Digital Leadership in Driving Work Innovation: The Role of Creativity, Motivation, and Gender

Anisa Permata Hastiti[1]*; Didik Subiyanto[2]; Syamsul Hadi[3]

[1,2,3]Master of Management, Faculty of Economics, Sarjanawiyata Tamansiswa University
Yogyakarta, Indonesia 55165
[1]anis301029.mhs@ustjogja.ac.id; [2]didiks@ustjogja.ac.id; [3]syamsul.hadi@ustjogja.ac.id

Received: 21st November 2024/ **Revised:** 6th May 2025
Accepted: 21st May 2025/ **Published Online:** 25th June 2025

Abstract **-** The research aimed to explore the role of digital leadership in promoting innovative work behaviors through the mediation of intrinsic motivation and problem-solving creativity and to analyze differences in influence based on gender. A total of 117 lecturers and education staff at private universities were analyzed through AMOS SEM to test the direct, indirect, and moderation influences of gender. The results show that digital leadership does not have a direct effect on innovative work behavior through intrinsic motivation and problem-solving creativity. Digital leadership has a positive effect on intrinsic motivation, thereby strengthening internal motivation for optimal contribution. Gender analysis reveals that digital leadership has a significant impact on intrinsic motivation and problem-solving creativity, with a stronger effect on women, particularly in increasing their intrinsic motivation. However, the relationship between problem-solving creativity and innovative work behavior remained insignificant. The implications emphasize the importance of strengthening strategic digital leadership to enhance intrinsic motivation and creativity, considering gender-based responses to drive innovative work behaviors.

Keywords: digital leadership, innovative work behavior, problem-solving creativity, intrinsic motivation, gender

I. INTRODUCTION

The phenomenon of digital transformation has become a key element in determining the success of organizations as the business world becomes increasingly dynamic and competitive (Verhoef et al., 2021). Many organizations are adopting digital technologies with the aim of improving operational efficiency, expanding their market reach, and creating added value for customers (Singh & Hess, 2020). (Singh & Hess, 2020).

Aspects of digital leadership, such as visionary leadership, digital citizenship, and systematic improvement, have a significant positive effect on the sharing of technical knowledge and emotional intelligence among private university lecturers (Anwar & Saraih, 2024). Additionaly, research conducted by AlAjmi (2022) shows that digital leadership by school principals significantly improves the integration of technology by teachers in elementary schools during the COVID-19 pandemic. The research highlights the importance of visionary leadership in maximizing the utilization of digital resources and integrating technology into the classroom.

According to Erhan et al. (2022), digital leadership can play a crucial role in influencing employees' intrinsic motivation and creativity, both of which are essential drivers of innovative work behavior. However, educational institutions still need to strengthen a deep understanding of digital mastery in promoting intrinsic motivation and problem-solving creativity as essential elements for innovative work behaviors. These limitations create a gap in which universities struggle to harness the full potential of digital technologies in the work environment. The implementation of digital leadership in universities has become more complex, especially in light of gender differences.

From this phenomenon, previous research remains limited in exploring the effects of digital

*Corresponding Author

doi: https://doi.org/10.21512/tw.v26i1.12572
1412-1212/2541-2388 ©2025 Authors
This is an open access article under the CC BY-NC-SA license(https://creativecommons.org/licenses/by-nc-sa/4.0/)
Journal The Winners is accredited as Sinta 2 Journal (https://sinta.kemdikbud.go.id/journals/profile/261)
How to Cite: Hastiti, A. P., Subiyanto, D., & Hadi, S. (2025). Digital leadership in driving work innovation: The role of creativity, motivation, and gender. Journal The Winners, 26(1), 43-57.

leadership on innovative work behaviors, particularly from a gender perspective. Gender factors do not receive adequate attention in research related to digital leadership and innovation in the education sector. These variations lead to different dynamics of responses to digital leadership. For example, some research suggests that men and women have different methods of expressing creativity and motivation in the workplace (Almadana et al., 2022; Lubis et al., 2022; Shubina & Kulakli, 2019). In explaining the mechanism, the research draws on the Grand Theory of Social Role, which posits that behavioral differences between men and women are strongly influenced by social roles constructed by gender (Minh-Duc & Huu-Lam, 2019).

Social role theory explains that social role expectations can affect the individuals' reactions to leadership styles, including digital leadership (Koburtay et al., 2019). In a university environment, the application is relevant due to the large number of lecturers and staff with different backgrounds and work experiences, which has the potential to bring different values and expectations of roles. Therefore, the research aims to understand the effects of digital leadership on innovative work behaviors, as well as the influence of gender in the university environment.

Moreover, the research proposes an analytical model that explores the influence of digital leadership on innovative work behaviors, with intrinsic motivation and problem-solving creativity as mediators. A more inclusive digital leadership model is reported by considering gender factors to promote innovative behavior among lecturers and staff without being constrained by differences.

The research answers the need for a more comprehensive analysis of the influence of digital leadership by considering gender aspects and mediating factors. Previous research conducted by Benitez et al. (2022), Mihardjo et al. (2019), Mo et al. (2023),Senadjki et al. (2024), and Tian et al. (2025) shows that effective leadership can inspire innovation through increased autonomous motivation. Particular attention is not given to gender differences in the context of digital leadership. Therefore, the research aims to offer a new contribution in comprehensively examining the interaction between digital leadership, intrinsic motivation, problem-solving creativity, innovative work behaviors, and gender differences.

Digital leadership plays a crucial role in driving innovative work behaviors in an era of rapid technological transformation (Erhan et al., 2022; Malewska et al., 2024). Leaders are required to posses managerial skills and expertise in leveraging technology to support collaboration, communication, and data-driven decision-making. In the context of innovative work, digital leaders play a role in creating a strategic vision that focuses on leveraging technology to generate new ideas (Contreras et al., 2024).

Based on the description, digital leadership enables collaboration across teams and departments through technology, increasing the process of developing ideas and improving the quality of innovative solutions (Memon & Ooi, 2023). Leaders are also responsible for managing the accumulation of knowledge from previous innovations (Malik et al., 2024). In this context, an ecosystem is created to drive innovation through faster and more efficient access to relevant information.

Digital leadership plays a crucial role in building an organizational culture that supports continuous exploration and learning (Alakaş, 2024). Innovation can be conducted without fear of failure by creating space to experiment and take measurable risks. Additionally, digital technologies are used to provide real-time feedback and recognition of creative contributions, which increases intrinsic motivation to engage in innovative work (Stofberg et al., 2021). This support influences innovation outcomes and strengthens commitment to long-term goals despite various challenges. However, digital leadership is also affected by different challenges, such as maintaining a balance between technology and the humanitarian aspects of leadership. Excessive reliance on technology without considering human needs, such as empathy and emotional support, can reduce leadership effectiveness and stifle innovation (Lynn Pulley & Sessa, 2001). Therefore, successful digital leaders must integrate technology skills with interpersonal abilities to create a harmonious and innovative work environment (Li & Xiao, 2023). Digital leadership has a significant influence on innovative work behaviors (Abbas et al., 2024). By leveraging technology strategically and fostering a collaborative and supportive culture, leaders can guide organizations to innovate and thrive in a competitive business landscape (Schiuma et al., 2022). However, the challenge of maintaining a balance between technology and interpersonal relationships shows the importance of leadership, focusing on efficiency and empowering individuals to reach full innovation potential (Bauwens & Cortellazzo, 2024).

H1: Digital Leadership has a significant positive impact on Innovative Work Behavior.

Digital leadership has a very important role in promoting creativity in problem-solving, especially in an era where technology continues to evolve rapidly (Kane et al., 2019). Leaders can create an environment that empowers employees to think creatively in the face of existing challenges (Liao et al., 2024). Digital technology allows for faster access to information and tools supporting innovative thinking, such as collaboration software, artificial intelligence, and data analytics. Therefore, digital leadership helps to remove traditional barriers to collaboration and communication, allowing teams to work more efficiently and generate creative ideas.

