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The Influence of Work Environment and Job Training on Teacher Productivity and Its Implications for Strengthening Students' IMTAQ and IPTEK (Case Study: Islamic Center Vocational High School, Central Sulawesi)

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Abstract. The rapid development of science and technology (ICT) in the modern era has significantly influenced the field of education. While this progress provides opportunities for younger generations to acquire various competencies, it also presents challenges in maintaining spiritual values, particularly in Islamic-based schools. This study investigates the influence of work environment and training on teacher productivity and examines their implications for strengthening faith and piety (IMTAQ) as well as mastery of science and technology (*IPTEK*) among students at the Islamic Center Vocational High School, based on a *pesantren* system in Central Sulawesi. The research employed a quantitative design with descriptive and associative approaches. Data were collected from 60 teachers using a saturated sampling method, and the analysis was conducted through Partial Least Square–Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS 4.0 software. The findings revealed that the work environment had a positive and significant effect on strengthening IMTAQ and IPTEK but did not significantly affect teacher productivity. Similarly, training significantly improved the strengthening of IMTAQ and IPTEK but showed no significant effect on teacher productivity. Teacher productivity, however, was found to significantly enhance the strengthening of IMTAQ and IPTEK. The moderating effects of teacher productivity combined with both work environment and training did not demonstrate a significant influence on IMTAQ and IPTEK reinforcement. These results highlight the importance of designing effective training programs and providing a conducive work environment that not only enhances productivity but also supports holistic educational goals, integrating spiritual values with scientific and technological competence.
Keywords: Work Environment, Training, Teacher Productivity, IMTAQ, IPTEK

INTRODUCTION

The 21st century has been characterized by rapid globalization and unprecedented advancements in science and technology (*IPTEK*). These dynamics have significantly influenced the educational sector, creating both opportunities and challenges for teachers and students alike (Annisa, Selamet, & R., 2023). On one hand, technological development provides access to a wide range of information, innovative teaching tools, and skill development that can prepare students for the competitive job market (Colquitt, LePine, & Wesson, 2015). On the other hand, it poses challenges in maintaining spiritual, ethical, and moral values, especially in Islamic-based schools where faith and piety (*IMTAQ*) are essential foundations of education (Creswell, 2022b).

IMTAQ, which derives from the combination of iman (faith) and taqwa (piety), carries a comprehensive meaning in Islamic pedagogy (Fau & Buulolo, 2023). Faith is understood as belief, loyalty, protection, and the act of placing everything in its proper order, while piety refers to self-restraint, awareness of obligations, and moral vigilance (Hasibuan, 2014). In educational settings, *IMTAQ* is not only an element of spiritual guidance but also a framework for shaping students' moral integrity and ethical conduct (Ghozali, 2018). According to Zakiyah Daradjat, *IMTAQ* functions as the spiritual power that guides humans to distinguish right from wrong and encourages them to act with righteousness (Mangkunegara, 2015). Consequently, education should strive for a holistic balance between *IMTAQ* and *IPTEK* to produce well-rounded individuals who are spiritually grounded and professionally competent (Parashakti & Noviyanti, 2021).

Nevertheless, many educational institutions have encountered a persistent imbalance between intellectual development and spiritual cultivation (Rahmawati, Bagis, & Darmawan, 2021). For example, students may demonstrate proficiency in technology and vocational skills but simultaneously display weaknesses in discipline, ethics, and religious observance

(Soegiyono, 2013). Conversely, students who excel in religious knowledge and practices may often lack the practical competencies required by the labor market (Rivai & Sagala, 2013). This dual imbalance poses a significant threat to the vision of holistic education (Wibowo, 2016). Addressing this gap has become increasingly urgent in pesantren-based vocational schools, where the integration of *IMTAQ* and *IPTEK* is considered a central educational mission (Robbins & Judge, 2015).

The Islamic Center Vocational High School (SMK Islamic Center) in Central Sulawesi represents an innovative model of education that integrates vocational training with pesantren values. As part of the Yayasan Islamic Center Pusat Palu, this institution aims to equip students with both spiritual strength and professional skills. Students are not only taught Islamic sciences and moral character but are also trained in vocational competencies that prepare them for employment. The school's mission, however, faced significant challenges following the 2018 natural disaster—an earthquake, tsunami, and liquefaction—that damaged its infrastructure and reduced its student population. This decline affected financial resources, particularly the allocation of the national operational funds (BOS), limiting opportunities for teacher training and professional development. The reduction in teacher training has contributed to stagnation in teacher productivity, further challenging the school's ability to fulfill its dual mission of *IMTAQ* and *IPTEK* integration.

