

Digital Literacy and Self-Directed English Learning Behaviors among Generation Z Students in Vocational Animal Health

Gadis Kartika Pratiwi^{*,a,1}, Esra Rombeallo^{b,2}, Rahayu Asmadini Rosa^{c,3}, Ni Wayan Apsari Shantika Pratistha^{d,4}

^{a,b,c,d} Politenik Pertanian Negeri Kupang, Kupang, Indonesia

¹gadis.pratiwi@staff.politanikoe.ac.id, ²esra.rombeallo@staff.politanikoe.ac.id,

³rahayu.rosa@staff.politanikoe.ac.id, ⁴apsari.pratistha@staff.politanikoe.ac.id

Article Info

Article history:

Received 2026-03-31

Accepted 2026-06-08

Published 2026-06-30

Keywords:

Autonomous English Learning, Digital Literacy, Generation Z, Self-Directed Learning, Vocational Education

Abstract

The rapid integration of digital technology in education makes it essential to examine how digital literacy influences students' learning behaviors, particularly among Generation Z who are often assumed to be inherently digitally competent. However, previous studies tend to emphasize technical skills and access, while overlooking how these competencies translate into autonomous learning practices. This study addresses this gap by investigating the relationship between digital literacy and self-directed English learning among first-year students of the Animal Health Study Program in a vocational higher education context. Using a descriptive quantitative design, data were collected through a structured questionnaire and analyzed using descriptive statistics to identify patterns across digital skills, exposure, and learning behaviors. The analysis involved categorizing responses into key dimensions and interpreting trends to answer the research questions. The findings reveal a discrepancy between high digital exposure and low engagement in autonomous English learning, highlighting that digital familiarity does not necessarily foster independent learning. This study contributes by emphasizing the need to integrate critical digital literacy and learner autonomy in instructional design. Future research is recommended to employ inferential analysis and mixed methods to further explore this relationship and to develop more effective pedagogical strategies.

DOI: <https://dx.doi.org/10.46923/ijbhes.v8i1.676>

Open access under Creative Common Attribution Share A like 4.0 International Licence

(CC-BY-SA) 

1. Introduction

Generation Z, often referred to as digital natives, constitutes a cohort that has been immersed in technology from an early age, profoundly shaping their communication, learning methodologies, and information engagement. While the precise inception of Gen Z is subject to some debate, with the mid-1990s frequently cited as a starting point (Jayatissa, 2023), this generation is generally characterized by its daily interaction with digital platforms. This pervasive technological integration is particularly significant within educational institutions, including vocational schools, where proficiency in English is increasingly crucial for accessing global knowledge and professional resources. For example, students in specialized fields such as animal health are required to engage with English-language materials, including academic publications, instructional videos, and digital resources. As a result, the incorporation of digital tools into English language acquisition has become essential, especially in environments where learning extends beyond the traditional classroom and necessitates heightened student responsibility for their educational journeys.

Many people think that Gen Z students are naturally good with technology, but research shows that this is not always true. Research suggested that younger generations exhibit greater digital proficiency than older generations (Abousaber, 2023; Hilda, 2024); however, digital literacy includes more than mere technical skills, incorporating critical assessment, ethical awareness, and responsible utilization of digital information. Furthermore, the phrase of “digital natives” has come under scrutiny owing to discrepancies in its definition and assessment (Kirschner & De Bruyckere, 2017; Wilson et al., 2022). Prior research mainly concentrated on general educational contexts, frequently neglecting vocational education environments and particular study programs. Furthermore, insufficient emphasis has been placed on the impact of digital literacy on students’ capacity to regulate their own learning, especially in the context of English language acquisition. This gap is even more obvious in places like East Nusa Tenggara (NTT), where differences in technology infrastructure and access may make students’ digital experiences more challenging (Husna & Budiman, 2024; Pasaribu & Darmastuti, 2025; Wulakada, 2021, 2024). Consequently, it is imperative to analyze digital literacy not as a presumed skill, but as a variable that may substantially affect learning behaviors.

