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GENAI IN HIGHER EDUCATION: CAN DIGITAL READINESS ENHANCE ACADEMIC RESILIENCE?

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Abstract

This study aims to examine the relationship between digital readiness, perceived usefulness of Generative Artificial Intelligence (GenAI), and academic resilience among university students in the digital learning era. The research involved 45 undergraduate students from Universitas Negeri Surabaya as respondents, selected to represent learners who actively engage in technology-supported academic activities. Using a quantitative approach, data were collected through a structured questionnaire measuring digital readiness, perceived usefulness of GenAI, and academic resilience, adapted from validated instruments in previous studies. The data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) to evaluate both the measurement and structural models. The results show that digital readiness has a significant positive effect on academic resilience, indicating that students with higher digital preparedness tend to possess better adaptability and persistence when facing academic challenges. Digital readiness also significantly influences perceived usefulness of GenAI, suggesting that students who are more digitally prepared are more likely to view GenAI as beneficial for learning. However, perceived usefulness of GenAI does not significantly affect academic resilience and does not mediate the relationship between digital readiness and academic resilience. These findings underscore that digital readiness serves as a direct and dominant predictor of academic resilience, while the perceived usefulness of GenAI has not yet functioned as a psychological mechanism that strengthens students' adaptive capacity. The study highlights the importance of improving students' digital competencies to foster resilience in technology-driven learning environments.

Keywords*: Digital Readiness, Perceived Usefulness of GenAI, Academic Resilience*

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INTRODUCTION

Education is a conscious and planned process that develops an individual's potential, enabling them to adapt and contribute to social life (García-Crespo et al., 2021). In higher education, students often face academic and social pressures that demand adaptability (Arias et al., 2024). One important factor in facing these challenges is academic resilience, which is the ability to remain steadfast, adapt, and recover from difficulties, allowing students to maintain their academic performance and

psychological well-being (Abubakar et al., 2021). Research shows that students with high academic resilience are better able to manage stress, maintain motivation, and demonstrate better learning engagement than those with low academic resilience (Romano et al., 2021).

Academic resilience can be influenced by digital readiness and the perceived usefulness of GenAI. Both factors help students adapt to the challenges of modern learning and maintain resilience in the face of academic pressure (Alshamy et al., 2025; Chan & Hu, 2023). Students who have good digital readiness tend to be more adaptable to changes in technology-based learning systems (Latifah et al., 2022). On the other hand, a positive perception of the usefulness of technology has been shown to increase student motivation and engagement in the learning process (Basuki et al., 2022; Sa'diyah et al., 2025). Recent studies show that the perceived usefulness of GenAI contributes to improving students' academic resilience by strengthening learning motivation, metacognitive strategies, and the ability to adapt to academic pressure (Heil et al., 2025; Yao & Liu, 2025). This condition indicates that digital readiness and perceptions of technology have the potential to influence students' academic resilience, especially in facing the demands of technology-based learning (Kurniadi et al., 2022). The relationship between digital readiness, perceptions of technology, and academic resilience is increasingly important to understand in the real context of students.

This can be seen from various empirical findings that show that there are still challenges to academic resilience amid the acceleration of digital transformation in higher education. The latest international study involving 3,950 pharmacy students from 12 countries, including Indonesia, shows that the academic resilience of Indonesian students is in the moderate to low category, with a median ARS-30 score of 114 (IQR 103–124), lower than other countries such as Sudan, Pakistan, and Nigeria (Elnaem et al., 2024). These findings confirm that amid the acceleration of digital transformation, Indonesian students still face challenges in improving their academic resilience. Furthermore, research (Nurmalitasari et al., 2023) in the article "Factors Influencing Dropout Students in Higher Education," which involved 384 college students in Indonesia, found that 47.1% of respondents were at risk of wanting to drop out of college due to their low ability to cope with academic stress and weak social support. This confirms that the ability to cope with stress and obtain adequate social support are important parts of academic resilience that need to be developed so that students are

able to persevere in the face of academic pressure.

Previous studies have shown that students with high digital readiness have better psychological capacity in facing learning difficulties, which confirms the important role of digital readiness in improving academic resilience through adaptability and resilience in facing technological challenges (Kurniadi et al., 2022). Digital literacy skills significantly influence the improvement of students' readiness in carrying out academic and professional activities (Yuliana & Rahmi, 2025).