Creativity is supported in problem-solving through an organizational culture (Maisyaroh et al., 2024). Leaders who understand the potential of technology tend to promote the exploration of new

ideas and provide space for employees to experiment with different technological methods to solve complex problems. Employees' skills are also improved by providing access to relevant technology tools and learning opportunities enabling them to obtain innovative solutions (Gao et al., 2024).

Digital leadership plays a role in facilitating cross-functional and cross-disciplinary collaboration (Lusiani et al., 2020). Technology allows teams from different departments to collaborate more easily, enriching the perspectives used in problem-solving. These intensive and purposeful interactions often promote the development of creative ideas due to the combination of different backgrounds, expertise, and perspectives.

The accumulated knowledge in the organization is managed effectively using technology to store and distribute information. Easier access to knowledge allows teams to learn from previous solutions, avoid repeating mistakes, and develop innovative new ones. Therefore, digital leaders ensure that innovation is temporary and an integral part of the organization's problem-solving process (Bansal et al., 2023). Digital leadership also faces challenges, especially in maintaining a balance between applying technology and promoting human creativity. Excessive reliance on technology can limit the flexibility of thinking, allowing digital leaders to create an atmosphere where technology is used as a support tool (Wang et al., 2024). However, successful leaders can leverage technology to promote creativity without neglecting the humanitarian aspect of problem-solving, leading to innovative, effective, and sustainable solutions (Dwivedi et al., 2022).

H2: Digital leadership has a significant positive effect on Problem-Solving Creativity.

Digital leadership supports intrinsic motivation by giving employees more autonomy (Havidz & Gupron, 2019). Technology allows individuals to work flexibly in terms of time and place as well as provides tools for effective collaboration. Technology enables individuals to work flexibly in terms of time and place while also providing tools for effective collaboration (Park, 2023). Additionally, digital leaders can use technology, enabling them to understand the progress and impact of their work more effectively (Sandra, 2021). This feedback plays a crucial role in reinforcing intrinsic motivation, as employees can recognize the positive impact of their contributions to the organization. The use of digital analytics and communication tools to provide real-time recognition and appreciation can increase employees' sense. In this context, work is valued, which increases commitment and passion to continue innovating and excelling (Lechermeier et al., 2020).

Continuous learning is supported through technology, which is crucial to keeping intrinsic motivation high (Gulzar et al., 2024). The provision of access to online training, technology-based learning tools, and relevant knowledge resources helps employees to continually develop skills and broaden horizons. This opportunity to learn and grow independently provides deep intrinsic satisfaction, as employees feel empowered to explore their full potential without having to rely entirely on formal structures (Marcel et al., 2024).

H3: Digital leadership has a significant positive effect on intrinsic motivation.

Creativity in problem-solving plays a central role in promoting Innovative Work Behaviors, especially in the context of organizations (Bertão et al., 2023). Problem-solving creativity refers to the ability to generate new ideas and original methods in tackling complex challenges (Layyinah & Subiyanto, 2022). In innovative work behavior, this variable is the process of developing ideas, implementing solutions, and creating new value. Organizations can come up with inefficient solutions with long-term consequences by combining creativity with the structure and goals of innovation (Alt et al., 2023). Creativity in problem-solving creates space for individuals and teams to think outside traditional boundaries and explore new methods. This is important in innovative work behaviors, which require open-mindedness and resilience in the face of uncertainty. In the process, employees are encouraged to question existing assumptions and seek new, more effective methods to achieve their goals (Desmet & Sternberg, 2024). This mindset foster an environment where innovation can thrive, as employees have the freedom to experiment and test ideas without fear of failure. Furthermore, creativity in problem-solving helps increase the innovation process (Mittone et al., 2022). Creative ideas from diverse thinking often lead to effective and quick-to-implement solutions. This allows individuals or teams to find new connections between information or missed data (El-Kassar et al., 2022).

The decision-making process is increased since creative solutions are often more flexible and adaptive to changing business environments or customer needs. Creativity in problem-solving contributes to cross-disciplinary collaboration, which is crucial in innovative work behaviors (Saif et al., 2024). Individuals from diverse backgrounds work together to solve problems through different perspectives, which can spark new ideas and innovative solutions. This creative process enhances in-depth discussions, exploration of diverse perspectives, and a joint search for unique and implementable solutions. Therefore, creativity promotes productive collaboration, leading to richer innovations that are relevant to the challenges at hand (Yalçın & Erden, 2021).

H4: Creativity in Problem-Solving has a significant positive effect on Innovative Work Behavior.

Intrinsic motivation arises from an internal drive

to act out of interest, satisfaction, or desire to achieve a personal goal (Saif et al., 2024). An intrinsically motivated individual tends to be more committed, creative, and passionate in the face of challenges, which are key qualities in creating innovation (Ridwan et al., 2024). In innovative work behaviors, where creativity and the courage to take risks are needed, intrinsic motivation becomes a factor driving individuals to stay engaged despite facing difficulties or uncertainties.

Individuals with intrinsic motivation are often more proactive in exploring new ideas to earn external rewards such as bonuses or promotions (Bos-Nehles et al., 2017). The satisfaction from finding a new solution or creating value makes these individuals more persistent and resistant to external pressure (Ankli & Palliam, 2012). In the context of innovative work behavior, intrinsic motivation is the main driving force behind improvement and innovation, even in the face of obstacles (Sode & Chenji, 2024). Support for a conducive work environment also plays a role in strengthening the variable (Maj, 2023). Employees will feel more valued and empowered when organizations create a culture that supports autonomy, learning, and positive feedback. The freedom and opportunity to learn strengthen the intrinsic drive to innovate. By rewarding creative efforts, intrinsically motivated individuals will feel more confident in trying new adventures, leading to diverse and innovative outcomes.

Intrinsic motivation decreases when the work environment is not supportive, such as when there is excessive pressure or a lack of appreciation for creative endeavors (Maj, 2023). Therefore, leaders need to actively enhance an atmosphere that values innovation and recognizes individual contributions, allowing intrinsic motivation to remain strong and sustainable.

H5: Intrinsic Motivation has a significant positive effect on Innovative Work Behavior.

Gender acts as a variable to control the potential influence on key variables, including Digital Leadership, Problem-Solving Creativity, Intrinsic Motivation, and Innovative Work Behavior. The relationship is unaffected by factors that are not the primary focus of the research. In this context, gender can affect an individual's response to leadership, engagement in creative problem-solving, the level of intrinsic motivation, and innovative work behaviors.

Previous research shows that men and women had different thinking styles, approaches to creativity, or motivational preferences (Bogilović et al., 2021). By making gender a control variable, the research obtains more objective results. The relationship between the main variables is influenced by factors relevant to the research.

H6a: Gender distinguishes the influence of Digital Leadership on Innovative Work Behavior.
H6b: Gender distinguishes the influence of Digital Leadership on Problem-Solving Creativity.
H6c: Gender distinguishes the influence of Digital Leadership on Intrinsic Motivation.
H6d: Gender differentiates the influence of Problem-Solving Creativity on Innovative Work Behavior.
H6e: Gender distinguishes the influence of Intrinsic Motivation on Innovative Work Behavior.