Teachers play a pivotal role in achieving educational success in pesantren-based schools. They serve as facilitators of knowledge, role models for character formation, and motivators for students' academic and spiritual growth. Beyond the task of instruction, teachers are entrusted with the responsibility of shaping students' holistic identity, balancing cognitive competencies with spiritual values. However, their effectiveness is highly dependent on two critical factors: the work environment and training opportunities. A supportive work environment enhances comfort, cooperation, and motivation, while regular training equips teachers with updated knowledge and skills. Previous studies highlight the importance of these factors. Bahri (2018) and Yuma & Pradana (2021), for instance, demonstrated a positive correlation between work environment and productivity. Similarly, Zulkarnaen et al. (2018) and Hau et al. (2023) emphasized the role of training in enhancing professional performance. Nevertheless, other studies such as Dahlia (2019) and Perdana (2019) found no significant relationship, creating an ongoing academic debate.

This debate presents a critical research gap. First, existing studies largely focus on industrial sectors or general schools, while pesantren-based vocational institutions remain underexplored. Second, the inconsistency of empirical findings regarding the effects of work environment and training on teacher productivity necessitates further investigation. Third, little research has directly examined how teacher productivity, in turn, contributes to the strengthening of *IMTAQ* and *IPTEK* among students in Islamic educational settings. Addressing these gaps is essential not only for theoretical enrichment but also for practical improvements in the management of pesantren-based schools.

Therefore, the present study seeks to analyze the influence of work environment and training on teacher productivity and to evaluate their implications for the reinforcement of *IMTAQ* and *IPTEK* among students at SMK Islamic Center in Central Sulawesi. By employing a quantitative method with Partial Least Square–Structural Equation Modeling (PLS-SEM), this study aims to provide empirical evidence on how these variables interact within the context of pesantren-based vocational education. Ultimately, the study aspires to contribute to educational policy and practice by offering insights into how schools can optimize teacher performance while simultaneously nurturing students' spiritual values and technological competencies.

MATERIALS AND METHODS

This study employed a quantitative approach with descriptive and associative designs. The descriptive aspect portrayed the actual condition of teachers at the Islamic Center Vocational High School in Central Sulawesi, while the associative aspect analyzed the causal relationships among the variables. Specifically, the model examined the direct and indirect effects of the independent variables on the dependent variable, mediated by teacher productivity (Sugiyono, 2017).

The variables included independent variables: Work Environment (X1) and Training (X2); the mediating variable: Teacher Productivity; and the dependent variable: Strengthening of IMTAQ and IPTEK among students. The framework was tested using Partial Least Square–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software, allowing simultaneous examination of complex relationships among latent variables (Sugiyono, 2018a; Sugiyono, 2018b).

The units of analysis were teachers and students at the Islamic Center Vocational High School. Sixty active teachers were selected as respondents, providing data on work environment, training, and productivity variables (Sugiyono, 2022). Student perspectives were represented indirectly through indicators measuring the strengthening of IMTAQ and IPTEK, reflecting outcomes of teacher productivity and institutional practices. This selection was based on the central role of teachers in implementing instruction and students as beneficiaries of educational outcomes (Sugiyono, 2019).

Operationalization defined variables in measurable terms using a Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Work Environment (X1) was measured by cleanliness, comfort, lighting, ventilation, facilities, supervisor support, and teamwork. Training (X2) was measured by training relevance, comprehensibility, application in work, and training frequency. Teacher Productivity (M) was measured by effectiveness (timeliness, work quality), efficiency (resource management), output (teaching targets), and discipline (attendance). Strengthening IMTAQ and IPTEK (Y) was measured by students' participation in religious activities, daily practice of Islamic values, spiritual closeness to God, interest in technology-based learning, ability to operate technological tools, and aspirations for further studies in technology.

The population consisted of all 60 teachers at SMK Islamic Center Vocational High School. Because the population was small, a census sampling technique was applied, including the entire population as respondents, consistent with Sugiyono's (2021) recommendation.

Data types included primary data collected directly via online questionnaires administered through Google Forms to accommodate teachers' schedules and locations, and secondary data obtained from institutional documents, reports, books, journals, and other relevant sources to support the theoretical framework and findings.

