From AI Literacy to Future Employability: A Serial Mediation Model of Career Adaptability and Digital Self-Efficacy among Generation Z in Developing Countries

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ABSTRACT

The accelerating diffusion of Artificial Intelligence across global labor markets has fundamentally reconfigured the competency demands placed on Generation Z, the largest generational cohort in Indonesia at 27.94% of the total population, who are positioned to constitute the primary backbone of the national workforce over the coming two decades. Despite growing scholarly attention to AI literacy, soft skills, career adaptability, and digital self-efficacy as individual predictors of employability, no prior study has integrated these constructs within a unified serial mediation framework that explains the psychological mechanism through which competencies are translated into future employability. study employed an explanatory quantitative design with a cross-sectional survey of 500 Generation Z professionals employed in Indonesia's digital and technology-based industries. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to test seven hypotheses, including five direct effect pathways and two serial mediation chains, grounded in Career Construction Theory, Human Capital Theory, and Social Cognitive Theory. All seven hypotheses were supported at $p < 0.001$. AI literacy ($\beta = 0.345$) and soft skills ($\beta = 0.326$) each significantly predicted career adaptability. Career adaptability exerted the strongest effect in the model on digital self-efficacy ($\beta = 0.685$), and both mediators significantly predicted future employability ($\beta = 0.371$ and $\beta = 0.349$ respectively). Critically, career adaptability and digital self-efficacy serially mediated the relationship between AI literacy and future employability ($\beta = 0.082$, $t = 5.640$) and between soft skills and future employability ($\beta = 0.078$, $t = 5.375$), confirming the proposed serial mediation model. The final outcome model explained 43.6% of variance in future employability ($R^2 = 0.436$). This study makes three original contributions. It repositions future employability as a career outcome shaped through chained psychological-cognitive mechanisms rather than direct competency transfer. It introduces the first empirically tested serial mediation model positioning career adaptability and digital self-efficacy as sequential mediators between competency inputs and future employability among Generation Z. It frames AI as a structural context rather than merely a workplace tool, opening new theoretical inquiry into how macro-level technological transformation shapes individual career psychology in developing countries.

Keywords: AI Literacy, Soft Skills, Career Adaptability, Digital Self-Efficacy, Future Employability, Generation Z and Developing Countries

INTRODUCTION

The rapid advancement of digital technology and Artificial Intelligence (AI) is fundamentally transforming the structure of work, required competencies, and career trajectories across global labor markets. World Economic Forum (2023) projects that approximately 44% of job competencies will undergo significant change within the next five years, rendering traditional task-based roles increasingly obsolete while simultaneously generating new demands for hybrid digital-human capabilities. Classical IT tasks, such as infrastructure management and conventional application development, are being progressively displaced by the complex demands of the digital era (Erceg & Zoranović, 2020). Consequently,

managing digital transformation successfully requires a unique and evolving set of skills and competencies that extend far beyond technical proficiency alone (Vivian Marcelino & Sophie Altrock, 2023). The emergence of automation technologies has also redefined traditional understandings of work itself, underscoring the urgency of talent development aligned with the demands of Industry 4.0 (Marlapudi & Lenka, 2024). As the nature of work continues to evolve, organizations in developing economies face compounding challenges, including skills shortages, widening competency gaps, insufficient industry readiness, entrenched organizational cultures, and employee resistance to change, all of which obstruct the effective implementation of Industry 4.0 practices (Chauhan, et al., 2021).

Indonesia presents a particularly compelling and urgent case within this global context. According to the 2020 National Population Census, Generation Z those born approximately between 1997 and 2012, constitutes 27.94% of Indonesia's total population, making them the single largest generational cohort in the country (BPS, 2021). This demographic concentration positions Generation Z as the primary backbone of Indonesia's labor market over the next one to two decades, particularly amid the accelerating pace of digital transformation and AI adoption. In the context of a developing nation, this demographic dominance simultaneously presents two contrasting realities: a demographic opportunity and a structural risk. The opportunity materializes when Generation Z demonstrates strong future employability aligned with the competency demands of AI-driven labor markets. Conversely, without such readiness, Indonesia faces the serious prospect of systemic competency mismatch, rising educated unemployment, and deepening digital inequality. In navigating this dual reality, career adaptability plays a pivotal role in enabling Generation Z to confront the dynamic and often unpredictable challenges of modern workplaces (Hadi, 2025). Furthermore, empirical evidence from emerging market contexts confirms that AI adoption is positively associated with career sustainability, employee productivity, and perceived employability, highlighting the central role of individual agency in leveraging digital tools for career development (Mohamud et al., 2025)

Two strategic competency dimensions have emerged as foundational in preparing Generation Z for AI-driven labor markets. The first is AI literacy, which encompasses the cognitive capacity to understand, critically evaluate, and effectively apply AI-based tools and systems in professional contexts. AI literacy functions as a crucial cognitive bridge, connecting educational leadership with vocational psychological outcomes and expanding theoretical models of future employability within digitally evolving educational contexts (Zehui et al., 2025). Cultivating positive attitudes toward AI, systematically enhancing AI literacy, and strengthening career self-efficacy have been empirically demonstrated to reduce job-search anxiety and better equip individuals to face the challenges of AI-driven labor markets (Li et al., 2025). The second dimension is soft skills, encompassing critical and analytical thinking, complex problem-solving, interpersonal communication, creativity, and cognitive flexibility. In technology-driven domains, there exists a clear and measurable demand for these competencies, with evidence consistently showing that individuals must possess a balanced integration of soft skills and digital capabilities in order to thrive in a future defined by accelerating technological advancement (Poláková et al., 2023) . The serious workforce shortfall

observed in developing countries is primarily attributable to the persistently low competency readiness of university graduates, a condition that not only weakens workforce quality but also erodes organizational competitiveness. The information technology sector in particular continues to face a pronounced soft skills deficit, and the professional enhancement achievable through soft skills strengthening has been identified as strategically indispensable for both individual development and organizational growth (Dubey et al., 2022).

Beyond the acquisition of competencies, the psychological dimension of future employability constitutes an equally critical and often underexplored domain. Digital self-efficacy, defined as an individual's belief in their own capacity to effectively navigate digital environments, operate emerging technologies, and adapt to continuously evolving digital work demands, represents a foundational psychological construct for career confidence in the technology-driven workplace. Digital transformation is actively redesigning career development pathways, making digital confidence a decisive factor in employability (Paredes-Aguirre & Fernandez-Solis, 2025). However, low digital self-efficacy can produce anxiety, pervasive self-doubt, and deliberate avoidance behaviors that systematically undermine future employability in digital work environments. In contrast, high digital self-efficacy promotes persistence, encourages experimentation, and facilitates adaptation when individuals encounter unfamiliar digital challenges. Strengthening digital self-efficacy is therefore critical for closing the gap between digital competence and digital confidence among young people, particularly in developing country contexts (K. Jasfar, F & Warsindah, 2022). This perspective is further reinforced by evidence that enhancing the digital readiness of youth requires collaborative strategies that integrate self-efficacy development, digital proficiency, and supportive policy frameworks, ultimately building a resilient, capable, and confident workforce prepared to thrive in a rapidly evolving digital era (Suhada et al., 2026).

