

Psychological Safety and Innovative Work Behavior: Work Engagement as a Mediator Among Generation Z in Indonesia

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ABSTRACT: The rapid growth of Indonesia's digital economy has increased organizational demands for innovation, particularly as Generation Z becomes a dominant workforce segment. Although previous studies have established a positive relationship between psychological safety and innovative work behavior, limited research has examined the motivational mechanism underlying this relationship, especially in emerging economies. Moreover, the integration of Social Exchange Theory (SET) and the Job Demands–Resources (JD-R) Model remains underexplored. This study investigates the mediating role of work engagement in the relationship between psychological safety and innovative work behavior among Generation Z employees in Indonesian digital companies. A quantitative cross-sectional survey was conducted involving 215 respondents selected through purposive sampling. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The findings reveal that psychological safety positively influences innovative work behavior and work engagement. Furthermore, work engagement significantly enhances innovative work behavior and partially mediates the relationship between psychological safety and innovative work behavior. These findings extend the JD-R Model by demonstrating that psychological safety functions as a strategic job resource that stimulates employee innovation through motivational processes. The study also enriches Social Exchange Theory by explaining how reciprocal organizational support encourages innovative behavior. Practically, organizations should foster psychologically safe work environments while strengthening employee engagement through supportive leadership, open communication, and meaningful work to enhance innovation among Generation Z employees.

KEYWORDS: psychological safety, innovative, work behavior, work engagement, Generation Z, JD-R Model, PLS-SEM, emerging economies

I. INTRODUCTION

Indonesia's digital economy is the largest in Southeast Asia, reaching approximately US\$77 billion in 2022 and projected to grow to US\$130 billion by 2025 (Google, Temasek, & Bain, 2022). This rapid digital transformation has intensified the need for organizational innovation, particularly in technology-driven industries where employees are expected to continuously generate and implement new ideas. At the same time, Generation Z, defined as individuals born between 1997 and 2012 (Dimock, 2019), is becoming a dominant segment of Indonesia's workforce and is projected to account for approximately 27% of all workers by 2030 (BPS, 2023). As digital-native employees, Generation Z is expected to play a pivotal role in organizational innovation, making it increasingly important to understand the organizational factors that stimulate their innovative work behavior (IWB). Innovative work behavior (IWB) refers to employees' intentional efforts to generate, promote, and implement new ideas that improve organizational performance (Scott & Bruce, 1994; Janssen, 2000). Because innovation has become a critical source of competitive advantage, identifying factors that encourage IWB has become a major concern in human resource management research. Previous studies have consistently shown that both psychological and organizational environments influence employees' innovative behavior (Amabile, 1996; Newman et al., 2017). Among these factors, psychological safety, defined as employees' shared belief that the workplace is safe for interpersonal risk-taking (Edmondson, 1999), has emerged as one of the most important antecedents of innovation.

Despite the growing body of literature, several important issues remain unresolved. Existing studies primarily report a direct positive relationship between psychological safety and innovative work behavior, while the underlying motivational mechanisms

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explaining how psychological safety is translated into innovation remain insufficiently understood. Work engagement, characterized by vigor, dedication, and absorption (Schaufeli et al., 2006), has been proposed as a potential motivational mechanism because engaged employees are more willing to invest cognitive and emotional resources in creative problem-solving and innovation (Bakker & Demerouti, 2017; Kahn, 1990). However, empirical evidence examining this mediating mechanism remains limited.

Furthermore, most previous studies have been conducted in Western organizational settings (Frazier et al., 2017; Newman et al., 2017), whereas little empirical evidence is available from emerging economies such as Indonesia, where high power distance and collectivist cultural values may influence employees' willingness to express new ideas and take interpersonal risks (Hofstede Insights, 2023). This limitation is particularly relevant for Generation Z employees, whose work expectations differ substantially from previous generations through stronger preferences for autonomy, meaningful work, continuous feedback, and psychological well-being (Waworuntu et al., 2022; Ali et al., 2024).

To clearly position the present study, the main findings and remaining gaps in previous research are summarized in Table 1.

Table 1. Previous Findings, Contradictions, Research Gap, and Current Study

Previous Findings	Contradictions / Limitations	Research Gap	Current Study
Psychological safety positively influences innovative work behavior (Edmondson, 1999; Newman et al., 2017).	Most studies examine only the direct relationship without explaining the motivational process underlying innovation.	The mediating mechanism linking psychological safety and IWB remains underexplored.	Examines the mediating role of work engagement between psychological safety and innovative work behavior.
Work engagement enhances proactive and innovative employee behaviors (Schaufeli et al., 2006; Bakker & Demerouti, 2017).	Few studies integrate work engagement as a mediator within the psychological safety–innovation relationship.	Limited evidence regarding the indirect effect of psychological safety through work engagement.	Tests a partial mediation model using PLS-SEM.
Most empirical studies are conducted in Western organizations (Frazier et al., 2017; Newman et al., 2017).	Cultural characteristics of emerging economies may alter these relationships.	Lack of empirical evidence from Indonesia and other emerging economies.	Provides empirical evidence from Generation Z employees in Indonesian digital companies.
Psychological safety is frequently explained using either Social Exchange Theory or the JD-R Model separately.	The reciprocal and motivational mechanisms have rarely been integrated into one framework.	Limited theoretical integration explaining innovative work behavior.	Integrates Social Exchange Theory (SET) and the Job Demands–Resources (JD-R) Model into a unified framework.

