

## Digital Readiness Gap Analysis: A Comparative Study Of Student Perceptions And Alumni Realities Of Universities Vs Polytechnics

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### Kata kunci

Keterampilan Siap Kerja, Produktivitas Digital, Uji Mann-Whitney U.

### Abstrak

*Transformasi digital dalam dunia kerja modern telah mengaburkan perbedaan tradisional antara kebutuhan keterampilan akademik dan vokasional. Penelitian ini bertujuan untuk membandingkan Kesiapan Produktivitas Digital lulusan Universitas (jalur akademik) dan Politeknik (jalur vokasional) guna mengetahui apakah terdapat kesenjangan kompetensi yang signifikan di era kecerdasan buatan dan komputasi yang tersebar luas. Penelitian ini menggunakan pendekatan kuantitatif komparatif dengan instrumen Digital Productivity Readiness Inventory (DPRI), yang mengukur kompetensi pada dimensi Spreadsheet, Manajemen Dokumen, Komunikasi Digital, dan Adaptabilitas terhadap AI. Sebanyak 77 responden valid (43 mahasiswa/alumni Universitas dan 34 mahasiswa/alumni Politeknik) dipilih menggunakan teknik stratified random sampling. Data dianalisis menggunakan Uji Mann-Whitney U karena ukuran sampel yang tidak sama dan distribusi data yang non-parametrik. Hasil penelitian menunjukkan bahwa instrumen memiliki reliabilitas tinggi ( $\alpha=0,961$ ) dan tidak terdapat perbedaan yang signifikan dalam kesiapan digital antara kedua kelompok ( $U=691,500$ ,  $p=0,689$ ). Analisis deskriptif menunjukkan bahwa lulusan Universitas ( $\mu=73,95$ ) dan Politeknik ( $\mu=75,47$ ) sama-sama berada pada tingkat "Kompetensi Tinggi". Temuan ini menantang asumsi bahwa lulusan vokasional secara inheren lebih "siap kerja" dalam hal pengoperasian alat digital. Hasil penelitian juga menunjukkan bahwa literasi digital dasar telah menjadi keterampilan umum yang diperoleh melalui pembelajaran mandiri, bukan hanya melalui kurikulum formal. Oleh karena itu, pemberi kerja sebaiknya lebih memprioritaskan penilaian berbasis keterampilan dibandingkan latar belakang institusi dalam proses rekrutmen. Selain itu, institusi pendidikan tinggi perlu beralih dari pengajaran keterampilan operasional dasar menuju pengembangan kelancaran digital tingkat lanjut (advanced digital fluency) dan kemampuan pemecahan masalah kompleks untuk menjaga daya*

saing lulusan. Penelitian ini memberikan bukti empiris yang membantah mitos “kesenjangan vokasional-akademik” dalam konteks produktivitas perkantoran, serta menyoroti peran teknologi yang semakin merata dalam menyamakan kompetensi lulusan.

**Keywords**

Digital Productivity, Mann-Whitney U Test, Work-Ready Skills.

**Abstract**

*Purpose: The digital transformation of the modern workforce has blurred the traditional distinctions between academic and vocational skill requirements. This study aims to compare the Digital Productivity Readiness of University (Academic track) and Polytechnic (Vocational track) graduates to determine if a significant competency gap exists in the era of AI and ubiquitous computing. Design/methodology/approach: A comparative quantitative study was conducted using the Digital Productivity Readiness Inventory (DPRI), which assesses competence across Spreadsheet, Document Management, Digital Communication, and AI Adaptability dimensions. A total of 77 valid respondents (43 University students/alumni and 34 Polytechnic students/alumni) were selected using stratified random sampling. Data were analyzed using the Mann-Whitney U Test due to the unequal sample sizes and non-parametric distribution of the data. Findings: The instrument demonstrated high reliability ( $\alpha=0.961$ ). The hypothesis testing revealed no significant difference in digital readiness between the two groups ( $U=691.500$ ,  $p=0.689$ ). Descriptive analysis indicated that both University ( $\mu=73.95$ ) and Polytechnic ( $\mu=75.47$ ) graduates possess a "High Competence" level. These findings challenge the assumption that vocational graduates are inherently more "work-ready" in terms of digital tool operation. Practical implications: The results suggest that basic digital literacy has become a generic life skill acquired through independent learning rather than formal curriculum alone. Consequently, employers should prioritize skill-based assessment over institutional background during recruitment. Furthermore, higher education institutions must pivot from teaching basic operational skills to fostering Advanced Digital Fluency and complex problem-solving to maintain graduate competitiveness. Originality/value: This study provides empirical evidence debunking the "Vocational-Academic Gap" myth in the context of office productivity, highlighting the role of technological ubiquity in equalizing graduate competencies.*