Career adaptability constitutes the second critical psychological mechanism in this framework. In AI-driven labor markets that are inherently dynamic, non-linear, and characterized by deep uncertainty, career adaptability represents the capacity to proactively manage occupational transitions, engage in continuous reskilling and upskilling, and effectively navigate role changes driven by automation and structural shifts in demand. Early-career employees frequently encounter significant challenges, including technical difficulties and competency gaps; those who activate adaptability resources such as curiosity and self-confidence demonstrate markedly greater adaptability, whereas skeptical employees exhibit higher resistance (Salcedo-Gil et al., 2025). Critically, strong correlations have been documented between individuals' beliefs about AI's growing dominance in the labor market and the enhancement of their career adaptability, suggesting that AI-related perceptions actively motivate career development investment. Career insecurity arising from concerns about job stability and relevance in the face of AI advancement has emerged as a significant driver of skill development as a coping mechanism, ultimately contributing to individuals' adaptability within an ever-evolving professional landscape (Burhan, 2025).

Despite these valuable individual contributions to the literature, a significant and consequential theoretical gap persists. Existing studies have addressed AI literacy, soft skills, career adaptability, and digital

self-efficacy largely in isolation. Li et al. (2025) and Zehui et al. (2025) affirm the importance of AI literacy and self-efficacy in preparing individuals for AI-driven markets, yet neither explains how career adaptability functions as a psychological mechanism linking competencies to future employability Poláková et al. (2023) and Dubey et al. (2022) establish soft skills as a strategic necessity in technology-driven labor markets, particularly in developing countries facing graduate competency deficits, but tend to position soft skills as direct predictors of future employability without explicating the mechanisms through which this influence operates among Generation Z. Salcedo-Gil et al. (2025) and Burhan (2025) demonstrate that career adaptability is critical amid automation-driven uncertainty, yet focus on reactive individual responses to AI pressure rather than identifying the antecedent factors that proactively build adaptive capacity from an early stage. Similarly, Paredes-Aguirre & Fernandez-Solis (2025), K. Jasfar, F & Warsindah (2022), and Suhada et al. (2026) affirm digital self-efficacy as a psychological foundation of future employability in digital work environments, but examine it as a standalone variable rather than positioning it as a cognitive mediator within a broader explanatory chain. Collectively, the existing literature separates the career pathway from the psychological-cognitive pathway, leaving unresolved the question of how Generation Z transforms competencies into sustainable future employability through a coherent and integrated psychological mechanism.

Addressing this gap, this study proposes a serial mediation model grounded in three complementary theoretical frameworks: Career Construction Theory, which explains how individuals build career narratives through adaptive resources; Human Capital Theory, which frames competency development as a strategic investment yielding labor market returns; and Social Cognitive Theory, which elucidates the role of self-efficacy beliefs in mediating the relationship between environmental inputs and behavioral outcomes. Specifically, this study investigates how AI literacy and soft skills influence future employability among Generation Z in Indonesia, through the sequential mediation of career adaptability and digital self-efficacy.

This study advances the literature through three principal contributions. First, it repositions future employability as a dynamic career outcome shaped through chained psychological-cognitive mechanisms rather than through skill mastery alone. Second, this study introduces and empirically tests a serial mediation model that has not previously existed in the literature, by positioning career adaptability as the first mediator and digital self-efficacy as the second mediator in a chain linking competencies (AI literacy and soft skills) to future employability among Generation Z. Unlike prior studies that examined these variables partially and in isolation, this study integrates them into a single coherent psychological-cognitive pathway, bridging three theoretical perspectives that have hitherto operated separately, namely the career development perspective (Career Construction Theory), the human capital perspective (Human Capital Theory), and the social-cognitive perspective (Social Cognitive Theory), thereby generating a more complete mechanistic understanding of how competencies are translated into sustainable employability in the AI era. Third, this study frames AI not merely as a workplace tool, but as a structural context that fundamentally reconfigures individual career dynamics, particularly within the unique circumstances of a developing country simultaneously navigating

demographic opportunity and digital transformation. Empirically, these three contributions are tested on a Generation Z population in Indonesia, a developing country with the youngest demographic composition in Southeast Asia, providing relevant insights for developing countries with similar demographic characteristics, while delivering significant theoretical and practical implications for ensuring that Indonesia's demographic dividend is genuinely transformed into a sustainable employability advantage in the AI era.

RESEARCH METHODOLOGY

Research Design

This study employed an explanatory quantitative approach with a cross-sectional survey design. This approach was selected to examine causal relationships among latent constructs and to elucidate the serial mediation mechanism linking AI literacy and soft skills with the future employability of Generation Z in the context of an AI-driven labor market in a developing country.

Population and Sample

The target population comprised Generation Z early-career professionals employed in Indonesia's digital industries. Respondents were eligible if they (1) were born between 1997 and 2012, (2) were currently employed in a digital-based organization, (3) had between zero and three years of work experience, and (4) regularly used AI-enabled digital technologies in their work, also (5) residents of Central Java Province, Indonesia. These criteria were established to ensure that respondents possessed adequate experience in using digital tools and AI-based technologies relevant to the study constructs. Central Java Province was selected as the study setting given its status as a province with rapidly growing industrial centers. A purposive sampling technique was employed, targeting 500 respondents. This sample size exceeds the minimum threshold recommended for Partial Least Squares Structural Equation Modeling (PLS-SEM), which stipulates five to ten times the maximum number of paths directed at any single construct within the model (Hair et al., 2022).

Data Collection

Data were collected through a structured online questionnaire distributed via Google Forms. Survey links were disseminated through university networks, professional communities, and social media platforms widely used by Generation Z. To ensure data quality, attention-check items were embedded within the questionnaire. This study was conducted in accordance with ethical research principles. Informed consent was obtained from all participants and data were collected anonymously. To mitigate common method bias, attention-check items were embedded and respondent anonymity was assured throughout data collection (Podsakoff et al., 2003).

