

# RETHINKING STUDENT WELL-BEING IN THE AGE OF ARTIFICIAL INTELLIGENCE: A SYSTEMATIC LITERATURE REVIEW

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**Abstract.** The advancement of Artificial Intelligence (AI) in higher education has transformed how students learn, access academic support, and seek psychological assistance. However, the relationship between AI and student well-being continues to yield mixed findings. This study aims to systematically review the role of AI in student well-being in higher education. A Systematic Literature Review methodology was employed, guided by the PRISMA framework and the PICOC structure. Literature searches were conducted across the Scopus, SpringerLink, and ScienceDirect databases, yielding an initial pool of 325 articles. Following a rigorous process of identification, deduplication, title and abstract screening, and full-text eligibility assessment, 21 articles met the inclusion criteria and were subsequently analyzed qualitatively. The findings indicate that AI can function as a source of academic support, a self-help tool, a medium for reflection, a motivational reinforcer, a facilitator of emotional regulation, and an instrument for the early detection of psychological risks among students. Nevertheless, AI also has the potential to generate anxiety about AI, technological dependency, ethical concerns, algorithmic bias, and disruptions to digital well-being. These findings underscore the necessity of developing AI in a manner that is human-centered, ethical, transparent, and integrated with human support to ensure its positive contribution to student well-being.

**Keywords:** Artificial Intelligence; student well-being; psychological well-being; higher education

## INTRODUCTION

The advancement of Artificial Intelligence (AI) in higher education has fundamentally transformed how students learn, access information, receive feedback, complete academic tasks, and seek psychological support. AI is no longer understood merely as a technology for administrative support; it has become an integral part of the learning ecosystem that shapes both the academic experience and students' overall well-being. The emergence of Generative AI tools such as ChatGPT, academic chatbots, adaptive learning systems, and AI-based mental health tools has substantially expanded opportunities for personalized learning, academic efficiency, and early access to psychological support. Nevertheless, these developments have also raised critical questions about how AI affects student well-being in an increasingly digital and complex higher education landscape.

Prior studies have demonstrated that AI has considerable potential to support students' academic processes. Generative AI has been shown to assist students in comprehending course material, organizing ideas, obtaining feedback, and improving academic performance, particularly when used actively and reflectively (Gao et al., 2024). In the context of language learning, AI has also been reported to influence students' motivation, learning anxiety, attitudes toward learning, and writing performance (Biju et al., 2024; Huang et al., 2024). Furthermore, emotionally designed AI-generated feedback has shown potential in supporting student well-being without

compromising learning quality (Alsaiani et al., 2025). Collectively, these findings suggest that AI can serve as a form of academic scaffolding that addresses not only the cognitive dimensions of learning but also the emotional dimensions that students navigate in meeting academic demands.

On the other hand, student well-being has emerged as a critical issue in higher education, as students face increasingly complex academic, social, emotional, and career-related pressures. Student well-being is not solely concerned with the absence of stress or anxiety; it also encompasses the capacity to manage emotions, sustain motivation to learn, cultivate social relationships, maintain digital balance, and develop future readiness. From the perspective of positive psychology, well-being comprises positive emotions, engagement, relationships, meaning, and accomplishment (Seligman, 2011). It is therefore essential that discussions surrounding AI and student well-being be directed toward understanding how AI may either strengthen or, conversely, disrupt students' psychological, academic, and social equilibrium.

Several recent studies have demonstrated that AI can contribute to student well-being through various psychological mechanisms. Sun et al. (2025) found that the use of AI-based mental health tools was positively associated with students' psychological well-being, with the association mediated by emotional self-efficacy and perceived autonomy. This finding indicates that AI can support well-being by empowering students to manage their emotions and exercise autonomy in seeking help. In the context of learning, AI adoption has also been linked to academic motivation and student well-being, particularly when reinforced by peer support (Akhter & Shaheen, 2026). This aligns with Self-Determination Theory, which emphasizes the importance of autonomy, competence, and relatedness in shaping individual well-being (Deci & Ryan, 2000).

Nevertheless, the relationship between AI and student well-being is not uniformly positive. Undirected or unguided use of AI can give rise to AI anxiety, technological dependency, academic pressure, career-related concerns, and disruptions to digital well-being. Al-Nasa'h et al. (2026) demonstrated that AI anxiety was negatively associated with digital well-being and positively associated with future career concerns among engineering and information technology students. Other studies have similarly shown that dependency on Generative AI correlates with motivational, behavioral, and psychological dimensions of student experience (Goh et al., 2025). Furthermore, Crawford et al. (2024) cautioned that when AI supplants human interaction in higher education, it introduces risks related to loneliness, student success, and retention. Taken together, these findings suggest that AI can simultaneously function as a source of support and a source of new pressures for students.

Further risks warrant attention, including ethical concerns, data security, privacy, algorithmic bias, and the erosion of human relationships within academic and psychological support services. Human-centered AI emphasizes that AI development must be oriented toward human dignity, autonomy, well-being, and interests (Ozmen Garibay et al., 2023). In the context of mental health, chatbots and AI-based mental health support tools have shown promise in alleviating psychological distress; however, their effectiveness remains contingent on intervention design, response quality, system security, and professional oversight (Feng et al., 2025; Hua et al., 2025). It is therefore imperative that AI in higher education not be positioned as a replacement for lecturers, counselors, or peer support, but rather as a supplementary tool that must be integrated ethically and responsibly.