Digital literacy skills show a positive and meaningful correlation with academic achievement (Putri & Prakoso, 2024). Digital literacy skills show a positive and meaningful correlation with academic achievement (Ang et al., 2022). Digital literacy skills show a positive and meaningful correlation with academic achievement (Turrohmah & Suryanto, 2023). In addition to digital readiness, which plays an important role in shaping students' academic resilience, perceptions of the usefulness of artificial intelligence-based learning technology are also a significant factor.

A positive view of the benefits of generative AI can strengthen learning motivation and support students' adaptive abilities in facing academic challenges (Chan & Hu, 2023; Elnaem et al., 2024; Klarin et al., 2024). Students' positive perceived usefulness of GenAI have also been proven to be able to increase motivation and metacognitive strategies, which ultimately increases academic engagement, as well as building more resilient learning resilience in the face of modern educational dynamics (Yao & Liu, 2025). The use of GenAI in academic activities is also able to increase students' cognitive and emotional engagement because the technology provides personalized support and quick feedback that helps them understand the material more deeply (Guo et al., 2025). This positive impact is in line with findings that confirm that GenAI can strengthen students' learning quality and digital literacy when integrated with appropriate pedagogical support (Saúde et al., 2024).

In addition, GenAI can provide cognitive and emotional support that helps students reduce stress and increase self-efficacy in facing academic challenges (Song & Liu, 2025). In line with this, the use of GenAI has also been proven to be able to increase students' motivation and learning engagement, which overall is an important foundation for strengthening their academic resilience and resilience (Aieron A et al., 2024). With the use of GenAI supported by the right learning strategies, students can gain ease of learning while fostering critical

thinking skills, digital literacy, and academic independence which play an important role in building learning resilience.

Previous studies have shown that digital readiness and perceived usefulness of Generative AI have an effect on students' academic resilience. However, in the context of higher education in Indonesia, studies that specifically examine the relationship between the two variables on academic resilience, with the perceived usefulness of GenAI as a mediating variable, are still limited. Therefore, this study aims to fill this gap by examining the relationship between digital readiness, perceived usefulness of GenAI, and student academic resilience in the context of learning in the digital era.

METHOD

This study uses a quantitative approach. The population in this study is students of the State University of Surabaya involving 45 students as research respondents with a response rate of 100%. This study uses a questionnaire developed based on a literature review and consists of three parts, namely digital readiness, perceived usefulness of GenAI, and academic resilience. Digital readiness items are developed from indicators submitted by (Brozzi et al., 2020; Deja et al., 2021; Rafiah et al., 2022), while the item perceived usefulness of GenAI was adapted from the study (Alshammari & Babu, 2025; Klarin et al., 2024), and the academic resilience item is based on the Academic Resilience Scale (ARS-30) framework of (Chatfield et al., 2022; Wu, 2022). The questionnaire used a five-point Likert scale to measure the variables in this study. This study uses data analysis with PLS-SEM, which consists of two stages: measurement model assessment and structural model assessment.

Table 1. Descriptive statistics of all variables.

Variables	Example Item	N	Mean	Standard Deviation
Digital Readiness	Lecture facilities already support digital learning activities	9	3.80	0.88
Perceived Usefullnes of Gen AI	GenAI helps me quickly find relevant material references	10	4.11	0.82
Academic Resillience	I stayed motivated to learn despite the difficulties	10	3.90	0.91

RESULT AND DISCUSSION

Measurement Model

Preliminary analysis was conducted to evaluate the validity and reliability of constructs in the measurement model. All measured indicators were tested using a reflective measurement model approach with the help of SmartPLS software version 4.1.1.5. Validity assessments were conducted using an outer loading value test, while reliability was assessed from Cronbach's Alpha (CA), rho_A, Composite Reliability (CR), and Average Variance Extracted (AVE). The test results showed that all indicators had an outer loading value above 0.600, thus meeting the indicator's validity criteria. Furthermore, the entire construct shows Cronbach's Alpha and Composite Reliability values above 0.700, which indicates that the internal consistency of each construct is in the high category and is statistically acceptable. The AVE value for all constructs is also above the 0.500 threshold, which indicates that each construct has good convergent validity. A summary of the results of the measurement model test shows that the constructs of Digital Readiness, Perceived Usefulness of GenAI, and Academic Resilience all meet the required criteria of validity and reliability, as can be seen in Table 2.