Along with the shortcomings of the “digital native” idea, past research has also shown that Gen Z learns and talks in ways that are not always consistent. Some studies suggest that people prefer to talk to each other in person (Lalić et al., 2020), while others show that people tend to use digital communication and stay away from direct interaction (Awalia & Zulkarnaini, 2025; Varol & Kılınc, 2021; Çora, 2019; Grigoreva et al., 2021; Panagiotou et al., 2022; Tang, 2021). Additionally, traits such as a short attention span and deficient interpersonal skills (Diaconu & Dutu, 2020; Maioli, 2016; Huss, 2023; Jiří, 2016; Fodor et al., 2017) may affect students’ participation in learning activities. These preliminary findings suggest that technological exposure does not inherently lead to effective or autonomous learning. Nonetheless, limited research has specifically investigated the relationship between digital literacy and self-directed English learning behaviors, especially in vocational settings where students are anticipated to nurture practical skills autonomously. This pointed out the necessity of establishing digital literacy as a pivotal element that can either facilitate or impede students' capacity for self-directed learning, particularly within English language learning contexts.

This study seeks to examine the influence of digital literacy on promoting self-directed English learning behaviors among Generation Z students enrolled in a vocational animal health program. This study aims to address the following research question: (1) What is the level of digital literacy among Generation Z students in the Animal Health program? (2) In what ways do Generation Z students participate in self-directed English learning activities? (3) Is there a substantial correlation between digital literacy and autonomous English learning behaviors among Generation Z students? This study aims to enhance the comprehension of digital literacy within vocational education settings and offer pragmatic guidance for the development of more effective digital-based English learning strategies.

2. Literature Review

A. Digital Literacy

Digital literacy is broadly understood as the ability to effectively use digital technologies to access, evaluate, create, and communicate information in various contexts. It extends beyond basic technical skills and includes cognitive and critical competencies necessary for meaningful engagement with digital environments. According to Abousaber (2023) and Hilda (2024) younger generations, particularly Generation Z and Generation Y, demonstrate relatively high levels of familiarity with digital technologies due to continuous exposure in their daily lives. However, digital literacy is not limited to operational skills; it also encompasses the ability to assess the credibility of online information, understand digital ethics, and engage responsibly in digital communication. This broader

understanding highlights that digital literacy is a multidimensional construct involving not only the use of tools but also the awareness of their implications in academic and social contexts.

From an evaluative perspective, digital literacy can be categorized into several key dimensions, including technical skills, information literacy, and critical digital awareness. Technical skills refer to the ability to operate devices and applications, while information literacy involves the capacity to search, evaluate, and utilize digital information effectively. Critical digital awareness includes understanding issues such as privacy, ethics, and the reliability of online sources. Despite the assumption that Generation Z naturally possesses these competencies, research suggests that digital proficiency varies depending on access, exposure, and purposeful use (Kirschner & Bruyckere, 2017; Wilson et al., 2022). This indicates that digital literacy should be viewed as a learned competence rather than an inherent trait. In educational contexts, particularly in areas with limited technological infrastructure, such as East Nusa Tenggara (Husna & Budiman, 2024), students may demonstrate uneven development across these dimensions, reinforcing the importance of examining digital literacy in specific learning environments.

B. Self-Directed Learning in English Learning

Self-directed learning (SDL) refers to a process in which learners take initiative in diagnosing their learning needs, setting goals, identifying resources, and evaluating learning outcomes independently. In the context of English language learning, SDL emphasizes learners' autonomy in selecting materials, managing their learning pace, and engaging in continuous practice outside formal classroom settings. With the increasing availability of digital resources, learners are able to access a wide range of English learning materials, including videos, online texts, and interactive applications. This flexibility enables learners to tailor their learning experiences according to their individual needs and preferences. For Generation Z students, who are accustomed to digital environments, SDL becomes particularly relevant as they often rely on online platforms for learning and communication.