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## INTRODUCTION

Global Economic Urgency: The Cost of Digital Illiteracy The digital skills gap has metastasized from a recruitment challenge into a global economic emergency. According to the *World Economic Forum's Future of Jobs Report 2023*, technological literacy is the third-fastest growing core skill globally, with 85 million jobs displaced by automation. The financial stakes are astronomical; *Korn Ferry* (2022) predicts a global talent shortage of 85 million people by 2030, creating an unrealized revenue loss of \$8.5 trillion annually. This crisis is exacerbated by the "AI Adoption Gap"; while the *PwC Global Workforce Survey 2024* reveals that 61% of workers have tried Generative AI at

least once, only 12% integrate it into their daily work, signaling a massive disconnect between technological potential and actual capability. Theoretically, this phenomenon reflects Bandura’s (1997) concept of *miscalibrated self-efficacy*, where an individual's belief in their capability often does not align with their actual competence. To summarize the critical urgency driving this research, key statistical evidence is presented in Table 1.

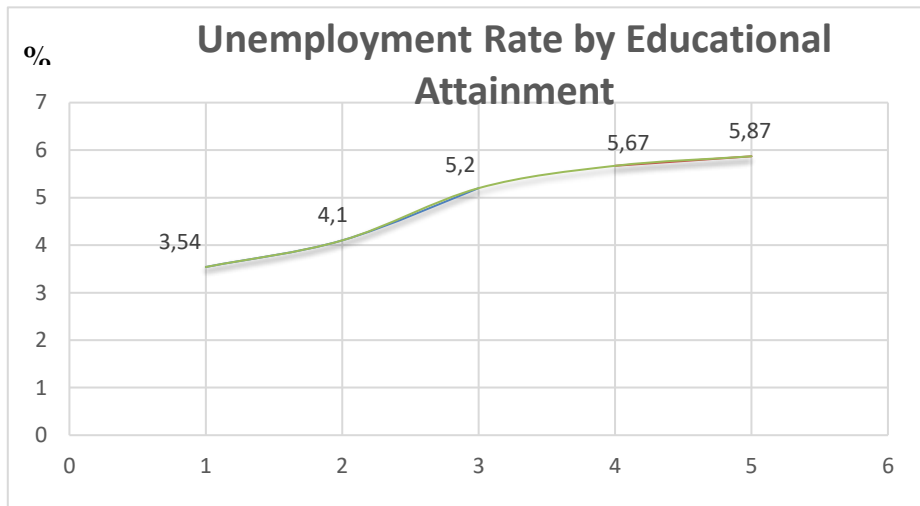
Table 1. Summary of Key Statistical Evidence Driving the Research Urgency.

Scope	Source / Report	Key Statistical Evidence	Implication for this Study
<b>Global Economy</b>	Korn Ferry (2022)	\$8.5 Trillion unrealized revenue by 2030 due to talent shortage.	Highlights the massive economic risk of the skills gap.
<b>AI Adoption</b>	PwC Global Survey (2024)	While 61% try GenAI, only 12% integrate it into daily work.	Indicates a gap between tech potential and actual capability.
<b>National Competitiveness</b>	Coursera Skills Report (2025)	Indonesia ranks 47th globally in overall skills proficiency.	Evidence of the low competitiveness of human capital.
<b>Unemployment</b>	BPS Indonesia (2024)	Diploma unemployment (5.87%) is higher than Elementary (3.54%).	Proof of the "competency mismatch" in higher education.
<b>Industry Demand</b>	Burning Glass (2021)	82% of middle-skill jobs require Spreadsheet & Word mastery.	Validates the selection of research variables (Excel/Word).
<b>Gen Perception</b>	Z Dell Technologies (2023)	37% of Gen Z feel their education failed to provide digital skills.	Justifies the need to measure student "Perception".