Measurement Instrument

All constructs were measured using a seven-point Likert scale (1 = *Strongly Disagree* to 7 = *Strongly Agree*). This scale was adopted as it provides greater variation in response options, enabling researchers to obtain more precise results and richer nuances in the analysis (Hair, et al., 2022). Furthermore, the seven-point scale has been demonstrated to enhance data reliability and validity while supporting advanced statistical analyses, and is therefore widely recognized and applied in social, management, and behavioral research.

The questionnaire comprised 60 measurement items distributed across five constructs. AI Literacy (X1**)** was measured using 12 items across four dimensions:

awareness, usage, evaluation, and ethics, adapted from (Wang et al., 2023). Soft Skills (X2) was assessed through 12 items across four dimensions: interpersonal skill, communication skills, decision making skill, and integrity, adapted from (Colledani et al., 2024). Career Adaptability (M1**)** was measured using 12 items across four dimensions: concern, control, curiosity, and confidence adapted from the Career Adapt-Abilities Scale (CAAS) developed by (Song et al., 2023). Digital Self-Efficacy (M2**)** was assessed through 12 items across four dimensions: digital information management, digital communication, digital content creation, and digital safety and problem solving, adapted (Paredes-Aguirre et al., 2024). Finally, Future Employability (Y) was measured using 12 items across four dimensions: knowledge and digital skills, personality quality, interpersonal network, and career development orientation, adapted from (Chen et al., 2023). All referenced instruments are indexed in Scopus, thereby ensuring the content validity and academic rigor of the measurement framework employed in this study.

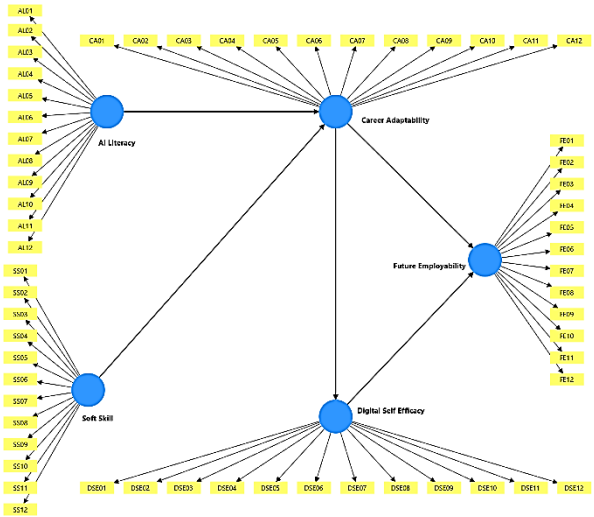


Figure 1. Conceptual framework

Table 1. Research hypotheses

Hyp.	Hypothesis statement	Path	Type
Antecedent Paths: Competency to Mediator 1			
H1	AI literacy has a positive effect on career adaptability among Generation Z in AI-driven workplaces.	X1 → M1	Direct effect
H2	Soft skills has a positive effect on career adaptability among Generation Z in AI-driven workplaces.	X2 → M1	Direct effect
Serial Mediator Path: Mediator 1 To Mediator 2			
H3	Career adaptability has a positive effect on digital self-efficacy among Generation Z.	M1 → M2	Direct effect
Mediator Paths to Outcome			
H4	Career adaptability has a positive effect on future employability among Generation Z.	M1 → Y	Direct effect
H5	Digital self-efficacy has a positive effect on future employability among Generation Z.	M2 → Y	Direct effect
Serial Mediation Paths - Novelty Hypotheses			
H6	Career adaptability and digital self-efficacy serially mediate the relationship between AI literacy and future employability among Generation Z.	X1→M1 →M2→Y	Serial mediation
H7	Career adaptability and digital self-efficacy serially mediate the relationship between soft skills and future employability among Generation Z.	X2→M1 →M2→Y	Serial mediation

RESULT AND DISCUSSION

Result

The respondents in this study consisted of 500 Generation Z participants working in Indonesia's digital-based industries. Female respondents accounted for 57.6% of the sample, while male respondents represented 42.4%. All respondents were classified as Generation Z, born between 1997 and 2012.

Regarding organizational background, most respondents were employed in technology startups (26.2%), followed by fintech companies (20.4%) and e-commerce or marketplace firms (16.2%). In terms of educational background, the

majority held bachelor's degree (74.6%), followed by a master's degree (14.8%) and diploma qualifications (10.6%). Furthermore, all respondents had between zero and three years of work experience, indicating that the sample represents Generation Z early-career professionals employed in Indonesia's digital industries.

Table 2. Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	212	42.4
	Female	288	57.6
Birth Year	1997–2012 (Generation Z)	500	100.0
Country of Employment	Indonesia	500	100.0
Type of Company	Technology Startup	131	26.2
	Fintech	102	20.4
	E-commerce / Marketplace	81	16.2
	Software as a Service (SaaS)	64	12.8
	Digital / IT Consulting	54	10.8
	Digital Media / Content Creator Platform	68	13.6
Work Experience	0–3 Years	500	100.0
Educational Background	Bachelor's Degree (S1)	373	74,6
	Master's Degree (S2)	74	14.8
	Diploma	53	10.6

Measurement Model Assessment

Table 3. Results of Outer Loading of Items

Item	AL	CA	DSE	FE	SK
AL01	0.887				
AL02	0.897				
AL03	0.887				
AL04	0.887				
AL05	0.891				
AL06	0.873				
AL07	0.880				
AL08	0.877				
AL09	0.889				
AL10	0.889				
AL11	0.887				
AL12	0.887				
CA01		0.889			
CA02		0.875			
CA03		0.883			
CA04		0.873			
CA05		0.879			
CA06		0.896			
CA07		0.881			
CA08		0.867			
CA09		0.881			
CA10		0.878			
CA11		0.889			
CA12		0.880			
DSE01			0.893		
DSE02			0.878		
DSE03			0.874		
DSE04			0.891		
DSE05			0.884		
DSE06			0.889		
DSE07			0.883		
DSE08			0.892		
DSE09			0.879		
DSE10			0.888		
DSE11			0.900		
DSE12			0.889		
FE01				0.869	
FE02				0.882	
FE03				0.858	
FE04				0.871	
FE05				0.881	
FE06				0.879	
FE07				0.877	
FE08				0.882	
FE09				0.860	
FE10				0.876	
FE11				0.870	
FE12				0.876	
SS01					0.870
SS02					0.893
SS03					0.880
SS04					0.883
SS05					0.867
SS06					0.869
SS07					0.880
SS08					0.883
SS09					0.878
SS10					0.889
SS11					0.883
SS12					0.898

Table 3. presents the outer loading values for all indicators in this study. The results demonstrate that every indicator achieves an outer loading well above the 0.708 threshold established by (Hair, et al., 2022), with values ranging from a minimum of 0.858 (FE03) to a maximum of 0.900 (DSE11). This range is notably narrow, spanning only 0.042 points across 60 indicators, which reflects a high degree of internal consistency and measurement precision across all constructs. In practical terms, each indicator contributes meaningfully to its respective latent construct, with no item falling below the accepted threshold or even approaching the cautionary zone below 0.750.

