Stress in the Age of AI: A Phenomenological Study of Gen Z Students in Private Higher Education in South Africa

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Abstract

Generation Z (Gen Z), born between 1997 and 2012, represents the first cohort of students to enter higher education with lifelong exposure to digital technologies. The rapid advancement of artificial intelligence (AI) has transformed higher education, offering opportunities for innovation while presenting challenges in adaptation. This study explored how Gen Z students in a private higher education institution in South Africa experience stress and how they perceive the role of AI in relation to that stress. Data was collected from 43 open-ended questionnaires and 10 semi-structured interviews, allowing for an in-depth understanding of students' lived experiences. Findings showed that students experienced moderate to high stress, largely due to academic pressures, financial strain, and uncertainty about the future. Importantly, AI was not perceived as a source of stress. Instead, students viewed AI as a supportive academic tool that helped simplify concepts, assist with writing, improve organisation, and reduce workload-related stress. This challenges traditional technostress theory, which emphasises overload, complexity, and techno-anxiety, by revealing that digital-native students may experience AI as a stress-reducing rather than stress-inducing technology. The study makes a theoretical contribution by reframing technostress theory for Gen Z learners and introduces the AI-Adaptation Model of Student Stress, which illustrates how technological familiarity enables techno-normalisation and positions AI as a coping resource rather than a burden. This highlights the need to reconsider how technostress is conceptualised for digitally immersed generations.

Keywords: Artificial Intelligence (AI); Generation Z (Gen Z); private higher education; stress; technostress

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Introduction

Generation Z (Gen Z), born between 1997 and 2012, represents the current cohort of students entering higher education with lifelong digital exposure (Lazar et al., 2023). Their learning preferences, communication patterns, and academic behaviours have been shaped by continuous interaction with technology. At the same time, artificial intelligence (AI) is increasingly influencing higher education, reshaping how students access information, complete academic tasks, and manage learning (Ameen et al. 2023; Lazar et al. 2023). While AI adoption is accelerating, its implications for students' stress experiences within private higher education remain insufficiently understood. Despite growing interest in AI in higher education, limited research has examined the relationship between AI use and student stress within the South African private higher education sector. Existing studies tend to focus on academic integrity, learning efficiency, or ethical concerns (Maluleke 2025; Laine et al. 2025), but not on how AI may alleviate or contribute to stress among Gen Z students. Furthermore, little is known about how Gen Z's unique digital conditioning influences their susceptibility to, or protection from, traditional technostress factors. This study addresses these gaps by exploring whether AI functions as a stressor or a coping resource for students in private higher education.

Technostress Theory

This study draws on Technostress Theory as a framework for examining how students respond emotionally and cognitively to AI use. The term "technostress" was first introduced in 1982 by clinical psychologist Craig Brod, who described it as a state arising from an individual's struggle to adjust to the implementation and use of new technologies (Brod, 1982, cited in Salazar-Concha et al. 2021). Since then, technology has grown at an unprecedented rate, and with it, the research on technostress. This phenomenon is linked to distinct causes such as technology-induced work overload, role ambiguity, and the invasion of personal boundaries (Tarafdar et al. 2007). Initially, technostress was primarily associated with the workplace and the challenges posed by early computer technologies. Traditional technostress theory suggests that excessive dependence on technology can lead to cognitive overload, anxiety, and reduced academic well-being (La Torre et al. 2019; Wang et al. 2021). Technostress's definition has expanded to describe a condition of physical and psychological discomfort resulting from the interaction with technology (Tarafdar et al. 2007). This experience is viewed not just as a negative reaction, but as a dynamic process where technological conditions (known as techno-stressors) are evaluated by the individual as demands requiring change. Crucially, the outcome of technostress—whether it is perceived as positive or negative—depends significantly on the individual's personality and their subsequent reaction or adaptive response to these technological demands (Salazar-Concha et al. 2021). Literature identifies five key factors that contribute to technostress, namely techno-overload, techno-uncertainty, techno-complexity, techno-insecurity, and techno-invasion (Tarafdar et al. 2007).