Based on these limitations, this study addresses three interrelated research gaps. First, it investigates whether work engagement functions as a motivational mediator between psychological safety and innovative work behavior among Generation Z employees. Second, it provides empirical evidence from Indonesia's digital economy, thereby extending the literature beyond the predominantly Western context. Third, it integrates Social Exchange Theory (Blau, 1964) and the Job Demands–Resources (JD-R) Model (Bakker & Demerouti, 2017) into a unified theoretical framework to explain how psychological safety stimulates innovative work behavior through motivational processes.

Accordingly, this study addresses the following research questions:

RQ1. Does psychological safety positively influence innovative work behavior among Generation Z employees in Indonesian digital companies?

RQ2. Does psychological safety positively influence work engagement among Generation Z employees?

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RQ3. Does work engagement positively influence innovative work behavior?

RQ4. Does work engagement mediate the relationship between psychological safety and innovative work behavior?

II. LITERATUR REVIEW

II.1 Main Theory: Social Exchange Theory (SET)

Social Exchange Theory (SET), introduced by Blau (1964), explains that employee attitudes and behaviors are shaped by reciprocal exchanges between organizations and employees. When organizations provide valuable socio-emotional resources, such as trust, support, and psychological safety, employees tend to reciprocate by demonstrating positive work attitudes and behaviors, including stronger organizational commitment, higher engagement, and greater willingness to contribute beyond formal job requirements (Saks, 2006). Within this perspective, psychological safety represents an important organizational resource that signals organizational support and encourages employees to respond through constructive and proactive behaviors.

Although SET effectively explains why employees reciprocate favorable organizational treatment, it primarily focuses on reciprocal exchange relationships and provides limited explanation regarding how organizational resources are transformed into motivational states that ultimately produce innovative behavior. Consequently, SET alone cannot fully explain the psychological mechanism through which psychological safety stimulates innovation.

Therefore, this study complements SET with the Job Demands–Resources (JD-R) Model to explain the motivational process linking psychological safety and innovative work behavior.

II.2 Supporting Theory: Job Demands–Resources (JD-R) Model

The Job Demands–Resources (JD-R) Model (Bakker & Demerouti, 2017) proposes that employee performance results from the interaction between job demands and job resources. Job resources—including autonomy, supervisory support, feedback, and psychological safety—not only reduce work-related strain but also activate motivational processes that enhance work engagement. Employees with higher engagement are more energetic, dedicated, and cognitively absorbed in their work, making them more likely to display proactive and innovative behaviors.

Although the JD-R Model has been extensively validated across various organizational settings, empirical studies have primarily examined work engagement as an outcome of job resources rather than as the mechanism explaining how psychological safety translates into innovative work behavior. Moreover, evidence from Generation Z employees in emerging digital economies remains limited.

Accordingly, the present study integrates SET and the JD-R Model to provide a more comprehensive explanation of innovative work behavior among Generation Z employees.

II.3 Psychological Safety and Innovative Work Behavior

Psychological safety refers to employees' shared belief that the workplace is safe for interpersonal risk-taking (Edmondson, 1999). When employees feel psychologically safe, they are more willing to express unconventional ideas, challenge existing practices, and experiment with new approaches without fear of embarrassment or punishment. These behaviors are fundamental components of innovative work behavior (Janssen, 2000).

Previous empirical studies consistently demonstrate a positive relationship between psychological safety and innovative behavior (Newman et al., 2017; Frazier et al., 2017). Employees who perceive a supportive and trusting work environment tend to participate more actively in idea generation, idea promotion, and idea implementation because they perceive lower interpersonal risks associated with innovation.

However, most previous studies have focused primarily on Western organizational contexts and have largely examined the direct relationship between psychological safety and innovative work behavior. Whether this relationship remains equally strong among Generation Z employees working in Indonesia's digital economy, characterized by relatively high power distance and collectivist cultural values, remains insufficiently understood.

Therefore, the following hypothesis is proposed:

H1: Psychological safety positively influences innovative work behavior among Generation Z employees in Indonesian digital companies.

II.4 Psychological Safety and Work Engagement

Kahn (1990) identified psychological safety as one of the three essential psychological conditions for employee engagement. Employees who perceive interpersonal safety are more willing to invest their cognitive, emotional, and physical resources in

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their work. Likewise, the JD-R Model suggests that psychological safety functions as an important job resource capable of enhancing work engagement (Bakker & Demerouti, 2017).

Empirical evidence generally supports this relationship. Frazier et al. (2017) reported that psychological safety is positively associated with work engagement and other engagement-related outcomes across various organizational settings. Similarly, studies conducted in developing countries indicate that psychologically safe workplaces encourage stronger employee involvement and commitment (Ghani et al., 2022).

However, existing studies have rarely examined whether this relationship differs for Generation Z employees, whose work expectations emphasize autonomy, meaningful work, continuous feedback, and psychological well-being. Consequently, the generalizability of previous findings to younger employees in Indonesia's digital sector remains uncertain.

Therefore, the following hypothesis is proposed:

H2: Psychological safety positively influences work engagement among Generation Z employees in Indonesian digital companies.

II.5 Work Engagement and Innovative Work Behavior

Work engagement is characterized by vigor, dedication, and absorption (Schaufeli et al., 2006). Engaged employees possess higher levels of psychological energy, persistence, and intrinsic motivation, enabling them to invest greater effort in generating, promoting, and implementing innovative ideas (Bakker & Demerouti, 2017).

Previous studies consistently report that work engagement enhances employees' creativity, proactive behavior, and innovation because engaged individuals are more willing to overcome uncertainty and persist during challenging innovation processes. Fredrickson's (2001) broaden-and-build theory further suggests that positive emotional states broaden employees' cognitive flexibility and facilitate creative problem solving.

