

The Role Of Transformational Leadership In Improving Innovative Work Behavior And Employee Performance With Digital Literacy As A Moderation Variable

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Abstract

This research aims to determine the role of transformational leadership in improving innovative work behavior and employee performance with Digital Literacy as a moderating variable. Carried out using a quantitative method approach, the research population included all lecturers at Muhammadiyah University of Palopo. With a sample of 150 respondents selected using a purposive sampling approach. To test the hypothesis, the research used the Structural Equation Model (SEM) technique using the Partial Least Square (PLS-SEM) approach with the help of the Smart PLS 4 application. The results of the research show that transformational leadership has a positive and significant influence on innovative work behavior, as well as on employee performance. Apart from that, innovative work behavior also has a positive effect on employee performance, and digital literacy significantly moderates the relationship between innovative work behavior and employee performance.

Keywords: Transformational leadership; Innovative Work Behavior; Employee performance; Digital literacy

1. Introduction

In the rapidly developing digital era, businesses and organizations must adapt to new challenges posed by globalization and rapid change. The role of transformational leadership in increasing innovative work behavior and employee performance has become a very relevant research subject. According to [1]. Transformational leadership is an important factor in improving employee performance because the role of a leader in an organization is an important thing to encourage employees to be able to work effectively. In an increasingly competitive and rapidly changing business environment, organizations need to understand that transformational leadership has a significant impact on their success.

The success of an organization depends on the leadership within it. According to [2] leaders must adopt an effective and responsive leadership style in a dynamic work environment. Transformational leadership is considered a key factor that can influence innovative behavior and employee performance. Transformational leadership is a leadership concept that is able to explore employee potential with the aim of improving their performance. This includes managers' ability to create a culture of innovation, direct organizational change, and encourage employees to think creatively, generate innovative ideas, and actively participate in the change process [3]. In the context of an ever-changing business environment, transformational leadership is becoming increasingly important to guide organizations to success.

Innovative work behavior is also a key factor in facing increasingly fierce competition. Successful organizations must encourage employees to develop innovative ideas and integrate innovation into daily activities at work. Innovative work behavior includes utilizing ideas, supporting ideas within the organization, and implementing ideas [4]. Therefore, employees need to strengthen their innovative work practices in order to make a substantial contribution to supporting the organization in competing effectively in the global market. It can be said that employees play an important role in carrying out all company/organization activities so that they can grow and develop to maintain the survival of the company/organization.

In the digital era, digital literacy also plays an important role as the main foundation for individuals in facing technological dynamics. According to Potter in [5] Digital literacy includes an individual's ability to use digital technology and digital communication tools to obtain, manage, integrate, analyze and evaluate information. In the midst of the importance of digital literacy in the world of work, organizations and individuals need to have a deep understanding, as well as maximum development and utilization efforts [6]. Therefore, digital literacy allows individuals to expand their knowledge, communicate effectively in an increasingly connected world and helps them understand existing technologies. Therefore, digital literacy is considered a moderating variable that can moderate the relationship between innovative work behavior and employee performance.

This research will explore the important role played by transformational leadership in increasing innovative work behavior and improving employee performance in various organizational contexts. This research will specifically examine how digital literacy, as a moderating variable, influences the dynamics of the interaction between innovative work behavior and employee performance. Through this approach, it is hoped that this research can provide in-depth insight into how transformational leaders can utilize digital literacy as a tool to encourage innovation and sustainable performance within organizations.

Several findings from previous research have provided important information that transformational leadership is a key component that can influence innovative work behavior, employee performance, and literacy [7]. However, several previous findings provide different results or there are still gaps in research findings. There are inconsistencies in the results of research on the influence of transformational leadership style on innovative work behavior while Son suggests that transformational leadership and digital literacy have no effect on employee performance. Furthermore, according to [8] digital literacy has not played a good role in improving employee performance. And [9] emphasized that poor digital literacy can have a negative impact on employees' innovative work behavior.