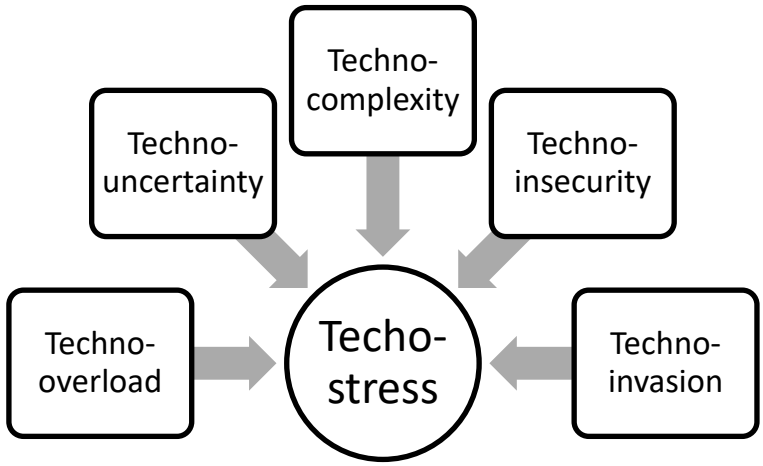

Figure 1. Diagram illustrating contributing factors to Technostress based on Tarafdar (2007).

These "techno-stressors" not only impair mental well-being but also negatively affect productivity, commitment, and satisfaction (Nastjuk et al. 2024). However, as technology has evolved and become more integrated into daily life, the scope of technostress comes into question. Given that Gen Zers have never known a world without digital connectivity, their perceptions of AI may differ significantly from those of previous generations (Seemiller and Grace 2016). The framework provides a lens through which to evaluate whether these traditional stressors apply to Gen Z students, who have grown up in a digitally saturated environment. This raises an important question: Does the traditional concept of technostress remain relevant for a generation that has never known life without digital technology?

A phenomenological approach is appropriate for this study because stress and technology use are deeply subjective experiences shaped by personal interpretation, emotion, and context. Phenomenology enables direct exploration of how Gen Z students experience both stress and AI in their daily academic lives, rather than relying on predetermined categories or quantitative measures.

This study aimed to explore the lived experiences of Gen Z students in relation to their use of AI within private higher education, with a particular focus on perceived stress. Specifically, it sought to answer the following questions:

1. What are the primary sources of stress for Gen Z students in private higher education?

2. How do Gen Z students perceive the relationship between AI use and their stress levels (technostress) in academic contexts?

3. What ethical concerns or limitations do students identify regarding AI in education?

By addressing these questions, this research contributes to a deeper understanding of whether AI exacerbates or alleviates stress in a generation accustomed to digital environments. The findings of this study can hold significant implications for higher education institutions seeking to optimise AI integration in academia.

Literature Review

The Rise of AI in Education

In the past decade, AI has expanded rapidly due to advances in computational power, large datasets, and deep learning innovations. Progress in Natural Language Processing (NLP) has enabled machines to understand and generate human language, reshaping how knowledge is produced and consumed (Basha et al. 2023). These developments underpin intelligent tutoring systems such as Grammarly and ChatGPT, which interact through natural language and mimic aspects of human tutoring by explaining concepts, answering questions, and guiding problem-solving (Laine et al. 2025). Since its release in 2022, ChatGPT has sparked widespread debate about AI's role in higher education. As a large language model, it exemplifies a new generation of AI tools—including Google Gemini, Meta AI, and Microsoft Copilot—that are transforming how students learn, how educators teach, and how institutions operate (Bit et al. 2024; Chetry 2024).

AI in higher education can be transformative, offering opportunities for personalised learning, operational efficiency, and innovative teaching practices. AI can offer language processing tools, automation in assessments and online learning platforms. These applications can offer personalised instructions and tools, student support, collaboration and immediate feedback, thereby transforming traditional teaching and learning methods (Adiguzel et al. 2023; Nikolopoulou 2024). However, the integration of AI in higher education is not without its challenges. Ethical considerations surrounding AI, such as data privacy, algorithmic bias, and the transparency of AI decision-making processes, are areas of concern (Köbis and Mehner 2021; Pedró 2020). The frequent use of AI systems in education raises questions regarding ethics, academic integrity, and plagiarism (Maluleke 2025; Song 2024) as well as concerns of accountability and over-reliance on AI (Delello et al. 2025), which may affect critical thinking and cognitive skills (Köbis and Mehner 2021; Watanabe 2023).

