

AI, Digital Behaviour and Psychological Well-Being Among Generation Z: A Multidimensional Study of Higher-Education Students

Balamanthara K.¹; S. Sudhakar²; G. Balaji³

¹Head & Assistant Professor, Department of Psychology Nandha Arts and Science College (Autonomous), Erode- 52

²Assistant Professor, Department of English Nandha Arts and Science College (Autonomous), Erode-52

³Assistant Professor, Department of Psychology, Nandha Arts and Science College (Autonomous), Erode-52

¹ORCID iD: 0009-0008-9411-9833

²ORCID iD: 0009-0008-6884-8725

³ORCID iD: <https://orcid.org/0009-0003-5192-5492>

Publication Date: 2026/09/16

Abstract: Generation Z university students are the first cohort to move through higher education alongside mainstream generative artificial intelligence (AI) tools, near-constant smartphone connectivity, and algorithmically curated social media. This article synthesises recent empirical evidence (2024–2026) to propose and justify a multidimensional framework linking AI usage patterns, digital behaviour, and psychological well-being among higher-education students. Drawing on Self-Determination Theory, the Unified Theory of Acceptance and Use of Technology (UTAUT2), and Cognitive Load Theory, the paper argues that AI and digital technologies exert simultaneous facilitative and detrimental effects across five interacting dimensions of student well-being: cognitive-academic, emotional, social-relational, behavioural-regulatory, and identity-related well-being. The review shows that generative AI tools such as ChatGPT can reduce cognitive load and support learning, yet uncontrolled reliance is associated with anxiety, diminished self-efficacy, and eroded critical thinking. Similarly, smartphone and social-media behaviour can supply social connectedness and information access while simultaneously predicting loneliness, fear of missing out, and addictive use patterns. A conceptual model and a proposed empirical methodology are presented to guide future cross-sectional validation among higher-education populations. The article concludes with implications for curriculum design, digital-wellness policy, and AI-literacy training in universities.

Keywords: Artificial Intelligence; Digital Behaviour; Psychological Well-Being; Generation Z; Higher Education; ChatGPT; Smartphone Addiction; Digital literacy.

How to Cite: Balamanthara K.; S. Sudhakar; G. Balaji (2026) AI, Digital Behaviour and Psychological Well-Being Among Generation Z: A Multidimensional Study of Higher-Education Students. *International Journal of Innovative Science and Research Technology*, 11(9), 216-224. <https://doi.org/10.38124/ijisrt/26sep265>

I. INTRODUCTION

Generation Z broadly defined as individuals born between the mid-1990s and the early 2010s is the first generation to enter and progress through higher education in an environment where generative artificial intelligence (AI), smartphones, and social media are not optional adjuncts to academic life but its default operating conditions (Koteczki & Balassa, 2025). Unlike earlier cohorts for whom digital technology was adopted incrementally, Generation Z students have never known a classroom, library, or peer group unmediated by a screen. Within the last three years, this

digital ecosystem has been further transformed by the rapid diffusion of large language model tools such as ChatGPT, which are now used by a majority of university students worldwide for writing, research, revision, and even emotional support (Babu et al., 2024; Oliński & Sieciński, 2025).

This convergence of generative AI with pre-existing patterns of smartphone and social-media use raises urgent questions about student psychological well-being. On one hand, a growing body of research documents genuine benefits: AI-based tools can lower cognitive load, personalise learning, and even function as low-threshold mental-health

resources for students who might otherwise not seek help (Chen et al., 2024). On the other hand, the same convenience that makes generative AI attractive appears to create new vulnerabilities: cognitive offloading, academic anxiety when tools are unavailable, and a subtle erosion of self-efficacy and critical thinking (Farhat, 2025; Zhang et al., 2024). Digital behaviour more broadly including smartphone use, social-media browsing, and constant connectivity has long been associated with both protective and risk factors for student mental health, including loneliness, social anxiety, and fear of missing out (Wang & Ma, 2024; Zhou & Feng, 2025).

Psychological well-being among higher-education students is therefore no longer explicable through a single construct such as “screen time” or “AI use.” It is a multidimensional outcome shaped by the interaction of cognitive, emotional, social, behavioural, and identity-related processes, each of which is differently implicated by AI and digital-technology engagement (Lim et al., 2024). This is compounded by generational specificity: Gen Z's digital fluency does not appear to automatically translate into digital or psychological resilience recent cross-national evidence indicates that, unlike older working cohorts, Gen Z users of AI report benefits largely confined to enjoyment rather than broader mental-health or physical-health improvement

(Nakavachara, 2025), suggesting that generational “digital-native” status is not synonymous with adaptive digital behaviour.

Against this backdrop, the present article pursues three interlocking objectives. First, it synthesises recent (2024–2026) empirical literature on AI adoption, digital behaviour, and psychological well-being among higher-education students to identify convergent and divergent findings. Second, it develops an integrative, multidimensional conceptual framework that positions AI usage and digital behaviour as simultaneously facilitative and risk-generating influences across five well-being dimensions. Third, it proposes a methodology through which this framework can be empirically validated in future higher-education research, and it derives practical implications for university policy, curriculum design, and student-support services. In doing so, the article addresses a gap identified across the reviewed literature: most existing studies isolate either AI acceptance, or smartphone/social-media behaviour, or a single well-being outcome, rather than integrating these strands into a coherent multidimensional account of the Generation Z student experience (Koteczki & Balassa, 2025; Dwidienawati et al., 2025).

