

The Impact of Work Engagement and Digital Competence on Generation Z's Work Productivity in South Tangerang City

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ARTICLE INFO

Keywords: Digital Competence, Work Engagement, Work Productivity, Generation Z

Received : 12 November

Revised : 23 December

Accepted: 10 January

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ABSTRACT

The rapid advancement of digital technology has fundamentally transformed the modern workplace, requiring employees to possess strong digital competencies to remain productive and competitive. Generation Z, born between 1997 and 2012, has grown up in a digital environment and is often perceived as technologically proficient. However, digital skills alone are insufficient to ensure high work productivity, as psychological factors such as work engagement also play a critical role. This study aims to examine the impact of digital competence and work engagement on the work productivity of Generation Z employees in South Tangerang City. A quantitative explanatory approach was employed using a survey method. Data were collected from 100 Generation Z employees across various industries using structured questionnaires. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that digital competence has a significant positive effect on work engagement and work productivity. Work engagement also significantly influences productivity and partially mediates the relationship between digital competence and productivity. These results indicate that productivity among Generation Z employees is driven by the integration of technological capability and psychological engagement. The study highlights the importance of developing digital competencies alongside engagement-oriented human resource strategies to enhance workforce productivity in the digital era.

INTRODUCTION

The rapid advancement of digital technology over the past two decades has profoundly transformed the way organizations operate and how work is performed. Digital transformation is no longer limited to the adoption of information technology tools but encompasses fundamental changes in organizational structures, work processes, communication patterns, and performance management systems. In the contemporary work environment, digital technologies such as artificial intelligence, big data analytics, cloud computing, and automation have become integral components of organizational operations. As a result, employees are increasingly required to possess not only technical knowledge but also the ability to effectively integrate digital tools into their daily work activities to achieve organizational objectives.

Between 2020 and 2025, the pace of digital transformation accelerated significantly, driven largely by technological innovation and external disruptions. One of the most influential drivers of this acceleration was the COVID-19 pandemic, which forced organizations worldwide to rapidly adopt remote and hybrid work models. This unprecedented shift highlighted the critical importance of digital competence as a core employee capability. According to the World Economic Forum (2023), more than 85 percent of organizations globally have intensified their digital transformation initiatives, fundamentally reshaping job roles and redefining performance expectations. Consequently, employee productivity in the digital era is increasingly determined by the extent to which individuals can adapt to technological change while maintaining high levels of motivation and engagement.

In this evolving context, productivity is no longer solely a function of physical effort or routine task completion. Instead, it reflects an employee's ability to work efficiently, creatively, and collaboratively within digitally mediated environments. Organizations that fail to equip their workforce with adequate digital competencies risk experiencing decreased efficiency, reduced innovation capacity, and declining competitiveness. However, technological capability alone does not guarantee high productivity. Psychological factors, particularly those related to motivation and engagement, play a crucial role in determining whether employees can fully leverage their competencies to achieve optimal performance.

In Indonesia, digital transformation has become a national strategic priority. The government has actively promoted the development of the digital economy as a key driver of long-term economic growth. The report by Google, Temasek, and Bain & Company (2023) projects that Indonesia's digital economy will reach a value of USD 360 billion by 2030, positioning the country as the largest digital economy in Southeast Asia. This growth trajectory creates an urgent demand for a workforce equipped with strong digital competencies. The Ministry of Communication and Informatics estimates that Indonesia will require at least nine million digitally skilled workers by 2030 to support national digitalization initiatives across both public and private sectors.

Within this context, Generation Z—individuals born between 1997 and 2012—represents a significant and growing segment of the Indonesian

workforce. As digital natives, members of Generation Z have grown up immersed in digital technologies, including smartphones, social media, and internet-based platforms. This early and continuous exposure to technology has led to the widespread assumption that Generation Z employees naturally possess superior digital skills and are therefore well prepared for the demands of the digital workplace. Consequently, organizations often expect Generation Z employees to adapt quickly to new technologies and contribute positively to productivity.

Despite these assumptions, empirical evidence suggests that familiarity with digital tools does not automatically translate into effective digital competence in professional settings. Digital competence extends beyond basic technology use and includes the ability to critically evaluate information, solve complex problems, collaborate through digital platforms, ensure data security, and creatively apply technology to achieve work-related goals (Ferrari, 2013; Vuorikari et al., 2022). Van Laar et al. (2020) argue that many young workers possess surface-level digital skills but lack deeper competencies required for effective performance in organizational contexts. This discrepancy raises important questions about the actual impact of digital competence on employee productivity, particularly among Generation Z.

