

The Effect of Education and Training (Diklat) and Self-efficacy on Employee Work Productivity With Work Engagement as A Mediating Variable at PT XYZ

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ABSTRACT

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Employee work productivity is an important indicator in assessing organizational success, as it reflects the ability to generate outputs effectively and efficiently. In the face of changing dynamics, employee work productivity is influenced by various factors, such as education and training (diklat), self-efficacy, and work engagement. This study aims to analyze the effect of education and training (diklat) and self-efficacy on employee productivity, both directly and indirectly through work engagement as a mediating variable. The research was conducted on employees of PT XYZ, an oil and gas company, using a quantitative approach with a survey method. Data were collected through questionnaires and analyzed using SEM-PLS with SmartPLS. The results show that education and training (diklat) and self-efficacy has a positive effect on both employee work productivity and work engagement. In addition, work engagement has a positive effect on employee work productivity and mediates these relationships. These findings indicate that productivity improvement is influenced not only by competence but also by employee level of engagement in their work.

INTRODUCTION

Human resources (HR) are strategic factors that determine organizational success in facing the dynamics of globalization and the Industrial Revolution 4.0. Changes in technology, work systems, and increasing global competition require companies to have human resources that are adaptive and capable of contributing optimally to the achievement of organizational goals. Human resources are the central factor and the most important asset in an organization, as they play a key role in all organizational activities, both as operators, maintainers, producers, and designers within work systems (Yohanson et al., 2021; Aula et al., 2022; Jacobis et al., 2026). This contribution is reflected in employee work productivity, which indicates the level of efficiency and effectiveness in producing outputs in accordance

with organizational targets (Armstrong, 2014; Kamuli, 2012). Productivity is a crucial indicator because it is directly related to company competitiveness, operational efficiency, and organizational sustainability (Sinungan, 2005).

Employee work productivity is influenced by employee competencies, which include knowledge, skills, abilities, work values, and work attitudes (Wibowo, 2014; Mulyasa, 2018). Strong competencies enable employees to work effectively and cope with increasingly complex job demands. A Deloitte survey indicates that 78% of business executives consider competency development a top organizational priority (Septiani et al., 2024). One of the key efforts to enhance competencies is through education and training (diklat), which aim to improve employees' knowledge, skills, and capabilities (Noe & Santoso, 2010; Herman, 2013). Previous research has shown

that education and training (diklat) has a positive effect on employee work productivity (Aliya & Tobari, 2019; Marbun, 2023). However, there are also studies that show that education and training (diklat) does not have a significant effect on employee work productivity (Grisela & Sirait, 2023).

Self-efficacy refers to an individual's belief in their ability to complete tasks and achieve specific goals (Bandura, 1997; Smith, 2011). Individuals with high self-efficacy tend to be more confident, proactive, adaptable to change, and capable of achieving better performance (Bakker, 2020). Several studies have found that self-efficacy has a positive effect on employee work productivity (Sitohang & Budiono, 2021; Maharani et al., 2024). However, some studies report that self-efficacy does not have a significant effect on employee work productivity (Soenanto et al., 2016; Idris, 2023).

These inconsistencies indicate that competencies developed through the education and training (diklat) and self-efficacy are not always optimally implemented in the workplace. Dynamic work environments, technological advancements, and increasing job demands often lead to work fatigue and decreased employee work productivity (Juliana et al., 2018). Therefore, psychological factors are needed to optimize the utilization of employee competencies, one of which is work engagement. Schaufeli and Bakker (2004) define work engagement as a positive psychological state characterized by vigor, dedication, and absorption. Employees with high work engagement tend to be more enthusiastic, focused, committed, and able to maintain performance when facing various job challenges (Inceoglu et al., 2018; Osborne & Hammoud, 2017).

Various studies show that education and training (diklat) and self-efficacy has a positive effect on work engagement (Trihandoko, 2019; Safariningsih et al., 2022; Yulia et al., 2024). On the other hand, work engagement has also been shown to have a significant effect on increasing employee work productivity (Grisela & Sirait, 2023; Nugraha, 2024; Lestari & Yucha, 2025). The findings indicate that work engagement has the potential to mediate the relationship between competencies and employee work productivity.