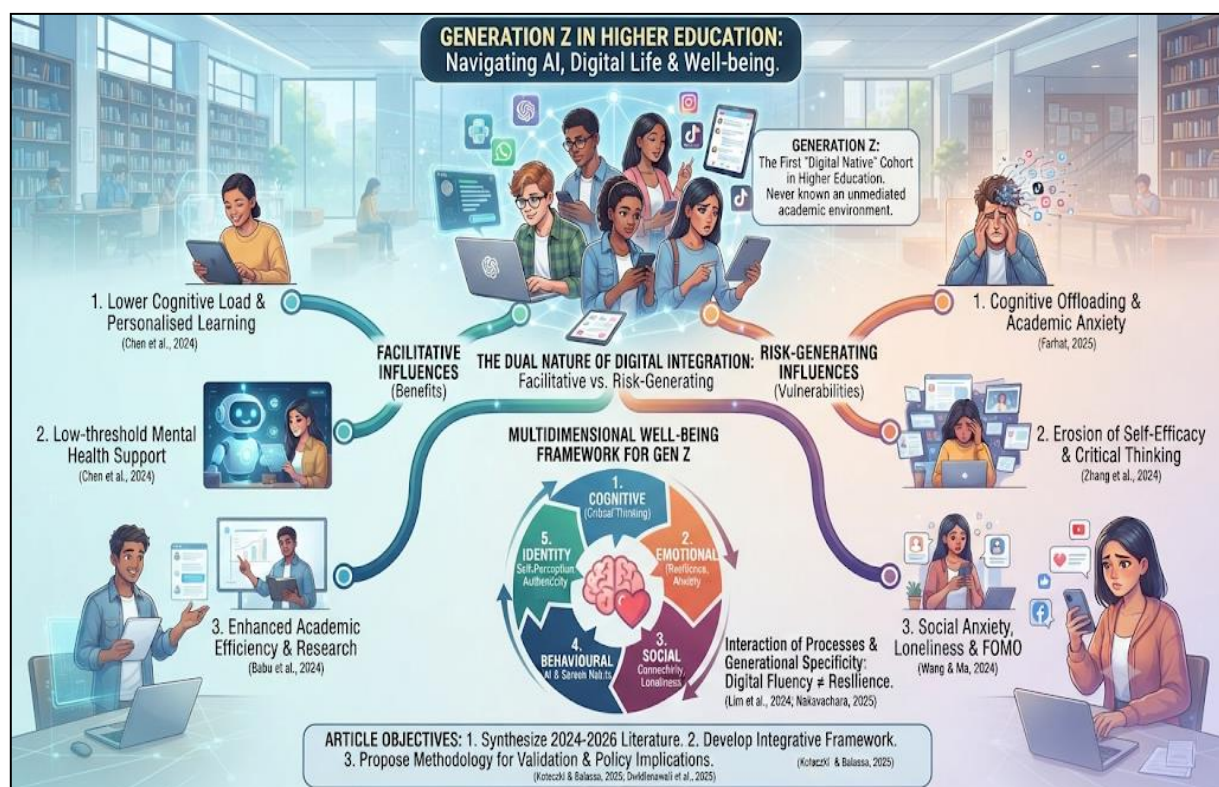


Fig 1 Generation Z in Higher Education: The Dual Nature of Digital Integration

This conceptual infographic illustrates Gen Z's digital academic environment, highlighting the tension between facilitative AI benefits (lower cognitive load, mental health support) and risk-generating vulnerabilities (cognitive offloading, anxiety, FOMO) across five multidimensional well-being sectors.

II. LITERATURE REVIEW

➤ Generation Z, AI Acceptance, and Adoption in Higher Education

Generation Z students are frequently characterised in the literature as pragmatic, hyper-connected, and generally open to technological innovation, including AI (Koteczki &

Balassa, 2025). Studies applying the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT2) consistently find that perceived usefulness, ease of use, and enjoyment are strong predictors of AI adoption intention among this cohort (Acosta-Enriquez, Ramos Farroñan, et al., 2024). A cluster analysis of Hungarian university students, for example, identified distinct subgroups ranging from enthusiastic adopters to sceptical users, demonstrating that Generation Z is not a monolithic bloc but a heterogeneous population whose relationship with AI is moderated by disposition, prior experience, and perceived social influence (Koteczki & Balassa, 2025).

Cross-national evidence corroborates this heterogeneity. A survey of Polish university students found that although Generation Z consistently rates ChatGPT's potential highly, its perceived current usefulness as a tutor, task assistant, or teacher is systematically rated lower than its theoretical potential, indicating a gap between enthusiasm and realised value (Oliński & Siciński, 2025). Similarly, research among Bangladeshi university students found that generational identity itself more than individual attitude or adoption tendency alone was the strongest predictor of ChatGPT usage rates, underscoring the importance of cohort-level norms in shaping digital behaviour (Babu et al., 2024). Ethical and integrity concerns also feature prominently: a study of Peruvian Generation Z students found that positive attitudes and factual knowledge about ChatGPT did not by themselves guarantee effective or ethical adoption, and that perceived ethics and student concerns were the strongest predictors of appropriate use (Acosta-Enriquez, Arbulú Ballesteros, et al., 2024).

➤ *Digital Behaviour: Smartphones, Social Media, and Problematic Use*

Digital behaviour among higher-education students has been studied most extensively through the lens of problematic smartphone use and social-media engagement. Multiple recent studies converge on the finding that smartphone use is not intrinsically harmful but becomes problematic when it functions as a coping mechanism for underlying social-emotional needs. Wang and Ma (2024) found that social isolation elevated smartphone addiction risk among Chinese college students, an effect substantially mediated by loneliness and pandemic-related anxiety. In a related vein, Zhou and Feng (2025), surveying over two thousand Chinese college students, demonstrated that social anxiety predicts smartphone addiction largely through the mediating pathway of loneliness, suggesting that excessive device use often substitutes for, rather than supplements, offline social connection.

