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THE COMPETENCIES MODEL OF ALPHA GENERATION: A MIX METHOD APPROACH IN EDUCATION AND TECHNOLOGY

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Abstract

Human resource development for Generation Alpha is based on the concepts of education and technology, due to daily habits that are closely linked to technology. However, the work abilities of Generation Alpha, characterized by their adaptability to technology and strong desire to learn, are not yet fully balanced due to a lack of soft skills such as communication, leadership, and social empathy. Respondents in this study were taken from secondary school students born after 2010. Using a verifiable quantitative research method based on literature studies, it was revealed that the variable of psychological well-being functions as a mediator between digital literacy and work readiness as well as soft skills and work readiness. It is understood that optimal digital and social skills for use in the workplace also depend on mental balance and the ability to manage stress.

Keywords: human resource management; generation alpha; digital literacy; soft skills; psychological well-being

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INTRODUCTION

All economic, social, and political activities are fundamentally dependent on human resource development (Avianti, 2024). Natural resources, technology, and capital will not be sustainably productive without a skilled workforce (Hasid et al., 2022). To increase national productivity, competent human resources with higher education, creativity, innovation skills, cost efficiency, and industrial competitiveness are needed (Syamsurijal, 2023). Digital transformation, creative economic development, and knowledge-based industrial growth are further accelerated by increasing human capacity through training, education, research, and technology adoption (Da'im et al., 2025). Countries with superior human resources are proven to be better prepared to face global challenges such as climate change, economic crises, and industrial revolutions (Avianti et al., 2025).

In the context of these changes, the creative economy is defined as activities based on human creativity and talent that generate added value through intellectual property (UNCTAD, 2008), while knowledge-based

industries are sectors that rely on knowledge, research, and technology as sources of innovation and productivity (OECD, 1996). Critical participation in this ecosystem requires critical literacy, which is the ability to analyze and evaluate texts and the power structures that shape them (Freire, 1978). All of these dynamics are taking place in the digital-native era, when a generation that has grown up with technology is developing patterns of learning, working, and interacting that are shaped by the digital environment (Prensky, 2001).

Generation Alpha, namely children born in 2010 and above, grew up in a digital-native context with early exposure to technology. They are projected to be the driving force behind innovation, the creative economy, and sustainable development because they have high potential for creativity, digital adaptation, and social awareness (Sihotang, 2025). However, despite their strengths, several studies show that their collaboration, empathy, and critical literacy skills still lag behind their digital literacy (Höfrová et al., 2024). Human resource development for this generation must include digital literacy, social-emotional skills, entrepreneurship, ethics and sustainability, mental health, and lifelong learning skills (Wojtaszczyk et al., 2025).

Various international indicators also confirm that the basic competencies of the younger generation, including Gen Alpha, still face significant challenges. PISA 2022 shows a decline in mathematics scores of nearly 15 points in OECD countries, with 31% of 15-year-old students below Level 2 in numeracy, indicating limited basic quantitative problem-solving skills (OECD, 2023). The 2020 OECD/INFE survey shows that young people have lower financial literacy than other age groups, in terms of knowledge, attitudes, and behavior (Borrett, 2024; OECD, 2020). In addition, the report (Smahel et al., 2020). EU Kids Online 2020 reveals children's low awareness of digital privacy, responsibility in online interactions, and ability to manage risks such as harmful content and cyberbullying. This condition indicates the need for systematic strengthening of numeracy, financial literacy, and digital ethics as fundamental competencies for the future generation (Mendoza et al., 2024). Therefore, Generation Alpha must be prepared not only with technical skills but also character, empathy, and physical and mental resilience to be able to adapt to rapid changes in the digital era (Coolsaet, 2024). Through holistic development, they can become innovative and ethical workers who support the nation's progress (Saini & Malik, 2025).