In addition, most previous studies have primarily examined the direct effects of education and training and self-efficacy on employee work productivity. Limited attention has been given to the mediating role of work engagement in explaining how

these factors enhance employee productivity, particularly in organizations facing dynamic business environments. Therefore, this study addresses these gaps by examining work engagement as a mediating mechanism between education and training, self-efficacy, and employee work productivity in the context of PT XYZ.

This phenomenon is relevant to the condition of PT XYZ as an upstream oil and gas sector company that faces the challenges of organizational transformation, digitalization, and improving operational performance. Based on company data for the 2020-2024 period, the decrease in oil and gas production and lifting against the RKAP set will occur in 2021, 2022, and 2024. Oil production decreased by 3.2% (2021), 1.8% (2022), and 8.77% (2024), as well as oil lifting by 2.1% (2021), 3.94% (2022), and 9.08% (2024). Meanwhile, natural gas production decreased by 4.4% (2022) and 0.42% (2024), and natural gas lifting by 2.16% (2022) and 1.21% (2024). This decline was also accompanied by a decrease in employee work productivity among employees at PT XYZ, as shown in Figure 1:

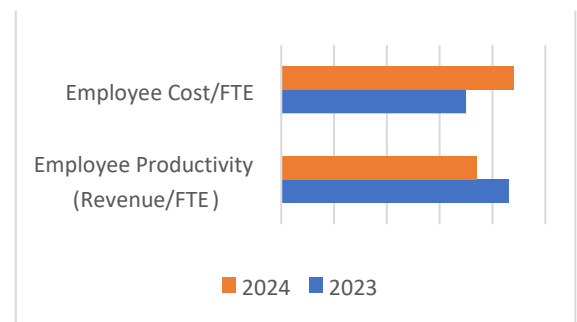


Figure I. Employee Productivity

Based on data from PT XYZ, employee productivity decreased from USD 1.62 million per FTE in 2023 to USD 1.44 million per FTE in 2024. In contrast, employee costs increased from USD 176 thousand to USD 212 thousand in the same period. This condition shows that the increase in the company's investment in human resources has not been followed by an increase in the output produced by employees.

In an effort to improve the quality of human resources, PT XYZ has implemented various development programs which are the implementation of education and training (diklat), as well as implementing multi-level competency standards ranging from Awareness to Mastery levels. However, employee work productivity still shows fluctuations

amid the dynamics of organizational transformation, digitalization, and work adaptation demands.

In addition, there is a gap in human resources, especially the capability gap, which shows that the competencies obtained through education and training (diklat) and self-efficacy has not been implemented optimally. These transformations include significant changes in work systems due to the COVID-19 pandemic, such as the implementation of work from home (WFH), followed by organizational restructuring through holding transformation and the transition back to work from office (WFO). In addition, the company has faced increasing demands to strengthen cross-functional and regional collaboration, as well as to implement digital transformation through the adoption of emerging technologies. These changes have affected work systems, work patterns, and job demands, creating challenges in maintaining employee work productivity. This is because each transformation requires employees to continuously adjust their competencies, work methods, and task execution approaches according to organizational dynamics. Therefore, employees are not only required to adapt to changing work environments but also to maintain consistent performance amid continuous transformation.

This condition indicates that competency development efforts do not always directly translate into improved employee productivity, particularly when employees face continuous organizational changes and transformation demands. In recent years, PT XYZ has experienced various transformations, including changes in work systems, organizational restructuring, and digital transformation through the adoption of new technologies. These changes require employees to continuously adapt their competencies, work patterns, and approaches to completing tasks. Therefore, another factor is needed to optimize the utilization of employee competencies, namely work engagement as a positive psychological condition characterized by vigor, dedication, and full involvement (absorption) in work (Schaufeli & Bakker, 2004).

Work engagement is needed as a factor that encourages employees to actualize their competencies to the maximum. As a mediating variable, work engagement explains the mechanism through which education and training (diklat) and self-efficacy influence employee work productivity. Through higher work engagement, employees are more likely

to apply the knowledge and skills gained from training, as well as utilize their confidence in completing tasks, thereby improving their productivity. Thus, this study is important to examine the role of work engagement as a mediating variable in the relationship between education and training (diklat) and self-efficacy on employee work productivity at PT XYZ.