Examining each construct individually, the AI Literacy construct (AL01-AL12) yields outer loadings between 0.873 and 0.897, with AL02 emerging as the strongest indicator (0.897), reflecting that respondents' awareness of differences between AI-based and conventional digital systems is the most discriminating dimension of AI literacy in this sample. The Soft Skills construct (SS01–SS12) demonstrates loadings between 0.867 and 0.898, with SS12 recording the highest value (0.898), suggesting that openness to feedback and willingness to improve based on others' input represents the most salient behavioral manifestation of soft skills among Generation Z professionals in this context.

For the Career Adaptability construct (CA01-CA12), loadings range from 0.867 to 0.896, with CA06 capturing the degree to which individuals make career decisions based on their own values rather than environmental pressure, yielding the highest loading (0.896). This finding is theoretically meaningful: among the four dimensions of career adaptability (concern, control, curiosity, and confidence), the control dimension appears to carry the greatest discriminative weight in an AI-driven workplace context, where individuals face constant pressure to conform to technological imperatives. The Digital Self-Efficacy construct (DSE01-DSE12) records the strongest overall pattern, with loadings between 0.874 and 0.900. DSE11 capturing respondents confidence in independently learning and adapting to newly introduced digital tools, achieves the highest loading across all 60 indicators (0.900), underscoring that autonomous digital learning capability is the most central expression of digital self-efficacy in this population.

Finally, the Future Employability construct (FE01-FE12) yields loadings between 0.858 and 0.882, with FE02 and FE08 jointly achieving the highest values (0.882). Notably, FE03 records the lowest loading across the entire measurement model (0.858), though this value remains well above the required threshold and does not compromise construct validity. The slightly lower loading of FE03, which captures the ability to integrate digital and domain-specific knowledge to produce innovative solutions, may reflect the inherent complexity of this competency dimension, which demands a more advanced level of integrative thinking that not all Generation Z respondents may yet possess at this career stage.

Taken together, these results provide robust evidence of indicator reliability across all five constructs. The consistently high and tightly clustered outer loadings, with 58 of 60 indicators exceeding 0.870 confirm that the measurement instruments adopted in this study demonstrate strong psychometric properties in the Indonesian Generation Z context, supporting the validity of proceeding to the structural model assessment.

Validity and Reliability Test

Table 4. Results of The Validity and Reliability Test

Variables	Cronbach's alpha	Composite reliability (rho_a)	Average variance extracted (AVE)
AI Literacy	0.975	0.975	0.785
Career Adaptability	0.974	0.974	0.776
Digital Self Efficacy	0.975	0.975	0.786
Future Employability	0.972	0.972	0.763
Soft Skill	0.974	0.974	0.776

The results presented in Table 4 confirm that all five constructs in this study satisfy the psychometric standards required for robust structural equation modeling.

Cronbach's alpha values across all constructs range from 0.972 to 0.975, substantially exceeding the minimum threshold of 0.70 recommended by (Hair, et al., 2022). Notably, the proximity of these values to one another, spanning a mere 0.003 points, indicates a remarkably uniform level of internal consistency across constructs that were developed from different theoretical traditions and measured through distinct item pools. This degree of consistency is rarely observed in multi-construct studies and speaks to the quality of the adapted instruments in the Indonesian Generation Z context.

Composite reliability (rho_c) values mirror the Cronbach's alpha pattern exactly, with all five constructs recording values of either 0.972, 0.974, or 0.975. Since composite reliability is generally considered a more precise reliability estimator than Cronbach's alpha, being less sensitive to the number of indicators, the convergence of these two indices provides particularly strong evidence that the constructs are measured with high precision and stability.

Average Variance Extracted (AVE) values range from 0.763 (Future Employability) to 0.786 (Digital Self-Efficacy), all comfortably exceeding the 0.50 threshold established by (Fornell & Larcker, 1981). AVE values at this level indicate that, on average, each latent construct explains more than 76% of the variance in its indicators, meaning the constructs capture far more signal than noise. The highest AVE belongs to Digital Self-Efficacy (0.786), suggesting that this construct is measured with the greatest precision among all five variables, which is theoretically coherent given that digital self-efficacy items tend to capture a tightly defined psychological domain centered on confidence in digital task performance. Taken together, the reliability and convergent validity evidence presented in Table 4 provides a solid psychometric foundation for the subsequent structural model analysis.

Table 5. Discriminant Validity (Fornell-Larcker Criterion)

Variables	AL	CA	DSE	FE	SS
AI Literacy	0.886				
Career Adaptability	0.551	0.881			
Digital Self Efficacy	0.458	0.685	0.887		
Future Employability	0.614	0.609	0.602	0.873	
Soft Skill	0.632	0.544	0.466	0.602	0.881

For discriminant validity, the results confirm that this condition is satisfied across all five constructs without exception. The diagonal values, AL (0.886), CA (0.881), DSE (0.887), FE (0.873), SS (0.881), uniformly exceed their respective inter construct correlations. The highest inter construct correlation in the matrix is observed between AI Literacy and Soft Skills (0.632), followed closely by AI Literacy and Future Employability (0.614). While these correlations are moderate to substantial in magnitude, they remain meaningfully lower than the corresponding diagonal values, confirming that despite the conceptual relatedness of these constructs in an AI-driven workplace context, they retain sufficient empirical distinctiveness to be treated as separate latent variables in the structural model.

Particularly noteworthy is the correlation between Career Adaptability and Digital Self-Efficacy (0.685), which is the highest pairwise correlation in the matrix. This is theoretically expected, and indeed predicted by the serial mediation logic of this study, as career adaptability is posited to be the primary antecedent of digital self-efficacy. The fact that their correlation, while high, still falls well below the Career Adaptability diagonal

value (0.881) confirms that these two mediating constructs, though closely related, measure distinct psychological constructs and can legitimately occupy separate positions in the serial mediation chain.