These patterns are not confined to any single national context; converging evidence from Chinese higher-education samples indicates that correlates of problematic smartphone use including academic stress, disrupted sleep, and lower life satisfaction are consistently reported regardless of the specific mediating pathway examined (Wang & Ma, 2024; Zhou & Feng, 2025). Beyond addiction per se, digital behaviour is entangled with well-being through fear of

missing out (FoMO): a large Indonesian study found that while social support and personal resilience directly promote Generation Z well-being, the anticipated negative role of technology and screen time was not straightforwardly confirmed, indicating that the well-being consequences of digital behaviour are conditional on individual and contextual moderators rather than uniform across the population (Dwidienawati et al., 2025).

➤ *AI Dependency, Cognitive Offloading, and Academic Well-Being*

A distinct but overlapping strand of research addresses the psychological consequences of generative-AI reliance specifically. Several studies document a double-edged pattern: AI tools reduce short-term cognitive load and increase task efficiency, but sustained or uncritical use is linked to “cognitive offloading,” reduced intrinsic motivation, and diminished critical-thinking engagement (Zhang et al., 2024). Using a large multi-university Chinese sample, Zhang and colleagues (2024) showed that academic self-efficacy, academic stress, and performance expectations each shape the likelihood of problematic AI usage behaviour, positioning AI dependency as a maladaptive coping response to academic pressure rather than a simple technology-use habit.

Qualitative case-study evidence adds texture to these quantitative patterns. Farhat (2025), through 40 semi-structured interviews with university students, traced how a tool initially adopted for efficiency gradually became integral to academic routine, eventually fostering cognitive reliance, anxiety during AI unavailability, and tension between AI-assisted output and authentic student voice. This “hooked-on-help” pattern illustrates that AI overreliance can carry the behavioural and affective signatures associated with other technology-use disorders, even though generative AI is a comparatively recent addition to the higher-education digital environment. Importantly, the same underlying tool can also function protectively: bibliometric and empirical evidence indicates that AI-based mental-health applications and chatbots can improve emotional self-efficacy and perceived autonomy among university students, particularly where institutional stigma or resource shortages limit access to traditional counselling (Chen et al., 2024).

➤ *Psychological Well-Being as a Multidimensional Construct*

Psychological well-being is best understood not as a single continuum from distress to flourishing but as a multidimensional construct encompassing cognitive, emotional, social, behavioural, and identity-related facets (Lim et al., 2024). Lim and colleagues (2024), studying Malaysian university students, found that psychological flexibility directly enhances well-being, and that this relationship is further shaped by unconditional self-acceptance and new-media literacy with media literacy strengthening the pathway most clearly among students with low-to-moderate literacy levels. This finding is significant for the present framework because it demonstrates that digital-literacy competencies do not merely protect against harm; they actively enable the psychological processes through

which well-being is achieved in a digitally saturated environment.

Complementary evidence from healthcare-education contexts shows that digital literacy and self-regulation jointly mediate the relationship between emotional intelligence and academic stress, with both factors independently reducing stress when present at higher levels (Ibrahim et al., 2024). Similarly, structural evidence from Chinese higher-education contexts shows that when generative AI and social media are embedded within collaborative-learning structures, their net

effect on academic performance and psychological well-being can be positive although the mediating role of collaborative learning operates differently for AI than for social media, at times attenuating rather than amplifying AI's benefits (Shahzad et al., 2025). Taken together, this literature supports a view of well-being as an emergent property of the interaction between technology-use patterns, individual regulatory capacity, and the social-academic structures within which digital behaviour is embedded, rather than as a direct, linear consequence of “screen time” or “AI use” in isolation.