The structured questionnaire aligned with the operationalization of variables contained 6 items for Work Environment, 4 items for Training, 5 items for Teacher Productivity, and 6 items for Strengthening IMTAQ and IPTEK. It was pre-tested for clarity, and validity and reliability were analyzed using SmartPLS.

Data analysis followed steps using PLS-SEM: evaluation of the outer model for convergent validity (outer loadings > 0.70, AVE > 0.50), reliability (composite reliability > 0.70, Cronbach's alpha > 0.60), and discriminant validity (HTMT ratio < 0.90). The inner model evaluation tested multicollinearity (VIF < 5), R-Square for explanatory power, F-Square effect size (small 0.02, medium 0.15, large 0.35), and Q-Square for predictive relevance (> 0). Hypotheses were tested using bootstrapping with 5,000 resamples, accepting hypotheses if t-statistic > 1.96 and p-value < 0.05. Importance-Performance Map Analysis (IPMA) identified

the most influential indicators for strengthening IMTAQ and IPTEK.

Ethical compliance was ensured by obtaining informed consent, guaranteeing confidentiality and anonymity of responses, and using the data solely for academic research purposes.

RESULTS AND DISCUSSION

Inferential Statistics

Outer Model

Figure 1 shows the outer model which shows the relationship between the constructs and the indicators of each variable.

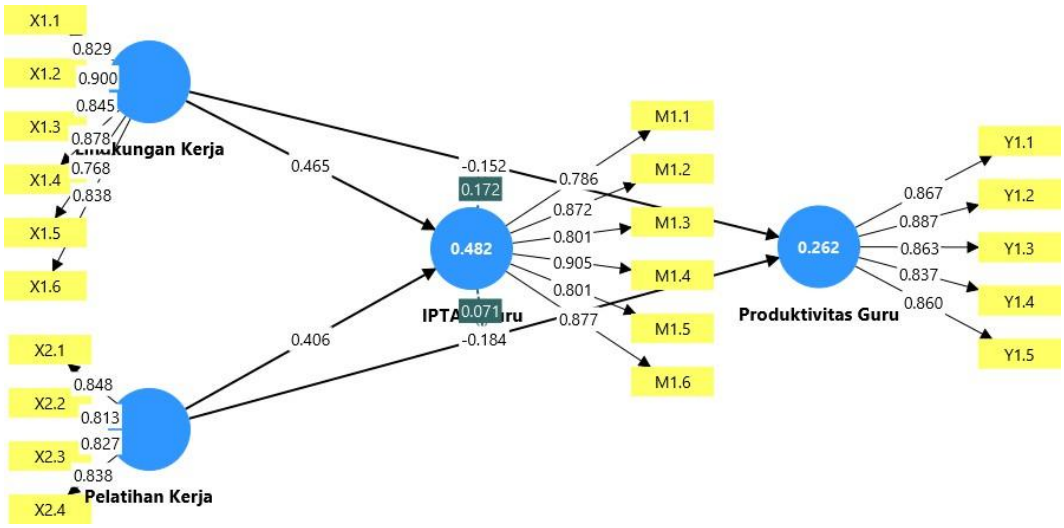

Figure 1. Actual Test Model Path

Source: Data Processing with SMART PLS (2025)

Outer loading

Table 1 describes the outer loading value of each indicator of the variables in this study.

Table 1. Outer Loading

Variables	Indicator	Outer Loading	Results
Work environment	**"X1.1"**	0.830	Reliable
	"X1.2"	0.900	Reliable
	"X1.3"	0.844	Reliable
	"X1.4"	0.878	Reliable
	"X1.5"	0.768	Reliable
	"X1.6"	0.837	Reliable
Job Training	**"X2.1"**	0.847	Reliable
	"X2.2"	0.814	Reliable
	"X2.3"	0.827	Reliable
	"X2.4"	0.838	Reliable
Science and Technology Teacher	**"M1.1"**	0.784	Reliable
	"M1.2"	0.872	Reliable
	"M1.3"	0.803	Reliable
	"M1.4"	0.905	Reliable
	"M1.5"	0.802	Reliable
	"M1.6"	0.876	Reliable
Teacher Productivity	**"Y1.1"**	0.866	Reliable
	"Y1.2"	0.887	Reliable
	"Y1.3"	**0.832**	Reliable

Variables	Indicator	Outer Loading	Results
	"Y1.4"	**0.861**	Reliable
	"Y1.5"	**0.852**	Reliable

Source: Data Processing with SMART PLS (2025)

Based on the table above, it can be seen that all indicators of each variable have a value > 0.70, so it can be said that the indicators of each existing variable are reliable.