Table 2. Measurement Model

Construct	Factor Loading	CA	rho_A	CR	AVE
Digital Readiness		0.919	0.933	0.932	0.607
DIG.1	0.854				
DIG.2	0.699				
DIG.3	0.851				
DIG.4	0.697				
DIG.5	0.751				
DIG.6	0.866				
DIG.7	0.785				
DIG.8	0.789				
DIG.9	0.694				
Perceived Usefulness of GenAI		0.941	0.975	0.948	0.65
AI.1	0.847				
AI.2	0.816				

Construct	Factor Loading	CA	rho_A	CR	AVE
AI.3	0.751				
AI.4	0.68				
AI.5	0.783				
AI.6	0.81				
AI.7	0.874				
AI.8	0.901				
AI.9	0.703				
AI.10	0.864				
Academic Resilience		0.931	0.937	0.942	0.623
AR.1	0.855				
AR.2	0.878				
AR.3	0.64				
AR.4	0.751				
AR.5	0.693				
AR.6	0.762				
AR.7	0.864				
AR.8	0.901				
AR.9	0.759				
AR.10	0.746				

Structural Model

Once the validity and reliability of the construct are confirmed, the analysis proceeds to structural model testing to evaluate the relationships between latent variables within the framework of the developed model. The test was conducted through path analysis and bootstrapping procedures with 45 respondents to assess the statistical significance of each relationship seen in Figure 1.

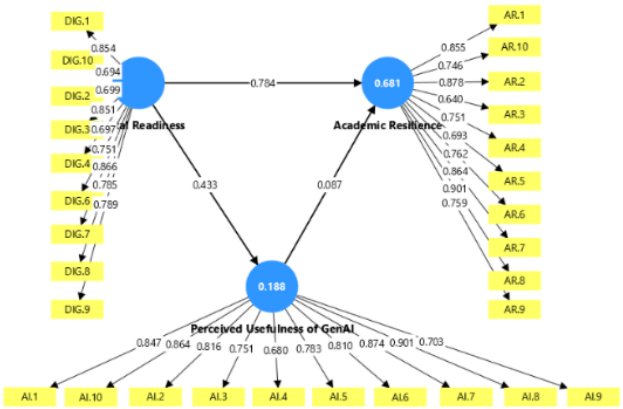

Figure 1. Structural Model

Direct Effect

The results of the hypothesis test as presented in Table 3 show a direct relationship between constructs in the structural model. With a t-table significance threshold value of 1.960 (α = 0.05,

bidirectional), each relationship path was statistically tested.

Table 3. Path Analysis for Direct Effect

Path Analysis	Original Sample	Standard Deviation	T Statistics	P Value	Decision
H_1: Digital Readiness -> Academic Resilience	0.784	0.100	7.835	0.000	Supported
H_2: Perceived Usefulness of GenAI -> Academic Resilience	0.087	0.127	0.683	0.495	Not Supported
H_3: Digital Readiness -> Perceived Usefulness of GenAI	0.433	0.172	2.513	0.012	Supported

The results of the analysis showed that Digital Readiness had a positive and significant effect on Academic Resilience with a p-value of 0.000. These results indicate that the higher the level of digital readiness students have, the higher their ability to adapt and survive academic challenges. Therefore, the H_1 hypothesis is declared accepted (supported).

Furthermore, the test results showed that the Perceived Usefulness of GenAI did not have a significant effect on Academic Resilience with a p-value of 0.495. These findings show that students' perceptions of the usefulness of GenAI technology have not been able to make a real contribution to increasing academic resilience. Therefore, the H_2 hypothesis is declared rejected (not supported).

However, other analysis results show that Digital Readiness has a positive and significant effect on the Perceived Usefulness of GenAI with a p-value of 0.012. These findings reinforce the role of digital readiness as an important factor that encourages individuals to view Generative AI technology as a useful tool in supporting learning activities and self-development. Therefore, the H_3 hypothesis is declared accepted (supported).

Indirect Effect

Important findings emerged on the mediation route. The results of the hypothesis testing are presented in Table 4.