However, empirical evidence regarding this relationship remains limited among Generation Z employees working in rapidly changing digital organizations. Their distinctive work values and career expectations may strengthen or alter the relationship between work engagement and innovative work behavior compared with previous generations.

Therefore, the following hypothesis is proposed:

H3: Work engagement positively influences innovative work behavior among Generation Z employees in Indonesian digital companies.

II.6 The Mediating Role of Work Engagement

Integrating SET and the JD-R Model suggests that psychological safety enhances innovative work behavior through both reciprocal and motivational mechanisms. From the SET perspective, employees reciprocate organizational support by displaying positive work attitudes and discretionary behaviors. Simultaneously, the JD-R Model explains that psychological safety functions as a job resource that increases work engagement, which subsequently stimulates innovative work behavior.

Although previous studies acknowledge the importance of both psychological safety and work engagement, they have generally examined these constructs independently or focused only on their direct effects. Limited empirical evidence has simultaneously investigated work engagement as the motivational mechanism through which psychological safety influences innovative work behavior, particularly among Generation Z employees in emerging digital economies.

Therefore, the following hypothesis is proposed:

H4: Work engagement mediates the relationship between psychological safety and innovative work behavior among Generation Z employees in Indonesian digital companies.

II.7. Conceptual Framework

The conceptual framework includes four hypotheses organized in a partial mediation structure of $X \rightarrow M \rightarrow Y$. This setup is suggested for analysis with the PLS-SEM method (Hair et al., 2022). Psychological safety, which is an outside factor, directly influences PKI (H1) and the degree of work engagement (H2). Work engagement can forecast the level of PKI (H3) and also serves as a mediator in the connection between psychological safety and PKI (H4). Figure 1 shows the entire research model, which includes the proposed direction of paths and the empirical path coefficients that were calculated from the results of the structural model estimation.

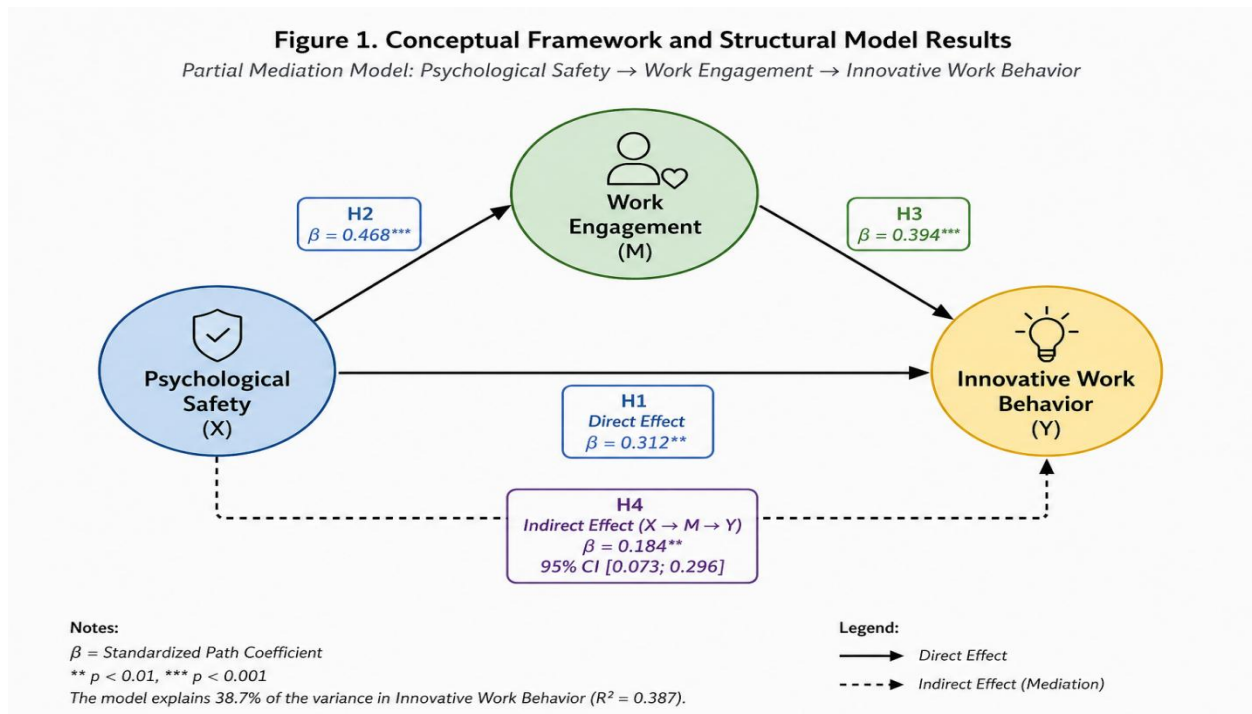


Figure 1. Conceptual Framework and Structural Model Results

Note: Solid green arrow = hypothesized motivational path (H2, H3). Dashed red arrow = direct effect (H1). $^{***} p < 0.001$; $^{**} p < 0.01$. KP = Psychological Safety; KK = Work Engagement; PKI = Innovative Work Behavior.

Figure 1 illustrates the proposed partial mediation model linking **psychological safety**, **work engagement**, and **innovative work behavior (IWB)** among Generation Z employees in Indonesian digital companies. The model indicates that psychological safety has both a **direct positive effect** on innovative work behavior (H1; $\beta = 0.312$, $p < 0.01$) and an **indirect effect** through work engagement (H4; $\beta = 0.184$, $p < 0.01$), suggesting that work engagement functions as a **partial mediator**. In addition, psychological safety significantly enhances work engagement (H2; $\beta = 0.468$, $p < 0.001$), while work engagement positively influences innovative work behavior (H3; $\beta = 0.394$, $p < 0.001$). Collectively, the model explains **38.7% of the variance** in innovative work behavior ($R^2 = 0.387$), indicating a moderate level of predictive power.