Characteristics of Generation Z

Generation Z (born 1997–2012) makes up the majority of today's higher education students (Pichler et al. 2021; Hernandez-de-Menendez et al. 2020). This "iGeneration," they have grown up in a digitally saturated world shaped by constant connectivity, mobile technologies, and increasingly, AI (Chan and Lee 2023; Seemiller and Grace 2016). This lifelong exposure has influenced their communication styles, learning

preferences, and social engagement (Ameen et al. 2023). Gen Z students are highly digitally fluent, comfortable multitasking, and able to navigate seamlessly between online and offline environments (Arora et al. 2020). They have a strong digital identity, characterised not only by content consumption but also active participation and creation within online communities (Ameen et al. 2023; Dolot 2018). However, this immersion brings challenges, including reduced face-to-face interaction, increased social isolation, sleep difficulties, and technology-related anxiety (Pichler et al. 2021; Twenge et al. 2019). Educationally, Gen Z tends to prefer independent, personalised, and self-paced learning, reflecting their upbringing with instant access to information (Muringa 2025; Seemiller and Grace 2016; Ang et al. 2022). They are often intrinsically motivated, valuing growth, fulfilment, and meaningful engagement over external rewards (Eckleberry-Hunt et al. 2018; Aldjic and Farrell 2022).

Despite these strengths, Gen Z faces heightened psychological pressures, with higher rates of anxiety and depression reported compared to previous generations (Geirdal et al. 2019; Zhang 2022). Their formative years have been shaped by political instability, global crises, and the COVID-19 pandemic, contributing to both increased caution and resilience (Ang et al. 2022; Pichler et al. 2021). In higher education, Gen Z largely embraces AI tools for their efficiency and personalisation benefits (Chan and Lee 2023). However, their constant exposure to technology also underscores the need to understand both its academic potential and its potential impacts on mental health, learning patterns, and social well-being (Pichler et al. 2021; Twenge et al. 2019).

The Digital Divide in the Global South

In the Global South—and South Africa specifically—students' experiences with technology are shaped by deep-rooted digital inequalities that stem from the country's sociohistorical landscape. The apartheid legacy created racially uneven access to technological resources, resulting in ongoing disparities in digital readiness among students entering higher education (Faloye and Ajayi 2022; Oyedemi and Mogano 2018). Research shows that first-year students often differ significantly in when they first gained access to computers and the internet. These timing differences strongly influence their confidence, digital competence, and comfort in navigating online learning environments (Oyedemi and Mogano 2018). Students from under-resourced schools frequently report difficulty using basic hardware and software, heightened anxiety when required to complete technology-mediated tasks, and challenges adapting to university systems and online study expectations (Nyahodza and Higgs 2017; Faloye and Ajayi 2022). Studies illustrate that early exposure to digital tools is associated with higher competence and self-efficacy, while delayed exposure contributes to uncertainty, frustration, and emotional strain when engaging with digital learning (Faloye and Ajayi 2022). These disparities highlight that stress related to technology use in South African higher education cannot be understood apart from the broader structural and historical inequalities that shape students' digital experiences (Oyedemi and Mogano 2018). Importantly, the divide is further complicated by differences between private and public institutions: while private institutions often offer stronger infrastructure and more

consistent access to digital tools, students still enter with uneven levels of prior exposure and digital confidence (Faloye and Ajayi 2022).

Stress and Private Higher Education

Stress arises when external demands exceed an individual's coping capacity, with consequences for physical and psychological well-being (Abouammoh et al. 2020; Koolhaas et al. 2011). Psychological stress is defined as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). In higher education, excessive stress is linked to burnout, anxiety, depression, and reduced academic performance, ultimately affecting student success and retention (Hurst et al. 2013; Hyseni Duraku et al. 2023). Academic stress, in particular, reflects students' negative responses to assessments, institutional expectations, and uncertainty about future careers (Barbayannis et al. 2022).

Several factors intensify stress within private higher education. High tuition fees and financial investment from families can heighten pressure to perform, contributing to anxiety and fear of underachievement (Kumar 2005; Leonard et al. 2015). The competitive nature of private institutions often amplifies these pressures, reinforcing stress related to performance and future prospects (Oh et al. 2020; Moore et al. 2021). The COVID-19 shift to online learning further increased frustration for students with limited digital literacy or inadequate access to technology (Barbayannis et al. 2022; Šola et al. 2021).

In South Africa, private higher education differs from the public sector in ways that influence students' technological experiences. Private institutions generally have stronger digital infrastructure, smaller class sizes, and faster adoption of emerging technologies (Nukunah et al. 2019). However, students enter with highly uneven digital backgrounds: some have extensive pre-university exposure, while others—particularly those from historically disadvantaged or under-resourced schools—still face the effects of the digital divide (Faloye and Ajayi 2022). These disparities mean that even in well-resourced private institutions, digital confidence and stress levels vary widely, making it essential to examine how Gen Z students interpret and engage with AI in their academic lives.