Based on this background, this study examines several research questions, including whether the education and training (diklat) affect employee work productivity; whether self-efficacy affects employee work productivity; whether education and training (diklat) and self-efficacy affect work engagement; whether work engagement affects employee work productivity; and whether work engagement mediate the influence of education and training (diklat) and self-efficacy on employee work productivity.

This study aims to analyze the effect of the education and training (diklat) and self-efficacy on employee work productivity at PT XYZ, as well as to analyze the role of work engagement as a mediating variable in this relationship. The results of the research are expected to contribute to companies in formulating human resource development strategies, especially in increasing employee work productivity through strengthening competencies and employee engagement.

LITERATURE REVIEW

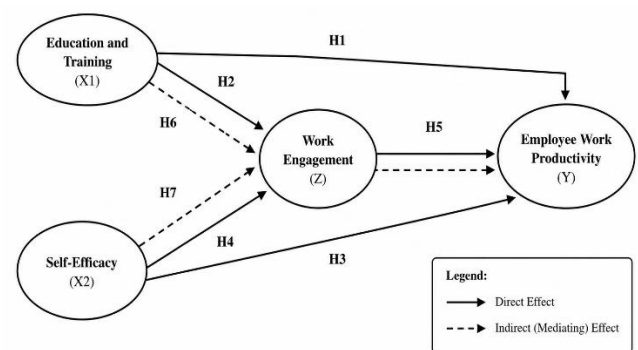


Figure II. Conceptual Model

The Effect of Education and training (diklat) on Employee Work Productivity

Education and training (diklat) is an effort to improve the technical abilities and professionalism of employees so that they can work more effectively and efficiently. Hasibuan (2005) stated that education and training (diklat) can enhance work productivity

through the improvement of technical and managerial skills. Previous research has also shown that education and training (diklat) contribute to increased employee work productivity (Yusuf, 2015; Isnawati et al., 2020; Aliya & Tobari, 2019). Based on this description, the following hypothesis is proposed:

H1: Education and training (diklat) has a significant positive effect on the employee work productivity at PT XYZ.

The Effect of Self-efficacy on Employee Work Productivity

Self-efficacy is an individual's belief in their ability to complete tasks and face work challenges. Individuals with high self-efficacy tend to be more persistent, proactive, and able to work optimally (Bakker, 2020). Previous research has shown that self-efficacy has an positive effect on employee work productivity (Maharani et al., 2024; Mayshara et al., 2023; Putri & Ahmadi, 2024; Sitohang & Budiono, 2021). Based on this description, the following hypothesis is proposed:

H2: Self-efficacy has a significant positive effect on the employee work productivity at PT XYZ.

The Effect of Education and training (diklat) on Work Engagement

Relevant and structured education and training (diklat) can enhance work understanding, confidence, and the meaning of work for employees. This contributes to the increase in work engagement which is characterized by vigor, dedication, and absorption. Maria and Georgios (2021) state that education and training (diklat) have a positive contribution to work engagement. This is supported by previous research (Farida & Hendarsjah, 2022; Hiskia & Yuniasanti, 2024; Trihandoko, 2019). Based on this description, the following hypothesis is proposed:

H3: Education and training (diklat) has a significant positive effect on work engagement employees at PT XYZ.

The Effect of Self-efficacy on Work Engagement

Self-efficacy a high encourages employees to be more confident, focused, and engaged in work. Bakker (2020) states that individuals with selfefficacy tall tends to have better levels of vigor, dedication, and absorption. This is supported by previous research

(Yulia et al., 2024; Mardiana & Wijowo, 2022; Safariningsih et al., 2022; Tran, 2023). Based on this description, the following hypothesis is proposed:

H4: Self-efficacy has a significant positive effect on work engagement employees at PT XYZ.

The Effect of Work Engagement on Employee Work Productivity

Work engagement is a positive psychological condition that encourages employees to work with full energy, dedication, and concentration. Inceoglu et al. (2018) state that work engagement is closely related to increased productivity and performance. Previous research has also shown that work engagement affects work productivity (Grisela & Sirait, 2023; Abdulrahman et al., 2022). Based on this description, the following hypothesis is proposed:

H5: Work engagement has a significant positive effect on the employee work productivity at PT XYZ.