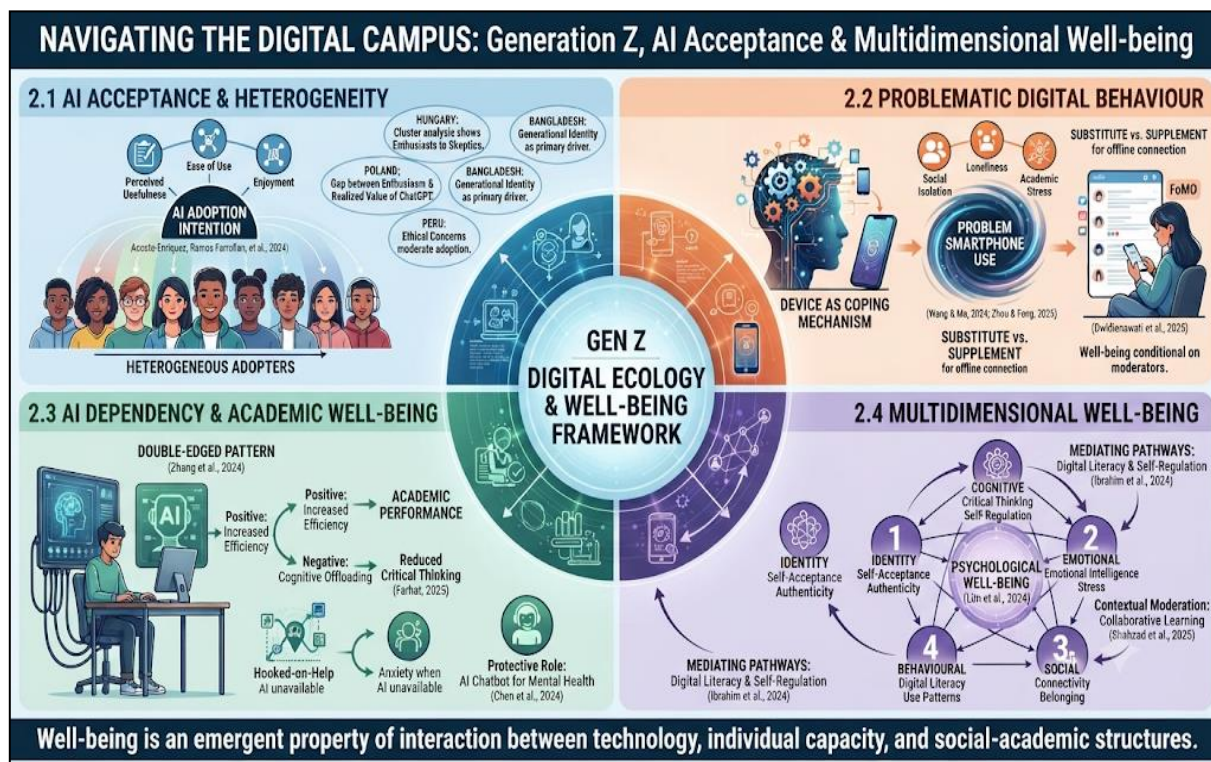


Fig 2 Navigating the Digital Campus: Gen Z's AI Adoption and Well-Being

This infographic illustrates the complex relationship between Gen Z students and technology. It highlights that while adoption is high, usage patterns are heterogeneous and often serve as a coping mechanism for social isolation or academic stress. The framework shows that AI dependency can lead to cognitive offloading, yet digital literacy and self-regulation can mediate these effects, resulting in a multidimensional well-being outcome.

➤ Theoretical Framework

The proposed framework draws on three complementary theoretical traditions. Self-Determination Theory (SDT) contributes the premise that psychological well-being depends on the satisfaction of basic needs for autonomy, competence, and relatedness; digital and AI technologies can either support these needs (for example, AI tools that scaffold competence, or social media that sustains relatedness) or undermine them (for example, AI dependency that erodes perceived competence, or smartphone use that substitutes for authentic relatedness) (Chen et al., 2024; Wang & Ma, 2024). The Unified Theory of Acceptance and Use of Technology (UTAUT2) contributes an account of why

students adopt AI tools in the first place performance expectancy, effort expectancy, social influence, and hedonic motivation and thereby explains variation in the intensity and character of AI engagement across student subgroups (Acosta-Enriquez, Ramos Farroñan, et al., 2024; Koteczki & Balassa, 2025).

Cognitive Load Theory (CLT) contributes the mechanism by which generative AI produces its double-edged effects on academic-cognitive well-being: by offloading extraneous cognitive demands, AI can free working-memory resources for deeper learning, but when offloading extends to germane, effortful cognitive processes, it can impair the development of independent problem-solving and critical-thinking skills (Zhang et al., 2024; Farhat, 2025). Integrating these three theories allows the present framework to explain both why students engage with AI and digital technology (UTAUT2), what psychological needs that engagement serves or undermines (SDT), and through what cognitive mechanism academically relevant harms or benefits arise (CLT).

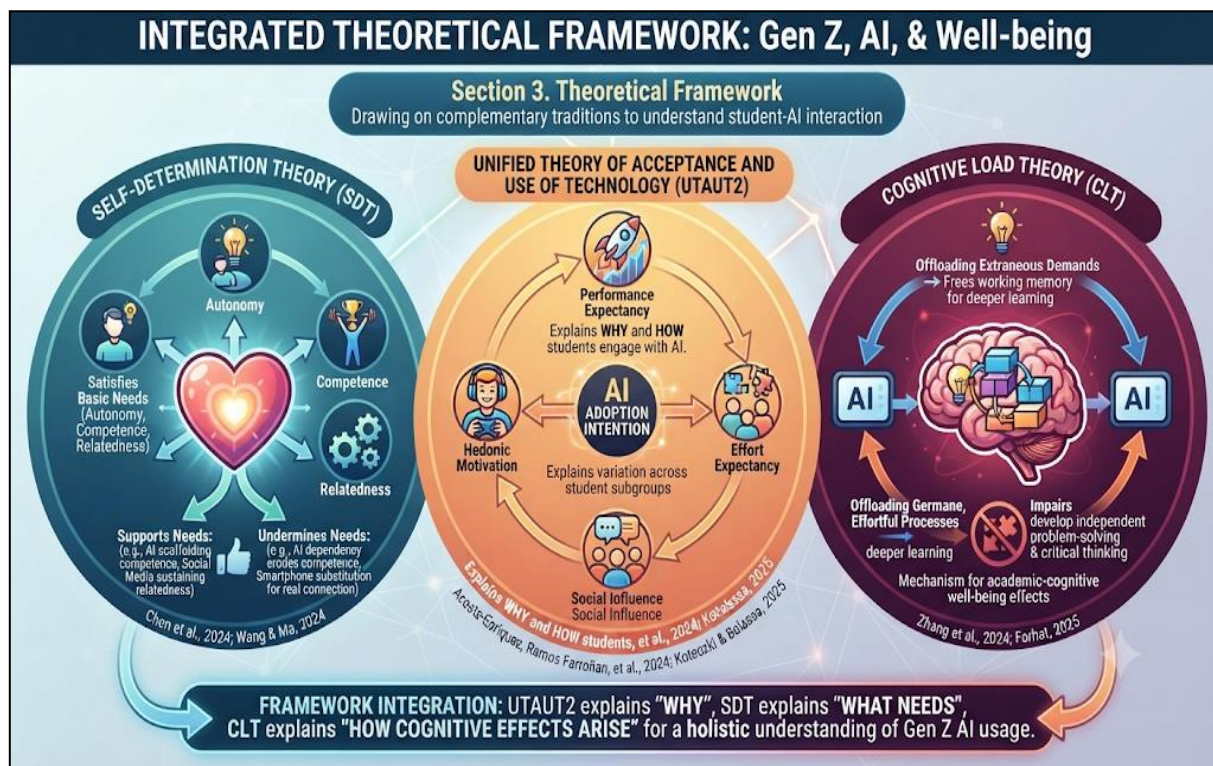


Fig 3 Integrating Theory: Understanding Gen Z's Technological Well-Being

This infographic illustrates the theoretical framework connecting technology use and student well-being through three lenses: Self-Determination Theory for psychological needs (autonomy, competence, relatedness), UTAUT2 for adoption motivations (performance and effort expectancy), and Cognitive Load Theory for how cognitive offloading affects learning and critical thinking.