This research makes a connection between transformational leadership and employee performance which has not been done by [10]. According to [11] The more intense the implementation of transformational leadership, the more impact it will have on employee performance. Therefore, to provide further insight into this area of research, this study aims to examine the role of transformational leadership in encouraging innovative behavior and improving employee performance with digital literacy as a moderating factor.

2. Methodology

This research uses quantitative methods and the population in this research are lecturers at Muhammadiyah University of Palopo. Population is the totality of objects or subjects contained in an area that must fulfill predetermined requirements related to the research problem, then conclusions are drawn from all individuals within the scope of the research. Sampling in this research used a purposive sampling method. In determining the sample size, the minimum sample size was determined, namely 10 times the number of measurement items determined in Ansori's (2015) research. In this study, 15 measurement indicators were used, so that the minimum sample obtained was $(10 \times 15 = 150)$. Thus, the minimum number of samples required in this research is 150 samples. And the total number of questionnaires returned in this study amounted to 150 samples, so the number of samples met the requirements and was above the minimum sample size limit.

This research adopts measurement items from previous empirical research. To collect data, the research used an online questionnaire which was distributed to respondents via social media. Fifteen measurement items related to Transformational leadership, innovative work behavior, employee performance, digital literacy, using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Hypothesis testing was carried out using Partial Least Squares (PLS-SEM), a Structural Equation Modeling (SEM) technique, using SMART PLS as a software package. This method was chosen because it is more suitable for developing complex theories and models (Hamid et al., 2017). This method is widely used in management research, and is effective in analyzing causal relationships between latent concepts based on empirical data. Operational definitions and measurement indicators of research constructs are presented in table 1.

Table of variables and indicators

Table 1. Table of indicators and definitions

Variable	Definition	Indicator	Source
Transformational leadership	A leadership style in which a leader seeks to inspire, motivate, and move his subordinates or team members to achieve higher goals and develop themselves personally and professionally	<ol style="list-style-type: none"> 1. Charisma 2. Inspiration 3. Intellectual Stimulation 4. Individual Attention 	[12]
Innovative work behavior	Innovative work behavior is the way individuals interact in the work environment that encourages new ideas, creativity, and	<ol style="list-style-type: none"> 1. Explore ideas 2. Developing ideas 3. Seek Support for ideas 4. Implement ideas 	[13]

Employee performance	the development of new solutions Employee performance is a measure of the extent to which individuals meet the goals and standards set by the organization.	<ol style="list-style-type: none"> 1. Work behavior 2. Work result 3. Work efficiency 	[14]
Digital literacy	Digital literacy is a person's ability to use digital technology, information and media effectively	<ol style="list-style-type: none"> 1. Operational skills 2. Information search 3. digital communication 4. Digital content creation 	[15]