Composite Reliability

Table 2. shows the values of Composite Reliability and Cronbach Alpha of the variables in the study.

Table 2. Composite Reliability

Variables	Composite Reliability	Cronbach's Alpha	Information
Work environment	0.937	0.919	Reliable
Job Training	0.900	0.852	Reliable
Science and Technology Teacher	0.936	0.917	Reliable
Teacher Productivity	0.934	0.914	Reliable

Source: Data Processing with SMART PLS (2025)

Table 2 shows that the composite reliability value for all variables is >0.70, thus concluding that all indicators in this study are considered reliable for calculating the variable construct. Furthermore, the Cronbach's Alpha value for each variable is >0.60, indicating that all variables in this study are reliable.

Inner Model

VIF – Variance Inflation Factor (Multicollinearity Test)

From the tests that have been carried out, table 4.8 shows the results of the VIF test or multicollinearity test.

Table 3. Inner VIF

	IPTAQ Teacher	Work environment	Job Training	Teacher Productivity	IPTAQ Teacher x Work Environment	IPTAQ Teacher x Job Training
Science and Technology Teacher				2,006		
Work environment	1,077			1,512		
Job Training	1,077			1,418		
Teacher Productivity						
Teacher's Science and Technology x Work Environment				1,137		
IPTAQ Teacher x Job Training				1,129		

Source: Data Processing with SMART PLS (2025)

Table 3 shows that the VIF test results, namely the inner VIF value, in the current research model are <5, indicating that there is no multicorrelation. This indicates that the quality of the research model is acceptable.

R Square

This study obtained R Square results according to table 4 as follows:

Table 4. R Square Calculation Results

	R-square
Science and Technology Teacher	0.482
Teacher Productivity	0.262

Source: SmartPLS 4.0 Data Processing (2025)

Based on Table 4, the R-Square value is used to measure the ability of the research model to explain variations in endogenous (dependent) variables, or what is known as the coefficient of determination.

The R-Square value of 0.482 indicates that the model is able to explain 48.2% of the variation in the Teachers' IPTAQ variable. This can be categorized as substantial (high) according to Chin's (1998) criteria, which sets a threshold of 0.26 for the strong category. This means that the work environment (X_1) and job training (X_2) variables have a significant contribution in influencing the strengthening of teachers' IPTAQ at Islamic Center Vocational Schools Based on Islamic Boarding Schools in Central Sulawesi. The remaining 51.8% is influenced by other factors outside this research model.

Meanwhile, the R-Square value of 0.262 indicates that the model can explain 26.2% of the variation in the Teacher Productivity variable. This value is right on the substantial threshold, meaning that the work environment (X_1), job training (X_2), and Teacher IPTAQ (M) collectively have a significant influence on teacher productivity. The remaining 73.8% is explained by other factors not examined in this study.

Thus, it can be concluded that this research model has strong predictive power for the Teachers' IPTAQ variable and is quite significant for the Teacher Productivity variable. These results indicate that the existence of a conducive work environment and relevant job training can strengthen teachers' IPTAQ, which in turn also contributes to increased productivity.

F Square

This section displays the results of the F-square calculation. An F-square value > 0.02 is considered weak, > 0.15 is considered moderate, and > 0.35 is considered strong. The following are the results of the F-square calculation in Table 5:

Table 5. F Square Calculation Results

	f-square
Work Environment -> Teacher Productivity	0.021
Job Training -> Teacher Productivity	0.032
Work Environment -> IPTAQ Teacher	0.388
Job Training -> IPTAQ Teacher	0.296
Teacher IPTAQ -> Teacher Productivity	0.270

Source: Data Processing with SMART PLS (2025)

Based on Table 5, the F-Square calculation shows that the direct effect of the work environment on teacher productivity is 0.021, which is considered weak. This means that

although the work environment makes a positive contribution, its direct effect on teacher productivity is not very strong. A similar effect is also seen in the case of job training on teacher productivity, which only produces a value of 0.032, which is considered weak. This finding indicates that neither the work environment nor job training significantly increases teacher productivity when standing alone without the mediation of other factors. This is different from the effect of the work environment on teachers' IPTAQ which produces a value of 0.388 and is categorized as strong. This confirms that A conducive, harmonious, and supportive work environment significantly strengthens teachers' IPTAQ values. Meanwhile, on-the-job training for teachers' IPTAQ scored 0.296, falling into the moderate category. Therefore, on-the-job training provided by schools is quite effective in improving teachers' IPTAQ, although its contribution is not as strong as the work environment.