AI and Technology-related Stress

Feelings of stress over technology isn't new; it has historically emerged whenever a significant technological shift occurred that required users to adapt quickly or interact with complex, unfamiliar systems (Mokyr et al. 2015). Stress and anxiety were noted during the introduction of personal computers in the 1980s, specifically related to fear of breaking the machine or an inability to master the new skills (sometimes called cyberphobia, technophobia or computer anxiety) (Khasawneh 2018). Today, the anxiety is often induced by the pervasiveness of always-on connectivity, information overload,

and the constant pressure to keep up with the rapid, complex evolution of software and hardware (Tarafdar et al. 2007). Terms such as “technostress” have mostly been regarded as negative, and researchers such as Pourahmad and Koc (2023) believe such stress can impede learning progress, perception, attitude, and motivation. However, the pressure associated with technological adaptation can, in some instances, be beneficial for students. It can act as a catalyst, compelling students to develop greater digital literacy, build resilience, and sharpen their problem-solving skills (Chukwuere and Chukwuere 2024). Individual user characteristics, coping mechanisms, and adaptive capabilities are therefore key determinants of how technology-related stress is experienced (Tarafdar et al. 2007).

Research Design and Methodology

As the researcher, I acknowledge that my position as a white female lecturer in higher education shaped the lens through which I approached this study. My familiarity with student experiences, academic pressures, and emerging technologies such as AI provided contextual insight but also risked influencing how I interpreted participants’ accounts. To remain attentive to their lived experiences rather than my assumptions, I engaged in continuous reflexivity through analytic memos, field notes, and regular discussions with fellow researchers who provided critical feedback. These strategies helped ensure that my interpretations were grounded in participants’ perspectives and that the themes identified reflected their meanings.

This study employed an interpretive phenomenological design to explore Gen Z students’ lived experiences of stress related to AI use in private higher education. Phenomenology seeks to uncover the essence of a phenomenon as it is subjectively experienced, prioritising participants’ perspectives rather than imposing external interpretations (Finlay 2013). This approach was appropriate because the study aimed to understand how students make sense of AI in relation to their academic and emotional lives—experiences that are deeply personal, contextual, and not easily captured quantitatively (Creswell 2009; Tuffour 2017). Situated within the interpretivist paradigm, the study assumes that reality is socially constructed and that knowledge emerges from individuals’ subjective meanings. A qualitative approach facilitated rich, detailed exploration of students’ emotions, interpretations, and meaning-making processes—facets not adequately represented numerically (Tisdell et al. 2025).

Purposive sampling was used to recruit participants with relevant insight into the phenomenon. Eligibility required participants to be Gen Z undergraduate students (born 1997–2012) enrolled at a private higher education institution. Recruitment occurred through classroom visits, where the study was explained and voluntary participation invited. Data collection continued until saturation was reached, when no new themes emerged. Ethical approval was obtained from the institution’s ethics committee (Reference: R.0002092 [REC]). Participants were informed of the study’s purpose, procedures, and their rights, including voluntary participation and withdrawal at any stage. Written informed consent was obtained from all participants.

Data Collection Procedure

Data were collected in two stages to capture both broad and in-depth insights. In the first stage, open-ended questionnaires allowed students to articulate their perspectives freely, yielding rich and nuanced data (Creswell 2009). Students from three classes across various faculties were invited to participate via a QR code linking to the online questionnaire; 43 students completed it anonymously. In the second stage, semi-structured interviews were conducted with a subset of volunteers to explore emerging themes in greater depth. This method enabled the researcher to probe for clarifications while following participants' unique perspectives. Interviews were audio-recorded and transcribed verbatim for thematic analysis. Out of the 43 questionnaire respondents, 10 students (six females, four males) participated in interviews, spanning first, second and third-year students. This composition provided a cross-section of the student body and diverse perspectives on AI in higher education.

Sample	**N**	**Gender**	**Academic Year**	**Notes**
Questionnaire respondents (anonymous)	43	Not reported	22 – 1st year 18 – 2nd year 13 – 3rd year	Electronic, anonymous responses
Interview participants (face to face)	10	6 - Female 4 - Male	4 – 1st year 3 – 2nd year 3 – 3rd year	Purposive volunteers from questionnaire sample

Figure 2. Table showing sample demographics

Data Analysis

The qualitative data from the open-ended questionnaires and semi-structured interviews were analysed using Braun and Clarke's (2006) six-phase thematic analysis.