Moreover, productivity in the digital workplace is influenced not only by technical skills but also by psychological and behavioral factors. One of the most widely studied psychological constructs in organizational research is work engagement. Work engagement is defined as a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2004). Engaged employees exhibit high levels of energy, strong involvement in their work, and a deep sense of meaning and purpose. Numerous studies have demonstrated that work engagement is positively associated with individual performance, organizational commitment, and overall productivity.

The Job Demands–Resources (JD-R) model provides a useful theoretical framework for understanding the role of work engagement in the relationship between individual resources and performance outcomes. According to the JD-R model, employee engagement arises when job demands are balanced by adequate job and personal resources (Bakker & Demerouti, 2017). Personal resources, such as skills, competencies, and self-efficacy, enhance employees' ability to cope with work demands and foster positive motivational states. In this regard, digital competence can be conceptualized as a personal resource that enables employees to manage digitally intensive work demands more effectively, thereby enhancing engagement and productivity.

However, recent evidence suggests that Generation Z employees may experience challenges in maintaining high levels of work engagement. Gallup's Global Workplace Report (2023) indicates that younger generations, including Generation Z, tend to report lower engagement levels compared to older cohorts. Factors contributing to this phenomenon include digital fatigue, reduced social interaction in remote or hybrid work environments, unclear career development pathways, and heightened job insecurity. These challenges are particularly

pronounced in fast-growing urban areas where work demands are high and organizational change occurs rapidly.

South Tangerang City represents one such urban context in Indonesia. As a rapidly developing city adjacent to the national capital, South Tangerang has experienced significant growth in economic activity, digital infrastructure, and workforce diversification. Organizations operating in this area increasingly rely on digital technologies to enhance service delivery and operational efficiency. At the same time, they face the challenge of managing a predominantly young workforce with high technological exposure but varying levels of engagement and productivity. Understanding the factors that influence Generation Z productivity in this context is therefore both theoretically and practically important.

Despite the growing importance of digital competence and work engagement, existing research has often examined these variables in isolation. Many studies focus exclusively on the direct effects of digital skills on performance or on the role of engagement as a predictor of productivity. Relatively few studies have integrated these constructs into a single explanatory model, particularly within the context of developing countries such as Indonesia. Furthermore, research specifically targeting Generation Z employees remains limited, even though this cohort is expected to dominate the workforce in the coming decades.

The lack of integrated empirical studies represents a significant research gap. Previous literature suggests that competencies may influence performance not only directly but also indirectly through motivational mechanisms such as work engagement (Saks, 2021; Xanthopoulou et al., 2022). From this perspective, digital competence may enhance productivity by increasing employees' confidence, autonomy, and sense of mastery, which in turn fosters higher engagement. Without sufficient engagement, however, even highly skilled employees may fail to achieve optimal productivity.

Addressing this gap, the present study aims to examine the combined influence of digital competence and work engagement on the work productivity of Generation Z employees in South Tangerang City. Specifically, this study investigates (1) the effect of digital competence on work engagement, (2) the direct effect of digital competence on work productivity, (3) the effect of work engagement on productivity, and (4) the mediating role of work engagement in the relationship between digital competence and productivity. By adopting a quantitative explanatory research design and employing Partial Least Squares Structural Equation Modeling (PLS-SEM), this study seeks to provide a comprehensive understanding of the mechanisms linking digital skills, psychological engagement, and performance outcomes.

Theoretically, this study contributes to the literature on human resource management and organizational behavior by extending the application of the Job Demands-Resources model to the context of Generation Z employees in a developing economy. It also enriches the discussion on digital competence by highlighting its role not only as a technical capability but also as a motivational resource that influences engagement and productivity. Practically, the findings

of this study offer valuable insights for organizations seeking to enhance workforce productivity in the digital era. Rather than focusing solely on technical training, organizations are encouraged to adopt integrated human resource strategies that simultaneously develop digital competencies and foster work engagement through supportive leadership, meaningful job design, and recognition systems.

In summary, as digital transformation continues to reshape the world of work, understanding the factors that drive employee productivity has become increasingly complex and critical. For Generation Z employees, productivity is shaped by the interplay between digital competence and psychological engagement. By examining these relationships within the context of South Tangerang City, this study aims to provide evidence-based insights that support the development of a productive, engaged, and digitally competent workforce in the digital age.