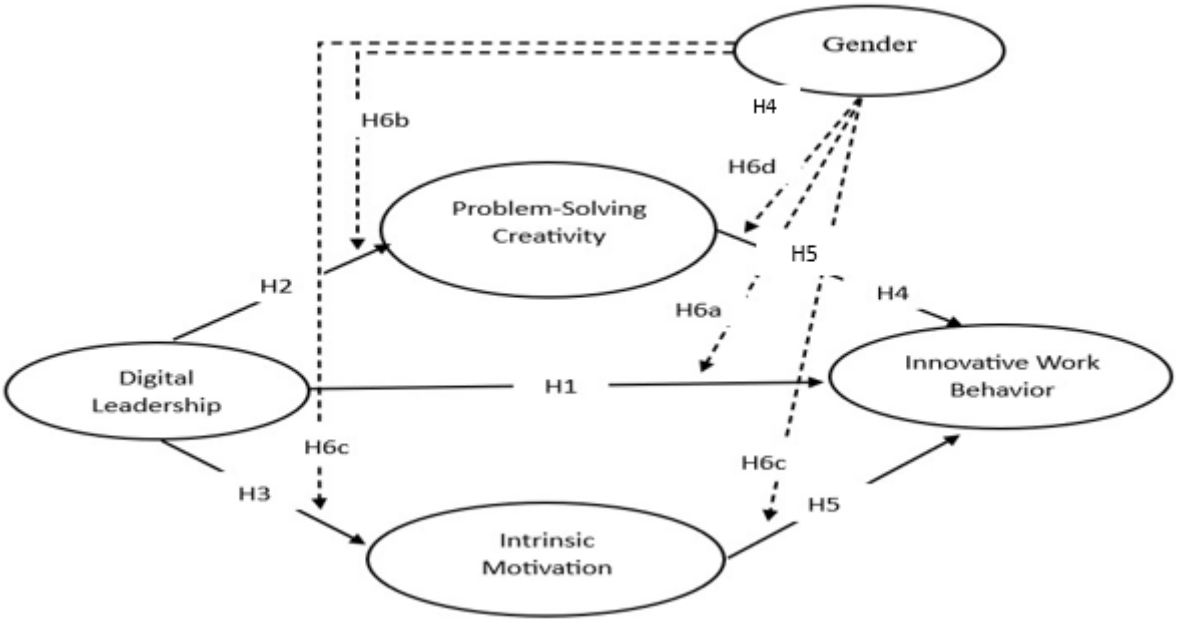

Figure 1 Empirical Research Model

Figure 1 presents a framework of the causal relationships among the variables: Digital Leadership, Intrinsic Motivation, Problem-Solving Creativity, and Innovative Work Behavior. Moreover, Figure 1 illustrates the research framework, where digital leadership serves as the primary independent variable influencing creativity, problem-solving, and intrinsic motivation. Problem-solving creativity is predicted to contribute to Innovative Work Behaviors. Meanwhile, intrinsic motivation is predicted to influence Innovative Work Behaviors, with gender set as the control variable. The variable is consistent with the formulated hypotheses and frameworks, allowing the result to enrich theoretical contributions in examining the role of gender differences.

II. METHODS

The research applies a quantitative design to analyze the influence of digital leadership on innovative work behavior. Creativity in problem-solving and intrinsic motivation are used as mediating variables, while gender differences are analyzed from a moderation perspective. The population includes all employees and lecturers at universities in Central Java. The sample is obtained using a purposive sampling method, with respondents selected based on their inclusion in creative or innovative work activities and possessing at least one year of work experience. Based on SEM guidelines, the data collected from 117 respondents meet the requirements (Gozali & Latan, 2015).

The research instrument consists of a structured questionnaire with a Likert scale ranging from 1 to 5, where 1 indicates 'strongly agree' and 5 indicates strongly agree. The variables measured include Digital Leadership (ability to use technology, motivation for the adoption of innovative technologies, and digital data-driven decision-making), Problem-Solving Creativity (new ideas and innovative approaches to solving problems), Intrinsic Motivation (job satisfaction without external incentives and motivation to achieve), Innovative Work Behavior (initiation of change and implementation of new ideas), and gender differences as moderation perspective. The questionnaire is tested for validity and reliability before being used for data collection.

The data collected is analyzed using Structural Equation Modeling (SEM) with AMOS software. The analysis stages include testing validity and reliability through Confirmatory Factor Analysis (CFA), testing structural models to analyze the relationships between variables, and the mediating roles of creativity problem-solving and intrinsic motivation. The bootstrap method is to test the influence of mediation, while the moderation analysis is to determine whether gender differences moderates the relationship.

III. RESULTS AND DISCUSSIONS

A rigorous data quality testing process is required before proceeding to an in-depth descriptive analysis of the demographic data and research variables. Therefore, the data meets scientifically recognized standards of reliability and validity. In this context, validity aims to assess the extent to which a research instrument can accurately measure a concept or variable. Meanwhile, reliability measures the consistency of research instruments in producing stable and reproducible data under similar conditions. This process is critical to ensure that the results of subsequent descriptive analyses truly reflect the actual conditions of the population. Table 1 shows the quality and integrity of the instruments used.

Table 1 Validity and Reliability of Research Variables

Variables	Indicators	Total items Correlation	Cronbach's Alpha	Information
Digital Leadership	DL1	0.808	0.901	Valid and Reliable
	DL2	0.798		
	DL3	0.794		
	DL4	0.737		
	DL5	0.643		
Creative Problem Solving	CPS1	0.687	0.868	Valid and Reliable
	CPS2	0.757		
	CPS3	0.674		
	CPS4	0.692		
	CPS5	0.621		
	CPS6	0.568		
Intrinsic Motivation	IM1	0.583	0.838	Valid and Reliable
	IM2	0.721		
	IM3	0.797		

Table 1 Validity and Reliability of Research Variables (Continued)

Variables	Indicators	Total items Correlation	Cronbach's Alpha	Information
	IM4	0.638		
	IM5	0.512		
Innovative Work Behavior	IWB1	0.683	0.852	Valid and Reliable
	IWB2	0.791		
	IWB3	0.709		
	IWB4	0.568		
	IWB5	0.519		
	IWB6	0.568		

Table 2 Respondent Demographics

Category	Demographics	Frequency	Percent
Gender	Man	66	56.4
	Woman	51	43.6
		117	100.0
Age	< 26 (Z)	25	21.4
	27 – 42 (Y)	30	25.6
	43 – 58 (X)	48	41.0
	> 59	14	12.0
		117	100.0
Education	High School / Equivalent	28	23.9
	S1	75	64.1
	S2	14	12.0

Futhermore, Table 1 shows the results of validity and reliability tests for Digital Leadership, Creative Problem Solving, Intrinsic Motivation, and Innovative Work Behavior. Each variable has several indicators measured through item-total correlation and Cronbach's Alpha value. Digital Leadership consists of five indicators (DL1 to DL5) with an item-total correlation between 0.643 to 0.808. The Cronbach's Alpha value of 0.901 shows excellent internal consistency since the variable is declared valid and reliable. Creative Problem Solving has six indicators (CPS1 to CPS6) with item-total correlation values ranging from 0.568 to 0.757. This variable shows high reliability with a Cronbach's Alpha value of 0.868, hence the indicators are considered valid and reliable.

Intrinsic Motivation consists of five indicators, IM1 to IM5, with item-total correlations ranging from 0.512 to 0.797. The Cronbach's Alpha of 0.838 indicates the stability of the instrument in the measurement. The indicators of the Intrinsic Motivation variable are declared valid and reliable. Finally, Innovative Work Behavior consists of six indicators, IWB1 to IWB6, with item-total correlations ranging from 0.519 to 0.791. A Cronbach's Alpha value of 0.852 shows that the instrument for the variable has strong reliability. The demographics, including gender, age, and education, are provided in detail because this information provides an important context for analyzing and interpreting the research data.

Table 2 contains demographic information of respondents providing an overview of the research sample based on gender, age, and education. The sample consists of 66 male (56.4%) and 51 female respondents (43.6%), which show a fairly balanced gender representation.

Respondents are categorized into four age groups: under 26 (Generation Z), 27–42 (Generation Y), 43–58 (Generation X), and 59 and above. The distribution is as follows: 25 respondents (21.4%) in Generation Z, 30 (25.6%) in Generation Y, 48 (41.0%) in Generation X, and 14 (12.0%) in the 59 and above group. This distribution shows the dominance of the middle age group, especially Generation X, who are more likely to bring different experiences and perspectives than others.