From an evaluative standpoint, SDL in English learning can be examined through several aspects, including learner autonomy, motivation, and self-regulation. Learner autonomy refers to the ability to make independent decisions about learning activities, while motivation drives sustained engagement in learning tasks. Self-regulation involves monitoring progress and adjusting strategies to achieve learning goals. Although Generation Z students are frequently perceived as independent learners due to their digital engagement, studies indicate that this assumption does not always hold true. Their tendency toward short attention spans and reliance on quick digital interactions (Diaconu & Dutu, 2020; Huss, 2021; Maioli, 2016) may affect their ability to engage in sustained and structured learning processes. Additionally, preferences for digital communication over direct interaction (Awalia & Zulkarnaini, 2025; Varol & Kılınç, 2021) may influence how they practice productive language skills. Therefore, SDL should be understood not merely as independent access to resources, but as a complex process requiring cognitive and behavioral engagement.

C. Characteristics of Generation Z in Learning Contexts

Generation Z is characterized by its close relationship with digital technology, which significantly influences learning behaviours and communication styles. As noted in various studies, Gen Z individuals frequently engage with digital media for communication, often preferring instant messaging and social media platforms over traditional forms of interaction (Çora, 2019; Grigoreva et al., 2021; Panagiotou et al., 2022; Tang, 2021). At the same time, some research suggested that they still value face-to-face communication in certain contexts (Lalić et al., 2020), indicating a hybrid communication preference. This generation is also described as highly adaptive to technological changes, enabling them to navigate digital environments with relative ease. However, their learning behaviours are shaped not

only by technological exposure but also by cognitive and social factors, including attention span and interpersonal communication skills.

Evaluatively, the characteristics of Generation Z in learning contexts can be categorized into several aspects, including communication preferences, cognitive tendencies, and digital engagement patterns. Research highlights that Gen Z learners often exhibit shorter attention spans and a preference for fast-paced information processing (Diaconu & Dutu, 2020; Huss, 2021; Maioli, 2016), which may influence their engagement with complex learning materials. Additionally, studies suggest that they may have weaker interpersonal communication skills and challenges in expressing emotions effectively (Fodor et al., 2019; Fodor & Jaeckel, 2018; Jiří, 2016), potentially affecting collaborative learning experiences. These characteristics suggest that while Gen Z students are highly connected digitally, their learning effectiveness depends on how well they can manage their engagement with information and learning tasks. In fact, a recent study done by Budiono (2025) found that TikTok and Instagram have a significant role in vocabulary learning in English. Thus, understanding these traits is essential for designing instructional approaches that support both digital engagement and meaningful learning outcomes.

3. Method

This study was conducted to examine the role of digital literacy in fostering self-directed English learning behaviours among Generation Z students in a vocational education context. The issue was selected based on the growing reliance on digital technology in English language learning and the assumption that Generation Z students inherently possess sufficient digital competence. However, previous studies have questioned this assumption, suggesting that digital literacy is not automatically acquired and varies depending on access, exposure, and purposeful use (Kirschner & De Bruyckere, 2017; Wilson et al., 2022). In addition, disparities in technological infrastructure, particularly in regions such as East Nusa Tenggara, may influence students' digital experiences and learning opportunities (Husna & Budiman, 2024). These conditions highlight the importance of investigating digital literacy as a factor that may affect students' ability to engage in self-directed English learning. Therefore, this study aims to provide empirical evidence on how digital literacy relates to learning behaviours in a specific vocational context, particularly among students in an Animal Health study program.

This study adopted a quantitative research design with a correlational approach to examine the relationship between digital literacy and self-directed English learning behaviors. Correlational research is appropriate for identifying the strength and direction of associations between variables without experimental manipulation (Bhandari, 2021). The data used in this study were collected through a structured questionnaire distributed using Google Forms. The participants, 78 students, were first-year students of the Animal Health Study Program at a vocational higher education institution, aged between 18 and 20 years, representing Generation Z. A purposive sampling technique was employed to select participants who met specific inclusion criteria, such as being active students within the defined age range, as this method allows researchers to intentionally choose individuals who are most relevant to the research objectives (Campbell et al., 2020). The questionnaire consisted of several sections, including digital literacy, digital learning behaviour, platform usage, and self-directed English learning practices. The items were designed using a Likert scale to measure students' perceptions, frequency of digital tool usage, and engagement in independent learning activities. This design allows for the systematic collection of quantifiable data to identify patterns and relationships between the variables under investigation.