Recent research shows that Generation Alpha will enter a job market influenced by AI, automation, and sustainability agendas (Ehlinger & Stephany, 2024). Although naturally digitally literate, they still lag behind in numeracy, financial literacy, digital ethics, and psychosocial well-being (Kurniawan, 2025). To be ready for work, they need a combination of technology and AI literacy, high-level cognitive skills, soft skills such as empathy and collaboration, and a lifelong learning ecosystem that connects schools, industry, and public policy (Siraj et al., 2025). Digital transformation requires human resources who not only master technical skills such as data literacy and AI use, but also social-emotional skills such as collaboration, empathy, and mental resilience (Nugroho et al., 2025).

From a theoretical perspective, Human Capital Theory (Becker, 1993) explains that improving competencies through education, training, and experience will increase productivity and economic growth. In the context of Generation Alpha, this theory needs to be expanded into the concept of Digital Human Capital, which includes mastery of technology, AI literacy, and the ability to adapt to digital developments (Waligóra & Górski, 2025). Meanwhile, the 21st Century Skills Framework emphasizes the importance of creativity, critical thinking, communication, and collaboration as basic competencies for the future (Miettinen, 2022).

Although the literature on Generation Alpha continues to grow, recent reviews point to a number of important research gaps. First, there is still a mismatch between education and industry needs, indicating a lack of educational models that integrate AI literacy and authentic experience-based learning (Sihotang, 2025). Second, research on the soft skills and emotional well-being of this generation is still limited (Waligóra & Górski, 2025). Third, research on digital ethics and responsible technology use is still minimal, especially regarding understanding digital privacy and AI ethics (Gupta et al., 2024). Fourth, research on Gen Alpha human resource development is still dominated by developed countries, so the context of Indonesia and Southeast Asia is underrepresented (Handayani et al., 2025). In addition, there is no lifelong learning model specifically designed for digital-native children, as most lifelong learning theories still focus on adult learning (Darmayasa et al., 2025).

Table 1 explains that Alpha Generation human resource development still faces various gaps at the theoretical, empirical, and practical levels. These gaps indicate the need for contextual, innovative, and data-driven studies to formulate human resource development models that are relevant to Indonesia's Alpha Generation in the digital era.

Table 1. Research Gaps Related to the Development of Generation Alpha Human Resources

Type of Gap	Description of Gap	Examples of Findings from Previous Studies	Implications for Further Research
1. Evidence Gap	Empirical evidence examining the relationship between digital literacy, soft skills, and the work readiness of Generation Alpha is still limited and not sufficiently robust. Existing studies largely rely on conceptual discussions or descriptive findings, with minimal use of quantitative data capable of demonstrating causal or explanatory relationships.	Previous studies tend to emphasize conceptual frameworks or narrative analyses without primary quantitative data, focusing on general characteristics of digital generations rather than empirically testing relationships between competencies and work readiness. Sihotang (2023) and Waligóra & Górski (2025) write more conceptually without quantitative data.	Data driven empirical studies using surveys, longitudinal data, or explanatory statistical models are required to provide stronger evidence and support theory-based conclusions on Generation Alpha workforce readiness.
2. Knowledge Gap	Existing research on 21st-century skills development has not fully conceptualized Generation Alpha as a socio psychologically distinct cohort from Generation Z. Current studies tend to treat skills such as collaboration, empathy, and digital ethics as universal constructs, without critically examining how Generation Alpha's cognitive characteristics and early digital socialization require new conceptual approaches.	Previous studies commonly adapt frameworks of 21st-century skills developed for Generation Z or Millennials, focusing on general digital competencies while overlooking generational differences in cognition, social interaction, and technology immersion (Siraj et al., 2025).	Further research is needed to develop and test conceptual frameworks that specifically reflect the socio-psychological and digital characteristics of Generation Alpha, rather than relying on adapted models from earlier generations.
3. Practical Knowledge Gap	The gap between academic research and educational practice in developing digital literacy and soft skills for Generation Alpha is predominantly described in normative terms, without empirical evidence of implementation failures or concrete examples of policy mismatch. Existing studies have not sufficiently examined institutional factors, such as teacher readiness, curriculum alignment, school culture, and policy support that critically influence the translation of research findings into educational practice.	Prior studies often emphasize the importance of integrating digital and soft skills into education, yet provide limited empirical analysis of how institutional constraints hinder implementation at the school or training-provider level.	Future research should incorporate institutional and policy-level analyses, including case studies and implementation evaluations, to identify structural barriers and enabling conditions for translating academic research into effective educational practice.
4. Methodological Gap	Most existing studies employ cross sectional, descriptive, or qualitative approaches and rely heavily on self reported data, limiting the ability to capture dynamic skill development and objective digital behaviors.	Prior research has rarely combined quantitative survey data with behavioral observations, learning analytics, or mixed-method approaches to assess digital literacy and soft skills comprehensively.	Future studies should adopt mixed-method and innovative methodologies, such as longitudinal designs, digital trace analysis, or advanced quantitative modeling to enhance measurement validity and analytical depth.