The majority of respondents have bachelor's degrees (S1), totaling 75 or 64.1%. Those with secondary and postgraduate education accounted for 28 (23.9%) and 14 (12.0%), respectively. The respondents have a higher education background, which may influence the understanding and participation in the research topic. This demographic distribution provides important information about the characteristics of the sample, reflecting diversity in terms of age, gender, and educational background.

After testing the validity and reliability, as well as describing the demographic data, the descriptions for each of the variables need to be analyzed concerning

the average. The results of the average score of each indicator and the category are presented in Table 3.

Based on the variables and indicators in Table 3, Digital Leadership (DL) has five indicators with a total of 117 respondents. The minimum and maximum scores for each indicator are between 3 and 5. The average score for the DL1 indicator is 4.27, categorized as "Very Good." Meanwhile, DL2 to DL5 indicators have an average score between 4.18 and 4.26 and are included in the "Good" category.

CPS variable consists of six indicators with 117 respondents. The minimum and maximum values on the CPS indicator range from 2 to 5. The CPS1 to CPS3 and CPS6 indicators have an average between 4.20 to 4.26 in the "Good" category. The CPS4 and CPS5 indicators have averages of 4.38 and 4.31 classified as " Very Good".

The Intrinsic Motivation (IM) variable has five indicators with the same respondents. The minimum and maximum values for this indicator are 2 and 5, respectively. The average for IM1, IM2, and IM5 ranged from 4.21 to 4.29, which was categorized as "Good," while IM3 had an average of 4.32 in the "Very Good" category. The IM4 indicator has an average of 4.05 in the "Good" category. The last variable is Innovative Work Behavior (IWB), which has six indicators with minimum and maximum values of 3 and 5, respectively. All IWB indicators from IWB1 to IWB6 have the same average value between 4.18 and 4.26 in the "Good" category.

After conducting a descriptive analysis that includes demographic characteristics and an overview of the variables, the subsequent stage is to apply inferential statistical analysis. This step aims to test and confirm the formulated hypothesis, leading to more in-depth conclusions and allowing the generalization of results in a wider population. Figure 2 shows data analysis with AMOS SEM based on the conceptual framework of the research.

The model in Figure 2 shows a fairly good fit after model improvement, considering various match indices. The influence of Digital Leadership on innovative work behavior occurs indirectly through Intrinsic Motivation.

Table 3 Descriptive Research Variables

Variables and Indicators	Sample	Minimum	Maximum	Mean	Category
Digital Leadership (DL)					
DL1	117	3	5	4.27	Very Good
DL2	117	3	5	4.24	Good
DL3	117	3	5	4.26	Good
DL4	117	3	5	4.26	Good
DL5	117	3	5	4.18	Good
Creative Problem Solving (CPS)					
CPS1	117	3	5	4.23	Good
CPS2	117	3	5	4.20	Good
CPS3	117	3	5	4.20	Good
CPS4	117	3	5	4.38	Very Good
CPS5	117	2	5	4.31	Very Good
CPS6	117	2	5	4.26	Good
Intrinsic Motivation (IM)					
IM1	117	3	5	4.28	Very Good
IM2	117	2	5	4.21	Good
IM3	117	2	5	4.32	Very Good
IM4	117	2	5	4.05	Good
IM5	117	3	5	4.29	Very Good
Innovative Work Behavior					
IWB1	117	3	5	4.24	Good
IWB2	117	3	5	4.26	Good
IWB3	117	3	5	4.26	Good
IWB4	117	3	5	4.18	Good
IWB5	117	3	5	4.26	Good
IWB6	117	3	5	4.26	Good

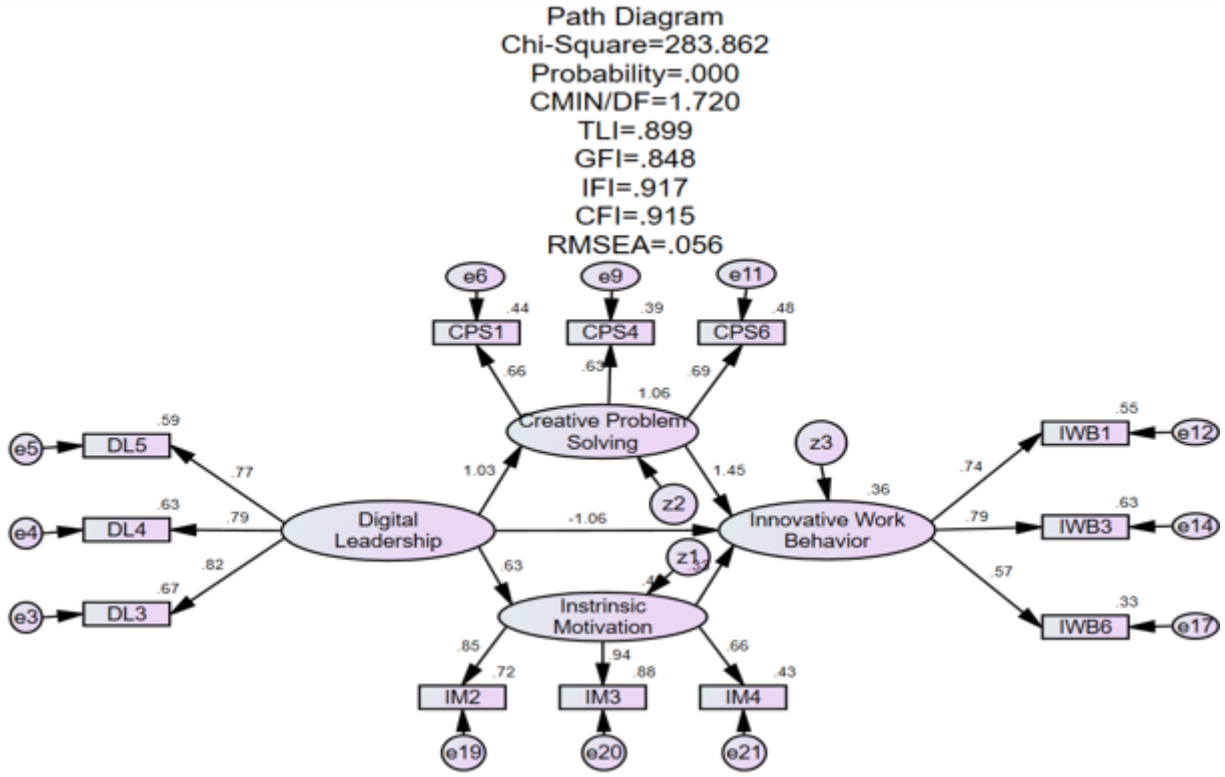

Figure 2 Path Diagram After Repair

Notes: Chi-square Minimum/Degree of Freedom (CMIN/DF):1.720 , Tucker-Lewis Index (TLI): 0.899, Goodness-of-Fit Index (GFI) : 0.848; Incremental Fit Index (IFI): 0.917, Comparative Fit Index (CFI): 0.915, Root Mean Square Error of Approximation (RMSEA): 0.056)

Table 4 Goodness of Fit

Goodness-of-fit Index	Cut-off Value	GOF Values	Information
Chi-square	Expected small	283,862	Good
Significance Probability	≥0.05	0,000	Marginal
RMSEA	≤ 0.08	0,056	Good
GFI	≥0.90	0,848	Good
CMIN/ DF	≤ 2.00	1,720	Good
TLI	≥0.95	0,899	Good
CFI	≥ 0.95	0,915	Good

Based on Table 4, the model meets the criteria of a good fit since the model is reliable for further interpretation.

Based on Table 5, the loading factor values for various indicators and variables, some indicators make a high contribution to the measured variables, while others contribute at a moderate level. In the Digital Leadership (DL) variable, DL3, DL4, and DL5 indicators have loading factor values of 0.840, 0.803, and 0.745, respectively. Therefore, the indicators make a strong contribution to the variable, as the values are above the commonly used threshold of 0.70. In the IWB variable, IWB1 and IWB3 indicators have loading factor values of 0.800 and 0.747, while IWB6 has a relatively lower value of 0.559. Although the value is considered adequate, the contribution of the IWB6 indicator to the Innovative Work Behavior variable is not strong.