Source: primary data 2025

Local Context: Indonesia’s "Talent Paradox" In Indonesia, this gap threatens to derail the *Making Indonesia 4.0* roadmap. The *Coursera Global Skills Report 2025* places Indonesia at rank 47th globally in overall skills proficiency, lagging behind regional peers. Despite a 237% surge in GenAI course enrollments (Coursera, 2024), basic digital literacy remains uneven. Data from the *Indonesian Central Statistics Agency (BPS)* in February 2024 reveals a paradoxical "inverted pyramid" of unemployment, as illustrated in Figure 1

Figure 1. Open Unemployment Rate in Indonesia by Education Level showing the "Inverted Pyramid" Phenomenon



Source: Indonesian Central Statistics Agency (BPS) 2024

As shown in Figure 1, the Open Unemployment Rate for Diploma graduates (5.87%) and University graduates (5.67%) is significantly higher than for elementary graduates (3.54%). This structural mismatch suggests that while campuses are producing graduates, they are failing to produce *employable* digital talent needed to fill the projected shortage of 9 million skilled ICT workers by 2030 (Kominfo, 2023). Similar concerns regarding this "competency mismatch" have been highlighted by local scholars (e.g., Pratama *et al.*, 2022; Santoso, 2023), who argue that vocational curriculums often lag behind the rapid changes in industrial digitalization.

The Gen Z Illusion and The "Micro-Gap" A primary driver of this mismatch is the "illusion of competence" among Generation Z. While *Microsoft's Work Trend Index 2024* indicates that 82% of leaders require employees with new skills, many graduates suffer from "Tech-Shame." A 2023 *HP Workforce Survey* found that 20% of young employees feel judged for lacking basic office tech skills. This aligns with findings by (Usher *et al.*, 2019), who noted that high confidence in social media usage often masks a deficiency in academic and professional digital skills.

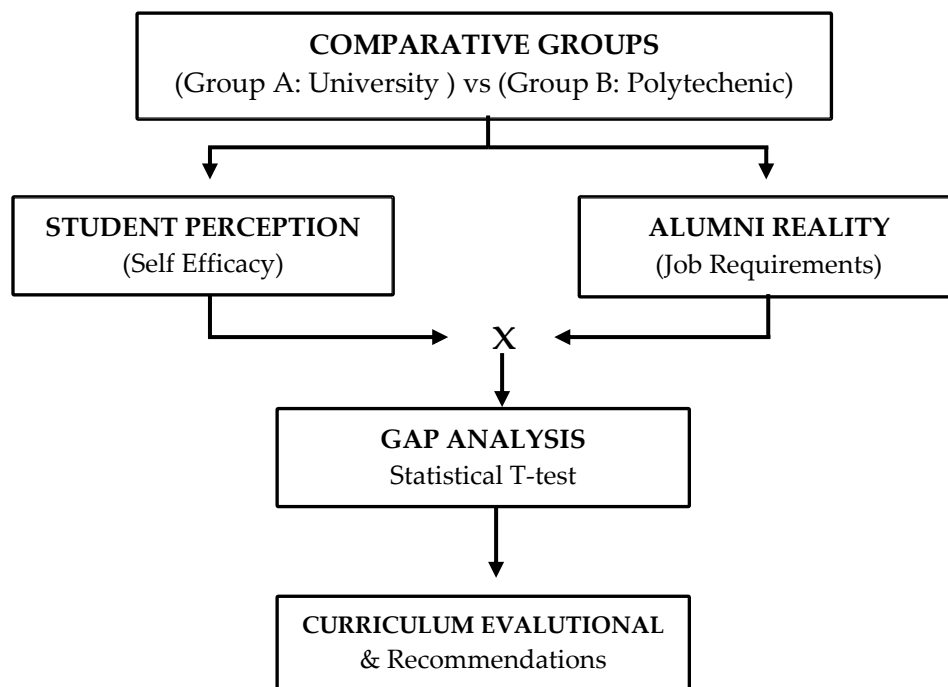
This gap is most critical and costly in fundamental productivity tools. A 2024 study by *Poon et al.* revealed a shocking statistic: 94% of business spreadsheets contain critical errors, directly risking financial decision-making. This "Micro-Gap" in basic tools leads to massive inefficiency; *Adobe's Future of Time Report (2022)* found employees waste six hours a week troubleshooting digital documents. Despite this, academic curriculums often prioritize theoretical computer science over practical office automation, leaving a workforce where 76% feel unprepared for a digital-first world (Salesforce, 2022).

