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The Effect Of *Training* Programs On Employee Productivity With The *Technology Acceptance Model (TAM)* As A Mediating Variable at PT. Tambi Plantation

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ABSTRACT

Indonesia has great potential in the tea plantation sector, but productivity is often hampered by limited human resources and technology. PT Tambi Plantation faces challenges in adopting technology, where the use of machinery is still limited due to the limited skills of workers. This study aims to analyze the impact of training programs on workers' productivity using technology adoption model as a mediating variable. Using a quantitative approach with a survey design, the study involved 32 respondent tea picking workers who were selected using a saturated sample. Data were collected through questionnaires and analyzed using partial least square (PLS). Results showed that the training programme had a significant positive effect on workers' productivity and technology adoption pattern. The technology adoption model also has a significant positive effect on worker productivity and acts as a mediator in the relationship between training programs and worker productivity. We recommend that PT Tambi Plantation develop a comprehensive training program to improve workers' technical skills and technological adaptability. This study contributes to understanding the relationship between training programs, technology adoption and worker productivity in the tea plantation sector.

Keywords: training program, worker productivity, technology adoption model, tea plantations.

1. Introduction

Indonesia is a country rich in natural resources with a variety of sectors, where the plantation subsector contributed 3.76 percent to total GDP in 2022 (Badan Pusat Statistik, 2022). One of the plantation commodities that play an important role in the Indonesian economy is tea. Tea plantations not only contribute to employment opportunities for the community but also play a role in environmental conservation efforts (Komen & Nadapdap, 2019)

However, the productivity of tea plantations faces challenges related to limited human resources and technology. Based on the Human Development Report 2022, Indonesia is ranked 112th in the Human Development Index (HDI), a position that is still relatively low in ASEAN (UNDP, 2024). The low quality of human resources has a direct impact on employee productivity, which is characterized by work inefficiency and difficulty in coping with existing tasks (Parashakti & Noviyanti, 2021)

The Technology Acceptance Model (TAM) can be a framework for understanding technology acceptance through two main aspects: perceived usefulness and perceived ease of use (Sungur Gül & Ateş, 2023). Based on these problems, it is necessary to conduct research on the effect of training and technology acceptance on employee productivity at PT Tambi Plantation, considering that technical training can improve skills and encourage innovation which leads to increased company productivity. PT Tambi Plantation, as a tea plantation company, faces challenges in technology adoption. Based on a survey with the Head of Plantation Unit Bedakah, the use of machinery is still hampered due to limited worker skills and reliance on manual methods. Despite having invested in new technology, utilization has not been optimal due to lack of training and adaptation.

2. Literature Review

2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) developed by Davis in 1989 is a theory that explains the acceptance of technology by users, based on the Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB). This model focuses on two main components: Perceived Usefulness which refers to the belief that the system will improve performance, with indicators including work speed, achievement, effectiveness, productivity, ease of work, and usefulness; and Perceived Ease of Use which refers to the belief that the system is easy to use without great effort, with indicators including ease of understanding, control, clarity, flexibility, skill, and use. TAM suggests that these two components have a cause-and-effect relationship that influences a person's intention and behavior in adopting new technology to improve efficiency and productivity.

2.2 Employee productivity

Employee productivity is a multidimensional concept that reflects the ratio of output to input in the production process, focusing on the quality of output and the efficient use of human resources to achieve organizational goals. According to Bloom et al. (2019), there is a strong positive correlation between good management practices and company productivity, with findings that companies in the United States tend to have better management practices than other countries. Brynjolfsson & Hitt (2000) in their research also revealed that information technology investments can significantly improve employee productivity, although such improvements are often not immediately visible and require complementary organizational reforms, including changes in organizational structure, processes, and culture.

2.3 Training programs

Training programs are a key element of talent development and organizational performance improvement, defined as planned efforts to help employees acquire skills relevant to their jobs. Noe (2010) proposed a four-stage training program evaluation model that includes reaction, learning, behavior, and outcomes, which has become a standard in the talent development industry. Research from Aguinis & Kraiger (2009) and Tharenou et al. (2007)) reinforces the importance of training programs by proving that organizations that consistently invest in high-quality training programs tend to see measurable improvements in productivity, profitability, and market value of the company, confirming that training is a strategic investment that provides significant returns for organizations.