Mediation of Work Engagement in Education and training (diklat) on Work Productivity

Education and training (diklat) not only improve employee competence, but can also increase work engagement which ultimately impacts productivity. Previous research has shown that education and training (diklat) can improve work engagement which then affects employee work productivity (Farida & Hendarsjah, 2022; Trihandoko, 2019; Abdulrahman et al., 2022). Based on this description, the following hypothesis is proposed:

H6: Work engagement mediates the influence of education and training (diklat) on the work productivity of employees at PT XYZ

Mediation of Work engagement on Self-efficacy on Employee Work Productivity

Self-efficacy encouraging individuals to be more involved in work, which ultimately increase employee work productivity. Previous research has shown a link between self-efficacy, work engagement, and employee work productivity (Yulia et al., 2024; Mardiana & Wijowo, 2022; Bakker, 2020). Based on this description, the following hypothesis is proposed:

H7: Work engagement mediates the influence of self-efficacy on the work productivity of employees at PT XYZ

METHOD

Types of Research

This study uses a quantitative approach because it aims to analyze the cause-and-effect relationship between the variables studied and test the hypotheses that have been formulated previously. Quantitative approaches are used to research specific populations or samples by collecting data through research instruments and statistical-based data analysis. According to Sujarweni (2014). In line with that, Sugiyono (2017) stated that the quantitative method is based on the philosophy of positivism and is used to research a specific population or sample with the aim of testing a hypothesis that has been established. and measurable manner.

Population and Sample

The population in this study is all employees of PT XYZ area which totals 89 people, spread across various departments such as Development & Planning, Production Operations, HSSE Operation, Supply Chain Management, and Finance. This study uses a saturated sampling technique, where all members of the population are used as research samples. This technique is used because the population is relatively small (less than 100 people), so that all 89 employees were used as research respondents.

Data Collection and Data Sources

The data collection technique in this study is using a questionnaire. Questionnaire is a data collection procedure where the researcher provides respondents or sources to answer. The data sources used in this study came from primary data. According to Sugiyono (2013), primary data is a data source that directly provides information to data collectors. In this study, primary data sources were obtained through the distribution of questionnaires to individuals directly involved in the research process, especially employees of the PT XYZ office. All items were measured using a five-point Likert scale, ranging from 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The data used in this study were

primary data obtained directly from employees of PT XYZ through questionnaire distribution.

Data Analysis Techniques

This study uses the Structural Equation Modeling – Partial Least Square (SEM-PLS) method with the help of SmartPLS software to analyze the relationships between variables. The evaluation of the model in SEM-PLS consists of an outer model and an inner model to test validity and reliability and assess the relationship between latent variables. Hypothesis testing is carried out based on the original sample value, T-statistic, and P-value. Thus, this analysis allows testing of relationships between variables to be carried out comprehensively, systematically, and measurably.

RESULTS

Table I. Measurement Model Assessment
(Outer Model)

Construct	Loadings	AVE	CA	CR
Education and training (diklat)		0.577	0.877	0.905
X1.1	0.318			
X1.2	0.78			
X1.3	0.658			
X1.4	0.764			
X1.5	0.826			
X1.6	0.752			
X1.7	0.777			
X1.8	0.737			
Self-efficacy		0.599	0.904	0.923
X2.1	0.716			
X2.2	0.788			
X2.3	0.822			
X2.4	0.757			
X2.5	0.794			
X2.6	0.002			
X2.7	0.183			
X2.8	0.716			
X2.9	0.787			
X2.10	0.791			
Work Engagement		0.518	0.813	0.865
Z.1	0.767			

Z.2	0.704
Z.3	0.661
Z.4	0.759
Z.5	0.657
Z.6	0.761
Work Productivity	0.516 0.913 0.927
Y.1	0.784
Y.2	0.76
Y.3	0.755
Y.4	0.804
Y.5	0.557
Y.6	0.774
Y.7	0.649
Y.8	0.702
Y.9	0.763
Y.10	0.777
Y.11	0.539
Y.12	0.696

Source: SmartPLS 4.0

The initial measurement model showed that one indicator of the Education and Training (Diklat) construct (X1.1 = 0.318) and two indicators of the Self-Efficacy construct (X2.6 = 0.002 and X2.7 = 0.183) had outer loading values below the acceptable threshold of 0.50. Therefore, these indicators were removed from the model. After re-estimating the measurement model, all remaining indicators for the Education and Training, Self-Efficacy, Work Engagement, and Employee Work Productivity constructs had outer loading values above 0.50 and were considered valid. These results indicate that the remaining indicators adequately measure their respective constructs and support the convergent validity of the measurement model.