Research on AI and student well-being also continues to reflect several notable limitations. A considerable portion of existing studies focuses predominantly on technology adoption, academic performance, or AI usage intentions. At the same time, research that specifically integrates AI with student well-being remains relatively fragmented across a wide range of terminologies —

including psychological well-being, digital well-being, academic stress, AI anxiety, burnout, motivation, enjoyment, and mental health. Through a bibliometric analysis, Chen et al. (2024) demonstrated that scholarship on AI in student mental health has grown rapidly, yet still requires more systematic mapping. Van et al. (2024) similarly affirmed the need for bibliometric and systematic reviews of AI-based support systems to enhance psychological well-being in higher education. This landscape underscores the necessity of a systematic literature review to consolidate these diverse findings into a more comprehensive and coherent framework.

Based on the foregoing discussion, this study is warranted to systematically examine how Artificial Intelligence has been investigated in relation to student well-being in higher education. This systematic literature review aims to map the forms of AI employed, the dimensions of well-being examined, the positive and negative impacts of AI on students, as well as the theoretical, methodological, and practical gaps that remain to be addressed. In doing so, this study is expected to offer a conceptual contribution to the advancement of student well-being scholarship in the age of AI, while simultaneously providing practical implications for higher education institutions, lecturers, counselors, and policymakers in integrating AI in a manner that is human-centered, ethical, and conducive to student well-being

## METHODS

### Research Design

This study employs a Systematic Literature Review (SLR) methodology, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework. PRISMA was adopted to ensure that the processes of identification, screening, eligibility assessment, and article inclusion were carried out in a systematic, transparent, and replicable manner. The scope of the review focuses on articles examining the relationship between Artificial Intelligence and student well-being in higher education. This SLR utilizes the PICOC framework to define the search focus, inclusion and exclusion criteria, and data extraction procedures. PICOC was selected for its capacity to map the core components of the review, namely: population, phenomenon or intervention under investigation, comparison, context, and outcome.

### Use of the PICCO Framework in Research

Table 1. PICCO Framework

| Component                     | Formulation in Research                                                                                                                                                               |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| P - Population                | University students, college students, undergraduate students, graduate students, higher education students                                                                           |
| I - Interest/<br>Intervention | Artificial Intelligence, Generative AI, AI chatbot, AI-based mental health tools, AI literacy, AI anxiety, AI-supported learning                                                      |
| C - Comparison                | AI vs non-AI, chatbot vs control, pre-post comparison, user vs non-user, atau tanpa comparison eksplisit                                                                              |
| C - Context                   | Higher education, university learning, online learning, academic support, student mental health support                                                                               |
| O - Outcome                   | Student well-being, psychological well-being, mental health, digital well-being, emotional well-being, anxiety, depression, stress, burnout, motivation, enjoyment, academic emotions |

### Data Sources and Search Strategy

The literature search was conducted across three primary databases: Scopus, SpringerLink, and ScienceDirect. These three databases were selected for their extensive coverage of

international literature in education, psychology, educational technology, mental health, and Artificial Intelligence. The search was performed using a combination of keywords constructed according to the PICOC framework. The primary keywords employed were as follows: ("artificial intelligence" OR "generative AI" OR ChatGPT OR "AI chatbot" OR "AI-based tools" OR "AI literacy" OR "AI anxiety") AND ("student" OR "university student" OR "college student" OR "higher education") AND ("well-being" OR wellbeing OR "psychological well-being" OR "mental health" OR "digital well-being" OR anxiety OR depression OR stress OR burnout OR "emotional well-being").

### Inclusion and Exclusion Criteria

Table 2. Inclusion and Exclusion Criteria

| Criteria      | Inclusion                                                                                                                                                | Exclusion                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Document Type | Peer-reviewed journal articles or scientific conference proceedings with a clearly defined research methodology                                          | Editorials, opinion pieces, book chapters, popular reports, and articles lacking an explicit methodology           |
| Population    | Students enrolled in higher education, including college, university, undergraduate, and graduate students.                                              | Primary and secondary school students, teachers, lecturers, working professionals, and general patient populations |
| AI Focus      | Articles addressing Artificial Intelligence, Generative AI, AI chatbots, AI literacy, AI anxiety, AI-supported learning, or AI-based mental health tools | General technology articles without AI elements                                                                    |
| Outcome       | Well-being, mental health, digital well-being, emotional well-being, anxiety, depression, stress, burnout, motivation, enjoyment                         | Articles on general technology with no AI component                                                                |
| Context       | Higher education, university learning, student support, and mental health support                                                                        | Industrial, purely clinical, or general population contexts                                                        |
| Language      | English                                                                                                                                                  | Languages other than English                                                                                       |
| Access        | Full-text available                                                                                                                                      | Full-text not accessible                                                                                           |

### Article Selection Process Based on PRISMA

The article selection process was carried out through four principal stages: identification, screening, eligibility assessment, and inclusion. The literature search initially identified 325 articles across the Scopus, SpringerLink, and ScienceDirect databases. Following the removal of 72 duplicate articles, 253 articles proceeded to title and abstract screening. Of these, 189 articles were excluded for failing to meet the criteria related to population, AI focus, or well-being outcomes. Subsequently, 64 articles were retrieved for full-text review; however, 6 articles were inaccessible in their entirety. Accordingly, 58 full-text articles were assessed for eligibility. Of this number, 37 articles were excluded on several grounds, including: the study population did not consist of higher education students, the article lacked a specific focus on Artificial Intelligence, no well-being outcomes were reported, the article constituted a review or protocol, or the methodological clarity was deemed insufficient. Ultimately, 21 articles were included in the qualitative synthesis.