From a theoretical perspective, these findings support the **Job Demands–Resources (JD-R) Model**, which posits that psychological safety serves as a valuable **job resource** that stimulates employees' motivational processes, resulting in higher work engagement and improved work outcomes (Bakker & Demerouti, 2023). The findings also align with recent evidence showing that psychologically safe workplaces encourage employees to express ideas, experiment with new approaches, and participate more actively in innovation because they experience lower interpersonal risk and greater intrinsic motivation (Edmondson & Mortensen, 2021; Newman et al., 2023). Furthermore, the mediation effect reinforces the argument that **work engagement is a key psychological mechanism** through which organizational resources are translated into innovative behavior, particularly among Generation Z employees who highly value supportive leadership, meaningful work, and psychological well-being (Ali et al., 2024).

METHODOLOGY

III.1 Research Design

This study employed a quantitative research design using a cross-sectional survey to examine the relationships among psychological safety, work engagement, and innovative work behavior among Generation Z employees in Indonesian digital companies. A quantitative approach was considered appropriate because the study aimed to test theoretically derived hypotheses and evaluate the causal relationships among latent constructs based on Social Exchange Theory (SET) and the Job Demands–Resources (JD-R) Model.

The study adopted a positivist research paradigm, assuming that organizational behavior can be objectively measured through standardized instruments and statistically tested using structural equation modeling. Data were collected at a single point in time through an online questionnaire distributed using Google Forms. Since the proposed model includes direct and indirect

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(mediating) relationships among latent variables, Partial Least Squares Structural Equation Modeling (PLS-SEM) was selected as the primary analytical technique because of its suitability for predictive research models, mediation analysis, and relatively complex structural relationships (Hair et al., 2022).

III.2. Population and Sample

The target population consisted of Generation Z employees working in Indonesian digital companies. Following Dimock (2019), Generation Z refers to individuals born between 1997 and 2012. To ensure respondents possessed sufficient organizational experience to evaluate psychological safety and work engagement, only employees who met the following criteria were included:

Born between 1997 and 2012.

Employed full-time or under permanent contract.

Worked in digital-based organizations (e-commerce, fintech, edutech, digital media, software, or technology companies).

Had at least six months of work experience.

A purposive sampling technique was employed because respondents were required to satisfy these predefined characteristics. The minimum sample size was determined using statistical power analysis (Cohen, 1992), assuming a significance level of 5%, statistical power of 0.80, and two maximum predictors in the structural model, resulting in a minimum requirement of 85 respondents. In addition, Hair et al. (2022) recommend a sample of approximately 150–300 observations for PLS-SEM models of moderate complexity.

Initially, 227 questionnaires were collected through professional and alumni networks over a six-week period. After eliminating incomplete responses, 215 valid questionnaires were retained for analysis, exceeding the minimum sample size requirement and providing adequate statistical power for estimating the proposed structural model.

3. OPERATIONAL DEFINITION OF VARIABLES

Three latent constructs were investigated in this study: psychological safety, work engagement, and innovative work behavior. All constructs were operationalized as reflective constructs and measured using previously validated instruments. Responses were assessed using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Psychological Safety was defined as employees' shared belief that the work environment is safe for interpersonal risk-taking without fear of embarrassment or negative consequences (Edmondson, 1999). The construct was measured using five reflective indicators adapted from Edmondson's (1999) Psychological Safety Scale.

Work Engagement refers to a positive, fulfilling work-related psychological state characterized by vigor, dedication, and absorption (Schaufeli et al., 2006). This construct was measured using the nine-item Utrecht Work Engagement Scale (UWES-9).

Innovative Work Behavior was defined as employees' intentional behavior in generating, promoting, and implementing new ideas that contribute to organizational improvement (Janssen, 2000). The construct was measured using nine indicators representing the three dimensions of innovative work behavior: idea generation, idea promotion, and idea implementation.

Prior to the main survey, the questionnaire was reviewed by academic experts to establish content validity and pilot-tested with 30 respondents to ensure item clarity, readability, and measurement reliability. Minor wording revisions were made based on participant feedback before the final questionnaire was distributed.

Table 1. Operational Definition of Variables

Construct	Operational Definition	Source	Indicators
Psychological Safety	Employees' perception that the workplace is safe for interpersonal risk-taking.	Edmondson (1999)	5
Work Engagement	A positive psychological state characterized by vigor, dedication, and absorption.	Schaufeli et al. (2006)	9
Innovative Work Behavior	Employees' behavior in generating, promoting, and implementing new ideas.	Janssen (2000)	9

4 DATA ANALYSIS USING SMARTPLS 4

The proposed research model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. PLS-SEM was selected because the study emphasizes prediction, simultaneously estimates multiple relationships among latent variables, accommodates mediation analysis, and performs well with moderate sample sizes (Hair et al., 2022).

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The analysis followed the two-stage approach recommended by Hair et al. (2022).

In the first stage, the measurement model (outer model) was evaluated to assess construct reliability and validity. Indicator reliability was examined using outer loadings, with values greater than 0.70 considered acceptable. Internal consistency reliability was assessed using Cronbach's alpha and Composite Reliability (CR), both expected to exceed 0.70. Convergent validity was evaluated through the Average Variance Extracted (AVE), with values above 0.50 indicating satisfactory convergent validity. Discriminant validity was examined using the Heterotrait–Monotrait Ratio (HTMT), with values below 0.85 demonstrating adequate discriminant validity.