Table 6. Discriminant Validity (HTMT)

Variables	AL	CA	DSE	FE	SS
AI Literacy					
Career Adaptability	0.565				
Digital Self Efficacy	0.469	0.702			
Future Employability	0.630	0.625	0.618		
Soft Skill	0.648	0.557	0.477	0.618	

The HTMT values presented in Table 6 range from 0.469 (Digital Self Efficacy-AI Literacy) to 0.702 (Digital Self Efficacy-Career Adaptability), with all values remaining well below the conservative threshold of 0.85, and indeed below even the more lenient threshold of 0.90, recommended by (Henseler et al., 2021) respectively. No construct pair approaches either threshold, providing unambiguous evidence of discriminant validity across the entire measurement model.

The highest HTMT value in the matrix, 0.702 between Digital Self Efficacy and Career Adaptability, warrants brief theoretical commentary. As the two serial mediators in this study's model, a degree of conceptual overlap between these constructs is not only expected but is in fact the theoretical premise of the serial mediation chain, the argument being that career adaptability resources cognitively scaffold the development of digital self efficacy beliefs. That this relationship, while theoretically intimate, does not breach discriminant validity boundaries (HTMT = 0.702 < 0.85) confirms that the two constructs remain empirically separable despite their theoretical proximity. This is a meaningful finding in itself, as it validates the decision to model career adaptability and digital self efficacy as two distinct sequential mediators rather than collapsing them into a single construct. The second-highest HTMT value is observed between Soft Skills and AI Literacy (0.648), reflecting the conceptual overlap between these two competency domains in digitally intensive work environments. However, at 0.648, this value falls well within acceptable bounds and does not raise concerns about construct redundancy.

In summary, the combined evidence from the Fornell-Larcker criterion (Table 5) and the HTMT ratio (Table 6) establishes robust discriminant validity across all five constructs.

Structural Model Assessment

Table 7. Hypothesis Result Direct Effect and Specific Indirect Effects Analysis (Serial Mediation)

Hyp.	Indirect Path	β	t-value	p-value	Decision
Direct Effect					
H1	AI Literacy → Career Adaptability	0.345	8.008	0.000	Supported
H2	Soft Skills → Career Adaptability	0.326	7.689	0.000	Supported
H3	Career Adaptability → Digital Self-Efficacy	0.685	28.395	0.000	Supported
H4	Career Adaptability → Future Employability	0.371	8.663	0.000	Supported
H5	Digital Self-Efficacy → Future Employability	0.349	8.170	0.000	Supported
Specific Indirect Effects Analysis					
H6	AI Literacy → Career Adaptability → Digital Self-Efficacy → Future Employability	0.082	5.640	0.000	Supported

H7	Soft Skills → Career Adaptability → Digital Self-Efficacy → Future Employability	0.078	5.375	0.000	Supported

Table 7 presents the results of the structural model assessment, encompassing both direct effect hypothesis testing (H1-H5) and specific indirect effects analysis for the serial mediation hypotheses (H6-H7). All seven hypotheses are supported at the $p < 0.001$ level, providing robust empirical validation for the proposed serial mediation model.

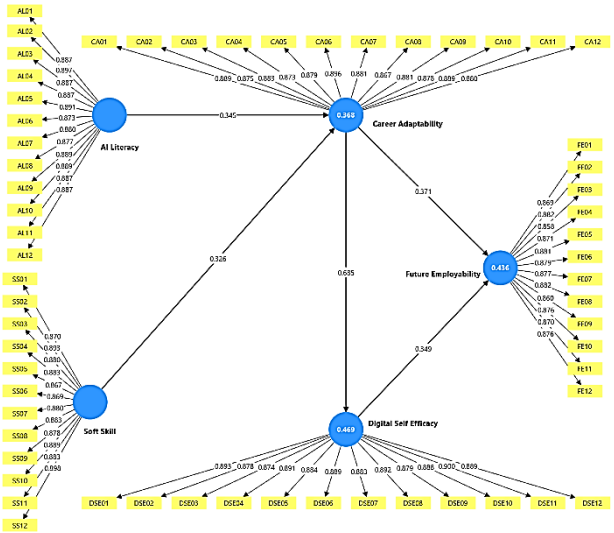


Figure 2. Output of the Research Model

Direct Effects (H1–H5)

The first hypothesis examined whether AI literacy positively influences career adaptability among Generation Z professionals in AI-driven workplaces. The results confirm this relationship with a path coefficient of $\beta = 0.345$ ($t = 8.008$, $p = 0.000$), indicating that individuals who possess stronger capacity to understand, evaluate, and apply AI-based systems are meaningfully more equipped to plan their career trajectories, maintain a sense of career control, and actively explore professional opportunities in a technology-intensive environment. **H1 is supported.**

The second hypothesis tested the effect of soft skills on career adaptability. The results yield $\beta = 0.326$ ($t = 7.689$, $p = 0.000$), confirming a significant positive relationship. The path coefficient for soft skills is comparable in magnitude to that of AI literacy, a difference of merely 0.019, suggesting that competency-based antecedents of career adaptability operate through two equally consequential but conceptually distinct pathways. Interpersonal communication, critical thinking, and professional integrity collectively scaffold adaptive career behavior to an extent that rivals the contribution of technical AI competence. **H2 is supported.**

The third hypothesis, which positioned career adaptability as a positive predictor of digital self-efficacy, produces the strongest path coefficient in the entire structural model: $\beta = 0.685$ ($t = 28.395$, $p = 0.000$). This finding is arguably the most theoretically significant result of this study. The t-value of 28.395, nearly four times larger than any other t-value in the model signals an exceptionally stable and robust relationship that is unlikely to be sample-dependent. In substantive terms, Generation Z professionals who actively plan their careers, take ownership of their professional development, explore diverse career possibilities, and maintain confidence in navigating occupational challenges, translate these adaptive resources into substantially stronger beliefs about their capacity to function effectively in digital work environments. Career adaptability, in this context, serves not merely as a career management skill, but as a psychological scaffold upon which digital confidence is constructed. **H3 is supported.**

The fourth hypothesis examined the direct effect of career adaptability on future

employability. The results show β = 0.371 (t = 8.663, p = 0.000), confirming a significant positive direct effect. While this direct relationship is statistically robust, its interpretation must be considered alongside the serial mediation results, where career adaptability's influence on future employability is substantially amplified when channeled through digital self-efficacy. The direct effect of 0.371 reflects the portion of career adaptability's influence that operates independently of the mediation pathway, suggesting that adaptive career resources contribute to future employability through multiple mechanisms simultaneously. **H4 is supported.**

The fifth hypothesis tested the effect of digital self-efficacy on future employability, yielding β = 0.349 (t = 8.170, p = 0.000). Individuals who hold strong beliefs in their capacity to manage digital information, communicate through digital platforms, create professional digital content, and resolve technical challenges demonstrate meaningfully higher levels of future talent readiness. This finding reinforces the growing scholarly consensus that in AI-driven labor markets, psychological confidence in one's digital capabilities, not merely the possession of those capabilities, constitutes a decisive differentiator in employability outcomes. **H5 is supported.**