The data collection process was conducted by distributing the questionnaire link to participants through online communication platforms, ensuring voluntary participation and informed consent. Respondents were asked to complete the questionnaire independently, within a specified time. The collected data were then analysed using descriptive and inferential statistical techniques. Descriptive

statistics, such as mean scores and percentages, were used to determine the level of digital literacy and self-directed learning behaviours among students. The results were then interpreted to identify the extent to which digital literacy contributes to students' self-directed English learning behaviours. This systematic approach ensures that the findings are reliable and relevant to the research objectives.

4. Result and Discussion

The following section presents the results of the student questionnaire, categorized based on technical skills and patterns of self-directed English learning behavior. These findings will be discussed (1) the level of digital literacy among Generation Z students in the Animal Health program, (2) in what ways do Generation Z students engage in self-directed English learning activities, and (3) correlation between digital literacy and autonomous English learning behaviours among Generation Z students. This study aims to enhance digital literacy understanding within vocational education contexts and to provide practical insights for developing more effective digital-based English learning strategies.

A. Technical and Operational Skill

Table 1 presents the self-assessment of technical and operational digital skills among 78 first-year students of the Animal Health Study Program, aged 18–20, representing Generation Z. Overall, the data indicate that students demonstrate a relatively high level of basic technical competence. Most respondents reported positive confidence in using search engines, with 51.3% agreeing and 24.4% strongly agreeing, making this the most familiar skill. Similarly, the ability to upload and download files shows strong proficiency, as 53.8% agreed and 21.8% strongly agreed. These results suggest that students are well accustomed to fundamental digital academic tasks.

In terms of using online meeting tools, although the majority still responded positively (43.6% agree; 25.6% strongly agree), a slightly higher proportion of neutral (21.8%) and disagreeing responses indicates that not all students are fully confident operating these platforms independently. The ability to install or update applications also appears strong, with 55.1% agreeing and 19.2% strongly agreeing, reflecting good operational autonomy with personal devices. However, troubleshooting basic technical problems emerges as the weakest area. While 46.2% agreed and 15.4% strongly agreed, this item recorded the highest neutral response (29.5%) and relatively higher disagreement levels. This suggests that although students can use technology effectively, their problem-solving skills in technical situations are less developed. In summary, the participants exhibit strong foundational digital skills, particularly in routine and task-oriented activities, but show comparatively lower confidence in handling technical issues independently.

Table 1. Technical and Operational Skill

No.	Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.	I can easily use search engines (e.g., Google) to find specific information.	2,2%	1,3%	20,5%	51,3%	24,4%
2.	I can upload and download files using platforms such as Google Drive or LMS.	1,3%	5,1%	17,9%	53,8%	21,8%
3.	I can use online meeting tools (e.g., Zoom, Google Meet) without assistance.	1,3%	7,7%	21,8%	43,6%	25,6%
4.	I can install or update applications on my laptop or smartphone.	3,8%	1,3%	20,5%	55,1%	19,2%
5.	I can troubleshoot basic technical problems (e.g., internet connection, login errors).	3,8%	5,1%	29,5%	46,2%	15,4%

Table 2. Cognitive Information Skill

No.	Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.	I can evaluate whether online information is reliable or not.	6,4%	2,6%	32,1%	44,9%	14,1%

Table 3. Self-perception and Confidence

No.	Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.	I feel confident using digital tools (such as Google translate and AI tools) to complete English tasks critically.	7,7%	1,3%	23,1%	44,9%	23,1%
2.	I find learning English easier when using digital resources.	5,1%	2,6%	12,8%	48,7%	30,8%
3.	Improving my digital literacy will help me learn English better	2,6%	0%	19,2%	52,6%	25,6%

Table 2 presents students' self-assessment of cognitive information skills, specifically their ability to evaluate the reliability of online information. The results indicate a generally moderate to positive level of confidence, with the largest proportion of students selecting "agree" (44.9%) and a smaller group "strongly agree" (14.1%), suggesting that more than half of the respondents perceive themselves as capable of assessing information credibility. However, a substantial percentage of students (32.1%) chose "neutral," indicating uncertainty or inconsistency in this skill, while a smaller portion expressed disagreement (6.4% strongly disagree; 2.6% disagree). These findings suggest that although many students feel confident in evaluating online information, a considerable number may still lack strong critical digital literacy skills, particularly in distinguishing reliable from unreliable sources.