In the second stage, the structural model (inner model) was evaluated by examining standardized path coefficients (β), coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and multicollinearity using the Variance Inflation Factor (VIF). Statistical significance of both direct and indirect relationships was assessed using a bootstrapping procedure with 5,000 resamples and bias-corrected 95% confidence intervals.

To minimize potential common method bias, Harman's single-factor test and full collinearity VIF were performed. Harman's single-factor variance below 50% and VIF values below 3.3 indicated that common method bias was unlikely to threaten the validity of the findings (Podsakoff et al., 2012; Kock, 2015).

4. RESEARCH QUESTIONNAIRE

Table 2 shows the complete measurement instruments for the three constructs, which are taken from scales that have been validated in the literature and have been refined through initial testing.

Table 2. Research Questionnaire Instrument

Code	No.	Statement / Indicator	Source
KP		Construct A: PSYCHOLOGICAL SAFETY	<i>Edmondson (1999)</i>
KP1	1	When I mess up on this team, it usually gets pointed out.	<i>Edmondson (1999)</i>
KP2	2	This team member can bring up challenging problems and issues. (R)	<i>Edmondson (1999)</i>
KP3	3	Members of this team occasionally dismiss others for being different.	<i>Edmondson (1999)</i>
KP4	4	It's a good idea to take a chance on this team.	<i>Edmondson (1999)</i>
KP5	5	Asking for assistance from other team members can be challenging. (R)	<i>Edmondson (1999)</i>
KK		Construct B: WORK ENGAGEMENT — UWES-9	<i>Schaufeli et al. (2006)</i>
KK1	6	In my job, I feel really energized (enthusiastic.)	<i>Schaufeli et al. (2006)</i>
KK2	7	In my job, I feel both strong and full of passion (Spirit).	<i>Schaufeli et al. (2006)</i>
KK3	8	When I get up in the morning, I have this feeling that I'm eager to start my work right away. (Excited)	<i>Schaufeli et al. (2006)</i>
KK4	9	I believe that the work I engage in is rich with meaning and significance. (Dedication)	<i>Schaufeli et al. (2006)</i>
KK5	10	I am enthusiastic about my work. (Dedication)	<i>Schaufeli et al. (2006)</i>
KK6	11	My work inspires me. (Dedication)	<i>Schaufeli et al. (2006)</i>
KK7	12	When I'm focused on my work, I lose track of everything happening around me.(Absorption)	<i>Schaufeli et al. (2006)</i>
KK8	13	I feel joyful when I put in a lot of effort at work.(Absorption)	<i>Schaufeli et al. (2006)</i>
KK9	14	I'm absorbed in my work. (Absorption)	<i>Schaufeli et al. (2006)</i>
PKI		Construct C: INNOVATIVE WORK BEHAVIOR	<i>Janssen (2000)</i>
PKI1	15	I come up with fresh ideas to solve tough problems. (Coming Up with Ideas)	<i>Janssen (2000)</i>
PKI2	16	I'm searching for new ways to work, including different methods, techniques, or tools. (Coming up with Ideas)	<i>Janssen (2000)</i>
PKI3	17	I come up with unique answers to challenges. (Coming Up with Ideas)	<i>Janssen (2000)</i>
PKI4	18	I rally support for creative ideas. (Encouraging Ideas)	<i>Janssen (2000)</i>
PKI5	19	I receive approval for creative concepts. (Encouraging Ideas)	<i>Janssen (2000)</i>
PKI6	20	I inspire important people in the organization to be enthusiastic about new and creative ideas. (Encouraging Ideas)	<i>Janssen (2000)</i>
PKI7	21	I transform creative ideas into practical applications. (Bringing Ideas to Life)	<i>Janssen (2000)</i>
PKI8	22	I consistently bring new ideas into the workplace. (Bringing Ideas to Life)	<i>Janssen (2000)</i>
PKI9	23	I assess the advantages of new ideas. (Bringing Ideas to Life)	<i>Janssen (2000)</i>

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Note: (R) = Reverse scale item. Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

IV. RESULTS

IV.1 Respondent Profile

A total of 227 questionnaires were returned during the data collection period. After eliminating 12 incomplete responses, 215 valid questionnaires were retained for further analysis, representing a valid response rate of 94.7%. Table 3 summarizes the demographic characteristics of the respondents.

Table 3. Demographic Profile of Respondents (N = 215)

<i>Characteristics</i>	<i>Category</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Gender	Male	90	41.9
	Female	125	58.1
	Total	215	100.0
Age	18–21 years	83	38.6
	22–25 years	132	61.4
	Total	215	100.0
Education	Diploma	32	14.9
	Bachelor's Degree	158	73.5
	Master's Degree	25	11.6
	Total	215	100.0
Industry Sector	FinTech	102	47.4
	E-commerce	62	28.8
	EdTech	51	23.8
	Total	215	100.0
Work Experience	6–12 months	112	52.1
	1–3 years	81	37.7
	More than 3 years	22	10.2
	Total	215	100.0

Table 3 presents the demographic characteristics of the respondents. Of the 215 valid respondents, 58.1% were female and 41.9% were male, indicating a relatively balanced gender distribution with a slight predominance of female employees. This composition reflects the increasing participation of women in Indonesia's digital industries, particularly among Generation Z professionals.

Regarding age, the majority of respondents (61.4%) were between 22 and 25 years old, while 38.6% were aged 18–21 years. This distribution confirms that the sample accurately represents the early-career segment of Generation Z, which constitutes the primary workforce entering Indonesia's rapidly growing digital economy.