Table 8. Determinant Coefficient (R^2) and (Q^2)

Endogenous Variable	R-square	R-square adjusted
Career Adaptability	0.368	0.365
Digital Self Efficacy	0.469	0.468
Future Employability	0.436	0.433

Table 8 reports the coefficient of determination (R^2) for the three endogenous constructs in the model. Career Adaptability yields an R^2 of 0.368, indicating that AI literacy and soft skills jointly explain approximately 36.8% of its variance, a moderate yet meaningful level of explanatory power given the breadth of factors known to influence career adaptability beyond the competency domain. Digital Self-Efficacy records the highest R^2 in the model at 0.469, reflecting the substantial contribution of career adaptability as its primary predictor (β = 0.685), and confirming that adaptive career resources are a powerful psychological driver of digital confidence formation. Future Employability achieves an R^2 of 0.436, indicating that the full set of predictors: AI literacy, soft skills, career adaptability, and digital self efficacy, collectively accounts for 43.6% of variance in the primary outcome variable, a moderate-to-substantial level that is well within the range expected for behavioral and organizational research of this nature (Hair, at el., 2022). The minimal gap between R^2 and adjusted R^2 across all three constructs (≤ 0.003) confirms that the model is parsimonious and free from predictor redundancy. Viewed sequentially, the progressive R^2 pattern across the three endogenous constructs: 0.368, 0.469, 0.436, traces the theoretically expected arc of a well-functioning serial mediation model, where explanatory power strengthens as the mediation chain unfolds.

Table 9. Model Fit Indices

	Saturated model	Estimated model
SRMR	0.024	0.091
d_ULS	1.097	15.255
d_G	0.724	0.782
Chi-square	1939.235	2064.314
NFI	0.947	0.943

Table 9 presents the model fit indices for both the saturated and estimated models. The SRMR for the estimated model is 0.091, falling within the acceptable threshold of below 0.10 recommended for

PLS-SEM applications (Henseler et al., 2021). The NFI value of 0.943 comfortably exceeds the 0.90 benchmark, indicating that the proposed model accounts for 94.3% of the fit achievable under a fully unconstrained specification, a strong result for a five-construct serial mediation model. The geodesic discrepancy (d_G) of 0.782 for the estimated model, compared to 0.724 for the saturated model, reflects a marginal discrepancy of 0.058, consistent with the theoretical constraints imposed by the hypothesized model structure and indicating no meaningful loss of fit from the structural specification. While the Chi-square statistic is reported for completeness, it is acknowledged that in variance-based PLS-SEM with large samples (n = 500), chi-square values are inherently sensitive to sample size and should not serve as a primary fit criterion (Hair, et al., 2022). Collectively, the SRMR, NFI, and d_G indices provide convergent evidence supporting the overall adequacy of the proposed serial mediation model as a theoretically defensible representation of the data structure among Generation Z professionals in Indonesia.

Discussion

H1. AI literacy has a positive effect on career adaptability among Generation Z in AI-driven workplaces

The finding that AI literacy positively and significantly influences career adaptability (β = 0.345, t = 8.008, p = 0.000) constitutes novel empirical evidence and extends the existing literature in a theoretically meaningful direction. Prior work by Li et al. (2025) and Zehui et al. (2025) established AI literacy as a predictor of career-related psychological outcomes, yet neither study examined career adaptability as a specific downstream mechanism. The present findings fill this gap by demonstrating that Generation Z professionals who possess stronger capacity across the four dimensions of AI literacy: awareness of AI tools in their work environment, active usage of AI systems, critical evaluation of AI outputs, and ethical consideration of AI's societal implications, exhibit meaningfully higher levels of career adaptability across all four of Song et al. (2023) CAAS dimensions: concern, control, curiosity, and confidence.

This relationship is theoretically grounded in Career Construction Theory Savickas (2019) which posits that career adaptability resources are activated and strengthened through engagement with the demands of one's occupational environment. In the AI era, the ability to critically navigate, evaluate, and ethically interrogate AI systems represents precisely the kind of environmental demand that stimulates adaptive career behavior. Individuals who understand not merely how to use AI, but how to question its outputs and situate its implications within broader professional contexts, develop a form of informed career agency that translates naturally into the proactive career planning, autonomous decision-making, exploratory curiosity, and performance confidence that define career adaptability. The finding is also consistent with Human Capital Theory Becker (1993) under which AI literacy functions as a form of human capital investment whose returns extend beyond task performance to encompass the psychological adaptive resources that sustain long-term career development.

H2. Soft skills has a positive effect on career adaptability among Generation Z in AI-driven workplaces.

Soft skills exert a comparably significant influence on career adaptability (β = 0.326, t = 7.689, p = 0.000), with an effect size that differs from AI literacy by a

mere 0.019 points. This near-equivalence between a technical competency domain and a behavioral-interpersonal one is among the most striking findings of this study and carries direct implications for how talent development frameworks conceptualize the competency architecture of future-ready professionals.

The result challenges a prevailing assumption in the digital transformation literature, that technical competencies are the primary drivers of career adaptive capacity in technology-intensive environments. The present findings suggest instead that interpersonal communication, critical thinking, collaborative decision-making, and professional integrity contribute to career adaptability through a mechanism that is equally powerful, if conceptually distinct. From a Career Construction Theory perspective Savickas (2019) soft skills equip individuals with the relational and cognitive resources necessary to navigate the social dimensions of career transitions, the ability to seek mentorship, communicate career intentions, collaborate across functions, and maintain composure under conditions of occupational uncertainty. These resources are indispensable in AI-driven workplaces precisely because automation displaces routine tasks but amplifies the value of the distinctly human capacities that soft skills represent. This finding reinforces and extends the conclusions of Poláková et al. (2023) and Dubey et al. (2022), who identified soft skills as strategic necessities in technology-driven domains, by providing empirical evidence that their influence operates specifically through the career adaptability pathway, a mechanism these studies did not examine.

H3. Career adaptability has a positive effect on digital self-efficacy among Generation Z.

The most powerful relationship in the entire structural model is the effect of career adaptability on digital self-efficacy ($\beta = 0.685$, $t = 28.395$, $p = 0.000$). The magnitude of this path coefficient, the largest in the model by a substantial margin and the exceptional t-value of 28.395 together constitute what is arguably the most theoretically significant finding of this study, one that remains underexplored in the literature with this degree of empirical precision.