LITERATURE REVIEW

Digital Competence

Digital competence has emerged as a critical individual capability in the contemporary workplace, particularly in the context of rapid digital transformation. Ferrari (2013) defines digital competence as the confident, critical, and responsible use of digital technologies for learning, work, and participation in society. This definition emphasizes that digital competence extends beyond basic technical skills and includes cognitive, ethical, and strategic dimensions. As organizations increasingly rely on digital systems to manage operations, communication, and decision-making, employees' digital competence becomes a key determinant of organizational effectiveness.

One of the most widely recognized frameworks for conceptualizing digital competence is the European Digital Competence Framework (DigComp). The latest version, DigComp 2.2, categorizes digital competence into five core dimensions: (1) information and data literacy, (2) communication and collaboration, (3) digital content creation, (4) safety, and (5) problem-solving (Vuorikari et al., 2022). These dimensions reflect the diverse ways in which employees interact with digital technologies in professional settings. Employees who possess strong digital competence are better equipped to process information efficiently, collaborate virtually, adapt to new technologies, and address complex work-related challenges.

Previous studies have consistently demonstrated the positive role of digital competence in enhancing individual and organizational performance. Van Laar et al. (2020) found that employees with higher levels of digital skills exhibit greater efficiency, adaptability, and innovation capability. Digital competence enables employees to automate routine tasks, reduce errors, and improve the quality and speed of work processes. In addition, digital competence supports continuous learning and adaptability, which are essential in dynamic work environments characterized by frequent technological change.

Despite the assumption that younger generations naturally possess strong digital skills, research suggests that digital competence varies significantly

among individuals, including those from Generation Z. While Generation Z employees may be proficient in using digital tools for social interaction and entertainment, they do not always demonstrate advanced competencies required for professional performance, such as critical information evaluation, cybersecurity awareness, and digital problem-solving (van Laar et al., 2020). This distinction highlights the importance of empirically examining digital competence rather than assuming its presence based on generational characteristics.

Work Engagement

Work engagement is a central construct in organizational psychology and human resource management, widely recognized as a key driver of employee performance and well-being. Schaufeli and Bakker (2004) define work engagement as a positive, fulfilling, work-related state of mind characterized by three dimensions: vigor, dedication, and absorption. Vigor refers to high levels of energy and mental resilience at work; dedication reflects a strong sense of significance, enthusiasm, and pride in one's job; and absorption describes being fully concentrated and deeply immersed in work activities.

The theoretical foundation of work engagement is closely linked to the Job Demands-Resources (JD-R) model. According to Bakker and Demerouti (2017), work engagement develops when employees have access to sufficient job resources (e.g., support, autonomy, feedback) and personal resources (e.g., skills, competencies, self-efficacy) to cope with job demands. Engaged employees are more likely to experience intrinsic motivation, positive emotions, and proactive work behavior, which in turn contribute to higher performance outcomes.

Empirical research has consistently shown that work engagement is positively associated with various indicators of employee effectiveness. Engaged employees demonstrate higher task performance, greater organizational commitment, and lower turnover intentions (Saks, 2021). Moreover, work engagement has been linked to creativity, innovation, and discretionary effort, all of which are critical for organizational success in competitive and knowledge-intensive environments.

In the context of digital work environments, work engagement plays an increasingly important role. Digitalization often increases job demands through information overload, constant connectivity, and rapid change. While digital technologies can enhance efficiency, they may also contribute to stress and fatigue if not managed effectively. Engaged employees are better able to cope with these demands because they perceive their work as meaningful and are motivated to invest effort despite challenges.

However, recent studies indicate that work engagement levels among younger employees, particularly Generation Z, tend to be lower than those of older generations. Gallup (2023) reports that Generation Z employees frequently experience disengagement due to factors such as limited social interaction in remote work settings, lack of mentoring, unclear career prospects, and digital fatigue. These findings suggest that engagement cannot be assumed, even among technologically savvy employees, and must be actively fostered by organizations.

Work Productivity

Work productivity refers to the efficiency and effectiveness with which employees perform their tasks to achieve organizational goals. Drucker (1999) conceptualizes productivity as the ability to produce valuable outputs by optimally utilizing available resources, including time, skills, and technology. In knowledge-based and service-oriented organizations, productivity is not merely a function of output quantity but also of output quality, problem-solving capability, and value creation.