Table II. Validity of HTMT Discriminators

	X1	Y	X2	Y
X1				
Y	0.767			
X2	0.653	0.802		
Z	0.771	0.797	0.717	

Source: SmartPLS 4.0

Based on the results of the discriminant validity test using the HTMT criteria, all values

between constructs were below the recommended limit of < 0.90 . Thus, the measurement model has met the discriminant validity. Furthermore, after the measurement model is declared valid, an internal test of the model is carried out to see the relationship between variables.

Table III. Bootstrapping Path Coefficient Results (Inner Model)

	Original sample (O)	T statistics (O /STDEV)	P values
Dirrect Effect			
X1-Y	0.276	2.603	0.005
X1-Z	0.452	4.800	0.000
X2-Y	0.399	3.866	0.000
X2-Z	0.357	3.730	0.000
Z-Y	0.276	2.162	0.005
Inderrect Effect			
X1-Z-Y	0.125	2.103	0.018
X2-Z-Y	0.099	2.212	0.014

Source: SmartPLS 4.0

The results showed that education and training (diklat) had a positive and significant effect on employee work productivity, with a coefficient value of 0.276, T-statistic of 2,603 (> 1.68), and P-value of 0.005 (< 0.05). This indicates that improving the quality and effectiveness of education and training (diklat) programs is able to improve employee abilities, skills, and work understanding, so that it has an impact on increasing employee work productivity. In addition, education and training (diklat) has also been proven to have a positive and significant effect on work engagement with a coefficient value of 0.452, T-statistic of 4.800 (> 1.68), and P-value of 0.000 (< 0.05), which shows that the more effective the implementation of education and training (diklat), the higher the level of enthusiasm, dedication, and involvement of employees in the work

Furthermore, self-efficacy has a positive and significant influence on employee work productivity with a coefficient value of 0.399, T-value of 3.866 (> 1.68), and P-value of 0.000 (< 0.05). This shows that employees' confidence in their ability to complete tasks contributes to increasing employee work

productivity. Self-efficacy also has a positive and significant effect on work engagement with a coefficient value of 0.357, a T-value of 3.730 (>1.68), and a P-value of 0.000 (<0.05), which means that it is getting higher self-efficacy, the higher the employee involvement in work. In addition, work engagement proven to have a positive and significant effect on employee work productivity with a coefficient value of 0.276, T-value of 2.162 (>1.68), and P-value of 0.005 (<0.05). This shows that employees who have a high level of work engagement tend to be able to produce more optimal performance.

The results of the study show that education and training (diklat) has a positive and significant indirect influence on employee work productivity through work engagement (coefficient 0.125; T-stats 2,103; P-value 0.018). This shows that education and training (diklat) not only has a direct impact, but also increase employee work engagement. Because the direct influence is also significant, then work engagement acting as a partial mediator. In addition, self-efficacy also has a positive and significant indirect effect on employee work productivity through work engagement (coefficient 0.099; T-stats 2,212; Pvalue 0.014). This shows that self-efficacy increase productivity both directly and through increased work engagement, so that work engagement also acts as a partial mediator.

DISCUSSION

The Effect of Education and training (diklat) on Employee Work Productivity

The findings indicate that education and training (diklat) contribute to improving employee work productivity at PT XYZ. The company's competency development programs, including training on corporate culture, capability development, industrial relations, and employee wellbeing, enhance employees' technical competencies and professional skills, enabling them to perform their tasks more efficiently and produce higher-quality work.

These findings can be explained by the Human Capital Theory (Becker, 1964), which posits that organizational investment in education and training enhances employees' knowledge, skills, and abilities as forms of human capital. Improved competencies enable employees to perform their jobs more effectively and productively, benefiting both individuals and the organization. Therefore, the better the quality of education and training provided by the company, the higher the level of employee work

productivity that can be achieved. These findings are consistent with Hasibuan (2005), who stated that education and training improve employees' technical and managerial capabilities, thereby increasing work productivity. They also support previous studies by Yusuf (2015), Isnawati et al. (2020), and Aliya and Tobari (2019), which reported that education and training have a positive effect on employee work productivity.