In the Intrinsic Motivation (IM) variable, IM3 and IM2 indicators have very high loading factor values of 0.936 and 0.857, which shows a very strong contribution. Meanwhile, IM4 has a loading factor of 0.654, which shows a moderate contribution. In the Creative Problem Solving (CPS) variable, CPS1, CPS4, and CPS6 indicators have the highest loading factor values of 0.753, 0.632, and 0.605, respectively. Although CPS4 and CPS6 have a moderate contribution, the values are still adequate in the context of measuring CPS variables. Most indicators make a strong contribution to the variables measured, especially those with a loading factor value above 0.70. After several criteria are met, such as sample

Table 5 Standardized Regression Weights

Indicators	Regression	Variable	Estimate
DL3	<---	DL	0.840
DL4	<---	DL	0.803
DL5	<---	DL	0.745
IWB1	<---	IWB	0.800
IWB3	<---	IWB	0.747
IWB6	<---	IWB	0.559
IM4	<---	IM	0.654
IM3	<---	IM	0.936
IM2	<---	IM	0.857
CPS4	<---	CPS	0.632
CPS6	<---	CPS	0.605
CPS1	<---	CPS	0.753

Table 6 Regression Weights

Endogenous Variables	Regression	Exogenous Variables	Estimate	S.E.	C.R.	P	Information
Creative Problem Solving	<---	Digital Leadership	0.831	0.064	12.901	***	Confirmed
Intrinsic Motivation	<---	Digital Leadership	0.802	0.111	7.231	***	Confirmed
Innovative Work Behavior	<---	Intrinsic Motivation	0.270	0.103	2.616	0.009	Confirmed
Innovative Work Behavior	<---	Creative Problem Solving	1.847	3.061	0.603	0.546	Unconfirmed
Innovative Work Behavior	<---	Digital Leadership	-1.088	2.508	-.434	0.664	Unconfirmed

P***<0.01.

sufficiency, model assumptions, and corresponding statistical significance values, the output of Regression Weights is used as a basis for inferring the analysis.

Digital Leadership has a significant influence on Creative Problem Solving (estimate = 0.831, P < 0.001) and Intrinsic Motivation (estimate = 0.802, P < 0.001). These results align with research by Lin (2024), which finds that digital leadership has a positive influence on employees' digital creativity. The influence is mediated by two main factors, namely creative self-efficacy and ambidextrous learning.

Intrinsic Motivation has significant influence on Innovative Work Behavior (estimate = 0.270, p = 0.009). These results support the research by Alqhaiwi et al. (2023), which suggests that intrinsic motivation plays an important role in driving employees' innovative work behaviors. However, the effect of Creative Problem-Solving on Innovative Work Behavior (estimate = 1.847, p = 0.546) and the direct influence of Digital Leadership on Innovative Work Behavior (estimated = -1.088, p = 0.664) are insignificant. In the organizational context, factors such as culture, work structure, and managerial support can influence the relationship between Digital Leadership and Innovative Work Behavior (Alqhaiwi et al., 2023).

The results are presented based on data from 117 respondents, without considering or differentiating by gender. The analysis is carried out thoroughly on all samples to obtain an overview and a comprehensive understanding of the relationships. This method determines patterns and trends in the data, eliminating the influence of gender differentiation. Therefore, the results reflect the general conditions of the population within the research. Based on the analysis, the following provides an in-depth discussion of the influence of each variable, in the order presented in the hypothesis formulation of the problem.

Digital Leadership has no significant influence on Innovative Work Behavior, as indicates by the estimate of -1,088 and p-value of 0.664, which is greater than the significance threshold (p < 0.05). The result aligns with previous research, which suggests that digital leadership often requires additional supporting factors to promote innovative work behaviors (Abbas et al., 2024; Erhan et al., 2022). The negative and insignificant influences can be attributed to several factors, such as the presence of mediating variables that are stronger in influencing the relationships or the characteristics of the sample. In this model, Digital Leadership may be more effective through other variables such as motivation or problem-solving creativity to improve employee innovative behavior.

The results support the hypothesis that Digital Leadership has a positive effect on Problem-Solving Creativity, with an estimate of 0.831 and a p-value of

$p < 0.001$, indicating the influence is very significant. The variable plays an important role in encouraging employees to be more creative (Sağbaş & Erdoğan, 2022; Wulandari & Subiyanto, 2024) and creates an environment for generating new solutions (Espina-Romero et al., 2023). This leadership style creates a climate that promotes experimentation and flexibility while also enhancing creativity in addressing day-to-day work challenges (Garzón-Lasso et al., 2024).

The hypothesis that Digital Leadership has a positive effect on Intrinsic Motivation is also confirmed, with an estimate of 0.802 and a p-value of $p < 0.001$, indicating the influence is very significant. This positive influence shows that the variable can increase intrinsic motivation. Therefore, employees feel more motivated to contribute and achieve better results from within. This may be due to the characteristics of Digital Leadership that support active participation, autonomy, and employee development. Previous research shows that supportive digital leadership can increase employee autonomy and a sense of belonging (Braojos et al., 2024; Gao & Gao, 2024). Effective digital leadership provides clear strategic direction and recognizes individual contributions, thereby increasing intrinsic motivation (Malik et al., 2024).

Problem-solving creativity has no significant influence on Innovative Work Behavior, with an estimate of 1,847 and a p-value of 0.546, which is greater than the significance threshold. Previous research shows that problem-solving creativity do not necessarily encourage employees to report innovative work behaviors (Liu et al., 2023; Papachristopoulos et al., 2023). Even though creativity leads to new ideas, other barriers prevent the implementation, such as resource limitations, organizational resistance, or lack of support. The results suggest that creativity in problem-solving is insufficient in promoting innovative work behaviors without the support of other factors.

Intrinsic Motivation has a positive and significant influence on Innovative Work Behavior, with an estimate of 0.270 and a p-value of 0.009, which indicates a significant relationship. Employees who have intrinsic motivation show more innovative work behaviors (Saether, 2019; Saif et al., 2024). Intrinsic motivation drives individuals to determine new and creative methods of conducting tasks. Intrinsically motivated employees are more proactive and willing to experiment in work, which further encourages innovative work behaviors (Alshahrani et al., 2025).

The role of gender in distinguishing the results of SEM analysis provides a deeper understanding of the causal relationships on outcomes. Table 7 presents the results of SEM analysis using the data of male respondents. The result presents parameter estimates, relationship coefficients between variables, and relevant significance values to understand the interaction level of the variables in the model interacted, among male respondents. The analysis explores the unique patterns or tendencies in causality relationships that may differ from the results with female respondents.

Male respondents show that Digital Leadership has a positive and significant influence on CPS and Intrinsic Motivation, with an estimate of 0.890 and 0.770, respectively. Furthermore, Intrinsic Motivation has a positive influence on Innovative Work Behavior, with an estimated of 0.293 ($p = 0.052$). The results show that the variable slightly encouraged innovative work behaviors (Alqhaiwi et al., 2023; Alshahrani et al., 2025). CPS reports a positive and insignificant influence on Innovative Work Behaviors ($p = 0.539$). An increase in the variable does not necessarily improve innovative work behaviors (Chen & Chang, 2024; Babu et al., 2024). Digital Leadership has a negative and insignificant influence on Innovative Work Behavior, with an estimated of -2,590 ($p = 0.595$). Therefore, the variable is not directly related to Innovative Work Behavior. The importance of Digital Leadership in improving CPS and Intrinsic Motivation is reported, even though the impact on innovative work behaviors is insignificant.

Table 8 presents SEM analysis which is carried out specifically using data from female respondents. These results show parameter estimates, relationship coefficients between variables, and relevant significance values to understand the interaction of the variables among female respondents.