2.4 Hypothesis Development

2.4.1 Effect of Training Program on Employee Productivity

Employees who have expertise through training tend to produce higher productivity than employees who do not have expertise. This shows that training has a positive and significant impact on employee productivity (Loliyana et al., 2023a; Parashakti & Noviyanti, 2021b; Sutrisna & Apriliyani, 2021). Increasing labor productivity is not only an individual matter, but also related to various aspects of company operations and activities that support the optimization of employee functions (Sarwani et al. (2020). Therefore, based on the relationship between these variables, the hypotheses that can be proposed are.

H1: Training programs have a positive impact on employee productivity

2.4.2 Effect of Training Program on Technology Acceptance Model

The use of machine adoption as a new program needs to be evaluated through perceived usefulness based on relevant factors. Users tend to find training systems useful if they find them useful and easy to use Zainab et al. (2017) Training is increasingly popular in organizational environments due to the flexibility of access, cost efficiency, and customized content. Perceived ease of use (PEOU) and productivity factors play an important role as external variables in the adoption of machine-based training. Individuals usually assess the effort required to use a system, so when the system is considered easy to use, it is likely to be implemented by users Zainab et al. (2017) Previous research also shows that training has a significant effect on perceived usefulness Zainab et al. (2017).

H2: Training programs have a positive impact on the Technology Acceptance Model.

2.4.3 Effect of Technology Acceptance Model on Employee Productivity

Productivity is an important tool for evaluating and monitoring organizational effectiveness Izuagbe et al. (2016) A person's behavioral intention to use technology is strongly influenced by

his attitude towards using the system. In the context of human resource management, if users of HR information system applications believe that technology can help them run their business, this will have an impact on improving individual performance Wijonarko & Wirapraja (2022) Previous research also shows that perceived usefulness has a significant effect on productivity (Izuagbe et al., 2016)

H3: Technology Acceptance Model has a positive impact on employee productivity.

2.4.4 Technology Acceptance Model as a mediating variable

The Technology Acceptance Model (TAM) is used to measure the level of user acceptance of technology in organizations Wijonarko & Wirapraja (2022) Productivity is highly dependent on an individual's ability to manage company resources, such as materials, machines, methods, and information, to achieve results in accordance with specified criteria. The implementation of training programs has also been shown to provide significant benefits, especially in increasing employee productivity (Loliyana et al., 2023)

H4: Technology Acceptance Model mediates the effect of training programs on employee productivity.
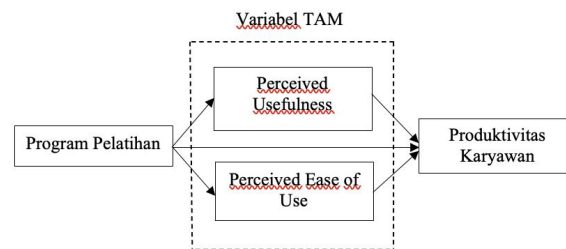
Gambar 2. 1 Model Penelitian

3. Research Methodology

This research uses a quantitative approach based on the philosophy of positivism to test the hypotheses that have been formulated. The study was conducted at PT Tambi Tea Plantation, Wonosobo, Central Java, from October to December 2024. The study population was all tea pickers who have used tea picking machines, with a saturated sampling technique focusing on active employees, who have attended training and used the machine at least five times. Primary data was collected through a Likert scale-based questionnaire with five answer options to measure the research variables, such as productivity, training program, and Technology Acceptance Model (TAM).