5. Empirical Gap	Empirical research has not yet examined the structural and causal relationships between digital literacy, soft skills, educational context, family environment, and work readiness among Generation Alpha.	Previous studies largely describe generational profiles and characteristics without testing relational or causal models among key variables influencing work readiness.	Quantitative empirical research using multivariate or structural equation modeling is needed to identify significant patterns and mechanisms underlying Generation Alpha's work readiness development.

Therefore, the development of Generation Alpha human resources has become a strategic topic, both for the world of education and national employment policy, especially in developing countries such as Indonesia, which faces digital and educational disparities between regions (Burgess et al., 2020).

METHOD

Based on Human Capital theory (Becker, 1993), digital literacy and soft skills are forms of knowledge investment that determine individual productivity in the future (Fardila et al., 2025). However, in the context of Generation Alpha, this theory needs to be expanded by considering psychological well-being as a mediating factor that determines the ability to adapt to the digital world of work (Effendy et al., 2024). A verifiable quantitative research method based on literature studies forms the concept of this research. To begin a good quantitative study, a literature review provides a strong theoretical foundation that helps in hypothesis formation and operational definition of variables (Ghanad, 2023). Data was collected using a quantitative questionnaire with a 1–5 Likert scale. The questionnaire was compiled from standardized instruments that have been used in international research on young people (youth and digital natives). Data collection was conducted by Online (Google Form) and Offline (paper forms). All variables in the model were measured at the same time (cross-sectional).

The research instrument comprises four primary sections designed to evaluate the relationships within the conceptual model. The first section measures Digital Literacy (X_1), based on Kluzer & Priego (2018) and Ng (2012), focusing on technical skills, data literacy, collaboration, and digital ethics as the foundation for 21st-century work readiness. The second section assesses Soft Skills (X_2), adapted from the NACE Framework and Elias et al. (1997), to evaluate interpersonal and problem-solving abilities that reinforce the link between literacy and readiness. Psychological Well-Being (M) serves as a mediating variable, utilizing an adapted Ryff's Scale (RPWB) to measure dimensions such as autonomy and personal growth that enable students to optimize their skill sets. Finally, Work Readiness (Y) is measured using scales from Caballero & Walker (2010) and Rothwell & Arnold (2007) to determine Generation Alpha's future preparedness. By integrating the Digital Human Capital Framework, this study posits that digital literacy directly impacts work readiness, while soft skills strengthen this influence and psychological well-being acts as a vital mediator for professional adaptation.