1. **Familiarisation:** The researcher first immersed themselves in the data by repeatedly reading all 43 questionnaire responses and transcribing the 10 interviews verbatim. Notes were made on initial impressions, recurring ideas, and references to AI use and stress.

2. **Generating Initial Codes:** Questionnaire and interview data were coded line by line to identify meaningful features (e.g., "AI as support," "time management"). Codes were generated separately and later compared across datasets.

3. **Searching for Themes:** Related codes were grouped into broader themes reflecting shared meanings. For example, "time-saving" and "academic assistance" informed the theme "AI as an academic tool."

4. **Reviewing Themes:** Preliminary themes were checked against the coded extracts and full dataset to ensure coherence. Overlapping or weak themes were merged, refined, or removed.

5. **Defining and Naming Themes:** Each theme was clearly defined and labelled to capture its central idea (e.g., "AI as an academic tool" describing AI's role in supporting learning efficiency).

6. **Producing the Report:** Final themes were organised in relation to the research questions and theoretical framework, with selected quotations used to illustrate participants' experiences.

An example to illustrate coding process:

Raw excerpt (from interview)
"It honestly helps me. It helps me format formal emails which I struggle with and also make to do lists and plan in general." (Participant Three)

Step One — Line-by-line initial coding (open coding):

Initial codes*:* AI as tool – *it helps me*; writing support – *format emails;* organisational aid – *to-do lists and plan*; reduces effort – *helps me, struggle with*

Step Two — Grouping similar initial codes into candidate codes / code labels:

- AI as a writing and support tool
- AI helps organise and reduce effort

Step Three — Codebook entry (finalised after peer discussion):

- Code name: AI as academic support
- **Definition:** Descriptions of AI facilitating writing, planning, time management, and simplifying tasks.
- **Inclusion criteria:** Mentions of aid, support, assistance, planning, ease

Step Four — Theme mapping:

- **Candidate theme:** AI as a useful educational tool → AI reduces study-related stress

Step Five — Cross-data check (triangulation):

- Confirmed the presence of **AI as academic support** codes both in questionnaire responses (broad frequency) and interviews (rich contextual elaboration). This increased confidence that the theme reflects a recurrent, salient feature of the dataset.

To enhance rigour, multiple validation strategies were used. First, data-source triangulation compared themes emerging from 43 open-ended questionnaires with those from 10 semi-structured interviews to check for consistency and divergence across methods. Secondly, an audit trail was maintained (researcher reflexive notes, coding logs, and memos) to document analytic decisions and enhance transparency. Finally, a codebook with definitions and exemplar extracts was developed and used throughout analysis to promote consistency. Collectively, these procedures strengthen the credibility, dependability, and confirmability of the findings.

Limitations

This study has several limitations that should be acknowledged. First, although the interview sample size (n = 10) is appropriate for phenomenological inquiry, the study was conducted within a single private higher education institution, which introduces sampling bias and limits the external validity of the findings. Second, despite the use of reflexivity throughout the research process, the researcher's dual role as an academic within the higher education sector may have influenced aspects of data interpretation. Third, participants entered the study with varying levels of AI literacy, which may have shaped how clearly or confidently they articulated their experiences; this variability was not measured and therefore could not be analytically controlled. Fourth, the study relied entirely on self-reported accounts of stress, making the findings vulnerable to recall bias and social desirability effects. Finally, although two qualitative data sources were used, the study did not incorporate additional forms of methodological triangulation such as observational data, behavioural measures, or document analysis, which may have strengthened the robustness of the findings. Future research would benefit from comparative, multi-institutional designs and mixed-method approaches to deepen understanding and enhance transferability.