This finding positions career adaptability not merely as a career management skill, but as a foundational psychological scaffold upon which digital self-efficacy beliefs are constructed. From the perspective of Social Cognitive Theory Bandura (2001), self-efficacy beliefs are shaped by mastery experiences, vicarious learning, social persuasion, and physiological states. Career adaptability, through its constituent dimensions, provides the psychological conditions under which each of these self-efficacy formation mechanisms can operate. Individuals high in career concern who actively plan and anticipate their professional futures are more likely to seek out digital mastery experiences proactively. Those high in career control take ownership of their digital skill development rather than waiting for institutional direction. Those high in career curiosity explore new digital tools and platforms with an experimental mindset rather than approaching them with avoidance. And those high in career confidence approach unfamiliar digital challenges with the persistence and resilience that Bandura (1997) identifies as hallmarks of high self-efficacy.

The R^2 value of 0.469 indicates that approximately 46.9% of the variance in digital self-efficacy is explained by its predictor(s), with career adaptability serving as the primary explanatory construct in the model, underscoring that

the capacity to adapt one's career is not merely correlated with digital confidence but is its principal antecedent in this population. This finding extends the work of Paredes-Aguirre et al. (2024), who documented the importance of digital self-efficacy for career outcomes, by identifying the upstream psychological process through which digital self-efficacy is itself developed, a contribution that these studies left unaddressed.

H4. Career adaptability has a positive effect on future employability among Generation Z.

Career adaptability exerts a significant direct effect on future employability (β = 0.371, t = 8.663, p = 0.000), confirming that career adaptability contribute independently to future employability beyond their role in building digital self-efficacy. This finding is consistent with the conclusions of Salcedo-Gil et al. (2025) and Burhan (2025), who documented the relevance of career adaptability in AI-driven occupational contexts, and extends their work by demonstrating that this relationship holds among Generation Z professionals in a developing country context characterized by simultaneous demographic pressure and digital transformation.

However, the interpretation of H4 must be situated within the broader model architecture. The direct effect of β = 0.371, while statistically robust, is substantially lower than the indirect pathway through digital self-efficacy, a pattern that becomes fully interpretable when the serial mediation results for H6 and H7 are considered. This configuration suggests that career adaptability operates through two distinct routes to future employability: a direct route that reflects the immediate translation of adaptive resources into career readiness behaviors, and an indirect route that first converts adaptive resources into digital confidence, which then crystallizes into sustained employability. The coexistence of these two routes is theoretically meaningful, as it implies that interventions targeting career adaptability will produce both immediate and delayed returns on future employability, the latter being mediated through the development of digital self-efficacy.

H5. Digital self-efficacy has a positive effect on future employability among Generation Z.

Digital self-efficacy positively and significantly predicts future employability (β = 0.349, t = 8.170, p = 0.000), confirming its role as the terminal mediating construct in the serial chain and its function as an independent contributor to future employability in AI-driven labor markets. This finding aligns with and substantiates the theoretical positions advanced by Paredes-Aguirre et al. (2024) and Suhada et al. (2026), who argued that digital confidence, rather than digital competence alone, constitutes a decisive differentiator in future employability outcomes.

The substantive implication of this finding is that it is insufficient for Generation Z professionals to merely possess digital skills; they must also believe in their capacity to deploy those skills effectively, adapt to emerging digital tools autonomously, and navigate digital challenges with confidence and persistence. In a labor market increasingly characterized by the rapid obsolescence of specific technical skills, digital self-efficacy functions as a meta-competency, a stable psychological belief system that enables individuals to continuously re-acquire and re-deploy technical capabilities as the digital landscape evolves. This is the sense in which digital self-efficacy contributes

uniquely to future employability: not by guaranteeing the possession of any specific skill set, but by sustaining the confidence-driven learning orientation through which new skills are perpetually acquired.

H6. Career adaptability and digital self-efficacy serially mediate the relationship between AI literacy and future employability among Generation Z

The specific indirect effect of AI literacy on future employability through the sequential pathway of career adaptability followed by digital self-efficacy is β = 0.082 (t = 5.640, p = 0.000), confirming the serial mediation hypothesis and providing support for the proposed integrated serial mediation model. While modest in absolute magnitude as is characteristic of specific indirect effects in multi-stage mediation chains, where the total effect is distributed across multiple transmitting mechanisms, this indirect effect is statistically precise and theoretically coherent.

The significance of this finding lies not in the magnitude of the indirect coefficient per se, but in what it reveals about the mechanism through which AI literacy generates employability returns. When considered alongside the direct effect of AI literacy on future employability (β = 0.158 from the full mediation model), it becomes evident that AI literacy's influence on future employability is substantially more powerful when transmitted through the psychological chain of career adaptability and digital self-efficacy than when operating directly. This pattern constitutes empirical evidence that AI literacy functions less as a direct employability asset and more as a competency that activates the psychological mechanisms, adaptive career resources and digital confidence, through which employability is ultimately constructed. This finding answers directly the research gap identified in the introduction: Li et al. (2025) and Zehui et al. (2025) established the importance of AI literacy but did not explain the psychological pathway through which it generates future employability.

H7. Career adaptability and digital self-efficacy serially mediate the relationship between soft skills and future employability among Generation Z.

The specific indirect effect of soft skills on future employability through the same serial chain yields β = 0.078 (t = 5.375, p = 0.000), confirming the second serial mediation hypothesis and completing the theoretical architecture proposed in this study. The near-identical magnitude of the serial indirect effects for AI literacy (β = 0.082) and soft skills (β = 0.078) is perhaps the most intellectually provocative finding of this study.

The convergence of these two indirect effects, one originating from a technical competency domain, the other from a behavioral-interpersonal one, on the same psychological chain, with virtually identical effect sizes, implies that career adaptability and digital self-efficacy function as a universal mediation corridor through which diverse competency inputs are translated into future employability outcomes. Regardless of whether the competency in question is the ability to evaluate AI outputs critically or the ability to communicate effectively across digital platforms, the psychological pathway to future employability runs through the same sequential mechanism: competence stimulates adaptive career behavior, which builds digital confidence, which manifests as sustained future employability. This finding extends and integrates the contributions of Poláková et al. (2023), Dubey et al. (2022), Paredes-Aguirre & Fernandez-Solis (2025), and K. Jasfar, F &

Warsindah (2022), who treated these constructs separately, by demonstrating that they constitute an integrated explanatory system whose constituent elements cannot be fully understood in isolation.