Table 2. Conceptual Framework and Interrelationships Between Variables

Variable	Conceptual Definition	Key Indicators	Direction of Relationship / Hypothesis Theoretical	Source / Reference
X1. Digital Literacy	The ability of individuals to understand, use, and create digital content effectively, critically, and ethically.	1) Digital technical skills; 2) Digital security and ethics; 3) Digital creativity; 4) Online collaboration.	↑ Improving adaptability and productivity in the workplace.	OECD (2023)
X2. Soft Skills	A set of non-technical skills that include communication, collaboration, leadership, and social empathy.	1) Communication; 2) Collaboration; 3) Problem solving; 4) Empathy and work ethics.	↑ Has a positive impact on work readiness and professional performance.	Goleman (1998), Partnership for 21st Century Skills (2019).

M. Psychological Well-being (Mediator)	A stable and positive mental state when facing the pressures of studying or the digital workplace.	1) Self-efficacy; 2) Resiliensi; 3) Emotional balance; 4) Growth mindset.	↔ Mediating the relationship between digital literacy and work readiness.	Ryff (1989), Siraj et al. (2025).
Y. Work Readiness of Generation Alpha	The level of individual readiness in facing the challenges of the modern workplace, which is technology-based and involves global collaboration.	1) Digital competence; 2) Soft skills at work; 3) Professional ethics; 4) Adaptability and career motivation.	Outcome variables — influenced by digital literacy, soft skills, and psychological well-being.	Fugate et al. (2004), Waligóra & Górski (2025).

Source: Researcher data analysis 2025

The conceptual model in this study assumes that digital literacy (X_1) and soft skills (X2) are two major factors in the development of Generation Alpha human resources that influence work readiness (Y), with psychological well-being (M) as a mediating variable.

The higher the digital literacy and soft skills, the higher the individual's work readiness, especially when supported by healthy and adaptive psychological conditions (Waligóra & Górski, 2025).

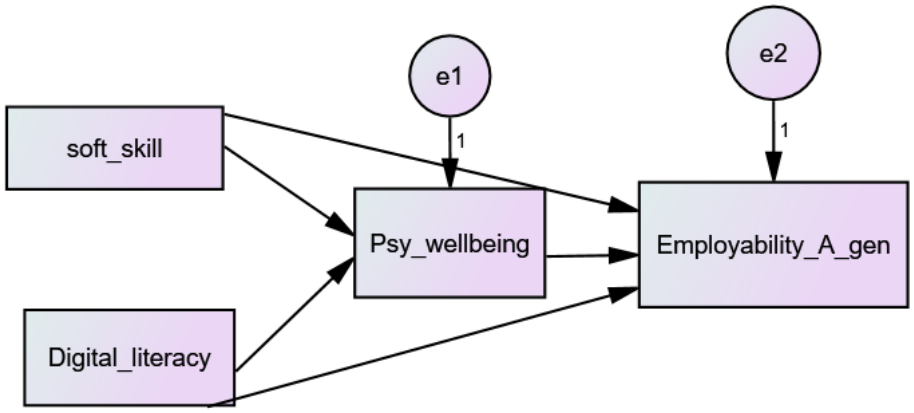

Figure 1. Conceptual Framework

H_1 : Digital literacy has a positive effect on Generation Alpha's work readiness.
H_2 : Soft skills have a positive effect on Generation Alpha's work readiness.
H_3 : Psychological well-being has a positive effect on Generation Alpha's work readiness.
H_4 : Digital literacy has a positive effect on work readiness through psychological well-being as a mediator.
H_5 : Soft skills positively influence Generation Alpha's work readiness through psychological well- being as a mediator.

RESULTS

This study involved 250 Generation Alpha students (aged 13–18 years) from 10 secondary schools in Indonesia. The gender composition was 49% female and 51% male (BPS, 2024). The daily behavior of Generation Alpha students with the composition of technology access: 92% have personal digital devices; 73% use the internet for more than 4 hours/day and have competence in the field of technology.