Table 3 illustrates students' self-perception and confidence in using digital tools for English learning, revealing generally positive attitudes across all items. Most students reported confidence in using digital tools such as Google Translate and AI tools, with 44.9% agreeing and 23.1% strongly agreeing, although a notable 23.1% remained neutral, suggesting some hesitation in critical use. Students showed even stronger agreement that digital resources make learning English easier, with 48.7% agreeing and 30.8% strongly agreeing, indicating widespread recognition of the benefits of digital support. Similarly, most respondents acknowledged the importance of digital literacy for improving English proficiency, as reflected in 52.6% agreement and 25.6% strong agreement, with almost no disagreement.

Overall, the three tables indicate that the Generation Z students demonstrate a generally strong level of digital literacy, particularly in technical and operational skills, where most respondents expressed confidence in performing routine digital tasks such as searching for information, managing files, and using applications. This findings in line with Abousaber (2023); Hilda (2024); and Jayatissa, (2023) study that younger generations exhibit greater digital proficiency.

Their self-perception and confidence in using digital tools for English learning are also notably positive, with a majority agreeing that digital resources facilitate learning and that improving digital literacy contributes to better English proficiency. However, the findings also reveal a more moderate level of cognitive information skills, as a considerable proportion of students reported neutral responses when evaluating the reliability of online information, suggesting some uncertainty in critical digital evaluation. This is in agreement with Kirschner & Bruyckere, (2017) and Wilson et al., (2022) that digital proficiency varies depending on access, exposure, and purposeful use. In sum, while students are technically competent and positively oriented toward digital learning, their higher-order critical literacy skills still require further development.

Table 4. Digital Exposure

No.	Question	Never	Rarely	Occasionally	Often	Always
1.	How often do you access YouTube?	3,8%	14,1%	30,8%	33,3%	17,9%
2.	How often do you use WhatsApp?	1,3%	2,6%	3,8%	21,8%	70,5%
3.	How often do you use Google?	2,6%	2,6%	14,1%	42,3%	38,5%
4.	How often do you use E-learning?	2,6%	1,3%	9%	30,8%	56,4%
5.	How often do you use media social (IG/TikTok/FB/etc.) to learn English?	2,6%	9%	24,4%	34,6%	29,5%

Table 5. Learning Behavior

No.	Question	Never	<1 hour/ week	1-2 hours/ week	3-5 hours/ week	>5 hours/ week
1.	How often do you listen to English audio, such as songs/ podcast/ listening practice?	3,8%	35,9%	21,8%	23,1%	15,4%
2.	How often do you read text in English, such as journal article or report?	38,5%	50%	7,7%	2,6%	1,3%
3.	How often do you write in English?	3,8%	57,7%	26,9%	9%	3,8%
4.	How often do you practice speaking in English?	12,8%	51,3%	20,5%	7,7%	7,7%

B. Patterns of Self-Directed English Learning Behaviours

Table 4 presents students' level of digital exposure across various platforms, revealing frequent and intensive use of certain digital tools. WhatsApp emerges as the most consistently used platform, with a striking 70.5% of students reporting "always" using it and an additional 21.8% "often," indicating its central role in daily communication. Similarly, Google and E-learning platforms are widely utilized, with 42.3% and 30.8% of students respectively reporting "often," and a substantial 38.5% (Google) and 56.4% (E-learning) indicating "always," highlighting their importance in academic activities. YouTube usage appears more moderate, with responses distributed across "occasionally" (30.8%) and "often" (33.3%), suggesting it is used regularly but not as consistently as other platforms. Notably, social media platforms (e.g., Instagram, TikTok, Facebook) are also frequently used for learning English, with 34.6% reporting "often" and 29.5% "always," reflecting their growing role as informal learning tools. Overall, the data suggest that students are highly exposed to digital environments, particularly for communication and academic purposes, while also increasingly leveraging social media for language learning.