Research Gap and Objective Despite the abundance of instruments assessing general self-efficacy (e.g., Yuen *et al.*, 2004; Brann *et al.*, 2021), challenges persist in

locating research that measures the specific "Perception vs. Reality" gap in office productivity tools within the Indonesian vocational versus academic context. Previous studies have evaluated digital literacy in broad terms, but few have utilized a validated inventory to empirically compare the readiness of University versus Polytechnic graduates in this specific domain. This comparison is vital because, as noted in the *LinkedIn Workplace Learning Report 2024*, 90% of organizations are concerned about employee retention and skill alignment, necessitating a precise measurement of the competency gap.

Therefore, this study aims to address this critical issue by developing and evaluating a digital readiness framework using a comparative design. Specifically, this research seeks to analyze the disparity between Student Perception (Self-Efficacy) and Alumni Reality (Job Requirements) using the *Digital Productivity Readiness Inventory (DPRI)*, and to compare the readiness levels between University and Polytechnic graduates. The conceptual framework guiding this analysis is presented in Figure 2.

**Figure 2.** *Conceptual Framework of Digital Readiness Gap Analysis*



Source: primary data 2025

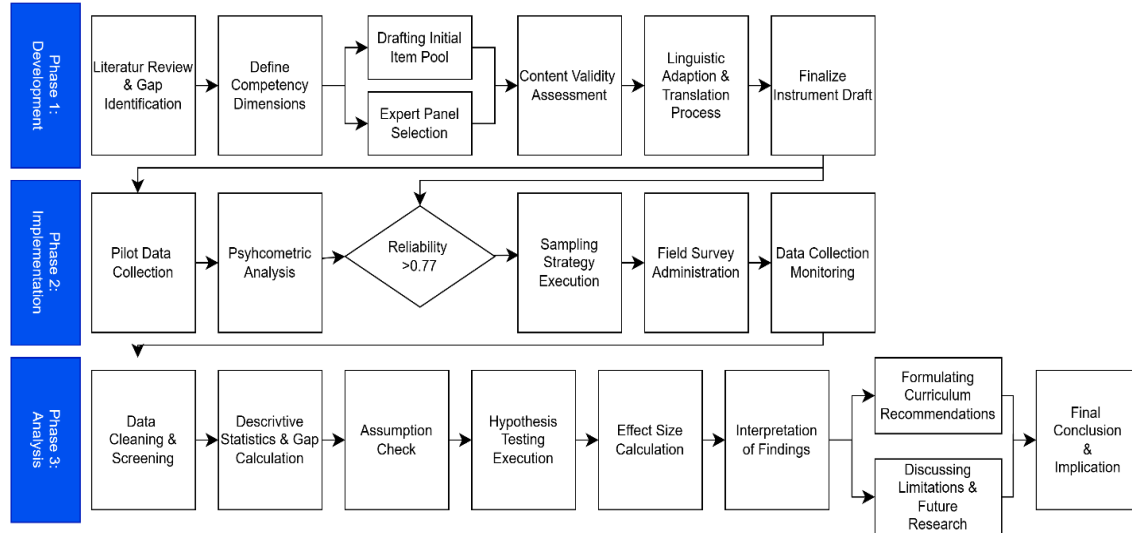
By providing quantitative evidence of this gap, this research offers valuable insights for educators to evaluate whether their curriculum truly prepares students for the high-demand, high-efficiency digital economy.

## METHODS

**Research Design** This study employed a quantitative approach utilizing a comparative cross-sectional survey design. To ensure methodological rigor, the research

procedure followed the two-phase scale development procedure recommended by Rattray & Jones (2007). Phase 1 focused on conceptualization and content validity. Phase 2 focused on field data collection and statistical analysis.

Figure 3. Research Methodology Flowchart illustrating the two-phase study design



Source: Rattray & Jones 2007

**Participants and Sampling Strategy** The target population was stratified into two distinct groups: (1) Final-year undergraduate students (Academic track), and (2) Early-career alumni (Vocational track) with less than three years of work experience. The sampling technique employed was Stratified Random Sampling.

Initial data collection yielded 78 responses. Following a rigorous data cleaning process, one respondent was excluded due to incomplete entries (missing values), resulting in a final sample of 77 valid respondents (N=77). The final distribution consists of University students/alumni (n1=43) and Polytechnic students/alumni (n2=34). Although the sample sizes between subgroups vary, the minimum requirement for comparative analysis was maintained to allow for valid statistical inference using non-parametric methods (Fraenkel, Wallen, & Hyun, 2012). The detailed demographic distribution is presented in **Table 2**.