The Effect of Self-efficacy on Employee Work Productivity

The findings indicate that self-efficacy contributes to improving employee work productivity at PT XYZ. Employees with greater confidence in their abilities tend to perform their tasks more effectively, persist when facing work challenges, and maintain consistent performance. As a result, they are more likely to achieve higher quality and quantity of work while meeting organizational performance standards.

According to Social Cognitive Theory (Bandura, 1986), individuals with high self-efficacy are more likely to exert greater effort, persist when facing difficulties, and achieve better work performance. These positive work experiences strengthen employees' motivation and commitment to their work, thereby encouraging higher work engagement. Consistent with this perspective, Bakker (2020) argued that individuals with high self-efficacy tend to be more productive, proactive, and willing to go beyond the formal demands of the organization. These findings are also consistent with previous studies by Maharani et al. (2024), Mayshara et al. (2023), Putri and Ahmadi (2024), and Sitohang and Budiono (2021), which reported that self-efficacy positively influences employee work productivity.

The Effect of Education and training (diklat) on Work engagement

The findings indicate that education and training (diklat) contribute to improving work engagement at PT XYZ. The company's competency development programs, including training on corporate culture, capability development, industrial relations, and employee wellbeing, help employees better understand their roles and responsibilities while enhancing their confidence in performing daily tasks. These programs encourage employees to become more enthusiastic, dedicated, and fully engaged in their work.

This finding is supported by the Job Demands–Resources (JD-R) Theory (Bakker & Demerouti, 2007), which explains that education and training serve as job resources that help employees develop their competencies, reduce work-related difficulties, and strengthen work motivation. As employees perceive greater organizational support through training opportunities, they are more likely to experience higher levels of vigor, dedication, and absorption. This finding is consistent with Maria and Georgios (2021), who argued that education and training practices positively contribute to employee engagement by enhancing employees' skills, motivation, and involvement in the workplace. Similar findings were reported by Farida and Hendarsjah (2022), Hiskia and Yuniasanti (2024), and Trihandoko (2019), which also found that education and training positively influence work engagement.

The Effect of Self-efficacy on Work engagement

The findings indicate that self-efficacy contributes to improving work engagement at PT XYZ. Employees with greater confidence in their abilities are more capable of handling work challenges, maintaining consistent performance, and remaining focused in achieving work objectives. As a result, they demonstrate higher enthusiasm, dedication, and involvement in their work activities.

Self-efficacy has a positive and significant effect on This finding is supported by the Job Demands–Resources (JD-R) Theory (Bakker & Demerouti, 2007), which identifies self-efficacy as a personal resource that enables employees to effectively cope with job demands while sustaining motivation and psychological well-being. At PT XYZ, employees with higher self-efficacy are better able to adapt to operational challenges and actively participate in organizational activities, leading to stronger work engagement. This finding is also supported by Bakker (2020), who argued that employees with high self-efficacy tend to exhibit higher levels of vigor, dedication, and absorption. Similar findings were reported by Yulia et al. (2024), Mardiana and Wijowo (2022), Safariningsih et al. (2022), and Tran (2023).

The Effect of Work engagement on Work Productivity

The findings indicate that work engagement contributes to improving employee work productivity at PT XYZ. Employees who actively participate in operational activities, remain dedicated to achieving

organizational targets, and maintain enthusiasm in carrying out their responsibilities are able to complete their work more effectively and consistently. This condition supports higher quality, efficiency, and productivity in daily operations.

This finding is supported by the Job Demands–Resources (JD-R) Theory (Bakker & Demerouti, 2007), which explains that work engagement is a positive motivational state characterized by vigor, dedication, and absorption that enables employees to perform their work more effectively and achieve better outcomes. This is in line with the opinion of Inceoglu et al. (2018), who stated that work engagement is an important element in creating high performance and organizational sustainability because it is closely related to increased productivity, job satisfaction, and employee retention. These findings are also consistent with previous studies by Inceoglu et al. (2018), Grisela and Sirait (2023), and Abdulrahman et al. (2022), which reported that work engagement positively influences employee work productivity.

Mediation of Work engagement in Education and training (diklat) on Employee Work Productivity

The findings indicate that work engagement mediates the relationship between education and training (diklat) and employee work productivity at PT XYZ. The company's competency development programs, including corporate culture, capability development, industrial relations, and employee wellbeing training, not only improve employees' competencies but also increase their enthusiasm and involvement in work, which ultimately enhances productivity.