Most respondents (73.5%) held a bachelor's degree, followed by diploma graduates (14.9%) and master's degree holders (11.6%). This educational profile indicates that respondents generally possess sufficient educational backgrounds to perform knowledge-intensive tasks and participate in innovation-oriented work environments.

In terms of industry, FinTech represented the largest proportion (47.4%), followed by e-commerce (28.8%) and EdTech (23.8%). These sectors are among the fastest-growing digital industries in Indonesia and rely heavily on employees' innovative capabilities to maintain competitiveness and respond to rapid technological change.

Regarding organizational tenure, 52.1% of respondents had worked between 6 and 12 months, 37.7% had one to three years of experience, and 10.2% had more than three years of experience. This distribution suggests that most respondents were relatively early in their careers but had accumulated sufficient organizational experience to evaluate psychological safety, work engagement, and innovative work behavior within their organizations.

Overall, the respondent profile indicates that the sample adequately represents Generation Z employees working in Indonesian digital companies, thereby supporting the suitability of the data for testing the proposed research model.

IV.2. indicator reliability (outer loadings)

Indicator reliability was assessed using outer loading values. According to hair et al. (2022), an outer loading value of 0.70 or above indicates satisfactory indicator reliability. The results show that all indicators of the psychological safety construct (kp1–kp5) achieved satisfactory outer loadings ranging from 0.774 to 0.819, indicating that each indicator adequately represents the construct. For the work engagement construct, most indicators exceeded the recommended threshold; however, three indicators—kk2 (0.669), kk6 (0.694), and kk9 (0.693)—were slightly below 0.70 but remained close to the acceptable level. In contrast, several indicators measuring innovative work behavior exhibited relatively low outer loadings, including pki1 (0.615), pki2 (0.591), pki3 (0.619), pki4 (0.685), pki5 (0.676), and pki7 (0.674). Only pki6 (0.705), pki8 (0.719), and pki9 (0.717) exceeded the recommended threshold. These findings indicate that the psychological safety construct demonstrates good indicator reliability, whereas the innovative work behavior construct requires further refinement because several indicators contribute weakly to the latent variable.

IV.3. construct reliability and convergent validity

Construct reliability was evaluated using cronbach's alpha and composite reliability (cr), while convergent validity was assessed using the average variance extracted (ave). The results indicate that all constructs achieved cronbach's alpha and composite reliability values above the recommended threshold of 0.70, confirming satisfactory internal consistency reliability. Specifically, psychological safety obtained a cronbach's alpha of 0.853, composite reliability of 0.895, and ave of 0.630. Work engagement also demonstrated good reliability, with a cronbach's alpha of 0.877, composite reliability of 0.902, and ave of 0.505. However, the innovative work behavior construct produced an ave value of 0.446, which is below the recommended threshold of 0.50. Although its reliability measures remained acceptable (cronbach's alpha = 0.844; composite reliability = 0.878), the lower ave indicates that convergent validity has not yet been fully achieved. This finding is consistent with the relatively low outer loading values observed for several indicators of the innovative work behavior construct.

IV. 3 discriminant validity

Discriminant validity was assessed using the heterotrait–monotrait ratio (htmt). Following hair et al. (2022), htmt values should be below 0.85 to indicate adequate discriminant validity. The results reveal that the htmt values for psychological safety–work engagement (0.880), psychological safety–innovative work behavior (0.949), and work engagement–innovative work behavior (0.917) all exceeded the recommended threshold. These findings indicate that discriminant validity has not been fully established, suggesting substantial conceptual overlap among the constructs, particularly between psychological safety and innovative work behavior. Therefore, additional refinement of the measurement model may be necessary to improve construct distinctiveness.

IV.4 collinearity assessment

Collinearity was evaluated using the variance inflation factor (vif). The results indicate that all vif values were below the recommended threshold of 3.3, suggesting that multicollinearity is not a concern in the measurement model. Therefore, the predictor constructs do not exhibit problematic levels of collinearity that could bias the estimation of the structural relationships.

IV.5 structural model evaluation (inner model)

The structural model was evaluated by examining the direct effects, indirect effects, and overall model fit using the bootstrapping procedure. The results indicate that psychological safety has a positive direct effect on innovative work behavior ($\beta = 0.489$) and an even stronger effect on work engagement ($\beta = 0.763$). In addition, work engagement positively influences innovative work behavior ($\beta = 0.417$). The indirect effect of psychological safety on innovative work behavior through work engagement is 0.318, resulting in a total effect of 0.807. These findings suggest that psychological safety is the strongest predictor in the proposed structural model and plays a crucial role in enhancing both employee engagement and innovative behavior.

Furthermore, the model fit assessment shows that the standardized root mean square residual (srmr) value is 0.054, which is below the recommended cut-off value of 0.08. This indicates that the proposed structural model demonstrates a satisfactory level of goodness-of-fit.

IV.6 hypothesis testing

Hypothesis testing was performed using the bootstrapping procedure. A hypothesis is considered supported when the t-statistic exceeds 1.96 and the p-value is less than 0.05.