Furthermore, the influence of teachers' IPTAQ on teacher productivity showed a value of 0.270, which is considered moderate. This result indicates that teachers who integrate knowledge and piety (IPTAQ) tend to demonstrate better productivity in carrying out their duties. Thus, IPTAQ plays a crucial role in bridging the influence of other factors on productivity.

When linked to its mediating role, these results confirm that IPTAQ is a crucial intermediary variable. While the direct influence of the work environment and on-the-job training on teacher productivity is weak, when measured through IPTAQ, the effect becomes more significant. This aligns with hypotheses H6 and H7, which position IPTAQ as the primary mediating factor in increasing teacher productivity.

Q Square (Predictive Relevance)

This study also conducted a predictive relevance test to assess the extent to which the PLS-SEM model has predictive ability for endogenous variables, namely Teacher IPTAQ and Teacher Productivity. The tests used included CVPAT (Cross-Validated Predictive Ability Test), Q^2 Predict, PLS-MAE, and LM-MAE. CVPAT was used to compare the predictive ability of the PLS-SEM model with two benchmark models, namely the Indicator Average and the Linear Model.

Table 6. CVPAT

Variables	PLS-SEM vs Indicator Average		PLS-SEM vs Linear Model	
	Avg. Loss difference	p-value	Avg. Loss difference	p-value
Science and Technology Teacher	-0.116	0.010	-0.063	0.018
Teacher Productivity	0.054	0.096	-0.066	0.150
Overall	-0.038	0.250	-0.064	0.014

Source: Data Processing with SMART PLS (2025)

The CVPAT test results in Table 6 show that for the Teacher IPTAQ variable, the Avg. Loss Difference value against the Indicator Average model is -0.116 with a p-value of 0.010. Since the p-value <0.05, this result is significant, meaning the PLS-SEM model has better predictive ability than the Indicator Average. Similar results are also seen in the comparison with the Linear Model, where the Avg. Loss Difference value is -0.063 with a p-value of 0.018. This confirms that PLS-SEM is significantly superior in predicting the Teacher IPTAQ variable compared to the two comparison models. For the Teacher Productivity variable, the comparison with the Indicator Average produces an Avg. Loss Difference value of 0.054 with a p-value of 0.096, making it insignificant (p>0.05). Likewise, in the comparison with the Linear Model, the Avg. Loss Difference is -0.066 with a p-value of

0.150, which means that the predictive ability of PLS-SEM on Teacher Productivity is not different significantly compared to the benchmark model.

Overall, the comparison with the Indicator Average shows an Avg. Loss Difference value of -0.038 with a p-value of 0.250, indicating no significant difference. However, the comparison with the Linear Model yields a value of -0.064 with a p-value of 0.014 ($p < 0.05$), indicating that the PLS-SEM model generally has better predictive ability than the Linear Model.

Table 7. Q square predictions (Predictive Relevance)

Variables	Q^2predict
Science and Technology Teacher	0.430
Teacher Productivity	-0.178

Source: Data Processing with SMART PLS (2025)

Based on Table 7, the Q^2 Predict value is used to assess the predictive ability of the model. The Q^2 Predict value for the Teacher IPTAQ variable is 0.430. Since the value is positive (> 0), this indicates that the model has good predictive relevance for the Teacher IPTAQ variable. Conversely, the Q^2 Predict value for the Teacher Productivity variable is -0.178. This value is negative (< 0), which means the model has no predictive relevance for this variable. In other words, the model is not able to predict variations in Teacher Productivity well, even though the results for the Teacher IPTAQ variable are quite strong.