In the digital era, productivity increasingly depends on employees' ability to leverage technology to enhance work processes. Digital tools enable faster communication, real-time data analysis, and greater flexibility in task execution. However, the benefits of technology for productivity are contingent upon employees' competence in using these tools effectively. Without adequate digital skills, technology adoption may lead to inefficiencies, errors, and frustration, ultimately reducing productivity.

Previous studies have demonstrated a direct positive relationship between individual competencies and work productivity. Sedarmayanti (2017) emphasizes that productivity is influenced by multiple factors, including skills, motivation, work environment, and organizational support. In line with this perspective, digital competence can be seen as a critical skill that enhances employees' ability to perform tasks efficiently in technologically mediated work environments.

At the same time, productivity is strongly influenced by motivational and psychological factors. Employees who are motivated and engaged are more likely to invest discretionary effort, persist in the face of challenges, and continuously improve their performance. Conversely, employees with low engagement may underutilize their skills and fail to achieve their full productivity potential, regardless of their technical competence.

METHODOLOGY

This study employed a quantitative explanatory research design to examine the relationships between digital competence, work engagement, and work productivity among Generation Z employees. The explanatory approach was selected to test causal relationships and to analyze both direct and indirect effects among the research variables.

The population of this study consisted of Generation Z employees, defined as individuals born between 1997 and 2012, who are currently working in various industries in South Tangerang City, Indonesia. A non-probability sampling technique using purposive sampling was applied to ensure that respondents met specific criteria, namely belonging to Generation Z, being actively employed, and regularly using digital technologies in their work activities. A total of 100 respondents participated in the study, which is considered sufficient for analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM).

Data were collected through a structured questionnaire distributed online. The questionnaire was designed to ensure respondent anonymity and confidentiality. All measurement items were assessed using a five-point Likert

scale ranging from strongly disagree to strongly agree. The questionnaire items were adapted from established literature and modified to fit the context of Generation Z employees in the digital workplace.

Digital competence was measured using indicators related to technical skills, information evaluation, digital communication, problem-solving ability, and the safe and responsible use of digital technologies. Work engagement was measured based on the dimensions of vigor, dedication, and absorption, as proposed by Schaufeli and Bakker. Work productivity was assessed through self-reported indicators reflecting work efficiency, quality of output, task completion, and overall job performance.

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the support of statistical software. The analysis was conducted in two stages. First, the measurement model was evaluated by assessing convergent validity, discriminant validity, and reliability through factor loadings, Average Variance Extracted (AVE), Cronbach's alpha, and composite reliability. Second, the structural model was evaluated to test the proposed hypotheses by examining path coefficients, coefficients of determination (R^2), effect sizes (f^2), and mediation effects to determine the role of work engagement in mediating the relationship between digital competence and work productivity.

Ethical considerations were taken into account throughout the research process. Participation was voluntary, respondents were informed of the purpose of the study, and no personally identifiable information was collected. All data were analyzed in aggregate form and used solely for academic research purposes.

RESEARCH RESULT

Respondent Characteristics

A total of 100 Generation Z employees working in South Tangerang City participated in this study. All respondents were born between 1997 and 2012 and were actively employed across various sectors that utilize digital technology in daily work activities. The diversity of industries provides a representative overview of Generation Z employees in an urban digital work environment.

Measurement Model Evaluation

Before testing the structural relationships, the measurement model was evaluated to ensure the validity and reliability of the constructs. Convergent validity was assessed using factor loadings and Average Variance Extracted (AVE), while reliability was evaluated using Cronbach's alpha and composite reliability.

Table 1. Construct Reliability and Validity

Variable	Cronbach's Alpha	Composite Reliability	AVE
Digital Competence	0.89	0.92	0.65
Work Engagement	0.88	0.91	0.67
Work Productivity	0.87	0.90	0.64

The results indicate that all constructs meet the recommended thresholds, with Cronbach’s alpha and composite reliability values exceeding 0.70 and AVE values above 0.50. This confirms that the measurement model demonstrates adequate reliability and convergent validity.

Discriminant validity was assessed using the Fornell–Larcker criterion, which requires the square root of AVE for each construct to be greater than its correlations with other constructs.

Table 2. Discriminant Validity (Fornell-Larcker Criterion)

Variable	Digital Competence	Work Engagement	Work Productivity
Digital Competence	0.81		
Work Engagement	0.63	0.82	
Work Productivity	0.68	0.70	0.80

The square root of AVE (diagonal values) for each construct is higher than the correlations with other constructs, indicating satisfactory discriminant validity.