Furthermore, table 5 presents students' self-directed English learning behavior in terms of time allocation, revealing generally low to moderate engagement across skills. Listening appears to be the most practiced activity, although still limited, with responses relatively distributed across time ranges and only 38.5% of students spending more than 3 hours per week, while a notable 35.9% engage for less than 1 hour. Reading shows the lowest level of engagement, with a striking 38.5% reporting "never" and 50% spending less than 1 hour per week, indicating minimal exposure to academic or extended English texts. Writing and speaking practices are also relatively infrequent, as many students reported spending less than 1 hour per week (57.7% for writing and 51.3% for speaking), with only a small proportion dedicating more than 3 hours. Overall, the findings suggest that despite high digital exposure, students' actual self-directed English learning practices, particularly productive skills and reading, limited and require further encouragement and support.

Tables 4 and 5 reveal a clear gap between students' high digital exposure and their limited use of these technologies for English learning. Table 4 shows that students are highly active in the digital

environment, with very frequent use of platforms such as WhatsApp, Google, E-learning systems, and even social media, which many report using often or always. However, Table 5 indicates that this high level of access does not translate into substantial English learning engagement. Most students spend less than one hour per week on key language activities such as reading, writing, and speaking, with reading in particular showing extremely low participation. Even listening, the most practiced skill, remains relatively moderate. This contrast highlights that although students are well-connected and digitally active, they do not consistently utilize these resources to support their English learning, suggesting a gap between digital exposure and purposeful, self-directed language use.

C. Correlation between Digital Literacy and Self-Directed English Learning

The findings indicate that high digital exposure does not appear to translate into autonomous learning behaviour among Generation Z students. As shown in Table 4, students demonstrate high levels of engagement with digital platforms such as social media, messaging applications, and e-learning systems, which aligns with the characteristics of Generation Z as digitally immersed users (Abousaber, 2023; Hilda, 2024). This frequent interaction reflects strong technical and operational skills, one of the key dimensions of digital literacy. However, as emphasized in the literature, digital literacy is a multidimensional construct that goes beyond mere usage and includes information literacy and critical awareness (Kirschner & Bruyckere, 2017; Wilson et al., 2022). Therefore, high exposure to digital tools does not necessarily indicate the ability to use them effectively for meaningful academic purposes.

This is further evidenced in Table 5, which shows that students' engagement in self-directed English learning remains relatively low, particularly in reading, writing, and speaking activities. Despite having easy access to abundant digital resources, most students spend less than one hour per week on these learning activities, suggesting limited learner autonomy and self-regulation. This finding supports previous studies indicating that Generation Z students, although digitally active, do not always demonstrate strong self-directed learning behaviours (Diaconu & Dutu, 2020; Huss, 2021; Maioli, 2016). Their preference for quick and passive digital interactions may hinder sustained and structured learning engagement. In line with the concept of self-directed learning, which requires initiative, motivation, and continuous practice, the results suggest that students have not fully utilized digital technologies to support independent English learning. Consequently, the gap between digital exposure and actual learning behaviour highlights the need for instructional strategies that not only integrate technology but also foster students' autonomy and critical engagement in the learning process.