SEM analysis with female respondents shows that Digital Leadership has a significant influence on Creative Problem Solving, with an estimated 0.761. Therefore, the variable can effectively encourage creative problem-solving skills in respondents. Digital Leadership also has a significant influence on Intrinsic Motivation, with an estimated 0.902 and a very significant p-value.

Table 7 Regression Weights of Male

Endogenous	Regression	Exogenous	Estimate	S.E.	C.R.	P	Information
Creative Problem Solving	<---	Digital Leadership	0.890	0.087	10.271	***	Confirmed
Intrinsic Motivation	<---	Digital Leadership	0.770	0.146	5.257	***	Confirmed
Innovative Work Behavior	<---	Intrinsic Motivation	0.293	0.150	1.945	0.052	Confirmed (Weak)
Innovative Work Behavior	<---	Creative Problem Solving	3.430	5.576	0.615	0.539	Unconfirmed
Innovative Work Behavior	<---	Digital Leadership	-2.590	4.872	-0.532	0.595	Unconfirmed

P=****<0.01

Table 8 Regression Weights of Female

Endogenous	Regression	Exogenous	Estimate	S.E.	C.R.	P	Information
Creative Problem Solving	<---	Digital Leadership	0.761	0.090	8.447	***	Confirmed
Intrinsic Motivation	<---	Digital Leadership	0.902	0.167	5.401	***	Confirmed
Innovative Work Behavior	<---	Intrinsic Motivation	0.287	0.130	2.213	0.027	Confirmed
Innovative Work Behavior	<---	Creative Problem Solving	-0.661	2.135	-0.310	0.757	Unconfirmed
Innovative Work Behavior	<---	Digital Leadership	0.834	1.584	0.527	0.598	Unconfirmed

P=***<0.001

Intrinsic Motivation has a significant influence on Innovative Work Behaviors, with an estimated 0.287 and a p-value of 0.027. This variable has a real contribution to promoting innovative work behaviors. However, the effect shows negative and insignificant results, with an estimated -0.661 and a p-value of 0.757. This suggests that creative problem-solving skills may be important but do not exert a significant direct influence on innovative work behaviors. Digital leadership has been shown to improve creative problem-solving and intrinsic motivation in female respondents. These results are in line with research by Chen and Chang (2024) that digital innovation among women is strongly influenced by psychological capital factors and gender equality policies.

IV. CONCLUSIONS

In conclusion, Digital Leadership plays an important role in promoting Innovative Work Behavior indirectly through strengthening intrinsic. The research do not report any direct influence of Digital Leadership or Problem-Solving Creativity on innovative behavior. In the context of the modern world of work, innovation requires a strategy that focuses on increasing creativity and developing internal employee motivation. The gender-based analysis reveals that the influence of Digital Leadership on Intrinsic Motivation is stronger among female respondents than among male respondents. This report highlights the importance of leadership methods that are responsive to the demographic characteristics of the workforce.

The research implications broaden the theoretical foundation of mediation mechanisms in the relationship between technology-based leadership and innovative behaviors, as well as offer practical policy directions for human resource development in the education sector and other industries. In practical terms, institutions adopt a digital leadership style, integrating technology and building a work culture that strengthens intrinsic motivation. Future research recommends examining additional mediators and moderators, such as organizational innovation culture, utilizing longitudinal research designs to gain deeper insights into cause-and-effect relationships, and extending investigations across diverse sectors to enhance the generalizability and relevance of the results.

In the context of education, the results show that strengthening Digital Leadership can be a strategic priority to promote the intrinsic motivation of lecturers and education staff. Therefore, institutions create a technology-based work environment to support the psychological needs of employees. A gender-based approach is also considered in designing leadership development programs to maximize motivational impact. Moreover, universities can improve sustainable innovative work behaviors by reinforcing intrinsic motivation through adaptive digital leadership.

Author Contributions: Conceived and designed the analysis, A. P. H., D. S., and S. H.; Collected the data, A. P. H., D. S., and S. H.; Performed the analysis, A. P. H., D. S., and S. H.; Contibuted data or analysis tools, A. P. H., D. S., and S. H.; Wrote the paper, A. P. H., D. S., and S. H.; Other contribution, A. P. H., D. S., and S. H.

Data Availability Statement: Data are available from the corresponding author, A. P. H., upon reasonable request.

REFERENCES

Abbas, S. M., Latif, M., & Sarwar, F. (2024). Digital leadership and innovative work behavior in IT sector: The mediating role of digital entrepreneurial orientation and digital organizational culture. *Employee Responsibilities and Rights Journal.* https://doi.org/10.1007/s10672-024-09503-7

AlAjmi, M. K. (2022). The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait. *International Journal of Educational Research, 112*, 101928. https://doi.org/10.1016/j.ijer.2022.101928

Alakaş, E. Ö. (2024). Digital transformational leadership and organizational agility in digital transformation: Structural equation modeling of the moderating effects of digital culture and digital strategy. *The Journal of High Technology Management*

Research, 35(2), 100517. https://doi.org/10.1016/j.hitech.2024.100517.

Almadana, A. V., Suharnomo, S., & Perdhana, M. S. (2022). Can generational differences and feelings of trust improve knowledge-sharing behavior? Consequences of high-performance work systems. *Journal of Workplace Learning, 34*(2), 200-214. https://doi.org/10.1108/JWL-05-2021-0058.

Alqhaiwi, Z. O., Koburtay, T., & Karatepe, O. M. (2023). Linking person-job fit and intrinsic motivation to salespeople's service innovative behavior. *Journal of Services Marketing, 37*(9), 1186-1200. https://doi.org/10.1108/JSM-04-2023-0154.

Alshahrani, M. A., Yaqub, M. Z., Ali, M., El Hakimi, I., & Salam, M. A. (2025). Could entrepreneurial leadership promote employees' IWB? The roles of intrinsic motivation, creative self-efficacy, and firms' innovation climate. *International Journal of Innovation Science.* https://doi.org/10.1108/IJIS-08-2024-0211

Alt, D., Kapshuk, Y., & Dekel, H. (2023). Promoting perceived creativity and innovative behavior: Benefits of future problem-solving programs for higher education students. *Thinking Skills and Creativity, 47*, 101201. https://doi.org/10.1016/j.tsc.2022.101201.

Ankli, R. E., & Palliam, R. (2012). Enabling a motivated workforce: Exploring the sources of motivation. *Development and Learning in Organizations, 26*(2), 7-10. https://doi.org/10.1108/14777281211201169.

Anwar, S., & Saraih, U. N. (2024). Digital leadership in the digital era of education: Enhancing knowledge sharing and emotional intelligence. *International Journal of Educational Management, 38*(6), 1581-1611. https://doi.org/10.1108/IJEM-11-2023-0540.

Babu, M. D., Prasad, K. B., & Prasad, U. T. (2024). Impact of ambidextrous leadership on innovative work behavior and employee performance in the IT sector. *Heliyon, 10*(13). https://doi.org/10.1016/j.heliyon.2024.e33124.

Bansal, A., Panchal, T., Jabeen, F., Mangla, S. K., & Singh, G. (2023). A study of human resource digital transformation (HRDT): A phenomenon of innovation capability led by digital and individual factors. *Journal of Business Research, 157*, 113611. https://doi.org/10.1016/j.jbusres.2022.113611.

Bauwens, R., & Cortellazzo, L. (2024). The different faces of e-leadership: Six perspectives on leading in the era of digital technologies. *Human Resource Management Review, 35*(1). https://doi.org/10.1016/j.hrmr.2024.101058.

Benitez, J., Arenas, A., Castillo, A., & Esteves, J. (2022). Impact of digital leadership capability on innovation performance: The role of platform digitization capability. *Information & Management, 59*(2), 103590. https://doi.org/10.1016/j.im.2022.103590.

Bertão, R. A., Jung, C. H., Chung, J., & Joo, J. (2023). Design thinking: A customized blueprint to train R & D personnel in creative problem-solving. *Thinking Skills and Creativity, 48*, 101253. https://doi.org/10.1016/j.tsc.2023.101253.