Structural Model Evaluation

After confirming the adequacy of the measurement model, the structural model was evaluated to test the proposed hypotheses. The coefficient of determination (R^2) was examined to assess the model’s explanatory power.

Table 3. Coefficient of Determination (R^2)

Endogenous Variable	R^2 Value
Work Engagement	0.40
Work Productivity	0.52

The R^2 value of 0.40 indicates that digital competence explains 40 percent of the variance in work engagement. Meanwhile, digital competence and work engagement together explain 52 percent of the variance in work productivity, suggesting a moderate to substantial explanatory power.

Hypothesis Testing

Hypotheses were tested using path coefficients, t-statistics, and p-values obtained through the bootstrapping procedure in PLS-SEM.

Table 4. Path Coefficients and Hypothesis Testing

Hypothesis	Relationship	Path Coefficient	t-value	p-value	Result
H1	Digital Competence → Work Engagement	0.63	7.85	0.000	Supported
H2	Digital Competence → Work Productivity	0.38	4.92	0.000	Supported
H3	Work Engagement → Work Productivity	0.45	5.67	0.000	Supported

The results show that digital competence has a significant positive effect on work engagement and work productivity. Work engagement also has a significant positive effect on work productivity.

Mediation Analysis

To examine the mediating role of work engagement in the relationship between digital competence and work productivity, indirect effects were analyzed.

Table 5. Mediation Analysis Results

Relationship	Indirect Effect	t-value	p-value	Mediation Type
Digital Competence → Work Engagement → Work Productivity	0.28	4.61	0.000	Partial Mediation

The indirect effect of digital competence on work productivity through work engagement is significant. Since the direct effect of digital competence on productivity also remains significant, work engagement partially mediates the relationship between digital competence and work productivity.

Summary of Findings

Overall, the findings indicate that digital competence plays a crucial role in enhancing both work engagement and work productivity among Generation Z employees. Work engagement serves as an important psychological mechanism that strengthens the impact of digital competence on productivity. These results support the proposed research model and confirm the importance of integrating technological capabilities with motivational factors in improving employee performance in the digital workplace.

DISCUSSION

This study aimed to examine the effects of digital competence and work engagement on the work productivity of Generation Z employees in South Tangerang City, as well as to analyze the mediating role of work engagement in the relationship between digital competence and productivity. The findings provide empirical support for the proposed research model and offer important theoretical and practical insights into productivity in the digital workplace.

The results indicate that digital competence has a significant positive effect on work engagement among Generation Z employees. This finding suggests that employees who possess higher levels of digital competence tend to feel more energetic, dedicated, and absorbed in their work. From the perspective of the Job Demands-Resources (JD-R) model, digital competence can be understood as a personal resource that enables employees to cope more effectively with digitally intensive job demands. When Generation Z employees feel confident in using digital tools, managing information, and solving technology-related problems, they are more likely to experience a sense of control and mastery, which enhances their motivational state and engagement at work. This result is consistent with previous studies that highlight the role of individual competencies in fostering employee engagement in technology-driven environments.

The findings also demonstrate that digital competence has a direct and significant positive effect on work productivity. This suggests that Generation Z employees who are more digitally competent are better able to perform their tasks efficiently, produce higher-quality work, and adapt to changing work processes. In a workplace increasingly shaped by digital technologies, employees who can effectively utilize digital tools are able to streamline workflows, reduce errors, and collaborate more effectively. This result supports earlier research indicating that digital skills are a critical determinant of employee performance and productivity in the digital era. However, the findings also imply that digital competence should be viewed not merely as technical proficiency, but as a multidimensional capability that supports effective work behavior.

Furthermore, the study reveals that work engagement has a significant positive effect on work productivity. Engaged employees demonstrate higher levels of energy, commitment, and focus, which translate into improved performance outcomes. For Generation Z employees, who often face challenges related to digital fatigue, job uncertainty, and limited social interaction in modern work settings, engagement plays a particularly important role in sustaining productivity. This finding aligns with extensive prior research showing that engaged employees are more productive, more resilient, and more willing to invest effort in their work.