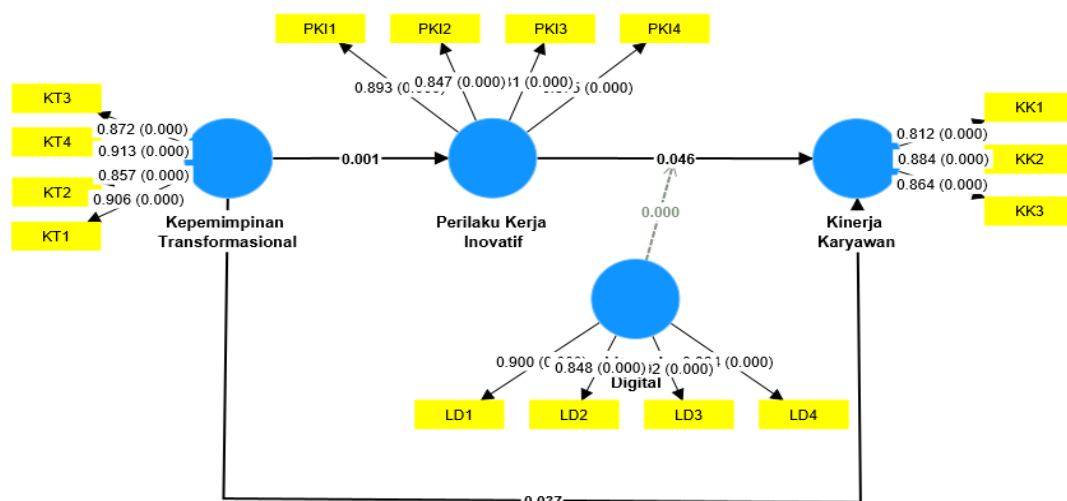
3. Results and Discussion

3.1. Results

3.1.1. Validity test

Convergent validity is related to the principle that the measure (manifest variable) of a construct must have a high correlation. Convergent validity was tested by examining the factor loading values and comparing them with the rule of thumb (>0.60). In addition, the average variance extracted (AVE) value is also considered, and it should exceed the rule of thumb (> 0.50). The validity test used to assess the level of validity of the SEM model in this research is convergent validity. There are two ways to determine the validity of the PLS-SEM model using convergent validity techniques, namely looking at the outer loading (factor loading) value and the average variance extracted (AVE) value.

Outer Loading



Pictures 1. Pictures outer loading

Table 2. Outer loading table

	Transformational leadership	Employee performance	Digital Literacy	Innovative Work Behavior
KK1		0,812		
KK2		0,884		
KK3		0,864		
KT1	0,906			
KT2	0,857			
KT3	0,872			
KT4	0,913			
LD1			0,900	
LD2			0,848	
LD3			0,892	
LD4			0,864	
PKI1				0,893
PKI2				0,847
PKI3				0,831
PKI4				0,875

Based on the output of factor loading values for the Transformational Leadership variable with 4 measurement indicators, namely $KT1 = 0.906$; $KT2 = 0.857$; $KT3 = 0.872$; $KT4 = 0.913$. Then the Innovative Work Behavior variable with 4 measurement indicators, namely $PKI1 = 0.893$; $PKI2 = 0.847$; $PKI3 = 0.831$; $PKI4 = 0.875$. Next is the Employee Performance variable with 3 measurement indicators, namely $KK1 = 0.812$; $KK2 = 0.884$; $KK3 = 0.864$. Next, the Digital Literacy variable with 4 measurement indicators, namely $LD1 = 0.900$; $LD2 = 0.848$; $LD3 = 0.892$; $LD4 = 0.864$. Based on the loading factor value of the variables Transformational Leadership, Innovative Work Behavior, Employee Performance, Digital Literacy, the value is above 0.60. Thus, the indicators forming the construct of Transformational Leadership, Innovative Work Behavior, Employee Performance, Digital Literacy are categorized as valid.

Average Variance Extracted (AVE)

Table 3. AVE table

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Transformasional Leadership	0,910	0,923	0,937	0,787
Employee performance	0,814	0,819	0,890	0,729
Digital literacy	0,899	0,901	0,830	0,768
Innovative work behavior	0,885	0,898	0,920	0,743

From the table above, it can be concluded that the AVE value for each construct, namely Transformational Leadership = 0.787, Innovative Work Behavior = 0.743, Employee Performance = 0.729 and Digital Literacy = 0.768, the four constructs already have a value of more than 0.50, meaning that the four constructs is declared valid.

3.1.2. Reliability test

Reliability is a measure of an indicator's consistency in measuring its variables. The values used to determine the level of reliability of the SEM model are Composite reliability and Cronbach Alpha. This type of reliability functions to determine the level of internal reliability of variable indicators.

Composite Reability

Table 4. Composite Rabilitiy Table

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Transformasional Leadership	0,910	0,923	0,937	0,787
Employee performance	0,814	0,819	0,890	0,729
Digital literacy	0,899	0,901	0,830	0,768
Innovative work behavior	0,885	0,898	0,920	0,743

The composite reliability output results for the Transformational Leadership construct = 0.937, Innovative Work Behavior = 0.920, Employee Performance = 0.890. And Digital Literacy = 0.930 So, Transformational Leadership, Innovative Work Behavior, Employee Performance, Digital Literacy already have good reliability or are categorized as reliable.