5. Conclusion

The findings of this study reveal several important insights into the relationship between digital literacy and autonomous English learning behaviors among Generation Z students in the Animal Health Study Program. Overall, the students demonstrate a relatively high level of digital literacy, particularly in terms of technical and operational skills, as well as strong exposure to digital platforms such as social media, messaging applications, and e-learning systems. This confirms that they are highly familiar with digital environments and are active users of technology in their daily lives despite living in East Nusa Tenggara (NTT), where differences in technology infrastructure and access may make students' digital experiences more challenging. However, the results also show that their cognitive information skills, especially in evaluating the reliability of online information, remain moderate, with a considerable proportion of students expressing uncertainty. More importantly, despite their high level of digital exposure, students exhibit limited engagement in self-directed English learning activities. Most respondents spend minimal time on reading, writing, and speaking practices, indicating that frequent use of digital tools does not necessarily translate into autonomous learning behavior. Therefore, the findings suggest that while students are digitally competent, they have not fully utilized digital technologies to support independent and meaningful English learning.

The novelty of this study is that it highlights the gap between digital access and purposeful academic use, emphasizing that being digitally connected does not automatically lead to effective learning outcomes. The study also supports the notion that self-directed learning requires not only access to resources but also learner autonomy, motivation, and self-regulation. Methodologically, this research provides empirical evidence from a vocational higher education context, particularly in a setting such as East Nusa Tenggara, which is often underrepresented in digital literacy studies. By integrating aspects of digital literacy and self-directed learning, this study offers a more comprehensive perspective on how Generation Z students interact with technology in learning contexts. The findings can serve as a practical reference for educators in designing instructional strategies that encourage not only the use of digital tools but also the development of critical thinking and autonomous learning behaviors among students.

Despite its contributions, this study has several limitations that should be addressed in future research. The study is conducted within a specific group of students in a single study program, which may affect the generalizability of the findings to other contexts or disciplines. Future studies are therefore recommended to involve mixed methods approaches, including interviews or observations, to gain deeper insights into students' actual learning practices. Additionally, further research should apply inferential statistical analysis to examine the relationship between variables more rigorously. Expanding the sample across different institutions and regions would also provide a broader understanding of digital literacy and self-directed learning among diverse student populations.

References

- Abousaber, I. (2023). Evaluating the Digital Divide Between Saudi University Academics and Gen Z Students. *Journal of Southwest Jiaotong University*, 58(3), 363–374. <https://doi.org/10.35741/issn.0258-2724.58.3.31>
- Awalia, F., & Zulkarnaini, Z. (2025). Memahami Pola Perilaku Generasi Z di Era Digital. *Jurnal Teknologi Dan Sains Modern*, 2(1), 15–25. <https://journal.scitechgrup.com/index.php/jtsm/article/view/251>
- Bhandari, P. (2021). *Correlational Research: When & How to Use*. Scribbr. https://www.scribbr.com/methodology/correlational-research/?utm_source=chatgpt.com
- Budiono, G. A. C. (2025). The Role of TikTok and Instagram in Vocabulary Learning Among Indonesian Gen Z Learners. *International Journal of Business, Education, Humanities and Social Sciences*, 7(2), 201–209. <https://doi.org/https://doi.org/10.46923/ijbhes.v7i2.534>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing: JRN*, 25(8), 652. <https://doi.org/10.1177/1744987120927206>
- Çora, H. (2019). the Effects of Characteristics of Generation Z on 21St Century Business Strategies. *Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 10(20), 909–926. <https://doi.org/10.36543/kauibfd.2019.038>
- Diaconu, M., & Dutu, A. (2020). Employees' behavior within labor market: generation Z Vs Generation Y. *The USV Annals of Economics and Public Administration*, 20(1 (31)), 113–119. <https://annalsfeaa.usv.ro/index.php/annals/article/view/1231/1191>
- Fodor, M., Jäckel, K., & Szilagyi, T. P. (2019). *Solutions Which Could Support Generation of Z in Case of Choosing the Proper Career Path*. (March), 88–97. <https://doi.org/10.20472/iac.2018.035.015>
- Fodor, M., & Jaeckel, K. (2018). What does It Take to Have a Successful Career Through the Eyes of Generation Z - Based on the Results of a Primary Qualitative Research. *International Journal on Lifelong Education and Leadership*, 4(1), 1–7. <https://dergipark.org.tr/en/pub/ijlel/issue/39629/468944>
- Grigoreva, E. A., Garifova, L. F., & Polovkina, E. A. (2021). Consumer Behavior in the Information Economy: Generation Z. *International Journal of Financial Research*, 12(2), 164. <https://doi.org/10.5430/ijfr.v12n2p164>
- Hilda. (2024). The Era of Digital Literacy: Highlighting Gen Z'S 60% Advantage in Technology Understanding. *Acta Informatica Malaysia*, 8(2), 60–63. <https://doi.org/10.26480/aim.02.2024.60.63>
- Husna, A., & Budiman, L. (2024). *Menghubungkan yang Tak Terhubung*.
- Huss, J. A. (2021). Gen Z students are filling our online classrooms: Do our teaching methods need a reboot? *Insight: A Journal of Scholarly Teaching*, 32(3), 167–186.