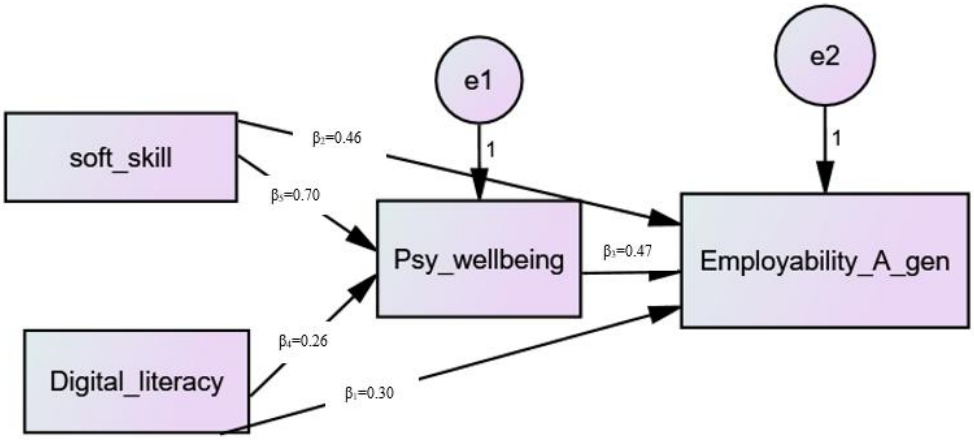

Figure 2. Conceptual Framework and Path Coefficients

Table 3. Hypothesis test results

	Path coefficients	Effect	CR	P(sig)
SoftSkills → PsyWellbeing	0,698	Positive	8.551	0
SoftSkills → EmployabilityAGen	0,459	Positive	2.054	0.04
DigitalLiteracy → PsyWellbeing	0,258	Positive	3.076	0.002
DigitalLiteracy → EmployabilityAGen	0,309	Positive	3.367	0
PsyWellbeing → EmployabilityAGen	0,474	Positive	4.144	0

This study provides empirical support for a holistic model of work readiness among Generation Alpha, demonstrating that digital literacy, soft skills, and psychological well-being are not isolated predictors but mutually reinforcing dimensions shaping readiness for future work. Unlike conventional employability frameworks that privilege technical competence, the findings suggest that work readiness in the context of Industry 5.0 should be conceptualized as a multidimensional construct integrating cognitive, socio-emotional, and psychological capacities.

The significant effect of digital literacy on work readiness ($\beta = 0.309$; $p < 0.01$) indicates that digital competence functions not merely as an instrumental skill but as a foundational adaptive resource. Given the high level of digital exposure among respondents—where 92% own personal digital devices and 73% engage with the internet for more than four hours daily—digital literacy emerges as an embedded component of Generation Alpha's developmental ecology rather than an externally acquired skill. This finding aligns with human capital theory while extending it by highlighting digital literacy as a form of adaptive capital that enables individuals to navigate digitally mediated work environments with confidence and agency.

The positive and significant influence of soft skills on work readiness ($\beta = 0.459$; $p = 0.04$) underscores the critical role of socio-emotional competencies in preparing adolescents for dynamic and collaborative work contexts. Communication, collaboration, and problem-solving skills appear particularly salient during adolescence a developmental stage characterized by identity formation and heightened social sensitivity. These results reinforce global employability literature while contextualizing it within Generation Alpha's digitally saturated socialization patterns.

More importantly, the strong effect of soft skills on psychological well-being ($\beta = 0.698$; $p < 0.001$) reveals a crucial mechanism often overlooked in prior studies. Soft skills operate not only as social capital facilitating workplace interaction but also as psychological capital that enhances emotional regulation, resilience, and self-efficacy. Empathy and collaboration, in particular, foster a sense of belonging and social support, which are essential for sustaining motivation and emotional balance in competitive and technology-intensive environments. This finding extends existing work readiness models by positioning soft skills as both direct and indirect drivers of employability outcomes.

Psychological well being was found to exert a significant influence on work readiness ($\beta = 0.474$; $p < 0.01$), highlighting its role as a central enabling condition rather than a peripheral outcome. Students with higher levels of self-efficacy, emotional stability, and resilience are better equipped to cope with academic pressure and emerging digital work challenges. This is particularly relevant for Generation Alpha, whose intensive internet use increases exposure to digital stressors.

