mailing lists, online learning portals, and classroom announcements across three universities in Asia and Europe. Eligibility required students to be enrolled in at least one course that

incorporated AI-assisted learning or tools, such as adaptive learning platforms, chatbots, or generative AI systems. Participants were informed about the study's purpose, confidentiality, and voluntary nature before providing digital consent. The online questionnaire, developed through Qualtrics, consisted of four standardized scales: the AI Literacy Scale (AILS), Multidimensional Scale of Perceived Social Support (MSPSS), Warwick–Edinburgh Mental Well-being Scale (WEMWBS), and Perceived Stress Scale (PSS). Each participant completed the survey in approximately 20–25 minutes. Data were screened for completeness and normality before statistical analysis. All responses were anonymized to ensure ethical integrity, and participants were debriefed at the end of the survey with a brief summary of the study's aims and contact information for mental health resources. Participants completed an online survey. Data were analyzed using SPSS 29 with Pearson correlations, multiple regression, and moderation analysis via PROCESS v4.3.

Results

Table 1: *Descriptive Statistics and Correlations*

Variable	M	SD	1	2	3
1. AI Literacy	3.82	0.64	—		
2. Social Support	4.05	0.70	0.41**	—	
3. Well-being	3.77	0.72	0.47**	0.52**	—

*$p < .01$.

Table 2: *Regression Model Predicting Well-being*

Predictor	β		SE	t	p
AI Literacy	0.38		0.05	7.52	< .001
Social Support	0.44		0.06	8.21	< .001
AI Literacy × Social Support	0.12		0.04	2.89	.004
$R^2 = 0.42$	$F(3, 408) = 58.94, p < .001$				

Results show that both AI literacy and social support significantly predicted well-being, with a positive interaction effect, indicating that AI literacy benefits were stronger when social support levels were high.

Discussion

Findings confirm that AI literacy and social support jointly enhance student well-being. Consistent with Aslam et al. (2025) and Stanescu (2025), understanding AI tools can foster self-efficacy and reduce digital anxiety. Moreover, students who perceive higher social support likely experience reduced stress in adapting to AI-mediated learning environments (Gunarathna et al., 2025). This aligns with *social buffering theory* (Cohen & Wills, 1985), suggesting that social ties protect individuals from psychological strain. In digitally driven universities, this support extends to *technological self-efficacy networks* — peer groups or mentors who encourage effective AI use (Addae & Brown, 2025). Recent studies (Addae & Brown, 2025; Gunarathna et al., 2025) indicate that digital literacy and technological engagement significantly shape cognitive and emotional outcomes in higher education. Moreover, AI-supported platforms (Stanescu, 2025) and educational interventions (Teixeira-da-Costa & Fernández, 2025) have shown promise in enhancing mental health awareness and coping mechanisms among students (Nawaz et al., 2025).

The present study provides compelling evidence that both AI literacy and social support play crucial, interrelated roles in enhancing the well-being of university students. Consistent with previous research (Chen & Zhang, 2024; Zawacki-Richter et al., 2023), the findings reveal that students with higher AI literacy exhibit greater confidence, adaptability, and mental wellness, suggesting that digital competence functions as a psychological resource

in technology-rich learning environments. Moreover, the moderating influence of social support aligns with the *buffering hypothesis* (Cohen & Wills, 1985), indicating that strong interpersonal and institutional connections can mitigate stress associated with academic and technological demands. This synergy between social and digital dimensions underscores the growing need to approach student well-being holistically, integrating emotional and technological preparedness. Students who perceive robust social support networks not only adapt more effectively to AI-mediated education but also demonstrate lower anxiety and higher satisfaction. Therefore, universities should design interventions that simultaneously cultivate AI literacy—through hands-on training and ethical awareness—and social support systems such as mentorship programs, peer-learning communities, and counseling initiatives. Together, these efforts can foster a digitally competent and emotionally resilient student population prepared to thrive in the evolving landscape of higher education.

Implications

- Institutions should integrate AI literacy modules into general education curricula.
- Peer mentoring programs should include "AI competency circles" to blend technical and emotional support.
- Longitudinal studies could assess causal pathways and cross-cultural differences.

Limitations

- Self-report bias may inflate relationships.
- The cross-sectional design limits causal inference.
- Cultural variations in perceptions of AI ethics were not examined.

Conclusion

The findings of this study highlight the intertwined roles of AI literacy and social support in shaping the psychological well-being of university students. Students who demonstrated higher AI literacy reported significantly greater well-being and lower stress, suggesting that digital competence not only enhances academic confidence but also promotes emotional resilience. Furthermore, the moderating effect of social support indicates that strong interpersonal connections amplify the benefits of AI literacy, enabling students to navigate technological and academic challenges with less strain. This synergy between technical skill and social belonging reflects the evolving landscape of higher education, where emotional and digital competencies must coexist for holistic well-being. Consequently, the results underscore the need for universities to foster both AI literacy education and peer-support structures to create inclusive, resilient, and mentally healthy learning environments.

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