Table 4. Path Analysis for Indirect Effect

Path Analysis	Original Sample	Standard Deviation	T Statistics	P Value	Decision
H_4: Digital Readiness -> Perceived Usefulness of GenAI -> Academic Resilience	0.038	0.078	0.484	0.628	Not Supported

The results of the analysis of the indirect influence showed that Digital Readiness did not have a significant effect on Academic Resilience through the Perceived Usefulness of GenAI with a p-value of 0.628, indicating that the mediation effect was not significant. These findings indicate that students' perceptions of the usefulness of GenAI technology are not able to mediate the relationship between digital readiness and academic resilience. Therefore, the H_4 hypothesis is declared rejected (not supported).

Discussion

The results of the hypothesis test show that Digital Readiness has a direct and significant effect on Academic Resilience, as well as has a strong influence on the Perceived Usefulness of GenAI. However, the Perceived Usefulness of GenAI has no direct effect on Academic Resilience, and does not act as a mediating variable in the relationship between Digital Readiness and Academic Resilience. Thus, it can be concluded that the contribution of Digital Readiness to students' academic resilience is direct, while the perception of GenAI's usefulness has not been able to bridge this influence. These findings confirm that Digital Readiness is a more dominant factor in supporting students' adaptive abilities, while the Perceived Usefulness of GenAI has not yet functioned as a psychological mechanism linking digital readiness with academic resilience (Ortega-Ochoa et al., 2024).

The results showed that Digital Readiness had a significant effect on Academic Resilience ($p = 0.000$), indicating that digital readiness encourages students to be better able to face academic pressure, in line with the theory of digital adaptation and self-regulated learning which emphasizes the role of technology mastery in supporting flexibility and self-regulation (Alifansa et al., 2024). In addition, Digital Readiness also had a significant effect on the Perceived Usefulness of GenAI ($p = 0.012$). Consistent with the TAM framework which explains that digital competence strengthens the perception of the usefulness of new technologies (Alifansa et al., 2024; Sudaryanto et al., 2023; Uren & Edwards, 2023). In contrast

to the previous two results, the Perceived Usefulness of GenAI had no significant effect on Academic Resilience (p = 0.241), suggesting that although GenAI was considered beneficial, the perception did not automatically increase academic resilience, in contrast to the findings of several studies that highlighted GenAI's role in improving engagement and learning strategies (Aieron A et al., 2024; Guo et al., 2025; Khlaif et al., 2025; Yao & Liu, 2025). This insignificance also explains the absence of the mediating role of the Perceived Usefulness of GenAI in the relationship between Digital Readiness and Academic Resilience (p = 0.317), in line with the view that the relationship between technology and psychological outcomes often requires other mediators (Liang et al., 2023). Overall, these results show that digital readiness plays a direct role in academic resilience, while the perception of the benefits of GenAI has not been a strong pathway in shaping student resilience.

However, contrary to theoretical expectations, the Perceived Usefulness of GenAI does not show a direct influence on Academic Resilience. In fact, a number of previous studies have shown that the use of GenAI can improve material understanding, learning motivation, and engagement (Aieron A et al., 2024; Guo et al., 2025). This insignificance suggests that although students consider GenAI useful to help their academic activities, the perception does not directly affect their ability to cope with academic pressure or challenges. This can happen because the use of GenAI tends to focus on cognitive aspects such as summarizing material or looking for references, so the benefits have not touched the affective dimension such as emotion regulation which is the main component of academic resilience (Khlaif et al., 2025). These findings provide a new perspective that the benefits of technology do not automatically improve students' academic resilience.

The insignificance of the influence of the Perceived Usefulness of GenAI also explains why the mediation pathway in the relationship between Digital Readiness and Academic Resilience is not proven. The perceived usefulness of GenAI is not able to be a psychological mechanism that bridges the two variables, so the contribution of Digital Readiness to academic resilience occurs directly, not through the perception of technological usefulness (Liang et al., 2023). This condition indicates that GenAI has not been used in depth by students for the purpose of developing self-regulation that can increase academic resilience. These findings show a different pattern from many previous studies that emphasize that digital technologies tend to strengthen students'