Findings

The findings reflect insights gathered through open-ended questionnaires and in-depth semi-structured interviews and developed into the following themes:

Theme 1: Stress as an overwhelming, multifaceted burden

Students described stress as a pervasive experience shaped by academic, financial, future-oriented, and social pressures.
They reported feeling overwhelmed by coursework, deadlines, and assessments:

“The amount of assignments and the due dates being close together cause me the most stress.” (Participant 18)

Fear of failure heightened their emotional burden:

“My assignments are the main cause of my anxiety… I often fear that I might fail.” (Participant 29)

Stress extended beyond academics into broader life environments. For many, financial demands and uncertainty about employment intensified their emotional strain:

“Money - it stresses me out. Studying is expensive, and I worry about affording everything.” (P3)

Several students also described social isolation or anxiety within classroom interactions:

“Lecturers randomly calling on students… makes me very anxious.” (P3)

Stress emerged as an embodied experience of overload, uncertainty, and emotional fatigue—deeply intertwined with the transition into higher education and students’ perceptions of their academic and economic futures. Students’ stress was influenced by several key factors, including the fast-paced structure of the curriculum and unclear academic expectations. High financial pressure and the emotional demands of transitioning into higher education further contributed to their overall stress levels. These structural conditions cultivated a sense of limited control and vulnerability, consistent with Lazarus and Folkman’s (1984) definition of stress as the appraisal of demands exceeding one’s resources.

Theme 2: AI is a Valuable Resource in Students’ Lives

Contrary to expectations grounded in technostress theory (Tarafdar et al. 2007), students *did not* experience AI as stressful, overwhelming, or cognitively demanding. Instead, AI tools were consistently described as helpful, calming, and reassuring:

“AI takes all my stress away by allowing me to get things done quickly.” (Participant 3)

“When I get stressed with a difficult question, I get helpful ideas from AI… it slows my anxiety down.” (Participant 4)

Students emphasised the comfort of predictable, non-judgemental support—qualities that differed from their interactions with lecturers or peers:

“It helps me plan, organise and just feel more in control.” (Participant 3)

AI was described as reducing stress through its ability to clarify complex concepts instantly, its constant availability during moments of heightened anxiety, its provision of private and non-judgmental support, and its capacity to make cognitively demanding tasks more manageable. These conditions positioned AI as a stabilising force rather than a cognitive burden. Students experienced AI as a co-regulatory agent that supported emotional regulation, reduced uncertainty, and promoted a sense of academic efficacy. The absence of technostress indicators—such as techno-overload or techno-complexity—suggests that AI's impact depends strongly on task type and contextual framing. Here, AI functioned not as a stressor but as a facilitator of psychological ease. This challenges traditional technostress theory by showing that for Gen Z, familiar digital tools embedded in a supportive educational context may *counteract* stress rather than exacerbate it.

Theme 3: AI is a useful Educational Tool

Students consistently described AI as a supportive academic resource that made their work feel more manageable and less overwhelming. Instead of creating confusion or cognitive strain, AI tools helped them simplify content, structure academic tasks, and provide clarity during moments of academic pressure:

"It explains four or five sections of the textbook in a paragraph." (Participant 3)
"When I get stressed with a difficult question, I get helpful ideas from AI." (Participant 4)

For many, AI served as a first step in understanding challenging coursework, reducing the emotional intensity of difficult assignments and alleviating fear of failure. AI was perceived as reducing stress by altering how students engaged with their academic work. It offered immediate clarification, supported organisation and planning, and provided non-judgemental feedback. It delivered simplified explanations that decreased cognitive load and responded quickly enough to prevent stress from intensifying into anxiety. These structural conditions meant AI lowered the cognitive demand of academic tasks. For these students, AI acted as a buffer against academic stress, enabling learning tasks to feel achievable rather than overwhelming. Rather than functioning as a stressor, AI-mediated academic challenges support emotional calm and academic self-efficacy.

Theme 4: Ethical and Academic Integrity Concerns

A significant number of students acknowledged that even though they generally have a positive view of AI, there are certain ethical concerns related to AI use in education. Many raised concerns that AI-generated content may contribute to plagiarism, raising ethical issues about academic integrity and originality.

"It is unethical to use AI-generated information as your own as this shows a lack of academic integrity." (Participant 1)

Students expressed concern that over-reliance on AI could result in unethical academic practices. Students voiced concerns that AI could be used as a shortcut in academics, thereby preventing genuine learning, hindering critical thinking and independent problem-solving skills.

“I feel like the Gen Z generation doesn’t know how to live without Al.” (Participant 10)

“AI needs to be used as a guide rather than a crutch.” (Participant 4)

Another frequently cited concern among students was the risk of misinformation and encountering inaccurate or misleading content generated by AI. However, this also reflected their awareness of the need to critically evaluate AI’s responses rather than accepting them as the absolute truth. This emphasises the importance of critical evaluation, and responsible AI use in academic work.