- Jayatissa, K. A. D. U. (2023). Generation Z – A New Lifeline: A Systematic Literature Review. *Sri Lanka Journal of Social Sciences and Humanities*, 3(2), 179–186. <https://doi.org/10.4038/sljssh.v3i2.110>
- Jiří, B. (2016). The employees of baby boomers generation, Generation X, Generation Y and Generation Z in selected czech corporations as conceivers of development and competitiveness in their corporation. *Journal of Competitiveness*, 8(4), 105–123. <https://doi.org/10.7441/joc.2016.04.07>
- Kirschner, P. A., & Bruyckere, P. De. (2017). The myths of the digital native and the multitasker. *Teaching and Teacher Education*, 67, 135–142. <https://doi.org/https://doi.org/10.1016/j.tate.2017.06.001>
- Lalić, D., Stanković, J., Bošković, D., & Milić, B. (2020). Career Expectations of Generation Z. *Lecture Notes on Multidisciplinary Industrial Engineering, Part F201*, 52–59. https://doi.org/10.1007/978-3-030-43616-2_6
- Maioli, Dr. E. (2016). New Generations and Employment – An Exploratory Study about Tensions Between the Psycho-social Characteristics of the Generation Z and Expectations and Actions of Organizational Structures Related with Employment (CABA, 2016). *Journal of Business*, 2(1), 01. <https://doi.org/10.18533/job.v2i1.53>
- Panagiotou, N., Lazou, C., & Baliou, A. (2022). Generation Z: Media Consumption and Mil. *İmgelem*, 6(11), 455–476. <https://doi.org/10.53791/imgelem.1187245>
- Pasaribu, S., & Darmastuti, R. (2025). Penyediaan Layanan Seluler 4 Untuk Percepatan Transformasi Digital Pada Masyarakat Desa 3T Di NTT. *Kritis*, (Edisi Khusus), 97–110. <https://doi.org/https://doi.org/10.24246/kritis.vi>
- Tang, F. (2021). A critical review of research on the work-related attitudes of Generation Z in China. *Social Psychology and Society*, 10(2), 19–28. <https://doi.org/10.17759/SPS.2019100203>
- Varol, F., & Kılınç, E. (2021). A Research on Post-Covid-19 Career Perception and Business Life Expectations of Generation Z: The Case of the Tourism and Business Faculties. *Journal of Tourism and Gastronomy Studies*, 9(1), 573–594. <https://doi.org/10.21325/jotags.2021.804>
- Wilson, M. L., Hall, J. A., & Mulder, D. J. (2022). Assessing digital nativeness in pre-service teachers: Analysis of the Digital Natives Assessment Scale and implications for practice. *Journal of Research on Technology in Education*, 54(2), 249–266. <https://doi.org/https://doi.org/10.1080/15391523.2020.1846146>
- Wulakada, H. H. (2021). Dilema Persebaran Dan Aksesibilitas Prasarana Pendidikan Di Provinsi Nusa Tenggara Timur. *Jurnal Geografi*, 1(1), 1–12.
- Wulakada, H. H. (2024). Disparitas Mutu Pendidikan di Wilayah Perbatasan (Refleksi Masyarakat Pinggiran Indonesia di Provinsi Nusa Tenggara Timur). *Seminar Nasional Pendidikan Geografi*, 6553(2), 119–139.