This finding can be explained by the Human Capital Theory (Becker, 1964), which states that investment in education and training improves employees' knowledge and skills, and by the Job Demands–Resources (JD-R) Theory (Bakker & Demerouti, 2007), which explains that education and training function as job resources that foster work engagement. This is in line with previous studies showing that education and training improve work engagement, which subsequently enhances employee work productivity (Farida & Hendarsjah, 2022; Trihandoko, 2019; Abdulrahman et al., 2022; Grisela & Sirait, 2023).

Mediation of Work engagement on Self-efficacy on Employee Work Productivity

The findings indicate that work engagement mediates the relationship between self-efficacy and employee work productivity at PT XYZ. Employees who are confident in their abilities are better able to adapt to operational challenges, remain committed to organizational goals, and actively engage in their work, leading to higher productivity.

This finding is supported by Social Cognitive Theory (Bandura, 1986), which explains that individuals with high self-efficacy exert greater effort and persist in overcoming difficulties, and by the Job Demands–Resources (JD-R) Theory (Bakker & Demerouti, 2007), which identifies self-efficacy as a personal resource that enhances work engagement. This is also in line with the opinion of Bakker (2020), who argued that individuals with high self-efficacy tend to be more productive, proactive, and willing to go beyond the formal demands of the organization. These findings are supported by previous studies by Yulia et al. (2024), Mardiana and Wijowo (2022), Safariningsih et al. (2022), and Grisela and Sirait (2023).

CONCLUSION

Based on the findings, education and training (diklat) improve employee work productivity at PT XYZ by enhancing employees' competencies, enabling them to achieve better work quality, quantity, timeliness, and efficiency. Education and training also strengthen work engagement by increasing employees' energy, dedication, and focus in carrying out their responsibilities. The results further indicate that self-efficacy contributes to both employee work productivity and work engagement. Employees with greater confidence in their abilities are more capable of performing their tasks effectively, overcoming work challenges, and maintaining strong engagement in their work. In addition, work engagement plays an important role in improving employee work productivity, indicating that engaged employees are more likely to achieve consistent and optimal performance.

Furthermore, work engagement mediates the relationships between education and training, self-efficacy, and employee work productivity. These findings suggest that competency development and self-efficacy enhance productivity not only directly but also indirectly through higher work engagement. This study extends the existing literature by providing empirical evidence that the relationships among

education and training, self-efficacy, work engagement, and employee work productivity are also applicable in the context of Indonesia's energy industry. Moreover, the findings identify work engagement as an important mediating mechanism through which education and training and self-efficacy enhance employee work productivity, thereby reinforcing the Human Capital Theory, Social Cognitive Theory, and Job Demands–Resources (JD-R) Theory.

LIMITATIONS

1. The number of samples in this study is relatively limited, so the results of the study cannot be fully generalized. Therefore, further research is recommended to increase the number of samples and expand the scope of respondents.
2. This study only uses one mediation variable, namely work engagement, so it has not been able to explain the mechanism comprehensively. Therefore, further research is recommended to add other mediating variables such as work motivation, job satisfaction, or organizational commitment, as well as consider moderation variables.
3. This study was conducted in only one zone, which limits the generalizability of the findings. Therefore, future research is recommended to expand the research object to other operational sectors or broader zones.
4. In the education and training (diklat) variable, the lowest indicator was in the aspect of attitude and skills. Therefore, companies are advised to improve the quality of education and training (diklat) through interactive methods such as hands-on practice, case studies, and simulations, as well as conduct periodic evaluations of the trainer's performance.
5. In the self-efficacy variable, the lowest indicator is in the aspect of objectivity. Therefore, employees are advised to increase their selfconfidence through work experience and competency development, and companies need to provide support through problem-solving education and training (diklat) and ongoing work assistance.
6. In the work engagement variable, the lowest indicator is in the absorption aspect. Therefore,

companies are advised to create a conducive work environment, manage the workload in a balanced manner, and monitor employee engagement through performance indicators.

7. In the work productivity variable, the lowest indicator is found in the aspect of work morale. Therefore, companies are advised to conduct regular evaluations and increase employee work motivation.

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