“AI is generally unreliable when seeking information, they often do not understand things in context and have a western framework from which it generates what you ask.” (Participant 7)

Theme 6: AI Replacing Human Employment

A final recurring theme that became evident was the fear of job displacement due to AI automation. Many students mentioned being concerned that AI would replace human jobs, making it harder to find employment.

“The need for jobs, careers and people will no longer be necessary, and it’ll be taken over by AI.” (Participant 8)

“I worry about human employees becoming obsolete in the work force.” (Participant 6)

Summary of Findings

The findings revealed that students in private higher education experienced moderate to high levels of stress arising from academic workload, financial pressure, future uncertainty, and social-emotional challenges. Yet despite these stressors, students’ experiences of AI were consistently positive and diverged from the negative outcomes predicted by technostress theory. According to Tarafdar et al. (2007), technologies may create stress through overload, complexity, invasion, or job insecurity; however, students did not report techno-overload, techno-complexity, or techno-invasion in their use of AI. This positive experience can be attributed to several factors evident in the data. First, students described AI as *simplifying* academic tasks—breaking down complex content, offering clear explanations, and supporting organisation during demanding periods. Its on-demand, non-judgemental nature appeared to reduce cognitive load, helping students feel more capable and in control of their studies. Second, Gen Z students possess a high level of digital fluency and confidence, making

them more likely to interpret AI as a familiar, intuitive resource rather than a disruptive or stressful technology. For this cohort, AI aligns naturally with their existing study habits and technological expectations, lowering rather than raising barriers to learning. The only dimension of technostress that emerged was job insecurity, with some students expressing concern about AI replacing future human roles. Importantly, these anxieties were future-oriented and did not affect their present comfort with or use of AI in academic contexts. Even with these concerns, students continued to view AI as beneficial, necessary, and aligned with their learning needs. Overall, the findings suggest that for Gen Z, AI functions less as a stressor and more as a supportive academic tool that enhances efficiency, confidence, and academic clarity.

Discussion

This study explored how AI is integrated into their academic lives and how these interactions influence their experiences of stress. The following discussion interprets the results in relation to each research question.

RQ1: What are the primary sources of stress for Gen Z students in private higher education?

The findings reveal that Gen Z students experience stress as a multifaceted and pervasive feature of their academic lives. Academic workload, fear of failure, unclear expectations, and dense assessment schedules constituted the most prominent stressors. These align with previous research identifying academic pressure as a key contributor to university student stress (Leonard et al. 2015; Barbayannis et al. 2022; Hurst et al. 2013). Financial strain also emerged as a significant stressor, consistent with patterns observed in South African higher education, where tuition fees, living costs, and the need for part-time work increase student vulnerability (Oh et al. 2020; Moore et al. 2021). Social and emotional challenges, including classroom anxiety, feelings of isolation, and interpersonal difficulties, further contributed to students' stress experiences. Taken together, these results reinforce structural explanations for stress, showing that students' emotional strain originates primarily from institutional, financial, and academic conditions rather than from technology use.

RQ2: How do Gen Z students perceive the relationship between AI use and their stress levels (technostress) in academic contexts?

Despite high levels of stress, students did not identify AI as a stressor, challenging assumptions in technostress theory. Tarafdar et al. (2007) suggest technology induces stress through overload, complexity, invasion, and job insecurity. In contrast, students in this study reported that AI reduced stress by breaking down complex content, simplifying tasks, and providing immediate, non-judgemental support. Participants did not experience techno-overload or techno-complexity; AI lowered cognitive load and clarified academic tasks. Techno-invasion was absent, as use was voluntary and selective. Job insecurity was noted only in long-term concerns about AI's impact on

future employment, without causing immediate academic anxiety. For Gen Z, who have grown up with persistent digital connectivity, AI is not a disruptive force but an integrated part of their cognitive environment. It mitigates academic uncertainty, streamlines tasks, and provides emotional reassurance, enhancing competence and control rather than stress. These findings suggest that the emotional and cognitive effects of technology are generationally contingent: for Gen Z, AI may alleviate rather than generate stress.

RQ3: What ethical concerns or limitations do students identify regarding AI in education?

Although students viewed AI positively, they maintained a cautious and critical stance towards its use in higher education. Concerns clustered around three areas:

1. **Academic integrity and plagiarism**, where students worried that AI's ease of use could enable unethical shortcuts.

2. **Overreliance and skill degradation**, particularly regarding critical thinking and independent problem-solving, echoing literature that warns against automation bias.

3. **Bias and misinformation**, with students recognising that AI may produce inaccurate, culturally biased, or decontextualised outputs.