➤ Proposed Multidimensional Conceptual Model

Synthesising the reviewed literature and theoretical perspectives, this article proposes a five-dimensional model of psychological well-being as it is shaped by AI usage and digital behaviour among higher-education students. Table 1 summarises each dimension, its defining well-being indicators, and the AI- and digital-behaviour mechanisms identified in the literature as its principal facilitators and risk factors.

Table 1 Five-Dimensional Model of AI- and Digital-Behaviour-Linked Psychological Well-Being

Dimension	Well-Being Indicators	Facilitative Mechanisms	Risk Mechanisms
Cognitive-Academic	Academic self-efficacy, perceived competence, critical thinking	AI-scaffolded learning; reduced extraneous cognitive load (Zhang et al., 2024)	Cognitive offloading; over-reliance; skill attrition (Farhat, 2025)
Emotional	Anxiety, emotional self-efficacy, life satisfaction	AI-based mental-health tools; emotional self-efficacy gains (Chen et al., 2024)	Anxiety during AI unavailability; technostress (Farhat, 2025)
Social-Relational	Loneliness, social connectedness, social anxiety	Social-media connectedness; peer collaboration platforms (Shahzad et al., 2025)	Loneliness-mediated smartphone addiction; declining life satisfaction (Zhou & Feng, 2025; Wang & Ma, 2024)
Behavioural-Regulatory	Self-regulation, digital literacy, problematic use	Digital-literacy and self-regulation training (Ibrahim et al., 2024)	Addictive use patterns; low self-regulation (Zhou & Feng, 2025)
Identity-Related	Self-acceptance, psychological flexibility, authenticity	New-media literacy strengthening self-acceptance pathways (Lim et al., 2024)	Erosion of authentic academic voice; identity dependency on AI output (Farhat, 2025)

The model treats these five dimensions as interacting rather than independent: for instance, behavioural-regulatory deficits (low self-regulation) can amplify cognitive-academic risk (AI over-reliance), which in turn can elevate emotional

risk (anxiety) when AI access is disrupted a cascading pattern documented qualitatively by Farhat (2025) and quantitatively by Zhang et al. (2024). Likewise, social-relational deficits such as loneliness appear to both predict and be predicted by

problematic smartphone behaviour, forming a reinforcing loop rather than a simple cause-effect chain (Wang & Ma, 2024; Zhou & Feng, 2025). This interactional structure implies that interventions targeting a single dimension in

isolation for example, restricting screen time without addressing underlying loneliness or academic stress are unlikely to produce durable improvements in student well-being.

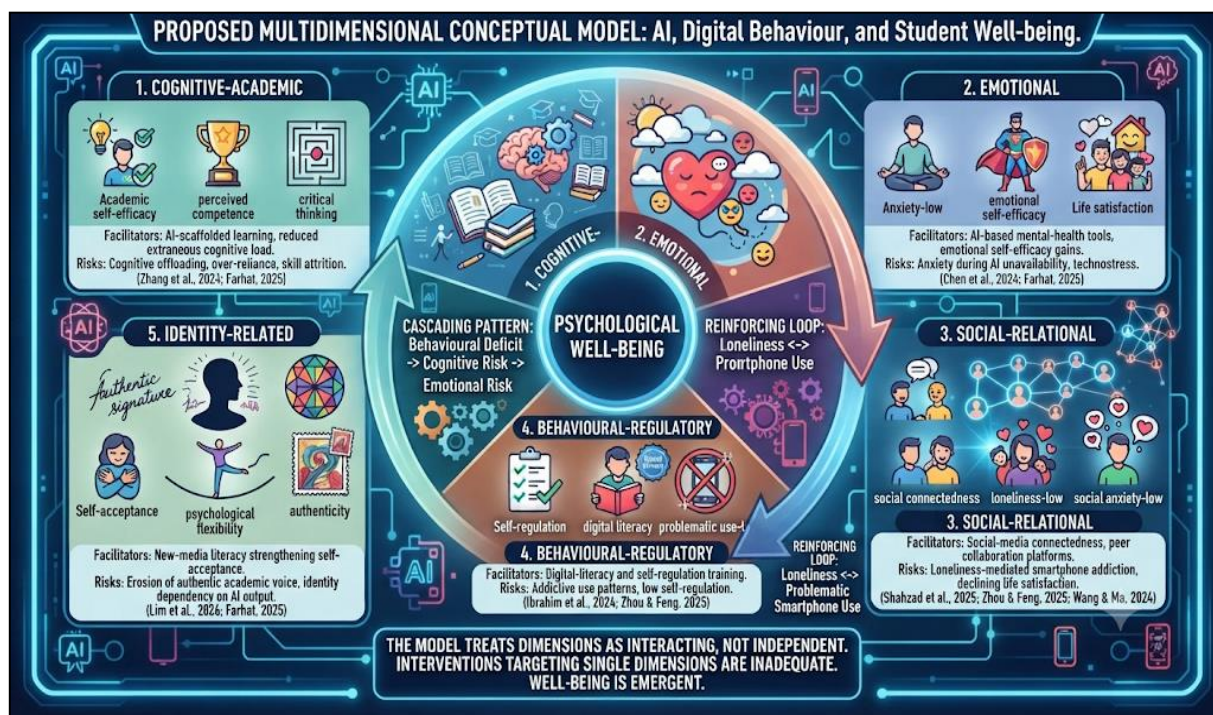


Fig 4 Multidimensional Model of Student Well-Being in the Digital Age

This infographic presents a five-dimensional model of student well-being (Cognitive-Academic, Emotional, Social-Relational, Behavioural-Regulatory, Identity-Related). It details indicators, facilitators, and risk factors for each dimension. Crucially, it illustrates how these dimensions interact in cascading patterns and reinforcing loops, demonstrating that well-being is emergent and cannot be addressed through isolated interventions.