Table 3. PRISMA Data Summary

| PRISMA Stage                                         | Number of Articles | Description                                                       |
|------------------------------------------------------|--------------------|-------------------------------------------------------------------|
| Articles identified from Scopus                      | 145                | Initial search results based on PICOC keywords                    |
| Articles identified from SpringerLink                | 88                 | Initial search results based on PICOC keywords                    |
| Articles identified from ScienceDirect               | 92                 | Initial search results based on PICOC keywords                    |
| Total initial articles                               | 325                | Total articles retrieved across all three databases               |
| Duplicate articles removed                           | 72                 | Articles appearing in more than one database                      |
| Articles after deduplication                         | 253                | Articles proceeding to the screening stage                        |
| Articles excluded after title and abstract screening | 189                | Did not meet population, AI focus, or well-being outcome criteria |
| Articles proceeding to full-text assessment          | 64                 | Articles retrieved for full review                                |
| Full-text inaccessible                               | 6                  | Articles unavailable in full-text form                            |
| Full-text articles assessed for eligibility          | 58                 | Articles evaluated against inclusion and exclusion criteria       |
| Articles excluded after full-text assessment         | 37                 | Did not meet final inclusion criteria                             |
| Final articles included in analysis                  | 21                 | Articles used in the primary synthesis                            |

### Data Analysis and Synthesis

Data were analyzed using narrative and thematic synthesis approaches. Narrative synthesis was employed to describe the general characteristics of the included articles, their research designs, the forms of AI utilized, and the well-being outcomes examined. Thematic synthesis was applied to organize the findings across articles into overarching themes.

Table 4. Research Data Synthesis Theme

| Synthesis Themes                                           | Analysis Focus                                                                      |
|------------------------------------------------------------|-------------------------------------------------------------------------------------|
| AI as an early intervention tool for student mental health | Chatbots, self-help tools, mental health apps, and digital psychological support    |
| AI as academic-emotional scaffolding                       | GenAI for learning, feedback, confidence, motivation, and academic emotions         |
| Internal psychological mechanisms                          | Self-efficacy, autonomy, empowerment, motivation, enjoyment, and peer support       |
| Risks of AI to digital well-being                          | AI anxiety, career concern, digital harassment, dependency, and digital fatigue     |
| AI for the detection and monitoring of psychological risks | Explainable AI, digital phenotyping, human-in-the-loop, and early detection         |
| Human-centered AI in higher education                      | Integration of AI with support from faculty, peers, counselors, and campus policies |

## RESULTS AND DISCUSSION

### Results

#### *Characteristics of Articles Analyzed in the Study*

Based on the PICOC-based selection process, 21 of the 325 initial articles retrieved from the Scopus, SpringerLink, and ScienceDirect databases met the inclusion criteria and were incorporated into the primary synthesis. The analyzed articles focused on higher education students, the use of Artificial Intelligence, and student well-being outcomes — including psychological well-being, mental health, digital well-being, anxiety, depression, stress, burnout, motivation, resilience, student success, and student support. Meanwhile, 37 articles were excluded at the full-text assessment stage for failing to meet the established criteria, such as not focusing on university students, not addressing AI in a specific manner, not reporting well-being outcomes, or constituting protocols, policy documents, or review articles.

In general, the analyzed articles indicate that the relationship between Artificial Intelligence and student well-being is complex and multidimensional. AI can support students' psychological functioning, academic engagement, self-help practices, early risk detection, and motivation to learn. Nevertheless, AI also carries inherent risks, including AI anxiety, technological dependency, digital fatigue, career-related concerns, and academic ethical issues. Consequently, the impact of AI on student well-being is highly contingent upon the design of the technology, AI literacy, social support, academic context, and the institutional governance frameworks that accompany its implementation (See Table 5).

#### *Thematic Synthesis Matrix*

Table 6. Findings of the Thematic Analysis

| Synthesis Theme                                     | Supporting Articles                                                                                                          | Patterns of Findings                                                                                                                                                                                                                          | The Importance of Student Well-Being                                                                                                                        |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AI as a low-threshold form of mental health support | Sun et al. (2025); Ehrlich et al. (2024); Yokotani et al. (2025); Klos et al. (2021); Liu et al. (2022); Dabou et al. (2025) | AI chatbots and AI mental health tools can support self-help, emotional expression, symptom management, and early access. However, the results are not always consistent and depend heavily on user engagement and the intervention's design. | AI can serve as an initial and complementary service to professional services, but it cannot be positioned as a substitute for a counselor or psychologist. |
| AI as academic-emotional scaffolding                | Elliott et al. (2026); Liu et al. (2026); Bai (2026); Deng et al. (2026); Wang & Cao (2025)                                  | AI helps students manage assignments, receive feedback, improve their academic success, reduce anxiety and shame, and increase their motivation and enjoyment.                                                                                | AI has a positive impact when integrated into a clear pedagogical design that supports students' self-regulation.                                           |
| Internal psychological mechanisms                   | Sun et al. (2025); Alshowkan & Shdaifat (2025);                                                                              | Self-efficacy, autonomy, empowerment, motivation, enjoyment, and peer                                                                                                                                                                         | The impact of AI on well-being is not direct, but rather                                                                                                    |