Data were analyzed using the Structural Equation Modeling-Partial Least Square (SEM-PLS) method with the help of SmartPLS. Evaluation of the measurement model includes validity and reliability tests, while the structural model is evaluated through the coefficient of determination, predictive relevance, and hypothesis significance tests. The hypotheses in this study examine the effect of training programs on employee productivity through TAM as

mediation, with significance determined at the 5% level. This method is suitable for non-normally distributed data with small samples, allowing analysis of complex relationships and testing of mediation effects.
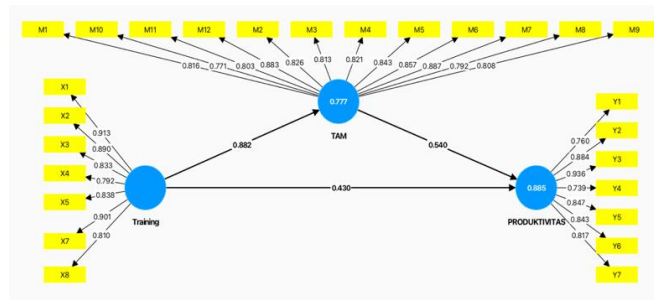
4. Results

4.1 Measurement Model (Outer Model)

4.1.1 Convergent Validity
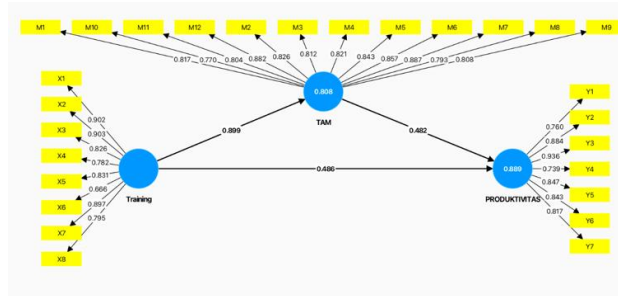
The analysis results show that most of the item indices on the research variables have a loading factor value above 0.7 which meets the validity criteria. However, there are several indicators with a loading factor value below 0.7. Therefore, these indicators must be removed from the research model to improve validity. One of the indicators removed is X6, because its loading factor value is below the minimum limit.

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4.1.2 Composite Reliability and Cronbach Alpha

Variabel	Cronbach Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Produktivitas	0.926	0.936	0.941	0.697

Technology Acceptance Model	0.958	0.960	0.963	0.684
Program Training	0.938	0.945	0.950	0.731

The analysis results show that the AVE (Average Variance Extracted) values of the four constructs are greater than 0.5, which indicates good discriminant validity. In addition, the construct reliability test based on composite reliability criteria and Cronbach's alpha shows values above 0.7 for all constructs. This proves that the four constructs have good reliability and are consistent in measuring the variables they present.

4.2 Structural Model (Inner Model)

4.2.1 R-Square

Variabel	R-square	R-square adjusted
Produktivitas Karyawan	0.885	0.877
TAM	0.777	0.770

The analysis results show the R-squared value of variable Y is 0.885, which means 88.5% is influenced by variable X and mediation, while 11.5% is influenced by other factors. For variable Z, the R-squared value of 0.777 indicates 77.7% is influenced by variable X, and 22.3% by factors outside the model.

4.2.2 Q-Square

$Q2$ value $= 1 - (1-R2) \times (1-R1)$

$Q2$ value $= 1 - (1-0.885) \times (1-0.777) = (1 - (0.115) \times (0.223)) = 1 - 0.0257 = 0.9743$ or 97.43%

Description:

Q2: Predictive Relevance value

R12: R-Square value of variable M

R22: R-Square value of variable Y

Based on the calculation results, it is known that theQ2 value is 0.9743, which proves that 97.43% of the heterogeneity in the survey data can be explained by the proposed structural model, while the remaining 2.57% is explained by other factors outside the model.

4.2.3 F-Square

Variabel	Produktivitas	TAM	Training
Produktivitas			
TAM	0.563		
Training	0.356	3.493	

The F-Square test results show that the training variable has a large influence on productivity with a value of 0.356, and a very large influence on the Technology Acceptance Model with a value of 3.493.

4.3 Hypothesis Testing

Hipotesis	Original Sampel (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P values
TAM -> Produktivitas Karyawan	0.540	0.539	0.126	4.270	0.000
Training -> Produktivitas Karyawan	0.430	0.434	0.127	3.390	0.001
Training -> TAM	0.882	0.885	0.042	21.049	0.000

4.3.1 The effect of the technology acceptance model on employee productivity

stores a significance of 0.000 or less than 0.05 with t count 4.270 (> t table 1.95), it can be stated that the technology acceptance model variable has a significant and real influence on employee productivity, the effect given is 0.54, so it can be stated that the *technology acceptance model* has a positive impact on employee productivity.