adaptive abilities, since in this context the perception of GenAI's benefits has no effect on academic resilience (Hariyono, 2023; Yao & Liu, 2025). The results provide a new perspective that the benefits of technology may be stronger on cognitive than psychological aspects, especially when its use has not been integrated with learning strategies that support the development of academic resilience (Nasution et al., 2024). Previous research has shown that students' digital readiness has a significant influence on their involvement in online learning, as well as a positive effect on Academic Resilience (Polat, 2024). Individuals with better digital readiness tend to have greater confidence in their academic abilities, which can ultimately help them be more resilient in the face of challenges and pressures in the learning process (Yuan et al., 2024). Students have the ability to effectively navigate learning technology, manage study time independently, and adapt to changes in dynamic online learning systems and methods (Abdillah, 2023). Previous research has stated that the use of computer technology, the role of teachers, and the independence of students, has made a positive contribution to strengthening students' academic resilience levels (Baluyos et al., 2023). The higher the digital readiness of students, the greater their ability to survive, adjust, and remain productive in the face of academic pressure in the learning environment (Husna et al., 2022).

The use of GenAI, which is perceived to make it easier for students to learn, improve the efficiency of student assignment completion, and provide more personalized learning support, can help individuals develop stronger adaptive abilities in building academic resilience (Sallam et al., 2023). The greater the perception of students of the usefulness of GenAI, the more often and effectively they use the technology to support independent learning, manage their time optimally, and complete academic assignments more efficiently (Almassaad et al., 2024). AI in learning can increase learning motivation and metacognitive strategies, which ultimately strengthens academic resilience through increased optimism, psychological resilience, and growth mindset (Yao & Liu, 2025). When students view GenAI as a useful and easy-to-operate tool, students tend to be more open to using it to support academic assignment completion, strengthen confidence, and minimize rejection of the use of new technologies (Klarin et al., 2024).

Students with a high level of digital readiness generally find it easier to recognize and utilize the potential of technology such as GenAI to improve their effectiveness and learning outcomes, because students who already have

technological skills and a strong sense of confidence in using various digital devices (Ardiyanti & Susilowati, 2023). Students with better digital readiness tend to view GenAI as a useful and practical technology to use to support learning activities and help them complete academic assignments more effectively (Rina et al., 2024). They not only use GenAI as a technical tool, but also as a means to think critically, generate creative ideas, and improve the quality of academic results (Ardiyanti & Susilowati, 2023). A high level of digital readiness encourages individuals to have a more positive view of the benefits of AI, especially in helping to improve work efficiency, accuracy of results, and analytical skills (Ayuningtyas et al., 2024). Students with high levels of digital readiness tend to have greater confidence that the use of GenAI can drive increased productivity and support their academic success (Maxwell et al., 2025).

The findings of this study provide theoretical implications by strengthening the role of digital readiness as a factor that directly affects academic resilience, while showing that the perception of the benefits of GenAI is not always related to the psychological aspects of students, thus offering a new perspective for technology acceptance theory (Chounta et al., 2024; Huang, 2022). Practically, higher education institutions need to prioritize increasing digital readiness through digital literacy programs that support learning independence, problem-solving, and adaptation in digital learning (Mabina et al., 2025). Since the perception of the benefits of GenAI does not directly increase academic resilience, its utilization needs to be directed towards strategies that encourage cognitive processes and self-regulation (Ang et al., 2022). With academic support and a holistic learning environment, universities can strengthen digital competencies while improving students' adaptive abilities in the digital era (Guo et al., 2025; Saúde et al., 2024; Yean & Foong, 2024).

CONCLUSION

This study concludes that digital readiness plays a dominant role in increasing student academic resilience. Digital readiness not only strengthens academic adaptability, but also increases the perceived usefulness of GenAI, although the perception of GenAI's benefits has not been shown to have a direct effect on academic resilience and does not mediate the relationship between the two variables. These findings confirm that academic resilience is more influenced by basic digital competencies than perceptions of new technologies. Theoretically, this

study expands the understanding of the role of digital readiness as a key predictor of academic resilience and makes an initial contribution to the integration of GenAI in the context of higher education. Practically, these results encourage the need to strengthen digital literacy and training on the use of AI so that students are better prepared to face digital learning challenges. Further research can expand the sample, add other psychological variables, or examine the experience of using GenAI directly to gain a deeper understanding of the factors that shape students' academic resilience.

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