III. PROPOSED METHODOLOGY FOR EMPIRICAL VALIDATION

To empirically validate the proposed framework, this article outlines a mixed-method, cross-sectional research design suitable for future application in higher-education institutions, including Indian university contexts where AI adoption and digital-behaviour research remains comparatively limited relative to East Asian and European settings.

➤ Research Design

A cross-sectional survey design is recommended as the primary data-collection strategy, consistent with the majority of the reviewed studies (Zhou & Feng, 2025; Ibrahim et al., 2024; Dwidienawati et al., 2025). A supplementary qualitative component — semi-structured interviews with a purposive subsample — is recommended to capture the experiential and narrative dimensions of AI dependency and digital behaviour, following the case-study approach demonstrated by Farhat (2025).

➤ Sampling

The target population comprises undergraduate and postgraduate students enrolled in higher-education institutions, recruited through stratified random sampling across disciplines (science, arts, commerce, and professional/health programmes) to ensure representativeness, consistent with sampling strategies used in comparable studies of 300 to 2,900 participants (Koteczki & Balassa, 2025; Zhou & Feng, 2025).

➤ Instruments

Instrumentation should combine validated scales corresponding to each of the five proposed dimensions: an AI-literacy and AI-dependency scale (adapted from Zhang et al., 2024), a smartphone/social-media addiction scale (adapted from instruments used by Wang & Ma, 2024, and Zhou & Feng, 2025), a digital-literacy and self-regulation scale (adapted from Ibrahim et al., 2024), a psychological-flexibility and self-acceptance scale (adapted from Lim et al., 2024), and a general psychological well-being measure capturing life satisfaction, anxiety, and perceived competence.

➤ Data Analysis

Partial Least Squares Structural Equation Modelling (PLS-SEM) is recommended for testing the hypothesised structural relationships among AI usage, digital behaviour, and the five well-being dimensions, given its demonstrated suitability for multidimensional, mediation-rich models in this literature (Shahzad et al., 2025; Koteczki & Balassa, 2025). Mediation and moderation analyses (e.g.,

bootstrapped indirect effects) should be used to test the cascading and reinforcing pathways proposed in the conceptual model, following analytical precedents in the

reviewed smartphone-addiction and AI-dependency literature (Zhou & Feng, 2025; Zhang et al., 2024).

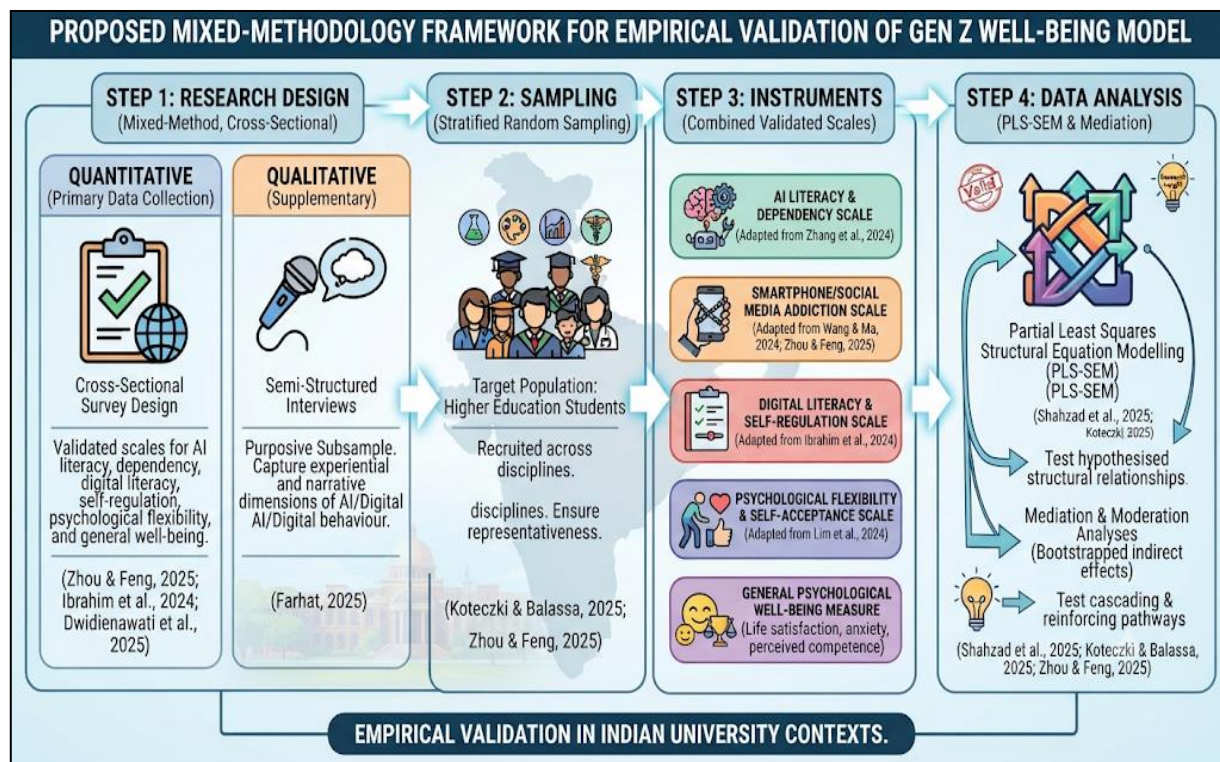


Fig 5 Proposed Mixed-Methodology Framework for Empirical Validation

- This flowchart outlines a four-step empirical validation strategy for the Gen Z well-being model in Indian universities.
- It combines a cross-sectional survey design with qualitative interviews, uses stratified random sampling across disciplines, employs validated multidimensional scales, and applies Partial Least Squares Structural Equation Modelling (PLS-SEM) to test complex mediation and structural pathways.