Cronbach's alpha

The results of the Cronbach's alpha value can be seen in the table below

Table 5. Cronbach's Alpha Table

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Transformasional Leadership	0,910	0,923	0,937	0,787
Employee performance	0,814	0,819	0,890	0,729
Digital literacy	0,899	0,901	0,830	0,768
Innovative work behavior	0,885	0,898	0,920	0,743

Judging from the table above, it shows that the value of Transformational Leadership = 0.910, Innovative Work Behavior = 0.885, Employee Performance = 0.814 and Digital Literacy =

0.899. Because each of the values above has exceeded 0.70, it can be said that the values above have met Crondbasch's alpha requirements.

3.1.3. Inner Model Evaluation

R Square Value

R squared is a value that shows how much influence the combined independent variables have on the dependent variable, with a number range between 0 to 1, describing the extent to which the independent variables together influence the value of the dependent variable in a statistical model.

Table 6. R square tables

	R-square	R-square adjusted
Innovative work behavior	0.229	0.224
Employee performance	0.671	0.662

Based on the output of the analysis using the bootstrapping method, an R-square value for the Innovative Work Behavior variable was 0.229 and the Employee Performance variable was 0.671. The conclusion is that the R square value for the Innovative Work Behavior variable is 0.229, which means that Innovative Work Behavior can be explained from Transformational Leadership at 22%, which is in the weak category, then the r square value for the Employee Performance variable is 0.671, which means that the Innovative Work Behavior variable can be explained. of the Transformational Leadership variable, 67% is included in the moderate category.

Patch Coefficient

The path coefficient is an important number that shows the direction and strength of the relationship between variables in a study. The range of path coefficient values is from -1 to 1. When the value is between 0 to 1, it indicates a positive relationship between the variables, while when the value is between -1 to 0, it indicates a negative relationship between the variables.

Table 7. Coefficient Patch Table

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values
Transformational Leadership -> Employee Performance	0,061	0,166	0,077	2,087	0,037
Transformational Leadership -> Innovative Work Behavior	0,479	0,454	0,146	3,288	0,001
Innovative Work Behavior -> Employee Performance	0,135	0,128	0,068	1,996	0,046
Digital Literacy x Innovative Work Behavior -> Employee Performance	0,189	0,183	0,049	3,857	0,000

Based on the output results, it can be concluded that Transformational Leadership has a positive and significant influence on employee performance as shown by the parameter coefficient value of 0.061. The significant value is 0.037, which is smaller than the alpha level of 5%. This is shown by the statistical T value of 2.087 which is greater than 1.989 (t table). Then, transformational leadership has a positive and significant effect on innovative work behavior as shown by the parameter coefficient value of 0.479. The significant value is 0.001, which is smaller than the alpha level of 5%. This is shown by the T statistical value of 3.288 which is greater than 1.989 (t table). Furthermore, innovative work behavior turns out to have a significant positive effect on employee performance as shown by a parameter coefficient value of 0.135. The significant value is 0.046, which is smaller than the 5% alpha level. This can be shown by the statistical T value of 1.996 which is greater than 1.989 (t table). Furthermore, digital literacy has a positive and significant effect on innovative work behavior with employee performance as shown by a parameter coefficient value of 0.189. The significant value is 0.000, which is smaller than the alpha level of 5%. This is shown by the T statistical value of 3.857 which is greater than 1.989 (t table). This means that the digital literacy variable acts as either a variable or a moderating effect between the variable innovative work behavior and employee performance.

3.2. Discussion

3.2.1 The Influence of Transformational Leadership on Innovative Work Behavior

Transformational Leadership is an important element in increasing employees' innovative work behavior. In this context, transformational leadership can create significant change through developing employee potential, supporting innovation, and creating an adaptable and responsive organizational culture. The transformational leadership variable with various indicators including Charisma, Inspiration, Intellectual Stimulation, Individual Attention, turns out to be able to play a good role in increasing the innovative work behavior of employees at Palopo Muhammadiyah University. This means that the Transformational Leadership variable has a positive and significant influence on Innovative Work Behavior so it can be stated that the first hypothesis is accepted. This is in line with previous research, namely research [16] suggests that Transformative Leadership has a significant influence on Innovative Work behavior variables and also on research [12] stated the same thing that Transformational Leadership has a significant influence on the Innovative Work behavior variable.