One of the most important contributions of this study is the identification of work engagement as a partial mediator in the relationship between digital competence and work productivity. The mediation analysis indicates that digital competence enhances productivity not only directly but also indirectly by increasing employees' engagement. This suggests that while digital skills enable employees to perform tasks more effectively, their impact on productivity is stronger when employees are psychologically engaged with their work. In other words, digital competence provides the capability, while work engagement provides the motivation necessary to fully utilize that capability. This finding reinforces the argument that productivity in the digital workplace is the result of an interaction between technical resources and psychological factors.

The partial nature of the mediation implies that digital competence retains a direct influence on productivity even when engagement is taken into account. This indicates that some aspects of productivity improvement stem directly from employees' ability to use digital technologies efficiently, independent of their engagement levels. Nevertheless, the significant indirect effect highlights the importance of fostering engagement to maximize the returns on investments in digital skill development.

From a practical perspective, the findings suggest that organizations employing Generation Z workers should adopt a holistic approach to productivity enhancement. Providing digital skills training alone may be insufficient if employees are not emotionally and cognitively engaged with their work. Organizations should therefore complement digital competency development with engagement-oriented human resource practices, such as supportive leadership, meaningful job design, opportunities for learning and career development, and recognition of employee contributions. Such integrated

strategies are particularly relevant in fast-growing urban areas like South Tangerang City, where digital transformation and workforce demands are rapidly evolving.

Theoretically, this study extends the application of the Job Demands-Resources model by empirically demonstrating the role of digital competence as a personal resource that influences productivity both directly and through work engagement. It also contributes to the limited body of research focusing specifically on Generation Z employees in developing economies. By integrating digital competence and work engagement into a single explanatory model, this study provides a more comprehensive understanding of the mechanisms underlying employee productivity in the digital era.

Despite its contributions, this study has several limitations that should be acknowledged. The use of a cross-sectional design limits the ability to draw strong causal conclusions, and the reliance on self-reported data may introduce common method bias. Future research could employ longitudinal designs, include objective productivity measures, or explore additional variables such as leadership style, organizational support, or digital well-being to further enrich the model.

In conclusion, the discussion of findings underscores that work productivity among Generation Z employees is shaped by the combined influence of digital competence and work engagement. As digital transformation continues to redefine work practices, organizations must recognize that technological capability and psychological engagement are equally important drivers of sustainable productivity in the digital age.

CONCLUSIONS

This study examined the influence of digital competence and work engagement on the work productivity of Generation Z employees in South Tangerang City, with a particular focus on the mediating role of work engagement. Based on the results of the data analysis, several important conclusions can be drawn.

First, digital competence has a significant positive effect on work engagement. This finding indicates that Generation Z employees who possess higher levels of digital competence tend to feel more energetic, dedicated, and absorbed in their work. Digital competence functions as a personal resource that helps employees manage digitally intensive job demands, thereby enhancing their motivational state.

Second, digital competence has a direct and significant positive effect on work productivity. Employees who are able to effectively use digital tools, evaluate information, and solve technology-related problems are more productive in terms of efficiency, quality of work, and task completion. This confirms that digital competence is a critical capability in the modern workplace. Third, work engagement has a significant positive effect on work productivity. Engaged employees demonstrate higher levels of enthusiasm, commitment, and focus, which contribute directly to improved performance outcomes. This

finding emphasizes the importance of psychological engagement in sustaining productivity among Generation Z employees.

Finally, this study confirms that work engagement partially mediates the relationship between digital competence and work productivity. Digital competence enhances productivity not only directly but also indirectly by increasing employees' engagement with their work. This result suggests that technological capability and psychological motivation must work together to achieve optimal productivity in the digital era.

Overall, the study concludes that work productivity among Generation Z employees is shaped by the integration of digital competence and work engagement. Focusing on one factor without addressing the other may limit the effectiveness of organizational efforts to improve employee performance.

RECOMMENDATIONS

Based on the findings of this study, several practical and theoretical recommendations are proposed.

For organizations, it is recommended that digital skills development programs be designed not only to improve technical proficiency but also to enhance employees' confidence and sense of mastery in using digital technologies. Continuous training, mentoring, and access to up-to-date digital tools can help Generation Z employees maintain and expand their digital competence. At the same time, organizations should implement human resource practices that foster work engagement, such as supportive leadership, clear performance feedback, meaningful job design, opportunities for career development, and recognition of employee contributions. Creating a positive and engaging work environment will enable employees to fully utilize their digital skills and contribute more effectively to organizational productivity.