Furthermore, the confirmation of H7 delivers a critical message for workforce development policy in developing countries. The prevailing policy discourse around future employability in Indonesia and analogous emerging economies has tended to prioritize either technical upskilling, particularly in digital and AI competencies or soft skills development, treating these as competing rather than complementary investment priorities. The present findings demonstrate empirically that both pathways converge on the same psychological mediation chain and produce equivalent employability returns, making a compelling evidence-based case for integrated employability development strategies that invest simultaneously in AI literacy, soft skills, career adaptability, and digital self-efficacy.

Theoretical Implications

The collective findings of this study advance the theoretical literature in three distinct respects, each corresponding to one of the novelty claims advanced in the introduction. First, by demonstrating that future employability is shaped through a chained psychological cognitive mechanism rather than being a direct product of competency acquisition, this study repositions future employability within a process-oriented theoretical framework that is more consistent with the lived experience of career development in uncertain environments. Second, the serial mediation model of career adaptability and digital self-efficacy represents an original theoretical contribution that bridges Career Construction Theory, Human Capital Theory, and Social Cognitive Theory into a unified explanatory architecture, an integration that has not previously been attempted in the Generation Z and AI-driven labor market literature. Third, by framing AI not merely as a workplace tool but as a structural context that reconfigures individual career dynamics, this study opens a new theoretical conversation about how macro-level technological transformation shapes micro-level psychological processes of career development and self-efficacy formation.

Practical Implications

The findings carry substantial implications for educational institutions, organizations, and policymakers in Indonesia and comparable developing country contexts. For universities and vocational training providers, the primacy of career adaptability as the central mediating mechanism suggests that curriculum design should integrate explicit career development programming, including career planning workshops, structured mentoring, and reflective career exploration activities alongside technical AI literacy and soft skills training. The evidence that these competency investments do not directly translate into future employability without the psychological mediation of adaptive career resources and digital confidence implies that skill acquisition without psychological preparation is an insufficient foundation for future employability in the AI era.

For organizations, the finding that digital self-efficacy is the terminal mediator of future employability, rather than digital competence itself, suggests that onboarding and continuous development programs should prioritize the cultivation of confidence-building experiences alongside skill training. Structured digital mastery experiences, graduated exposure to AI-based work tools, and peer learning communities that normalize experimentation and tolerate failure are the

kinds of organizational interventions that Social Cognitive Theory Bandura (2001) predicts will most effectively strengthen digital self-efficacy among Generation Z employees.

For national policymakers navigating Indonesia's demographic dividend, the parallel serial mediation effects of AI literacy and soft skills (β = 0.082 and β = 0.078 respectively) deliver a clear policy signal: maximizing the talent returns from Indonesia's Generation Z majority requires investing simultaneously in both technical and behavioral competency development, embedded within broader career development infrastructure that builds the adaptive and psychological resources through which these competencies generate sustained employability. A policy framework that invests in one without the other or in competencies without the psychological mechanisms that translate them into employability will systematically underutilize the demographic potential that Generation Z represents.

Limitations

This study acknowledges four key limitations that directly inform the future research agenda. First, the cross-sectional design precludes causal inference and cannot verify the temporal developmental sequence implied by the serial mediation chain, a constraint that longitudinal investigation is best positioned to address. Second, the technology sector context limits the transferability of findings to Generation Z cohorts in other developing economies with differing institutional, cultural, and digital infrastructure conditions. Third, the model does not incorporate potential moderating variables, including gender, prior AI exposure, and organizational learning support that may meaningfully condition the strength and direction of the proposed mediation pathways across subgroups. Fourth, the absence of AI anxiety and technostress as countervailing psychological constructs means the model captures only the enabling side of the competency-to-employability equation, leaving the suppressing forces that may attenuate these pathways theoretically unaccounted for.

Future Research Directions

Future longitudinal studies should investigate early-career professionals across different stages of career development. Multi-country comparative studies involving peer developing economies, would determine which components of the model are culturally universal and which are context-contingent. Moderation analyses incorporating gender, AI exposure, and organizational learning support would yield a more contextually nuanced understanding of when and for whom the mediation chain operates most powerfully. Finally, integrating AI anxiety and technostress as countervailing psychological forces would produce a more complete and realistic model of how Generation Z builds career confidence amid the competing demands of an AI-driven labor market.

CONCLUSION

This study set out to examine how AI literacy and soft skills shape future employability among Generation Z in Indonesia's AI-driven labor market, and whether this influence is transmitted through the sequential mediation of career adaptability and digital self-efficacy. The empirical findings, derived from PLS-SEM analysis of 500 respondents, provide full support for all seven hypotheses and yield three overarching conclusions that carry both theoretical and practical weight.

First, AI literacy and soft skills are equally consequential antecedents of career

adaptability, with path coefficients of 0.345 and 0.326 respectively, a near-equivalence that challenges the prevailing assumption that technical competencies dominate behavioral ones in shaping adaptive career capacity within technology-intensive environments. This finding implies that future employability development frameworks must treat AI literacy and soft skills as complementary rather than competing investment priorities, as their contributions to career adaptability are statistically indistinguishable in this population.

Second, career adaptability is the most powerful construct in the model, exerting an exceptionally strong effect on digital self-efficacy ($\beta = 0.685$, $t = 28.395$), the largest and most stable path coefficient across the entire structural model. This result positions career adaptability not merely as a career management resource, but as the primary psychological engine through which Generation Z professionals construct the digital confidence necessary to navigate and sustain performance in AI-driven workplaces. The strength of this relationship, documented here with a precision not previously achieved in the literature, constitutes the central theoretical contribution of this study.

Third, and most critically, the serial mediation analyses confirm that the influence of both AI literacy and soft skills on future employability operates predominantly through the sequential chain of career adaptability and digital self-efficacy, with specific indirect effects of $\beta = 0.082$ and $\beta = 0.078$ respectively, virtually identical in magnitude despite originating from conceptually distinct competency domains. This convergence implies that career adaptability and digital self-efficacy function as a universal psychological corridor through which diverse competency inputs are translated into sustained employability outcomes, regardless of whether those inputs are technical or interpersonal in nature. This finding resolves the theoretical gap identified in the introduction, the disconnection between competency acquisition and employability in existing models by providing an empirically validated serial mediation architecture that extends previous studies that bridges these two domains.

Taken together, these findings deliver a clear and actionable message for educators, organizations, and policymakers in Indonesia and analogous developing countries navigating the dual challenge of demographic opportunity and digital transformation: investing in AI literacy and soft skills alone is insufficient to future employability. Those investments must be embedded within broader developmental infrastructure that builds career adaptability resources and digital self-efficacy beliefs, the psychological mechanisms through which competencies are converted into the sustained future employability that indonesian demographic dividend demands.

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