Table 8. PLS-MAE and LM-MAE

	Q^2predict	PLS-SEM_MAE	LM_MAE
"M1.1"	0.165	0.323	0.386
"M1.2"	0.359	0.431	0.481
"M1.3"	0.244	0.427	0.444
"M1.4"	0.291	0.434	0.457
"M1.5"	0.316	0.355	0.363
"M1.6"	0.400	0.430	0.488
"Y1.1"	-0.075	0.548	0.577
"Y1.2"	-0.138	0.575	0.553
"Y1.3"	-0.230	0.600	0.635
"Y1.4"	-0.082	0.527	0.566
"Y1.5"	-0.163	0.529	0.508

Source: Data Processing with SMART PLS (2025)

Table 8 compares the prediction accuracy of the PLS-SEM (PLS-MAE) model with the Linear Model (LM-MAE). The lower the MAE value, the more accurate the prediction.

Teachers' IPTAQ (M1.1-M1.6): Most of the PLS-MAE values are lower than LM-MAE, indicating that the PLS-SEM model provides more accurate predictions for each indicator of the Teachers' IPTAQ variable. Teacher Productivity (Y1.1-Y1.5): Most of the PLS-MAE values are also lower than LM-MAE, although the difference is not too large. This indicates that although the model as a whole has no predictive relevance for this variable (negative Q^2), the PLS-SEM model still provides slightly better predictions than the simpler linear model.

Overall, this research model shows strong and significant predictive ability for the Teachers' IPTAQ variable, supported by a positive Q^2 Predict value and superior MAE performance. Conversely, this model shows weak predictive ability for the Teachers' Productivity variable, indicated by a negative Q^2 Predict value. Nevertheless, the MAE test still shows that the PLS-SEM model is still statistically better at predicting each indicator than the simple linear model. This confirms that the tested variables have a stronger role in predicting Teachers' IPTAQ than Teacher Productivity.

Based on the results of predictive testing including CVPAT, Q^2 Predict, and a comparison of PLS-MAE with LM-MAE, it can be concluded that this research model has different predictive power for each endogenous variable. The CVPAT results show that the PLS-SEM model is significantly superior in predicting the Teacher IPTAQ variable compared to the comparison models (Indicator Average and Linear Model). However, for the Teacher Productivity variable, the model's predictive ability is not significantly different from the comparison model, so the prediction for this variable is considered weak. The Q^2 Predict results strengthen these findings. A positive Q^2 value of 0.430 for the Teacher IPTAQ variable indicates that the model has strong predictive relevance. Conversely, a negative Q^2 value of -0.178 for Teacher Productivity indicates that the model has no predictive relevance for this variable. The comparison test of PLS-MAE and LM-MAE also provides a similar picture. For the Teacher IPTAQ indicators, the PLS-MAE value is lower than LM-MAE, confirming that PLS-SEM is more accurate in predicting this variable. Meanwhile, although most of the PLS-MAE values for the Teacher Productivity indicator were also lower, the resulting differences were not significant enough to show strong predictive relevance.

Thus, it can be concluded that this research model has a stronger predictive ability for teacher IPTAQ compared to teacher productivity. This is in line with the important role of teacher IPTAQ as mediating variables that have been shown to have a significant contribution in explaining the relationship between the work environment, job training, and teacher productivity. These findings support the research hypothesis that strengthening teachers' IPTAQ plays a key role in increasing teacher productivity at Islamic Center Vocational Schools Based on Islamic Boarding Schools in Central Sulawesi.

Goodness of Fit (GoF) Test

Goodness of Fit in SmartPLS is calculated using the following formula:

$\sqrt{AVE\ rata\text{-}rata\ x\ R^2\ rata\text{-}rata}$

Interpretation of GoF Value:

1. Small GoF: < 0.1 (weak model)
2. Moderate GoF: 0.1 - 0.36 (moderate model)
3. Large GoF: > 0.36 (strong model)

Table 9. Goodness of Fit (GoF) Test

	R-square	Average variance extracted (AVE)
Science and Technology Teacher	0.482	0.708
Teacher Productivity	0.262	0.744
Average	0.372	0.726
Goodness of Fit (GoF)		**0.519685**

Source: Data Processing with SMART PLS (2025)

The GoF value of 0.519685 indicates that the research model has a strong fit. This means that the model has Good predictive ability and the ability to explain the data substantially. Simply put, the model constructed, including the relationships between variables and estimated weights, has excellent fit with the available empirical data.

Hypothesis Testing

Latent Variables

After bootstrapping, the path coefficient results were obtained according to the data listed in

table 10.