| Synthesis Theme                                            | Supporting Articles                                                                                  | Patterns of Findings                                                                                                                                                | The Importance of Student Well-Being                                                                                                                     |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                            | Al-Nasa'h et al. (2026); Akhter & Shaheen (2026); Wang & Cao (2025)                                  | support are key pathways that explain the relationship between AI and well-being.                                                                                   | comes through the enhancement of agency, competence, and social support.                                                                                 |
| The Risks of AI to Digital Well-Being                      | AL-Nasa'h et al. (2026); Salem (2026); Luque-Reca et al. (2026); Černý (2025); Dabou et al. (2025)   | AI can lead to AI anxiety, concerns about future careers, digital harassment, ethical concerns, and digital imbalance.                                              | Student well-being in the age of AI must encompass digital safety, AI literacy, ethics, AI use regulations, and protection against sociotechnical risks. |
| AI for the detection and monitoring of psychological risks | Fu et al. (2026); Alves et al. (2023/2024)                                                           | XAI, digital phenotyping, and human-in-the-loop approaches can help identify psychological risks among college students                                             | AI monitoring must be transparent, interpretable, and not completely replace human judgment                                                              |
| Human-Centered AI in Higher Education                      | Elliott et al. (2026); Akhter & Shaheen (2026); Alves et al. (2023/2024); Salem (2026); Černý (2025) | Students still need professors, peers, counselors, and a safe learning environment. AI is most effective when it enhances rather than replaces human relationships. | AI needs to be developed as a learning partner and early-stage support system that is integrated into the campus ecosystem                               |

*Matrix of Article Characteristics Used*

Table 5. Matrix of Key Article Findings

| No | Author & Year              | AI Focus                                      | Design & Sample                                               | Outcome Well-Being                                                    | Key Findings                                                                                                                                                                                                                                  | Position in the Synthesis                                                              |
|----|----------------------------|-----------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1  | Sun et al., 2025           | AI-based mental health tools                  | Cross-sectional; 3,859 Chinese college students               | Psychological well-being, emotional self-efficacy, perceived autonomy | The use of AI-based mental health tools is positively associated with psychological well-being. Emotional self-efficacy and perceived autonomy mediate this relationship; the model explains 38% of the variance in psychological well-being. | AI as a form of psychological support based on autonomy and emotional regulation       |
| 2  | Ehrlich et al., 2024       | Mind Tutor AI wellbeing app                   | Two RCT pilot studies; N=177 and N=240 first-year UK students | Student well-being                                                    | Mind Tutor did not have a significant impact on student well-being, but it provided important lessons about engagement, timing, and the acceptability of digital applications.                                                                | Evidence that AI-powered wellness apps aren't automatically effective                  |
| 3  | Elliott et al., 2026       | Personalized GenAI academic agents/Cogniti AI | Pilot mixed-methods study; 139 Australian students            | Learning, success, engagement, well-being                             | GenAI agents improve learning and success, but do not show significant changes in engagement and well-being. Students benefit from 24/7 support, increased confidence, and reduced stress, but still need human interaction.                  | AI as academic support, not a substitute for human relationships                       |
| 4  | Alshowkan & Shdaifat, 2025 | AI literacy                                   | Cross-sectional; 497 nursing students in Saudi Arabia         | Well-being, empowerment, anxiety                                      | AI literacy influences empowerment, anxiety, and well-being through both direct and indirect pathways. The findings highlight the importance of AI literacy, emotional support, and a structured curriculum.                                  | AI literacy is both a protective factor and a potential source of psychological stress |
| 5  | Liu et al., 2026           | GenAI-integrated flipped                      | Quasi-experiment; 95 first-year students                      | Emotional well-being, academic achievement                            | The GenAI-FC group demonstrated higher academic achievement and emotional well-being than the                                                                                                                                                 | AI as a pedagogical design that supports emotional learning                            |

|    |                         |                                                 |                                                                               |                                                                  |                                                                                                                                                                                                                                          |                                                                |
|----|-------------------------|-------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
|    |                         | classroom                                       |                                                                               |                                                                  | traditional flipped classroom group.                                                                                                                                                                                                     |                                                                |
| 6  | AL-Nasa'h et al., 2026  | AI anxiety                                      | Cross-sectional; 820 engineering and IT students in Jordan                    | Digital well-being, AI anxiety, career concerns                  | High AI anxiety, low digital well-being, and moderate career concern. AI anxiety is strongly negatively correlated with digital well-being and positively correlated with career concern.                                                | AI as a Source of Career Anxiety and Digital Imbalance         |
| 7  | Salem, 2026             | AI-mediated interactions and digital harassment | Cross-sectional; 2,185 students from Saudi Arabia and 32 developing countries | Mental health impact, e-learning continuity                      | AI-mediated interactions are most strongly associated with exposure to digital harassment. This exposure accounts for 38.2% of the variance in mental health impact and 33.6% of the variance in e-learning continuity.                  | Socio-technical risks of AI to security and well-being         |
| 8  | Luque-Reca et al., 2026 | AI attitudes / AIAS-4                           | Psychometric validation; 650 Spanish college students                         | AI attitude, academic AI use, and well-being association         | AIAS-4 is valid, reliable, and modestly predictive of AI use in academic settings. Attitudes toward and use of AI are lower among female participants.                                                                                   | Attitudes toward AI as an indicator of psychological readiness |
| 9  | Deng et al., 2026       | AI use as a coping strategy                     | Cross-sectional; 520 college students                                         | Decent education, academic stress, and interpersonal interaction | Challenge and hindrance stressors predict AI use. AI use enhances perceptions of a decent education and mediates the relationship between academic stressors and that perception. Interpersonal interaction moderates this relationship. | AI as an Academic Coping Strategy in the Context of Stress     |
| 10 | Elashram & Alamri, 2026 | Patterns of AI application use                  | Cross-sectional correlational study; 367 graduate students                    | Burnout, academic resilience                                     | The use of AI and academic resilience are negatively correlated with burnout. AI use accounts for 34.1% of the variance in burnout, while resilience accounts for 19.1%.                                                                 | AI as a psychological resource for reducing burnout            |
| 11 | Al-Nasa'h et al., 2026  | Online learning self-efficacy                   | Cross-sectional; 428 engineering                                              | Digital well-being                                               | Online learning self-efficacy is negatively correlated with AI anxiety                                                                                                                                                                   | Self-efficacy as a Protective Factor                           |