Table 2. Demographic Distribution of Respondents

Category	Group	Frequency (n)	Percentage (%)
<b>Institution</b>	University (Academic)	43	55.8%
	Polytechnic (Vocational)	34	44.2%
<b>Status</b>	Final-Year Student	46	59.7%
	Early-Career Alumni	31	40.3%
<b>Total</b>		77	100%

Source: primary data 2025

**Instrument Development** The instrument developed is the Digital Productivity Readiness Inventory (DPRI), consisting of 20 items across four dimensions (Spreadsheet, Document, Communication, AI). The instrument was grounded in the Microsoft Work Trend Index and underwent a linguistic adaptation process to ensure conceptual equivalence in Indonesian. The measurement utilizes a Paired-Likert Scale (1-5). A reliability test was conducted on the final valid dataset (N=77), confirming that the instrument is highly reliable. The overall Cronbach's Alpha is  $\sigma = 0.961$ , with all dimensions exceeding the 0.70 threshold as detailed in **Table 3**.

Table 3. Blueprint of Digital Productivity Readiness Inventory (DPRI)

Variable Dimension	Items	Cronbach's $\alpha$	Status
<b>Spreadsheet Mastery (X1)</b>	5	0,899	Highly Reliable
<b>Document Management (X2)</b>	5	0,920	Highly Reliable
<b>Digital Communication (X3)</b>	5	0,874	Reliable
<b>AI &amp; Adaptability (X4)</b>	5	0,901	Highly Reliable
<b>Overall Instrument</b>	20	0,961	Highly Reliable

Source: primary data 2025

**Ethical Considerations** Ethical principles were strictly adhered to. Informed consent was obtained digitally, assuring respondents that their participation was voluntary and data would be processed anonymously solely for academic purposes.

**Data Analysis** The collected data were analyzed using IBM SPSS Statistics version 27.0. The analysis proceeded in three stages:

1. **Descriptive Analysis:** To determine Mean ( $\mu$ ) and Standard Deviation ( $\sigma$ ) for mapping the competency profile.
2. **Gap Analysis:** Quantified using the formula  $Gap = \mu Perception - \mu Reality$ .
3. **Hypothesis Testing:** Due to the unequal sample sizes between the groups ( $n1=43$ ,  $n2=34$ ), the **Mann-Whitney U Test** (Non-Parametric) was employed as a robust alternative to the independent t-test. This test compares the distribution of readiness levels between University and Polytechnic graduates based on **Mean Ranks**, ensuring valid conclusions.

## RESULTS

**Instrument Reliability Check** Before conducting the hypothesis testing, a final reliability analysis was performed on the valid dataset (N=77) to ensure the internal consistency of the *Digital Productivity Readiness Inventory* (DPRI). The results indicated an overall Cronbach's Alpha of 0.961, with all dimensions exceeding the 0.70 threshold. This confirms that the data collected is highly reliable and valid for further inferential analysis. **Descriptive Statistics** Descriptive analysis was conducted to map the digital competency levels of respondents from both institutions. The comparison of mean scores between University and Polytechnic graduates is presented in Table 4.

Table 4. Descriptive Statistics of Digital Readiness Scores (Valid N=77)

Group	N	Mean Score ( $\mu$ )	Std. Deviation	Category
University (Academic)	43	73.95	18.21	High Competence
Polytechnic (Vocational)	34	75.47	17.24	High Competence
<b>Total</b>	<b>77</b>	<b>74.62</b>	<b>17.69</b>	—

Source: primary data 2025

As shown in **Table 4**, the average digital readiness score for Polytechnic graduates ( $\mu=75.47$ ) is slightly higher than that of University graduates ( $\mu=73.95$ ). However, the numerical difference is marginal (approx. 1.52 points). Both groups fall within the "High Competence" category based on the scoring interval, suggesting that students from both educational streams perceive themselves as capable users of digital productivity tools. Hypothesis Testing (Mann-Whitney U Test). To determine whether this observed difference is statistically significant, the Mann-Whitney U Test was employed. This non-parametric test was selected due to the unequal sample sizes ( $n1=43$ ,  $n2=34$ ) and the distribution characteristics of the data. The hypothesis test results are detailed in Table 5.