Table 10. Path Coefficients (Latent)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EnvironmentWork -> Teacher Productivity	-0.152	-0.170	0.119	1,278	0.201
Job Training -> Teacher Productivity	**-0.184**	**-0.202**	**0.193**	**0.954**	**0.340**
Work Environment -> IPTAQ Teacher	**0.465**	**0.470**	**0.092**	**5,069**	**0.000**
Job Training -> IPTAQ Teacher	**0.406**	**0.410**	**0.096**	**4,216**	**0.000**
IPTAQ Teacher -> Teacher Productivity	**0.632**	**0.664**	**0.141**	**4,497**	**0.000**
Work Environment -> Teacher Productivity Through IPTAQ	**0.172**	**0.168**	**0.097**	**1,767**	**0.077**
Job Training -> Teacher Productivity Through IPTAQ	**0.071**	**0.069**	**0.113**	**0.634**	**0.526**

Source: Data Processing with SMART PLS (2025)

Based on Table 10, the test results show the direct influence and interaction between variables in the research model. The decision to accept or reject is made by comparing the T-statistic value with a critical value of 1.96 (for a 5% significance level) and a P-value that must be less than 0.05. The analysis is carried out sequentially starting from the direct influence of the independent variable on the dependent variable, the influence of the independent variable on Teacher IPTAQ, the influence of Teacher IPTAQ on Teacher Productivity, to the interaction/moderation influence.

Results of the Direct Path Hypothesis Test

Work Environment on Teacher Productivity

The test results show a T-statistic of 1.278 < 1.96 with a P-value of 0.201 > 0.05, indicating that the work environment does not significantly impact teacher productivity. This may be because, although the work environment at the Islamic Center Vocational School is quite good, this condition only makes teachers feel comfortable, but does not necessarily increase productivity. Teacher productivity is more influenced by internal factors such as motivation, commitment, and spiritual awareness.

These results align with research by Harris & Sass (2011), which stated that environmental factors do not always significantly impact teacher productivity. However, these results differ from research by Bahri (2018) and Syahputra et al. (2022), which found that the work environment significantly influences teacher performance. This difference suggests that in the context of Islamic boarding schools, spiritual aspects (IPTAQ) are a greater determinant of productivity than purely technical factors.

Job Training on Teacher Productivity

The test results showed a T-statistic of 0.954 < 1.96 with a P-value of 0.340 > 0.05, indicating that on-the-job training had no significant effect on teacher productivity. This condition may be caused by the training not being conducted continuously, so its impact has not been felt significantly. Teachers do gain additional knowledge, but its application in the field is still limited due to factors such as facilities, time, and the relevance of the material to

teachers' needs.

These results are consistent with Harris & Sass (2011), who found that teacher training does not always have a direct impact on productivity. However, these results differ from research by Zulkarnaen et al. (2018) and Hau et al. (2023), which showed that training significantly impacted performance. This difference demonstrates that the quality and sustainability of training significantly determine its effectiveness.

Work Environment on Teachers' IPTAQ

The test results showed a T-statistic of 5.069 > 1.96 with a P-value of 0.000 < 0.05, indicating that the work environment significantly influences teachers' IPTAQ. This indicates that a harmonious work environment, adequate religious facilities, and the support of colleagues and leaders strengthen teachers' religious values. Teachers feel that the work environment not only provides comfort but also encourages them to further strengthen their faith and piety.

These results align with research by Al-Omari & Okasheh (2017), which found that the work environment can enhance positive attitudes and motivation. Therefore, although it doesn't directly impact productivity, the work environment plays a significant role in developing teachers' IPTAQ, which then becomes a crucial factor in improving performance.

Job Training for IPTAQ Teachers

The test results showed a T-statistic value of 4.216 > 1.96 with a P-value of 0.000 < 0.05, indicating that job training had a significant effect on teachers' IPTAQ. This means that the training teachers attended not only increased skills, but also strengthens spiritual values. Teachers who participate in the training feel more professionally competent and are increasingly motivated to integrate knowledge with piety.

These results support research by Cherotich et al. (2013) and Sari et al. (2023), which asserted that training can improve both skills and positive attitudes. In the context of Islamic boarding schools, this influence is even greater because the training is directed at strengthening religious aspects.

Teacher IPTAQ on Teacher Productivity

The test results show a T-statistic value of 4.497 > 1.96 with a P-value of 0.000 < 0.05, so that teachers' IPTAQ has a significant effect on teacher productivity. This means that teachers who have a balance between science and technology and IMTAQ are more disciplined, responsible, and show better performance.