|    |                       |                                              |                                                                           |                                                            |                                                                                                                                                                                                            |                                                                          |
|----|-----------------------|----------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|    |                       | and AI anxiety                               | students in Jordan                                                        |                                                            | and positively correlated with digital well-being. AI anxiety mediates the relationship between OLSE and digital well-being.                                                                               | Against AI Anxiety                                                       |
| 12 | Fu et al., 2026       | Explainable AI/LightGBM-SHAP/BERTopic        | XAI framework; 12,773 structured data points and 6,415 valid text entries | Psychological risk, anxiety, academic pressure, loneliness | XAI identified social support, sleep quality, GPA, hours spent gaming, and gender as risk predictors. BERTopic identified the themes of academic pressure, career confusion, and interpersonal loneliness. | AI for the Early Detection of Psychological Risks Among College Students |
| 13 | Bai, 2026             | Generative AI in creative problem-solving    | Quasi-experiment; 108 students                                            | Academic emotions, anxiety, shame, and performance         | Generative AI reduces anxiety and shame while increasing correctness and novelty. Metacognitive regulation plays a key role in the effective use of AI.                                                    | GenAI as a tool for academic emotional support and creative performance  |
| 14 | Yokotani et al., 2025 | Unified Protocol chatbot                     | RCT; 310 Japanese students                                                | Anxiety, depression, and emotional expression              | The UP chatbot reduced anxiety compared to the waitlist, and the effect persisted at follow-up. The chatbot encouraged expressing sadness as a means of emotional acceptance.                              | Chatbots as an acceptance-based emotional intervention                   |
| 15 | Klos et al., 2021     | Tess AI chatbot                              | RCT Pilot Study; 181 Argentine students                                   | Anxiety, depression, and acceptability                     | There were no significant differences between the groups, but the Tess group experienced a reduction in anxiety within the group and demonstrated good acceptability.                                      | Early evidence of AI chatbots in the Latin American context              |
| 16 | Liu et al., 2022      | AI chatbot self-help depression intervention | RCT; 83 Chinese students                                                  | Depression, anxiety, and therapeutic alliance              | Chatbots are more effective than bibliotherapy at reducing PHQ-9 and GAD-7 scores and at fostering a stronger therapeutic alliance.                                                                        | AI chatbots as a self-help intervention                                  |
| 17 | Wang & Cao, 2025      | AI-supported music learning                  | Cross-sectional SEM; 174                                                  | Motivation, enjoyment, well-                               | AI-supported music learning boosts motivation and enjoyment; both                                                                                                                                          | AI as a Fun and Meaningful                                               |

|    |                         |                                               |                                                                            |                                                               |                                                                                                                                                                                                                                                                |                                                                   |
|----|-------------------------|-----------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
|    |                         |                                               | students                                                                   | being                                                         | contribute to well-being. Motivation explains the relationship between enjoyment and well-being.                                                                                                                                                               | Learning Experience                                               |
| 18 | Alves et al., 2023/2024 | Human-in-the-loop AI mental health monitoring | User study: Brazilian college students                                     | Depression risk, trust, recommendation acceptance             | Students were involved in evaluating the data before and after AI classification. The response to the AI's classifications and recommendations was generally positive.                                                                                         | Human-in-the-loop to improve AI reliability and accuracy          |
| 19 | Akhter & Shaheen, 2026  | AI adoption in EFL learning                   | Cross-sectional SEM; 482 Pakistani college students                        | Psychological well-being, motivation, peer support            | AI adoption is positively correlated with motivation and well-being. Peer support strengthens the relationship between AI adoption and well-being.                                                                                                             | AI is more effective when backed by peer support                  |
| 20 | Černý, 2025             | Digital well-being in the GenAI context       | Qualitative thematic analysis; 474 student recommendations                 | Digital well-being, autonomy, responsibility, and AI literacy | Digital well-being is understood through social expectations, interactions with GenAI, risks, and adaptive strategies. Key strategies include critical thinking, autonomy, care, responsibility, and awareness of the differences between humans and machines. | A Student-Centered Conceptualization of Digital Well-Being        |
| 21 | Dabou et al., 2025      | AI chatbot platforms                          | Cross-sectional comparative study; 298 health sciences students in the UAE | Depression, anxiety, stress                                   | 69.1% of college students have used an AI chatbot. Chatbot users have higher levels of depression and anxiety than non-users; the authors interpret this as a possible indication of help-seeking behavior, rather than a direct causal relationship.          | AI chatbots as an indicator of the need for psychological support |