IV. DISCUSSIONS

The reviewed literature converges on a central paradox: the same AI and digital tools that Generation Z students adopt for their perceived usefulness, enjoyment, and efficiency are also implicated in the erosion of the very competencies and connections they are meant to support. Generative AI reduces short-term cognitive burden while potentially undermining long-term critical-thinking development (Zhang et al., 2024; Farhat, 2025); social media and smartphones extend social reach while, for a substantial subset of students, deepening loneliness and social anxiety (Wang & Ma, 2024; Zhou & Feng, 2025). This paradox cannot be resolved by treating AI or digital behaviour as uniformly beneficial or harmful; rather, the evidence supports a differentiated, dimension-specific, and person-specific understanding of technology's role in student well-being.

A second key insight concerns the limits of “digital nativity” as a protective factor. Although Generation Z is

frequently assumed to possess intuitive digital competence by virtue of having grown up with these technologies, recent evidence complicates this assumption. Nakavachara (2025) found that, across seven countries, Generation Z AI users reported well-being gains largely confined to job or task enjoyment, in contrast to Millennial (Generation Y) users, who reported broader gains across mental health, job enjoyment, and physical health. This suggests that familiarity with technology does not automatically confer the self-regulatory or reflective capacities needed to convert AI and digital engagement into holistic well-being gains capacities that appear to depend instead on explicit digital-literacy and self-regulation development (Ibrahim et al., 2024; Lim et al., 2024).

Third, the evidence underscores those interacting rather than additive relationships explain the mixed results in the literature. For example, Shahzad et al. (2025) found that generative AI and social media both positively predicted academic performance and well-being overall, yet collaborative learning mediated the two technologies' effects in opposite directions positively for social media, negatively for AI. Such findings caution against simple policy prescriptions (e.g., blanket restriction or blanket promotion of AI tools) and instead support context-sensitive, dimension-specific interventions consistent with the multidimensional model proposed here.

Finally, the qualitative evidence from Farhat (2025) and the psychometric evidence from Zhang et al. (2024)

jointly suggest that AI dependency in higher education shares structural features with other behavioural dependencies: escalating use, functional impairment (in this case, of critical thinking and authentic academic voice), and affective disturbance upon interruption of use. This positions AI-dependency risk as a legitimate object of student-wellness policy in its own right, distinct from though related to longstanding concerns about smartphone and social-media addiction.

➤ *Implications for Higher-Education Policy and Practice*

The findings synthesised here carry several practical implications for higher-education institutions. First, universities should integrate structured AI-literacy training that goes beyond technical instruction in prompting or tool use to explicitly address self-regulation, appropriate reliance, and the cognitive trade-offs of AI-assisted work, consistent with recommendations arising from the digital-literacy and self-regulation literature (Ibrahim et al., 2024; Zhang et al., 2024). Such training should be embedded within academic-integrity and study-skills curricula rather than treated as a stand-alone digital-citizenship module.

Second, student-counselling and wellness services should be equipped to recognise AI-dependency and problematic smartphone-use patterns using the behavioural markers identified in this review — escalating reliance, anxiety upon disconnection, and loneliness-driven device use — and should consider validated AI-based support tools as a complementary, not a substitute, resource, given evidence that such tools can enhance emotional self-efficacy when appropriately designed and supervised (Chen et al., 2024). Third, given that psychological flexibility and new-media literacy interact to protect well-being (Lim et al., 2024), institutions should prioritise interventions that build reflective and flexible engagement with digital tools rather than interventions premised solely on restricting access or usage time, an approach that the reviewed evidence suggests is unlikely, on its own, to be effective (Dwidienawati et al., 2025).

Fourth, curriculum and assessment design should account for the differentiated mediating role of collaborative learning identified by Shahzad et al. (2025): structuring AI use within collaborative, socially embedded academic tasks may help offset the isolating and over-reliance risks associated with individual, unsupervised AI use. Finally, institutional policy should be informed by continuous, dimension-specific monitoring rather than a single composite “digital well-being” indicator to detect which of the five proposed dimensions (cognitive-academic, emotional, social-relational, behavioural-regulatory, or identity-related) is most affected within a given student population, enabling targeted rather than generic interventions.

V. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This article is a conceptual and integrative synthesis rather than a primary empirical study; its proposed model and methodology require empirical testing before firm causal

claims can be made. The reviewed literature is also geographically uneven, with a pronounced concentration of studies from China and a smaller but growing body from Europe, Southeast Asia, and Latin America; comparatively fewer large-scale studies address Indian or South Asian higher-education populations specifically, despite India's status as one of the world's largest higher-education systems and a rapidly growing AI-adoption market. Future research should prioritise cross-cultural replication of the proposed five-dimensional model, particularly in under-represented regional contexts, and should employ longitudinal rather than purely cross-sectional designs to establish the directionality of the cascading and reinforcing pathways proposed here.