Bogilović, S., Bortoluzzi, G., Černe, M., Ghasemzadeh, K., & Žnidaršič, J. (2021). Diversity, climate, and innovative work behavior. *European Journal of Innovation Management, 24*(5), 1502-1524. https://doi.org/10.1108/EJIM-03-2020-0100.

Bos-Nehles, A., Renkema, M., & Janssen, M. (2017). HRM and innovative work behavior: a systematic literature review. *Personnel Review, 46*(7), 1228-1253. https://doi.org/10.1108/PR-09-2016-0257.

Braojos, J., Weritz, P., & Matute, J. (2024). Empowering organizational commitment through digital transformation capabilities: The role of digital leadership and a continuous learning environment. *Information Systems Journal, 34*(5), 1466-14927. https://doi.org/10.1111/isj.12501.

Chen, P., & Chang, Y.-C. (2024). Incorporating creative problem-solving skills to foster sustainability among graduate students in education management. *Cleaner Production Letters, 7*, 100082. https://doi.org/10.1016/j.clpl.2024.100082.

Contreras, F., Jauregui, K., & Rank, S. (2024). The intellectual structure of human resource management and digitalization research: A bibliometric-mapping analysis. *Journal of Engineering and Technology Management, 73*, 101829. https://doi.org/10.1016/j.jengtecman.2024.101829.

Desmet, O. A., & Sternberg, R. J. (2024). Innovative teaching strategies for fostering transformational creativity. *Thinking Skills and Creativity, 52*, 101543. https://doi.org/10.1016/j.tsc.2024.101543.

Dwivedi, Y. K., Hughes, L., Kar, A. K., Baabdullah, A. M., Grover, P., Abbas, R., Andreini, D., Abumoghli, I., Barlette, Y., Bunker, D., Chandra Kruse, L., Constantiou, I., Davison, R. M., De', R., Dubey, R., Fenby-Taylor, H., Gupta, B., He, W., Kodama, M., … Wade, M. (2022). Climate change and COP26: Are digital technologies and information management part of the problem or the solution? An editorial reflection and call to action. *International Journal of Information Management, 63*, 102456. https://doi.org/10.1016/j.ijinfomgt.2021.102456.

El-Kassar, A.-N., Dagher, G. K., Lythreatis, S., & Azakir, M. (2022). Antecedents and consequences of knowledge hiding: The roles of HR practices, organizational support for creativity, creativity, innovative work behavior, and task performance. *Journal of Business Research, 140*, 1-10. https://doi.org/10.1016/j.jbusres.2021.11.079.

Erhan, T., Uzunbacak, H. H., & Aydin, E. (2022). From conventional to digital leadership: Exploring digitalization of leadership and innovative work behavior. *Management Research Review, 45*(11), 1524-1543. https://doi.org/10.1108/MRR-05-2021-0338.

Espina-Romero, L., Noroño Sánchez, J., Rojas-Cangahuala, G., Garay, J., Ríos-Parra, D., & Corredoira, J. (2023). Digital Leadership in an Ever-Changing World: A Bibliometric Analysis of Trends and

Challenges. *Sustainability, 15*(17), 13129. https://doi.org/10.3390/su151713129.

Gao, M., Kanwal, S., & Khawar, A. (2024). Catalysts of digital excellence: Unraveling the threads of connectivity, embedment, and visibility in enterprise social media for enhanced task and innovative performances. *Acta Psychologica, 248*, 104396. https://doi.org/10.1016/j.actpsy.2024.104396.

Gao, P., & Gao, Y. (2024). How does digital leadership foster employee innovative behavior: A cognitive–affective processing system perspective. *Behavioral Sciences, 14*(5), 362. https://doi.org/10.3390/bs14050362.

Garzón-Lasso, F., Serrano-malebrán, J., Arenas-arango, S., Molina, C., & Serrano-malebrán, J. (2024). Full range leadership style and its effect on effectiveness, employee satisfaction, and extra effort : An empirical study. *Frontiers in Psychology, 15*. https://doi.org/10.3389/fpsyg.2024.1380935.

Gozali, I., & Latan, H. (2015). *Partial Least Squares: Konsep, teknik, dan aplikasi menggunakan program SmartPLS3.0*. Badan Penerbit UNDIP.

Gulzar, M., Smolander, K., Ali, A., & Naqvi, B. (2024). Motivational factors and Challenges in the adoption of latest digital technology in educational institutes: A thematic analysis. *Procedia Computer Science, 239,* 1670-1677. https://doi.org/10.1016/j.procs.2024.06.344.

Havidz, H. B. H., & Gupron, G. (2019). Determination of employee performance: Perceived organizational support, communication, and leadership styles (A human resource management literature study). *Dinasti International Journal of Digital Business Management, 1*(1), 116-131.

Kane, G., Phillips, A., Copulsky, J., & Andrus, G. (2019). *The technology fallacy: How people are the real key to digital transformation.* MIT Press. https://doi.org/10.7551/mitpress/11661.001.0001

Koburtay, T., Syed, J., & Haloub, R. (2019). Congruity between the female gender role and the leader role: A literature review. *European Business Review, 31*(6), 831-848. https://doi.org/10.1108/EBR-05-2018-0095.

Layyinah, A. G., & Subiyanto, D. (2022). The influence of training roles, self-efficacy, and creative problem-solving on improving employee performance. *Journal of Management and Islamic Finance, 2*(1), 12-24. https://doi.org/10.22515/jmif.v2i1.4346.

Lechermeier, J., Fassnacht, M., & Wagner, T. (2020). Testing the influence of real-time performance feedback on employees in digital services. *Journal of Service Management, 31*(3), 345-371. https://doi.org/10.1108/JOSM-10-2018-0341.

Li, M., & Xiao, W. (2023). Research on the effect of e-leadership on employee innovation behavior in the context of "self" and "relationship." *Journal of Organizational and End User Computing (JOEUC), 35*(1), 1-20. https://doi.org/10.4018/JOEUC.317090.

Liao, H-T., Pan, C.-L., & Wu, Z. (2024). Digital Transformation and innovation and business ecosystems: A bibliometric analysis for conceptual insights and collaborative practices for ecosystem innovation. *International Journal of Innovation Studies, 8*(4), 406-431. https://doi.org/10.1016/j.ijis.2024.04.003.

Lin, Q. (2024). Digital leadership: A systematic literature review and future research agenda. *European Journal of Innovation Management*. https://doi.org/10.1108/EJIM-07-2023-0522.

Liu, X., Huang, Y., Kim, J., & Na, S. (2023). How ethical leadership cultivates innovative work behaviors in employees? Psychological safety, work engagement, and openness to experience. *Sustainability, 15*(4). https://doi.org/10.3390/su15043452

Lubis, A. S., Lumbanraja, P., Absah, Y., & Silalahi, A. S. (2022). Human resource competency 4.0 and its impact on Bank Indonesia employees' readiness for transformational change. *Journal of Organizational Change Management, 35*(4/5), 749-779. https://doi.org/10.1108/JOCM-02-2021-0045.

Lusiani, M., Abidin, Z., Fitrianingsih, D., Yusnita, E., Adiwinata, D., Rachmaniah, D., Mukhlasin, Fauzi, A., & Purwanto, A. (2020). Effect of servant, digital and green leadership toward business performance: Evidence from Indonesian manufacturing. *Systematic Reviews in Pharmacy, 11*(11), 1351-1361.

Lynn Pulley, M., & Sessa, V. I. (2001). E-leadership: Tackling complex challenges. *Industrial and Commercial Training, 33*(6), 225-230. https://doi.org/10.1108/00197850110405379.

Maisyaroh, M., Juharyanto, J., Wiyono, B. B., Nawi, A. M., Adha, M. A., & Lesmana, I. (2024). Unveiling the nexus of leadership, culture, learning independence, passion trend-based learning, and teacher creativity in shaping digital student skills. *Social Sciences & Humanities Open, 9,* 100884. https://doi.org/10.1016/j.ssaho.2024.100884.