### ***AI as Early Mental Health Support for Students***

Findings from several studies suggest that AI, particularly chatbots and AI-based mental health tools, has the potential to serve as an early form of support for students experiencing psychological distress. Sun et al. (2025) found that the use of AI-based mental health tools was positively associated with psychological well-being, with the association mediated by emotional self-efficacy and perceived autonomy. This finding indicates that AI can support well-being when students feel more capable of managing their emotions and maintaining a sense of control over their own self-help process. However, Ehrlich et al. (2024) found that Mind Tutor did not produce a significant impact on the well-being of first-year students, suggesting that the effectiveness of AI mental health applications cannot be assumed automatically. More discernible effects were observed in chatbot-based intervention studies, such as Liu et al. (2022), which reported reductions in depression and anxiety, and Yokotani et al. (2025), which demonstrated decreased anxiety through the expression of negative emotions and emotional acceptance.

### ***AI as Academic Support with Implications for Well-Being***

A number of articles indicate that AI does not always directly influence well-being but may affect it indirectly through academic experience. Elliott et al. (2026) found that Cogniti AI enhanced students' perceptions of learning and success, yet did not produce significant changes in well-being, affirming that Generative AI agents function more effectively as academic support tools than as direct psychological interventions. In contrast, Liu, Sriwisathiyakun, and Petsangsri (2026) reported stronger outcomes when Generative AI was embedded in a structured flipped classroom learning design; the GenAI-FC group achieved higher emotional well-being and academic performance scores than the control group. Bai (2026) similarly demonstrated that Generative AI in creative problem-solving contexts can reduce anxiety and shame while enhancing correctness and novelty, particularly among students with strong metacognitive regulation.

### ***AI Literacy, Self-Efficacy, Autonomy, and Motivation as Psychological Mechanisms***

The synthesis findings reveal that AI's influence on well-being is mediated by several psychological mechanisms, most notably self-efficacy, autonomy, empowerment, motivation, and perceived control. Sun et al. (2025) confirmed the mediating roles of emotional self-efficacy and perceived autonomy. Al-Nasa'h et al. (2026) found that online learning self-efficacy reduced AI anxiety and enhanced digital well-being. Akhter and Shaheen (2026) demonstrated that AI adoption was associated with academic motivation and well-being, and that peer support further strengthened this relationship. In the context of music education, Wang and Cao (2025) showed that AI-supported music learning enhanced motivation and enjoyment, which in turn contributed to overall well-being.

### ***AI Anxiety and Digital Risks as Threats to Well-Being***

Conversely, AI has also emerged as a source of psychological pressure. Al-Nasa'h, Al-Tarawneh, and Alhwayan (2026) found that AI anxiety was strongly and negatively correlated with digital well-being and positively correlated with future career concerns. This suggests that students who perceive AI as a threat to their competence, professional identity, or career prospects tend to report lower levels of digital well-being. Salem (2026) extended these risks to the broader digital ecosystem, demonstrating that AI-mediated interactions were strongly associated with exposure to digital harassment, which in turn was linked to poorer mental health outcomes and diminished e-learning continuity. Černý (2025) further showed that digital well-being in the context of Generative AI demands adaptive strategies, including critical thinking, accountability, autonomy, and awareness of the boundaries between humans and machines.

### ***AI as a Tool for Detection, Monitoring, and Human-in-the-Loop Support***

Beyond its role as a learning aid and self-help tool, AI has also been applied to the early detection and monitoring of psychological risks among students. Fu et al. (2026) employed Explainable AI using LightGBM-SHAP and BERTopic to identify psychological risk factors and distress themes among students, including academic pressure, career confusion, and interpersonal loneliness. Alves et al. (2023/2024) emphasized the critical importance of human-in-the-loop approaches in AI-based mental health monitoring, noting that digital data cannot reliably represent students' actual psychological conditions without human validation. It is therefore essential that AI-based monitoring systems be transparent, interpretable, and designed to actively involve students or mental health professionals in the interpretive process.

## **Discussion**

### ***Artificial Intelligence and the Paradigm Shift in Student Well-Being***

The presence of AI in higher education has transformed the ways in which students learn, seek assistance, understand their emotions, manage academic pressures, and engage with their learning environment. Consequently, student well-being in the context of AI can no longer be understood solely as an individual psychological condition but rather as the product of interactions among students' personal capacities, technology design, social support, and institutional governance. This perspective aligns with Crawford et al. (2024), who emphasized that when AI supplants human interaction in higher education, it introduces risks related to loneliness, student success, and retention. AI, therefore, does not merely bring academic efficiency; it also reshapes the relational structures that have long been fundamental to student well-being.

AI operates within a complex socio-technical system. Technology does not function in isolation; it is interconnected with academic norms, institutional culture, learning policies, academic integrity, and student support services. This view aligns with the principle of human-centered artificial intelligence, which positions human beings as the central reference point for technology design and evaluation, rather than as passive users of algorithmic systems (Ozmen Garibay et al., 2023). In the context of higher education, this means that AI must be designed to strengthen students' capacities, rather than to replace critical thinking processes, academic relationships, or ethical deliberation.