4.3.2 The effect of training programs on employee productivity

stores a significance of 0.001 or less than 0.05 with t count 3.390 (> t table 1.95), it can be stated that the *training* program variable has a significant and real influence on employee productivity, the effect given is 0.430, which means that the *training* program has a positive impact on employee productivity.

4.3.3 The effect of the training program on the technology acceptance model

stores a significance of 0.000 or less than 0.05 with t count 21.049 (> t table 1.95), it can be stated that the job satisfaction variable has a significant and real influence on the intention to

move, the effect given is 0.882, so it can be stated that the *training* program has a positive effect on the *technology acceptance model.*

Hipotesis	Original Sampel (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P values
Training -> TAM -> Produktivitas	0.476	0.477	0.116	4.095	0.000

4.3.4 The results of testing the variable hypothesis prove that the p value is 0.000 <0.05 and the t statistic value is 4.095> from the t table (1.96). Because this means that the hypothesis is accepted or the mediating variable mediates the x variable.

5. Discussion

5.1 Effect of Training Program on Employee Productivity

The training program is proven to have a positive impact on employee productivity at PT Perkebunan Tambi. After attending the training, there was a significant increase in productivity from 50-70 kg per day to 100-250 kg per day. The training is designed to improve employees' knowledge, skills, and work behavior to support success in their tasks. This finding is consistent with previous research (Loliyana et al., 2023b; Sutrisna & Apriliyani, 2021; Parashakti & Noviyanti, 2021b), which shows that training has a positive impact on labor efficiency and productivity, especially by helping employees overcome difficulties in using new technologies.

5.2 Effect of Training Program on Technology Acceptance Model (TAM)

Training programs have a positive influence on the Technology Acceptance Model (TAM), especially on*perceived usefulness* and*perceived ease of use*. Training provides employees with an understanding of how technology, such as tea picking machines, can help them work more efficiently and easily. This supports the adoption of new technology in the workplace, as explained in Zainab et al.'s (2017) study, which found that training significantly increased the perceived usefulness of technology. Thus, training plays an important role in increasing employee acceptance of technology.

5.3 Effect of TAM on Employee Productivity

TAM is proven to contribute positively to employee productivity at PT Perkebunan Tambi. Employees who understand the usefulness and ease of use of technology tend to continue adopting the technology, which ultimately increases their work output. Productivity becomes an important tool to evaluate and monitor organizational effectiveness, as stated by Izuagbe et al. (2016). This study also supports previous findings, which show that the acceptance of technology that is perceived as useful and easy to use is able to improve employee performance and work effectiveness.

5.4 Effect of Training Program on Employee Productivity with TAM as Mediating Variable

Training programs have a positive effect on employee productivity, with the Technology Acceptance Model (TAM) as the mediating variable. This mediating effect is evidenced by a t-statistic value of 4.095 which is greater than the t-table (1.96) and a p-value of 0.000 which is less than 0.05. Training helps employees understand how to use technology, so they can adopt and utilize it to increase work productivity. Thus, training not only improves employees' technical capabilities, but also encourages the acceptance of technology which has an impact on improving work results.

6. Conclusion

6.1 Effect of Training Program on Productivity

The training program has a positive and significant influence on employee productivity at PT Perkebunan Tambi. The more intensive the training provided to employees, the higher their productivity.

6.2 The effect of Technology Acceptance Model on Productivity

Technology Acceptance Model (TAM) also has a positive and significant effect on employee productivity. Increased acceptance of technology by employees has a direct impact on increasing their work productivity.

6.3 Effect of Training Program on Technology Acceptance Model

Training program has a significant positive effect on TAM. Effective training increases employee perceptions of the usefulness and ease of technology, which in turn supports acceptance of the technology.

6.4 The Mediating Role of TAM

TAM proved to be able to mediate the effect of training programs on employee productivity. In other words, training not only improves skills, but also helps employees accept and use technology more effectively, which has an impact on increasing productivity.

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