Maj, J. (2023). Organizational culture and leadership as facilitators of creativity and innovation: Insights from the ICT sector in Poland in a post-COVID-19 reality. *Journal of Economics and Management, 45*(1), 182-215. https://doi.org/10.22367/jem.2023.45.09.

Malewska, K., Cyfert, S., Chwiłkowska-Kubala, A., Mierzejewska, K., & Szumowski, W. (2024). The missing link between digital transformation and business model innovation in energy SMEs: The role of digital organizational culture. *Energy Policy, 192,* 114254. https://doi.org/10.1016/j.enpol.2024.114254.

Malik, M., Raziq, M. M., Sarwar, N., & Tariq, A. (2025). Digital leadership, business model innovation, and organizational change: Role of leader in steering digital transformation. *Benchmarking: An International Journal, 32*(5), 1632-1662. https://doi.org/10.1108/BIJ-04-2023-0283.

Marcel, Gaol, F. L., Supangkat, S. H., & Ranti, B. (2024). Toward digital transformation adoption: A conceptual framework from transformational leadership perspective. *Procedia Computer*

Science, 234, 1175-1182. https://doi.org/10.1016/j.procs.2024.03.113.

Memon, K. R., & Ooi, S. K. (2023). Identifying digital leadership's role in fostering competitive advantage through responsible innovation: A SEM-Neural network approach. *Technology in Society, 75*, 102399. https://doi.org/10.1016/j.techsoc.2023.102399.

Mihardjo, L. W. W., Sasmoko, S., Alamsjah, F., & Elidjen, E. (2019). Digital leadership impacts on developing dynamic capability and strategic alliance based on market orientation. *Polish Journal of Management Studies, 19*(2), 285-297. https://doi.org/10.17512/pjms.2019.19.2.24.

Minh-Duc, L., & Huu-Lam, N. (2019). Transformational leadership, customer citizenship behavior, employee intrinsic motivation, and employee creativity. *Journal of Asian Business and Economic Studies, 26*(2), 286-300. https://doi.org/10.1108/JABES-10-2018-0070.

Mittone, L., Morreale, A., & Vu, T.-T.-T. (2022). What drives innovative behavior?- An experimental analysis of risk attitudes, creativity, and performance. *Journal of Behavioral and Experimental Economics, 98*, 101868. https://doi.org/10.1016/j.socec.2022.101868.

Mo, Z., Liu, Y., Lu, C., & Yu, J. (2023). Influences of industrial internet platform firms' ESG performance and digital leadership on user firms' innovation performance: The mediating role of inter-firm trust. *Journal of Digital Economy, 2*, 204-220. https://doi.org/10.1016/j.jdec.2024.01.002.

Papachristopoulos, K., Dubord, M.-A. G., Jauvin, F., Forest, J., & Coulombe, P. (2023). Positive impact, creativity, and innovative behavior at work: The mediating role of basic needs satisfaction. *Behavioral Sciences, 13*(12), 984. https://doi.org/10.3390/bs13120984.

Park, R. (2023). What if employees with intrinsic work values are given autonomy in worker co-operatives? Integration of the job demands-resources model and supplies–values fit theory. *Personnel Review, 52*(3), 724-744. https://doi.org/10.1108/PR-05-2021-0362.

Ridwan, M., Fiodian, V. Y., Religia, Y., & Hardiana, S. R. (2024). Investigating the effect of intrinsic and extrinsic motivation in shaping digital entrepreneurial intention: The mediating role of self-efficacy. *Asia Pacific Journal of Innovation and Entrepreneurship.* https://doi.org/10.1108/APJIE-02-2024-0036.

Saether, E. A. (2019). Motivational antecedents to high-tech R&D employees' innovative work behavior: Self-determined motivation, person-organization fit, organization support of creativity, and pay justice. *The Journal of High Technology Management Research, 30*(2), 100350. https://doi.org/10.1016/j.hitech.2019.100350.

Sağbaş, M., & Erdoğan, F. A. (2022). Digital leadership: A systematic conceptual literature review. *İstanbul Kent Üniversitesi İnsan Ve Toplum Bilimleri Dergisi, 3*(1), 17-35.

Saif, N., Amelia, Goh, G. G. G., Rubin, A., Shaheen, I., & Murtaza, M. (2024). Influence of transformational leadership on innovative work behavior and task performance of individuals: The mediating role of knowledge sharing. *Heliyon, 10*(11). https://doi.org/10.1016/j.heliyon.2024.e32280.

Sandra, D. (2021). Using digital technology to evaluate heart coherence in craniosacral therapy as an indicator of spiritual leadership. *European Journal of Integrative Medicine, 44,* 101329. https://doi.org/10.1016/j.eujim.2021.101329.

Schiuma, G., Schettini, E., Santarsiero, F., & Carlucci, D. (2022). The transformative leadership compass: Six competencies for digital transformation entrepreneurship. *International Journal of Entrepreneurial Behavior & Research, 28*(5), 1273-1291. https://doi.org/10.1108/IJEBR-01-2021-0087.

Senadjki, A., Au Yong, H. N., Ganapathy, T., & Ogbeibu, S. (2024). Unlocking the potential: The impact of digital leadership on firms' performance through digital transformation. *Journal of Business and Socio-Economic Development, 4*(2), 161-177. https://doi.org/10.1108/jbsed-06-2023-0050.

Shubina, I., & Kulakli, A. (2019). Critical thinking, creativity and gender differences for knowledge generation in education. *Literacy Information and Computer Education Journal (LICEJ), 10*(1), 3086-3093. https://doi.org/10.20533/licej.2040.2589.2019.0405

Singh, A., & Hess, T. (2020). How chief digital officers promote the digital transformation of their companies. In R. D. Galliers, D. E. Leidner, & B. Simeonova (Eds.), *Strategic information management: Theory and practice* (pp. 202-220). Routledge. https://doi.org/10.4324/9780429286797-9

Sode, R., & Chenji, K. (2024). The mediating role of workplace spirituality: Exploring the relationship between, self-transcendence, spiritual transcendence, and innovative work behavior. *Acta Psychologica, 245*, 104228. https://doi.org/10.1016/j.actpsy.2024.104228.

Stofberg, L., Strasheim, A., & Koekemoer, E. (2021). Digitalization in the workplace: The role of technology on employee engagement and creativity teams. In N. Ferreira, I. L. Potgieter, & M. Coetzee (Eds.), *Agile coping in the digital workplace: Emerging issues for research and practice* (pp. 231-x257). Springer International Publishing. https://doi.org/10.1007/978-3-030-70228-1_12.

Tian, H., Han, J., Sun, M., & Lv, X. (2025). Keeping pace with the times: Research on the impact of digital leadership on radical green innovation of manufacturing enterprises. *European Journal of Innovation Management, 28*(3), 900-927. https://doi.org/10.1108/EJIM-11-2022-0647.

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business*

Research, 122, 889-901. https://doi.org/10.1016/j.jbusres.2019.09.022.

Wang, G., Mansor, Z. D., & Leong, Y. C. (2024). Linking digital leadership and employee digital performance in SMEs in China: The chain-mediating role of high-involvement human resource management practice and employee dynamic capability. *Heliyon, 10*(16), e36026. https://doi.org/10.1016/j.heliyon.2024.e36026.

Wulandari, F., & Subiyanto, D. (2024). The role of transformational leadership in critical situations: Problem-solving performance in public service as the outcome. *Quality - Access to Success, 25*(200), 179-187. https://doi.org/10.47750/QAS/25.200.19.

Yalçın, V., & Erden, Ş. (2021). The effect of STEM activities prepared according to the design thinking model on preschool children's creativity and problem-solving skills. *Thinking Skills and Creativity, 41*, 100864. https://doi.org/10.1016/j.tsc.2021.100864.