Table 5. Mann-Whitney U Test Results (University vs. Polytechnic)

Variable	Mann-Whitney U	Z	Asymp. tailed)	Sig. (2-	Decision
<b>Digital Readiness Score</b>	691.500	-0.405	0.689		Fail to Reject $H_0$

Source: primary data 2025

Based on the output in **Table 5**, the analysis yielded a significance value (*Asymp. Sig. 2-tailed*) of **0.689**. Since the *p-value* is greater than the significance level of 0.05 ( $0.689 > 0.05$ ), the null hypothesis ( $H_0$ ) is **accepted**.

This result statistically confirms that **there is no significant difference** in digital productivity readiness between University and Polytechnic graduates. Although Polytechnic graduates scored nominally higher, the difference is not substantial enough to be considered generalizable. Both academic and vocational streams appear to produce graduates with relatively comparable levels of digital literacy in the context of office productivity tools.

## DISCUSSION

Interpretation of Findings: The Myth of the Vocational-Academic Gap The primary objective of this study was to investigate whether a significant disparity exists in digital productivity readiness between University (Academic track) and Polytechnic (Vocational track) graduates. Historically, vocational education has been perceived as more "work-ready" and practical-heavy compared to the theory-oriented academic track. However, the findings of this study challenge this traditional dichotomy. The statistical analysis ( $N=77$ ) revealed **no significant difference** ( $U=691.500$ ,  $p=0.689$ ) between the

two groups. Both University ( $\mu=73.95$ ) and Polytechnic ( $\mu=75.47$ ) respondents demonstrated a "High Competence" level. This finding suggests that in the context of digital productivity tools (Spreadsheet, Documents, AI), the gap between vocational and academic capability has largely disappeared.

Several factors may explain this convergence:

1. **Ubiquity of Digital Tools:** Unlike specialized machinery skills (e.g., welding or heavy equipment) which require specific vocational labs, digital productivity tools are platform-agnostic. University students utilize the same software (Microsoft Office, Google Workspace) as Polytechnic students for their daily assignments, theses, and presentations, leading to comparable accumulation of "flight hours" in using these tools.
2. **Informal Digital Learning:** The rise of self-directed learning platforms (YouTube tutorials, Coursera, Udemy) allows students from any discipline to upskill independently. A University student majoring in Management might be just as proficient in Excel Macros as a Polytechnic student majoring in Administration because they both access the same external learning resources.
3. **Curriculum Adaptation:** Modern University curricula have increasingly integrated practical laboratory credits into their academic programs, while Polytechnics have incorporated substantial theoretical frameworks. This "academic drift" in universities and "vocational drift" in polytechnics has blurred the distinct lines regarding basic digital competencies.

**The Role of AI and Self-Efficacy** An interesting observation from the descriptive data is the high confidence level in using AI tools across both groups. This aligns with the Microsoft Work Trend Index (2024), which indicates that "Gen Z" entrants to the workforce are natively comfortable with AI-augmented workflows. The lack of significant difference here implies that adaptability to new technology is more a function of generational characteristics rather than institutional curriculum. Both groups show a readiness to adopt AI for efficiency, regardless of their formal educational background.

**Implications for Stakeholders** The findings carry significant implications for the labor market and educational policy:

1. **For Employers:** Recruitment processes should move away from screening based on "University vs. Polytechnic" diplomas. Since basic digital competency is statistically equivalent, hiring decisions should focus on portfolio-based assessment or specific technical tests rather than the type of institution.
2. **For Educators:** Since students are already achieving "High Competence" in basic tools, the curriculum in both Universities and Polytechnics needs to be elevated. Basic "Introduction to Computer" courses may no longer be sufficient. The focus should shift towards **Advanced Digital Fluency**, such as Data Analytics, No-Code Development, and complex AI Prompt Engineering, to create a new competitive edge.

**Limitations and Future Research** While this study provides valuable insights, several

limitations must be acknowledged. First, the sample size (N=77) was relatively small and limited to specific study programs, which may restrict the generalizability of the results. Second, the use of self-reported measures (perception-based) carries the risk of social desirability bias, where respondents may overestimate their actual skills. Future research is recommended to employ performance-based testing (actual skill tests) rather than survey questionnaires and to expand the sample size to cover a broader range of disciplines.

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