These concerns reflect an emerging digital maturity among Gen Z students: although comfortable with AI, they are not uncritical of its risks. Their awareness aligns with contemporary scholarship urging responsible AI literacy in higher education (Eden et al. 2024; Chan and Lee 2023; Laine et al. 2025). Collectively, these ethical considerations underscore that students perceive AI as beneficial not because it is flawless, but because they feel capable of using it judiciously. This again supports the idea that technology is not viewed as inherently threatening, but as a tool requiring critical engagement.

Based on these findings, this study proposes a refined conceptual model to explain contemporary student experiences: the **AI-Adaptation Model of Student Stress**. This model suggests that Gen Z students' relationship with AI is shaped by *techno-normalisation*—the process by which AI is perceived as an ordinary, expected component of academic life—and *techno-support*—the stress-reducing function AI serves by lowering cognitive load and enhancing academic efficiency. Together, with their digital orientation and familiarity with technology, these concepts help explain why AI did not produce stress in this cohort, and why it instead functioned as a coping or support mechanism. This theoretical contribution expands technostress scholarship by suggesting that technology does not affect all generations uniformly. For Gen Z and future digital generations, AI may not trigger traditional technostress, but instead serve as a buffer against strain, specifically academically. Future research should therefore

consider generational familiarity, digital fluency, and perceived controllability as central mediators of AI-related stress.

Recommendations

The findings suggest several implications for how private higher education institutions can integrate AI to support learning and student well-being. Since students reported high academic, financial, and emotional stress, but did not view AI as a stressor, institutions should use AI strategically to reduce cognitive load. Students valued AI for simplifying complex concepts, supporting writing, and improving organisation; therefore, institutions should prioritise AI tools that assist with summarisation, study planning, and comprehension. Guided support is essential to ensure AI enhances rather than replaces learning.

Given students' concerns about plagiarism, overdependence, and misinformation, institutions must establish clear policies on ethical AI use. These guidelines should clarify acceptable practices, expectations for originality, and the need to verify AI-generated content. Transparent policies will provide students with consistency and reduce uncertainty about responsible use.

Pedagogically, educators should design learning activities that integrate AI in ways that strengthen comprehension and reflective thinking. This balance addresses students' worries about AI replacing human educators and preserves the interpersonal aspects crucial in education. The study also highlights the need for structured AI literacy development. Students may have varying levels of confidence and critical evaluation skills, indicating uneven digital fluency. Institutions should therefore embed AI literacy into the curriculum, covering ethical use, algorithmic bias, fact-checking, and academic integrity. This will help students use AI critically, responsibly, and independently.

Finally, future research should extend to public institutions and a wider range of disciplines to capture more diverse experiences. Mixed-method or longitudinal studies could further explore how AI affects stress and learning over time. As AI continues to evolve rapidly, ongoing research is essential to ensure integration remains ethical, effective, and aligned with the needs of students.

Conclusion

This study provides important insights into how Gen Z students in private higher education experience AI in relation to stress and academic life. The findings challenge dominant assumptions within technostress theory, which traditionally positions technology as a source of cognitive overload and strain. Instead, this study suggests a shift toward perceiving AI as an integrated, supportive element of their learning environment rather than a stress-inducing technology. The suggested AI-Adaptation Model of Student Stress illustrates how Gen Z students' digital orientation leads to

techno-normalisation and techno-support, resulting in AI functioning as a stress-reducing rather than stress-inducing academic tool. This represents a novel theoretical contribution, indicating that existing technostress frameworks may require reconceptualisation for a generation immersed in digital ecosystems. Practically, the results highlight the importance of institutionally guided AI integration that supports learning without undermining academic integrity or humanistic skills. Students valued AI for reducing academic pressure, clarifying complex concepts, and improving organisation, yet they also recognised ethical concerns and the risks of overdependence. These findings underscore the need for higher education institutions to develop robust AI literacy initiatives, clear usage policies, and pedagogical approaches that balance technological support with critical thinking and reflective practice.

Future research should extend these insights by examining diverse institutional contexts, particularly public universities and disciplines beyond the humanities, where technology access and academic cultures may differ. Longitudinal and mixed-methods studies could also deepen understanding of how AI influences stress, learning behaviours, and well-being over time. As AI continues to evolve rapidly, ongoing inquiry will be essential to ensure that educational practices remain responsive, ethical, and grounded in the lived experiences of learners.

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