3.2.2 The influence of transformational leadership on employee performance

From the results of this analysis, it means that the Transformational Leadership variable has a positive and significant influence on employee performance. The transformational leadership variable with indicators of charisma, inspiration, intellectual stimulation, individual attention was able to contribute and have a good influence on employee performance variables. This is in line with previous research, namely in research [17] suggests that Transformational Leadership has a significant influence on performance variables and Transformational Leadership is one of the most important things in supporting employee performance capacity. So it can be stated that the second hypothesis is accepted.

3.2.3 The Effect of Innovative Work Behavior on Employee Performance

Innovative work behavior plays a key role in improving employee performance. High employee performance is the main goal of every company, and innovative work behavior has been identified as one of the factors that drives the achievement of better performance. This means that the Innovative Work Behavior variable has a positive and significant influence on employee performance so that it can be stated that the third hypothesis is accepted. This research is in line with previous research, namely research [18] suggests that innovative work behavior has a significant effect on employee performance.

3.2.4 The influence of digital literacy on innovative work behavior and employee performance

In this research, it was found that digital literacy has a significant impact on innovative work behavior and employee performance. This shows that, digital literacy plays an important role in work situations, in this particular variable this variable has a strong influence on improving employee performance in the organization. This means that there is a positive and significant influence between the digital literacy variable on innovative work behavior and employee performance so that it can be stated that the fourth hypothesis is accepted. This research agrees with previous researchers, namely in research [19] which suggests that digital literacy has a significant influence on innovative work behavior and employee performance.

4. Conclusion

This study expands the limited research on how Transformational Leadership can support innovative work behavior to achieve better performance in the workplace. From the results of the research that has been conducted, it can be stated that the significant role of Transformational leadership for employees in organizations lies in its ability to improve employee performance through the use of technology and a leadership style that combines innovation, skill development and adaptation to change. This empirically opens up great opportunities for organizational growth in the current digital era. Research also confirms that implementing intelligent transformational leadership strategies and awareness of digital literacy are the keys to maximizing the potential for innovation and performance in the modern workplace. Analysis carried out on the path coefficient table (table 7) reveals that all variables have a significant influence. Thus, the results of this research empirically support Transformational Leadership in the digital era, in line with the acceptance of the hypothesis in this research.

Apart from that, there are several limitations in our research, namely the first is that the sample used was only around 150 samples and this is still relatively small, whereas the standard sample used in the structural equation model is around 200 to 300 samples. So it is recommended for further research to add more representative samples according to the numbers above. Second, our research only focused on one area, namely Muhammadiyah University of Palopo, so the generalization of the findings is limited. Therefore, to produce a more comprehensive understanding and broad comparison, it is recommended that further research involve several universities in the city of Palopo. And it is hoped that future research will add other variables that might also influence many things in this research.

5. Acknowledgment

In closing this research, we would like to express our deepest gratitude to all parties who have contributed to research on the Role of Transformational Leadership in Improving Innovative Work Behavior and Employee Performance with Digital Literacy as a moderating variable. We also thank the respondents who took the time to participate in this research and share their insights. We also express our highest appreciation to the stakeholders who have provided the support and information necessary for the smooth running of this research. Thank you also to family and friends who always provided moral support and encouragement during this research journey. Finally, this research would not have been possible without guidance, encouragement and support from all parties.

1. Prof. Dr. H. Suhardi M Anwar, Drs., M.M., CIQaR as Chancellor of Palopo Muhammadiyah University
2. Dr. Antong, S.E., M.Si. as Dean of the Faculty of Economics and Business, Muhammadiyah University of Palopo.
3. Jumawan Jasman, S.E., M.M. as Head of the Management Study Program, Muhammadiyah University of Palopo
4. Rahmad Solling Hamid, S.E., M.M. as supervisor 1
5. Dr. Goso, S.E., M.M. as supervisor 2

Thank you to all parties involved for their guidance and support throughout this endeavor.

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