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Table 4. Hypothesis testing results

HYPOTHESIS	PATH	B	T-VALUE	P-VALUE	DECISION
H1	PSYCHOLOGICAL SAFETY → INNOVATIVE WORK BEHAVIOR	0.489	8.918	<0.001	SUPPORTED
H2	PSYCHOLOGICAL SAFETY → WORK ENGAGEMENT	0.763	30.787	<0.001	SUPPORTED
H3	WORK ENGAGEMENT → INNOVATIVE WORK BEHAVIOR	0.417	7.603	<0.001	SUPPORTED
H4	PSYCHOLOGICAL SAFETY → WORK ENGAGEMENT → INNOVATIVE WORK BEHAVIOR	0.318	<0.001	<0.001	SUPPORTED

The hypothesis testing results demonstrate that all proposed hypotheses are supported. Psychological safety has a positive and significant effect on innovative work behavior ($\beta = 0.489$, $p < 0.001$), indicating that employees who perceive a psychologically safe work environment are more likely to engage in innovative behaviors. Psychological safety also exerts a strong positive influence on work engagement ($\beta = 0.763$, $p < 0.001$), suggesting that employees feel more energetic, dedicated, and absorbed in their work when they experience interpersonal safety. Moreover, work engagement significantly enhances innovative work behavior ($\beta = 0.417$, $p < 0.001$), indicating that engaged employees are more willing to generate, promote, and implement innovative ideas.

The mediation analysis further reveals that work engagement significantly mediates the relationship between psychological safety and innovative work behavior ($\beta = 0.318$, $p < 0.001$). Since both the direct and indirect effects remain statistically significant, work engagement functions as a partial mediator, indicating that psychological safety influences innovative work behavior both directly and indirectly through increased employee engagement.

DISCUSSION

V.1 Psychological Safety and Innovative Work Behavior

The findings indicate that psychological safety has a positive and significant effect on innovative work behavior ($\beta = 0.489$, $t = 8.918$, $p < 0.001$), supporting H1. This finding suggests that Generation Z employees are more willing to generate, promote, and implement innovative ideas when they perceive their work environment as psychologically safe. A workplace that allows employees to express opinions, experiment with new approaches, and make mistakes without fear of criticism encourages greater participation in innovation activities.

This result supports Edmondson's theory of psychological safety, which argues that interpersonal safety encourages learning behavior and risk-taking. Within digital organizations, where continuous innovation is essential, psychological safety reduces employees' fear of failure and increases their willingness to explore creative solutions. Generation Z employees particularly value supportive work environments because they tend to seek autonomy, constructive feedback, and opportunities for self-development.

The present finding is consistent with previous studies reporting that psychological safety positively influences innovative work behavior (Newman et al., 2017; Frazier et al., 2017). However, unlike most previous research conducted in Western organizations, this study demonstrates that the positive relationship also exists in Indonesia's digital economy, despite its relatively high power-distance culture. This finding extends previous literature by showing that psychological safety remains a critical antecedent of innovation even within emerging economies characterized by different cultural values.

From a theoretical perspective, the result strengthens Social Exchange Theory (SET) by suggesting that employees reciprocate organizational support and trust through discretionary behaviors such as innovation. Organizations that create psychologically safe environments receive positive behavioral responses in the form of higher innovative work behavior.

Practically, managers should foster open communication, encourage knowledge sharing, and develop leadership styles that tolerate mistakes as learning opportunities to strengthen employees' innovative capacity.

V.2 Psychological Safety and Work Engagement

The analysis demonstrates that psychological safety positively influences work engagement ($\beta = 0.763$, $t = 30.787$, $p < 0.001$), thereby supporting H2. This relationship indicates that employees who perceive a safe and supportive work environment are more likely to experience higher levels of vigor, dedication, and absorption in their work.

Psychological safety functions as an important organizational resource because it reduces interpersonal anxiety and encourages employees to invest greater cognitive and emotional energy in their work. When employees believe that expressing ideas or asking questions will not result in negative consequences, they become more engaged with organizational activities and more committed to achieving organizational goals.

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This finding is consistent with the Job Demands–Resources (JD-R) Model, which proposes that job resources stimulate motivational processes that ultimately enhance work engagement (Bakker & Demerouti, 2017). It also supports previous empirical findings showing that psychological safety enhances employee engagement across different organizational contexts (Frazier et al., 2017).

Theoretically, this finding confirms that psychological safety operates as an important job resource capable of initiating motivational processes among Generation Z employees. This evidence expands the application of the JD-R Model within digital organizations operating in emerging economies.

For practitioners, organizations should prioritize supportive leadership, regular feedback, and inclusive communication practices to strengthen employee engagement.

V.3 Work Engagement and Innovative Work Behavior

The results further reveal that work engagement has a positive and significant effect on innovative work behavior ($\beta = 0.417$, $t = 7.603$, $p < 0.001$), supporting H3. Employees who are energetic, dedicated, and fully immersed in their work demonstrate greater willingness to develop and implement innovative ideas.

Highly engaged employees possess stronger intrinsic motivation, enabling them to persist when facing uncertainty and challenges associated with innovation. Rather than avoiding complex problems, engaged employees actively search for creative solutions and collaborate with colleagues to improve organizational performance.

This finding supports previous studies emphasizing work engagement as an important predictor of creativity and innovation (Schaufeli et al., 2006; Bakker & Demerouti, 2017). For Generation Z employees, meaningful work and opportunities for personal growth appear to further strengthen the positive relationship between engagement and innovation.

From a theoretical standpoint, the finding reinforces the motivational process proposed by the JD-R Model, demonstrating that engagement acts as a mechanism translating organizational resources into positive behavioral outcomes.

Managers should therefore implement HR practices that increase employee engagement through meaningful job design, recognition systems, career development opportunities, and continuous learning programs.

V.4 The Mediating Role of Work Engagement

The final analysis confirms that work engagement significantly mediates the relationship between psychological safety and innovative work behavior ($\beta = 0.318$, $p < 0.001$), supporting H4. Since both the direct and indirect effects remain significant, work engagement functions as a partial mediator.