For policymakers and educational institutions, the findings highlight the importance of aligning digital skills development initiatives with employability and engagement outcomes. Programs aimed at preparing young workers for the digital economy should integrate technical training with the development of soft skills, self-regulation, and work-related motivation to ensure sustainable workforce productivity.

For future research, it is recommended that scholars expand the scope of the study by including larger and more diverse samples across different regions and industries. Longitudinal research designs could be employed to better capture causal relationships over time. Additionally, future studies may incorporate other relevant variables, such as leadership style, organizational support, digital well-being, or job satisfaction, to provide a more comprehensive understanding of productivity in the digital workplace.

In conclusion, enhancing productivity in the digital era requires a balanced approach that integrates technological competence with psychological engagement. By addressing both dimensions, organizations can better support Generation Z employees in achieving high and sustainable levels of work productivity.

ADVANCED RESEARCH

While this study provides valuable insights into the relationships between digital competence, work engagement, and work productivity among Generation Z employees, several opportunities remain for advancing future research in this field. Addressing these opportunities will contribute to a deeper and more comprehensive understanding of productivity in the digital workplace.

Future research may extend the current model by incorporating additional variables that reflect the complexity of digital work environments. Constructs such as digital well-being, technostress, job autonomy, perceived organizational support, and leadership style could be examined as moderating or mediating variables. Including these factors would allow researchers to explore how positive and negative aspects of digitalization interact with digital competence and work engagement to influence productivity. For example, high digital competence may not lead to higher productivity when employees experience excessive technostress or digital overload.

Advanced research could also explore the role of contextual and organizational factors. Differences in organizational culture, industry type, and digital maturity levels may influence how digital competence translates into engagement and productivity. Comparative studies across industries, organizational sizes, or regions would help identify whether the proposed relationships remain consistent or vary depending on contextual conditions. Such research would enhance the external validity and generalizability of findings.

From a theoretical perspective, future studies may integrate multiple frameworks to explain employee productivity in digital contexts. In addition to the Job Demands-Resources model, theories such as Self-Determination Theory, Social Cognitive Theory, or Technology Acceptance Models could be combined to better explain motivational mechanisms and behavioral outcomes. This multi-theoretical approach would allow researchers to examine how autonomy, competence, self-efficacy, and perceived usefulness of technology jointly influence engagement and performance.

Methodologically, future research should consider using longitudinal or experimental designs to capture changes in digital competence, engagement, and productivity over time. Longitudinal studies would enable researchers to examine causal relationships and dynamic effects as employees adapt to new technologies. Experimental or quasi-experimental designs could also be used to evaluate the effectiveness of digital training or engagement interventions, providing stronger evidence of causality.

Advanced research may also benefit from the use of mixed-methods approaches. Quantitative findings could be complemented with qualitative data obtained through interviews or focus group discussions to gain deeper insights into Generation Z employees' experiences, perceptions, and challenges in digitally intensive work environments. Such approaches would enrich the interpretation of statistical results and provide practical insights that may not be captured through surveys alone.

In addition, future studies could incorporate objective measures of productivity, such as performance records, key performance indicators (KPIs), or supervisor evaluations, to reduce the potential bias associated with self-reported data. The integration of subjective and objective measures would strengthen the robustness of research findings.

Finally, cross-generational and cross-cultural research represents an important avenue for advanced investigation. Comparing Generation Z with other generational cohorts, such as Millennials or Generation X, would help determine whether the role of digital competence and work engagement differs across age groups. Cross-cultural studies could further explore how national culture, digital infrastructure, and labor market conditions shape the relationship between technology, engagement, and productivity.

In conclusion, advanced research in this area should move beyond isolated variable testing toward more integrative, contextualized, and methodologically rigorous approaches. Such efforts will contribute to the development of comprehensive theories and evidence-based strategies for enhancing employee productivity in an increasingly digital and dynamic world of work.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to all individuals and institutions that contributed to the completion of this study. First and foremost, appreciation is extended to the respondents who generously participated in this research and provided valuable data, making this study possible.

The author also wishes to thank academic supervisors and lecturers for their guidance, constructive feedback, and continuous support throughout the research process. Their expertise and encouragement greatly contributed to the improvement of the quality of this study.

Gratitude is further extended to colleagues and peers who offered insightful discussions, suggestions, and moral support during the preparation of this research. Their contributions helped enrich the research process and outcomes.

Finally, the author acknowledges the support of family members for their patience, understanding, and encouragement throughout the completion of this study. This research would not have been successfully completed without the support and cooperation of all parties involved.

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