The significant relationship between digital literacy and psychological well-being ($\beta = 0.258$; $p = 0.002$) further clarifies the causal pathways underlying work readiness. Digital literacy enhances individuals' sense of control and competence in navigating online environments, thereby reducing anxiety and supporting emotional stability. Ethical and informed technology use also promotes digital safety and creative expression, reinforcing adaptive coping mechanisms. These findings suggest that digital literacy contributes to work readiness not only through skill acquisition but also by strengthening psychological resilience.

DISSCUSSION

In dialogue with recent international literature on Generation Alpha, Industry 5.0, and future work competencies, this study both corroborates and extends existing findings. While prior research has emphasized technological proficiency and productivity, the present findings challenge narrowly technocentric models by empirically demonstrating the centrality of psychological well-being and socio-emotional competencies. The results support emerging global perspectives that call for human-centered approaches to workforce development, particularly in digitally mediated economies.

By empirically validating the interrelationships among digital literacy, soft skills, and psychological well-being, this study contributes a more integrative framework for understanding work readiness among Generation Alpha. Rather than treating these constructs as parallel predictors, the findings reveal a relational structure in which competencies and well-being dynamically interact to shape adaptive readiness for work.

The findings carry important implications for education systems and human resource development strategies. Educational institutions should move beyond fragmented skill development and adopt integrated approaches that simultaneously cultivate digital literacy, soft skills, and psychological well-being. Project-based collaborative learning, digital ethics education, and structured socio-emotional learning programs are critical interventions for fostering holistic readiness. From a policy perspective, the results highlight the need for curriculum reform that embeds mental well-being and soft skills development alongside digital competence. Teacher training, curriculum alignment, and institutional support for student mental health should be prioritized to ensure effective translation of research into practice. Without addressing these structural and institutional dimensions, efforts to enhance Generation Alpha's work readiness risk remaining normative rather than transformative.

Theoretically, this study advances work readiness scholarship by proposing a multidimensional and interactional model tailored to Generation Alpha. It positions psychological well-being as a mediating and enabling mechanism linking digital and socio-emotional competencies to employability outcomes. This reframing offers a more developmentally and psychologically grounded understanding of work readiness, with implications for future empirical and theoretical research. Overall, the findings demonstrate that digital literacy, soft skills, and psychological well-being jointly and interactively shape the work readiness of Generation Alpha. Work readiness in the era of global digital transformation should therefore be understood not merely as technical preparedness, but as a holistic capacity rooted in cognitive competence, socio-emotional maturity, and psychological resilience. By articulating these relationships empirically and theoretically, this study contributes to a more nuanced and globally relevant understanding of future workforce development.

CONCLUSION

This study demonstrates that the work readiness of Generation Alpha is shaped by the integrated and mutually reinforcing roles of digital literacy, soft skills, and psychological well-being, rather than by technical competence alone. The findings extend existing employability and work readiness frameworks by positioning psychological well-being as a central enabling mechanism that strengthens and mediates the influence of digital and socio-emotional competencies. Digital literacy emerges as adaptive capital that enhances both readiness and emotional stability, while soft skills function simultaneously as social and psychological capital that sustains resilience, motivation, and collaborative capacity. These results underscore the need for a human-centered and developmentally grounded approach to workforce preparation in the context of Industry 5.0. Practically, the study highlights the importance of integrated educational strategies that combine digital competence development, socio-emotional learning, and mental well-being support, alongside policy reforms that align curriculum design, teacher training, and institutional mental health frameworks. By offering an empirically grounded and theoretically refined model of work readiness, this research contributes to the global discourse on future human resource development and provides a strategic foundation for preparing Generation Alpha to navigate digitally intensive and socially complex work environments.

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