From the perspective of positive psychology, well-being encompasses positive emotions, engagement, relationships, meaning, and accomplishment (Seligman, 2011). This framework is particularly relevant for situating AI, as it can support learning engagement, accelerate feedback, and help students feel more capable of meeting academic demands. However, AI can also disrupt well-being when it fosters dependency, diminishes social interaction, or intensifies performance pressure. Shahzad et al. (2024) found that AI and social media can be perceived as positively contributing to academic performance and mental well-being, while Shahzad et al. (2025) cautioned that Generative AI and social media in higher education must be approached carefully, as their effects on psychological well-being are contingent upon usage patterns and learning context.

### ***AI, Autonomy, and Self-Efficacy in Student Well-Being***

One of the most theoretically robust frameworks for understanding the relationship between AI and student well-being is Self-Determination Theory. Deci and Ryan (2000) posited that individual well-being is enhanced when three fundamental psychological needs are met: autonomy, competence, and relatedness. In the context of higher education, AI can support autonomy by providing students with more flexible access to information, feedback, and learning

assistance. AI can also support competence when students feel more capable of comprehending course material, completing tasks, managing academic emotions, and making informed learning decisions.

Social Cognitive Theory similarly positions self-efficacy as a critical determinant of adaptive behavior and individual achievement (Bandura, 1997). In the context of AI, students who possess confidence in their ability to use technology tend to be better equipped to engage with AI productively. Prior research has consistently identified self-efficacy as a significant factor in AI adoption within higher education. Acosta-Enriquez et al. (2025) demonstrated that psychosocial factors, including self-efficacy, play a role in students' appropriation of AI. Zhao and Li (2024) similarly linked AI dependency to academic self-efficacy, academic stress, and performance expectations. Accordingly, the use of AI should be oriented toward strengthening self-efficacy rather than fostering dependency.

Relatedness remains a central challenge. While AI can deliver rapid and personalized responses, it is not fully capable of replacing human relationships characterized by empathy, emotional presence, and contextual understanding. Kuhail et al. (2024) found that students continue to draw clear distinctions between human and AI-based counseling, particularly regarding trust, empathy, and depth of understanding. This reinforces the argument that AI can serve as a complement to psychological support, but cannot replace professional counseling relationships. It is therefore essential that AI-based well-being support be sustained in tandem with the involvement of lecturers, peers, counselors, and the broader academic community.

### ***Generative AI as Academic and Emotional Scaffolding***

In the context of learning, Generative AI can be conceptualized as a form of digital scaffolding. The concept of scaffolding is rooted in Vygotsky's (1978) view that learners require temporary support to reach higher levels of cognitive development. AI can assume a scaffolding role by helping students grasp concepts, organize ideas, test arguments, obtain feedback, and reflect on their learning process. However, effective scaffolding does not mean providing instant answers; rather, it means guiding students toward more independent and self-directed thinking.

Prior research supports this conceptualization. Gao et al. (2024), drawing on the ICAP framework and Self-Determination Theory, demonstrated that Generative AI can enhance the academic performance of business students when used in an active and constructive manner. Kohnke and Moorhouse (2025) similarly found that Generative AI has the potential to strengthen the emotional dimensions of language learning, particularly when the technology is leveraged to create more supportive learning experiences. In the context of feedback, Alsaiani et al. (2025) affirmed that emotionally enriched AI-generated feedback can support student well-being without compromising the learning process. Collectively, these findings suggest that AI can serve as both academic and emotional scaffolding when designed with students' psychological needs in mind.

The Control-Value Theory of Achievement Emotions is also relevant for explaining AI's role in students' academic emotions. Pekrun (2006) argued that academic emotions are shaped by individuals' appraisals of control and value in relation to a given task. AI can help reduce negative emotions when students feel more capable of managing their learning process. Conversely, AI can intensify pressure when students feel left behind, incompetent, or anxious about technological demands. Biju et al. (2024) demonstrated that AI-assisted assessment formats can influence foreign language anxiety, learning attitudes, motivation, and writing performance, indicating that AI integration in learning must attend to the emotional dimension, not merely cognitive efficiency.

Pedagogically sound AI is AI that strengthens student agency. AI should help students ask better questions, think more reflectively, and make more intentional academic decisions. When AI

is used solely to accelerate task completion without fostering reflection, it risks undermining self-regulated learning and academic integrity — a concern echoed by Crawford et al. (2023), who emphasized the necessity of ethical leadership in the use of ChatGPT to preserve character, assessment integrity, and the quality of learning.

### ***AI Anxiety, Digital Well-Being, and Career Uncertainty***

The presence of AI in higher education has also given rise to new forms of anxiety and uncertainty. AI anxiety can be understood as a psychological response to rapid technological change, particularly when students perceive their skills, academic identity, or career prospects as being under threat. Within the Transactional Model of Stress and Coping, Lazarus and Folkman (1984) explained that stress arises when individuals appraise a situation as threatening and perceive their available coping resources as insufficient. In this context, AI becomes a stressor when students perceive it as a threat to their competence, employment opportunities, or sense of self-worth.

Li et al. (2025) demonstrated that AI attitudes and AI literacy mediate the relationship between career self-efficacy and job-seeking anxiety. Liang and Zhai (2025) similarly found that awareness of AI's impact is associated with students' employment risk perception. Furthermore, Wei (2025) highlighted the relationship between AI-unemployment anxiety and self-creative identity, with self-creative identity serving as a mediating factor. These findings collectively indicate that anxiety toward AI is not purely technological in nature, but is deeply intertwined with self-identity, creativity, career readiness, and the perception of occupational risk.