VI. CONCLUSION

Generation Z's higher-education experience is now inseparable from generative AI and pervasive digital connectivity, and the psychological consequences of this entanglement are neither uniformly positive nor uniformly negative. This article has synthesised recent, high-quality empirical evidence to argue that AI usage and digital behaviour shape student well-being through five interacting dimensions cognitive-academic, emotional, social-relational, behavioural-regulatory, and identity-related each governed by a distinct balance of facilitative and risk mechanisms. Digital nativity alone does not guarantee adaptive engagement with these technologies; rather, well-being outcomes depend on the interaction between technology-use patterns, individual self-regulatory and reflective capacities, and the social-academic structures within which digital and AI engagement occurs. A multidimensional, dimension-specific approach to research, policy, and practice rather than a single “screen time” or “AI use” metric offers the most promising path toward supporting the psychological well-being of higher-education students in the AI era.

REFERENCES

- [1]. Acosta-Enriquez, B. G., Arbulú Ballesteros, M. A., Arbulu Perez Vargas, C. G., Orellana Ulloa, M. N., Gutiérrez Ulloa, C. R., Pizarro Romero, J. M., Gutiérrez Jaramillo, N. D., Cuenca Orellana, H. U., Ayala Anzoátegui, D. X., & López Roca, C. (2024). Knowledge, attitudes, and perceived ethics regarding the use of ChatGPT among generation Z university students. *International Journal for Educational Integrity*, 20(1), Article 1. <https://doi.org/10.1007/s40979-024-00157-4>.
- [2]. Acosta-Enriquez, B. G., Ramos Farroñan, E. V., Villena Zapata, L. I., Mogollon Garcia, F. S., Rabanal-León, H. C., Morales Angaspilco, J. E., & Saldña Bocanegra, J. C. (2024). Acceptance of artificial intelligence in university contexts: A conceptual analysis based on UTAUT2 theory. *Heliyon*, 10(19), Article e38315. <https://doi.org/10.1016/j.heliyon.2024.e38315>.
- [3]. Babu, M. A., Yusuf, K. M., Eni, L. N., Jaman, S. M. S., & Sharmin, M. R. (2024). ChatGPT and generation ‘Z’: A study on the usage rates of ChatGPT. *Social*

- Sciences & Humanities Open, 10, Article 101163. <https://doi.org/10.1016/j.ssaho.2024.101163>.
- [4]. Chen, X., Yuan, H., Dong, M., Cai, X., Ai, F., & Zhou, Y. (2024). Artificial intelligence significantly facilitates development in the mental health of college students: A bibliometric analysis. *Frontiers in Psychology*, 15, Article 1375294. <https://doi.org/10.3389/fpsyg.2024.1375294>.
- [5]. Dwidienawati, D., Pradipto, Y., Indrawati, L., & Gandasari, D. (2025). Internal and external factors influencing Gen Z wellbeing. *BMC Public Health*, 25(1), Article 1584. <https://doi.org/10.1186/s12889-025-22124-5>.
- [6]. Farhat, Z. (2025). Hooked on help: Student overreliance on ChatGPT in higher education. *Journal of Information Technology Teaching Cases*. Advance online publication. <https://doi.org/10.1177/20438869251397953>.
- [7]. Ibrahim, R. K., Al Sabbah, S., & Al-Jarrah, M. (2024). The mediating effect of digital literacy and self-regulation on the relationship between emotional intelligence and academic stress among university students: A cross-sectional study. *BMC Medical Education*, 24, Article 1309. <https://doi.org/10.1186/s12909-024-06279-0>.
- [8]. Koteczki, R., & Balassa, B. E. (2025). Exploring Generation Z's acceptance of artificial intelligence in higher education: A TAM and UTAUT-based PLS-SEM and cluster analysis. *Education Sciences*, 15(8), Article 1044. <https://doi.org/10.3390/educsci15081044>.
- [9]. Lim, J. H., Bin Ahmad, M., & Prihadi, K. D. (2024). New media literacy, self-acceptance, and psychological flexibility in enhancing Gen Z wellbeing. *Psychology, Society & Education*, 16(3), 10–19. <https://doi.org/10.21071/pse.v16i3.17235>.
- [10]. Nakavachara, V. (2025). AI and worker well-being: Differential impacts across generational cohorts and genders (Working paper). Faculty of Economics, Chulalongkorn University. <https://arxiv.org/abs/2511.11021>.
- [11]. Oliński, M., & Sieciński, K. (2025). Youth and ChatGPT: Perceptions of usefulness and usage patterns of Generation Z in Polish higher education. *Youth*, 5(4), Article 106. <https://doi.org/10.3390/youth5040106>.
- [12]. Shahzad, M. F., Xu, S., Liu, H., & Zahid, H. (2025). Generative artificial intelligence (ChatGPT-4) and social media impact on academic performance and psychological well-being in China's higher education. *European Journal of Education*, 60(1), Article e12835. <https://doi.org/10.1111/ejed.12835>.
- [13]. Wang, Y., & Ma, Q. (2024). The impact of social isolation on smartphone addiction among college students: The multiple mediating effects of loneliness and COVID-19 anxiety. *Frontiers in Psychology*, 15, Article 1391415. <https://doi.org/10.3389/fpsyg.2024.1391415>.
- [14]. Zhang, S., Zhao, X., Zhou, T., & Kim, J. H. (2024). Do you have AI dependency? The roles of academic self-efficacy, academic stress, and performance expectations on problematic AI usage behavior. *International Journal of Educational Technology in Higher Education*, 21(1), Article 34. <https://doi.org/10.1186/s41239-024-00467-0>.
- [15]. Zhou, X., & Feng, B. (2025). Social anxiety and smartphone addiction among college students: The mediating role of loneliness. *Frontiers in Psychiatry*, 16, Article 1621900. <https://doi.org/10.3389/fpsy.2025.1621900>.