This finding suggests that psychological safety enhances innovative work behavior through two complementary mechanisms. First, employees directly become more willing to express and implement creative ideas because they perceive lower interpersonal risk. Second, psychological safety increases employees' work engagement, which subsequently motivates them to invest greater effort in innovation activities.

Unlike previous studies that predominantly examined the direct relationship between psychological safety and innovative work behavior, this study demonstrates that motivational processes play a substantial role in explaining how psychological safety influences innovation. Consequently, the integration of Social Exchange Theory and the JD-R Model provides a more comprehensive explanation of innovative work behavior than either theory alone.

This represents the principal theoretical contribution of the study. Social Exchange Theory explains why employees reciprocate organizational support, whereas the JD-R Model explains how psychological safety activates motivational resources that ultimately stimulate innovation. Integrating these two theoretical perspectives offers a richer explanation of employee innovative behavior within Indonesia's digital economy.

From a managerial perspective, organizations should not rely solely on creating psychologically safe workplaces. They must also ensure that psychological safety is translated into higher work engagement through supportive leadership, employee empowerment, continuous feedback, meaningful work assignments, and opportunities for professional development. These initiatives are particularly important for Generation Z employees, whose work motivation is strongly influenced by psychological well-being, autonomy, and opportunities for continuous learning.

CONCLUSION

This study examined the relationships among psychological safety, work engagement, and innovative work behavior (IWB) among Generation Z employees working in Indonesian digital companies. Using Partial Least Squares Structural Equation Modeling (PLS-SEM), the findings demonstrated that psychological safety positively and significantly influences both work

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engagement and innovative work behavior. In addition, work engagement positively affects innovative work behavior and partially mediates the relationship between psychological safety and innovative work behavior.

These findings indicate that employees who perceive a psychologically safe work environment are more willing to express ideas, take interpersonal risks, and actively participate in innovation activities. Psychological safety not only directly encourages innovative work behavior but also strengthens employees' motivational states through higher work engagement. Consequently, organizations seeking to improve innovation performance should simultaneously create psychologically safe workplaces and implement human resource practices that enhance employee engagement.

The study also demonstrates that the integration of Social Exchange Theory (SET) and the Job Demands–Resources (JD-R) Model provides a comprehensive explanation of how organizational resources influence employee innovation. While SET explains employees' reciprocal responses toward supportive organizational environments, the JD-R Model clarifies the motivational process through which psychological safety enhances work engagement and ultimately stimulates innovative work behavior. Therefore, innovative behavior among Generation Z employees should be understood as the result of both reciprocal social relationships and motivational resource activation.

Overall, the findings contribute to a better understanding of employee innovation in Indonesia's digital economy and provide empirical evidence that psychologically safe workplaces are essential for sustaining innovation among younger employees.

VI.1. Theoretical Contribution

This study offers several important theoretical contributions.

First, it extends the application of the Job Demands–Resources (JD-R) Model by identifying psychological safety as a strategic job resource that influences innovative work behavior both directly and indirectly through work engagement. This finding enriches the motivational pathway proposed by the JD-R framework within the context of digital organizations.

Second, this research integrates Social Exchange Theory (SET) and the JD-R Model into a unified conceptual framework. Previous studies have generally employed these theories separately to explain employee behavior. By combining reciprocal exchange mechanisms with motivational processes, this study provides a more comprehensive explanation of how psychological safety translates into innovative work behavior.

Third, the study contributes empirical evidence from Generation Z employees in Indonesia's digital economy, addressing the limited availability of research conducted in emerging economies. Most previous studies have been undertaken in Western organizational settings; therefore, this research broadens the external validity of existing theories by demonstrating their applicability in a collectivist and relatively high power-distance cultural context.

VI.2. Practical Contribution

The findings provide several implications for managers and human resource practitioners.

Organizations should prioritize the development of psychologically safe workplaces by promoting supportive leadership, transparent communication, mutual respect, and constructive feedback. Such practices encourage employees to express ideas without fear of criticism or negative consequences, thereby increasing innovation.

Furthermore, organizations should strengthen work engagement through meaningful job design, employee empowerment, continuous learning opportunities, recognition systems, and career development programs. These practices are particularly relevant for Generation Z employees, whose work motivation is strongly influenced by autonomy, meaningful work, psychological well-being, and opportunities for personal growth.

For organizations operating in Indonesia's rapidly growing digital economy, integrating psychological safety with engagement-focused human resource strategies may become a sustainable competitive advantage in fostering employee creativity and innovation.

VI.3. Research Limitations and Future Research

Despite its contributions, this study has several limitations.

First, the study employed a cross-sectional research design, which limits the ability to infer causal relationships among the constructs. Future studies are encouraged to adopt longitudinal or experimental designs to better examine changes in psychological safety, work engagement, and innovative work behavior over time.

Second, the respondents were limited to Generation Z employees working in Indonesian digital companies. Consequently, the findings may not be fully generalizable to employees from other generations, industries, or countries. Future research should compare different generational cohorts and organizational contexts to examine whether similar relationships are observed.

Third, this study focused on work engagement as the sole mediating variable. Other psychological mechanisms, such as psychological empowerment, organizational commitment, creative self-efficacy, learning orientation, or knowledge sharing

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behavior, may also explain how psychological safety influences innovative work behavior and should be investigated in future research.

Finally, although the proposed model explains a meaningful proportion of the variance in innovative work behavior, additional organizational variables—such as transformational leadership, innovation climate, perceived organizational support, digital leadership, and organizational learning capability—may further enhance the explanatory power of the model. Future studies are encouraged to incorporate these variables to develop a more comprehensive understanding of employee innovation within digital workplaces

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