Savickas's (2013) Career Construction Theory offers a useful lens for understanding this phenomenon. Students construct their careers through adaptability, personal narrative, and readiness for change. AI can destabilize students' career narratives when they begin to question the relevance of the competencies they are currently developing. Higher education institutions must therefore integrate AI literacy with career adaptability, employability skills, and reskilling preparedness. Xiao and Zheng's (2025) research on ChatGPT and employment confidence further demonstrated that AI can serve as a career-readiness booster when used appropriately, yet without a healthy career framing, it risks becoming a source of future-oriented anxiety.

Digital well-being also emerges as a significant concern. Chen et al. (2025) underscored the importance of distinguishing between digital competency and digital dependency in understanding digital well-being. Goh et al. (2025) furthered the study of Generative AI dependency, demonstrating that reliance on AI has motivational, behavioral, and psychological correlates. Consequently, student well-being in the age of AI cannot be assessed solely based on technological proficiency. However, it must also encompass the capacity to maintain healthy boundaries, manage dependency, preserve self-regulation, and engage with AI reflectively and intentionally.

### ***Human-Centered AI and the Ethics of Student Psychological Support***

Any discussion of AI and well-being must necessarily engage with ethical considerations. AI deployed in mental health support, academic assistance, or psychological risk detection must account for privacy, data security, transparency, accuracy, algorithmic bias, and the risk of stigmatization. Human-centered AI emphasizes that technology must be developed to uphold human dignity, autonomy, and well-being (Ozmen Garibay et al., 2023). In the context of higher education, this principle is particularly salient, as students are vulnerable when algorithm-driven systems process their academic data, digital behaviors, or psychological conditions.

Research on AI mental health chatbots also calls for caution. Hua et al. (2025) noted that the development of mental health chatbots has progressed from rule-based systems to large language models. However, significant challenges remain concerning accuracy, safety, and response quality.

Feng et al. (2025), through a systematic review and meta-analysis, similarly found that AI chatbots can help reduce mental distress among adolescents and young adults. However, their effectiveness is contingent upon intervention design, target population, and risk management protocols. This underscores that AI-based mental health support must be evidence-based and must not be deployed without professional oversight.

In student services, AI can assist with initial assessments, psychoeducation, needs mapping, and service referral. However, decisions about students' psychological well-being must continue to involve human judgment. This principle is consistent with the human-in-the-loop approach, a model that preserves the role of human professionals in validation, interpretation, and decision-making. In the context of counseling, Ofem et al. (2024) found that acceptance of AI in counseling practice is shaped by professional awareness, gender, and professional rank, indicating that integrating AI into counseling services requires professional preparedness, not merely technological readiness.

Ethical risks also arise within the learning context. Sweeney (2023) drew attention to issues surrounding essay mills, contract cheating, and AI in higher education assessment. Pérez-Portabella et al. (2025) similarly examined the ethical considerations of using Generative AI in academic essay editing. It is therefore imperative that the use of AI for student support and learning be accompanied by clear ethical guidelines to prevent misuse, dependency, and violations of academic integrity.

### ***Conceptual Directions for Student Well-Being in the Age of AI***

Student well-being in the age of AI must be understood as a balance among personal capacity, social support, technology design, and institutional policy. Student well-being cannot be adequately measured by the absence of stress or anxiety alone; it must also encompass students' capacity to engage with technology mindfully, preserve autonomy, sustain social relationships, derive meaning from learning, and cultivate readiness for the future. This perspective aligns with Chen et al. (2024), who demonstrated through bibliometric analysis that AI is increasingly prominent in student mental health research, yet still requires a more integrative understanding that bridges technology, psychology, and education.

AI must be positioned within an augmentative paradigm, rather than a substitutive one. AI should expand students' capacities, not replace critical thinking, human relationships, or ethical deliberation. A healthy higher education environment in the age of AI integrates technological sophistication with humanistic values, critical reflection, psychological support, and digital equity. Van der Maden et al. (2023) emphasized the importance of AI design frameworks that support community well-being, ensuring that AI is directed not only toward individual efficiency but toward the collective flourishing of the academic community.

## **CONCLUSION**

Based on the review's findings, it can be concluded that Artificial Intelligence plays a complex, ambivalent, and context-dependent role in shaping student well-being in higher education. AI does not merely function as a technological tool but can also serve as academic support, a self-help resource, a medium for reflection, a facilitator of motivation to learn, a support mechanism for emotional regulation, and an early detection tool for students' psychological risks. Nevertheless, the use of AI also presents several potential risks, including increased AI anxiety, technological dependency, reduced social interaction, academic integrity concerns, algorithmic bias, data

security issues, and disruptions to digital well-being when it is not accompanied by adequate literacy and governance.

Therefore, higher education institutions are encouraged to develop AI utilization policies that are human-centered, ethical, transparent, and evidence-based; integrate AI as a supportive component in learning processes, counseling services, and student support systems without replacing human roles; and equip students with critical, reflective, and responsible AI literacy. Through this approach, AI can be positioned not as a substitute for academic and psychological relationships but rather as a supportive partner that enhances psychological well-being, academic achievement, self-directed learning, and students' readiness to face a future increasingly shaped by technology.

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