These results support research by Iis Uun Fardiana (2015), which asserts that the integration of faith and taqwa (imtaq) and science and technology (iptaq) drives improvements in teacher performance. Thus, IPTAQ serves as a reinforcing factor that bridges professional skills and actual productivity in the field.

Interaction/Moderation Test Results

Work Environment as a Moderator between Teachers' IPTAQ and Teacher Productivity

The test results show a T-statistic value of 1.767 < 1.96 with a P-value of 0.077 > 0.05, so the work environment does not play a moderating role. In the relationship between IPTAQ and teacher productivity. This may occur because the work environment functions more as an external factor, while the internal aspect of IPTAQ has a stronger influence on productivity. These results differ from research that emphasizes the importance of organizational support in strengthening performance, but instead shows that spiritual factors are more dominant in Islamic boarding schools.

Job Training as a Moderation between Teacher IPTAQ and Teacher Productivity

The test results showed a T-statistic of 0.634 < 1.96 with a P-value of 0.526 > 0.05,

indicating that job training also did not play a moderating role. This can be explained because training only has a strong effect when directed at building IPTAQ, not when it stands alone as a moderating factor. These results differ from studies that emphasize the role of training in performance, but show that in the context of Islamic boarding schools, its influence is more mediating through strengthening spiritual values.

Overall, these results indicate that the Work Environment and Job Training have a significant influence on Teacher IPTAQ, while their direct and interaction effects on Teacher Productivity are not significant.

Discussion

Work Environment on Teacher Productivity

The results of the study showed that the work environment did not significantly influence teacher productivity (T-statistic = 1.278 < 1.96; P-value = 0.201 > 0.05). This condition shows that even though teachers work in a comfortable and conducive environment, it does not necessarily increase their productivity.

Theoretically, according to Perceived Organizational Support Theory (Eisenberger et al., 1986), organizational support, such as physical and social comfort, can improve performance. However, in this study, this support did not have a significant impact. This is because teacher productivity is more influenced by internal factors, such as motivation and spirituality.

These results align with Harris & Sass (2011), who stated that environmental factors are not always significant for teacher productivity. However, they differ from the findings of Syahputra et al. (2022), who found a significant influence. This difference indicates that the context of Islamic boarding schools places greater emphasis on the religious dimension (IPTAQ) than solely on the technical dimension.

Job Training on Teacher Productivity

The results of the study showed that on-the-job training had no significant effect on teacher productivity (T-statistic = 0.954 < 1.96; P-value = 0.340 > 0.05). Teachers who participated in the training did acquire additional skills, but these skills did not automatically increase productivity without internal motivation.

According to Human Capital Theory (Becker, 1993), training is a long-term investment, so results are only visible when the training is conducted continuously. This may explain why its immediate impact is insignificant.

The results of this study align with those of Harris & Sass (2011), who stated that formal teacher training often has no direct impact on productivity. However, these results differ from those of Zulkarnaen et al. (2018) and Hau et al. (2023), who found a significant positive effect. This difference demonstrates that the quality and sustainability of training significantly determine its effectiveness.

Work Environment on Teachers' IPTAQ

The work environment was shown to have a significant influence on teachers' IPTAQ (T-statistic = 5.069 > 1.96; P-value = 0.000 < 0.05). This means that a supportive work environment, the availability of religious facilities, and harmonious working relationships strongly encourage teachers to integrate knowledge with piety.

These results are consistent with the middle-range theory of Knowledge Integration (al-Faruqi & al-Attas), which emphasizes that the environment can strengthen spirituality. This is also in line with research by Al-Omari & Okasheh (2017), which states that the work environment influences work attitudes and motivation. These findings demonstrate that although the work environment does not directly increase productivity, it plays a significant role in developing IPTAQ, which in turn boosts teacher productivity.

Job Training for IPTAQ Teachers

Job training has been shown to have a significant effect on teachers' IPTAQ (T-statistic = 4.216 > 1.96; P-value = 0.000 < 0.05). This means that the training teachers receive not only enhances their skills but also strengthens their spiritual commitment and awareness of integrating science and technology with religious values. This finding aligns with research by Cherotich et al. (2013) which confirms that training can improve both skills and positive attitudes in employees, as well as research by Sari et al. (2023) which shows that training plays a role in increasing work motivation. In the context of Islamic boarding school-based education, training serves a dual function: providing professional skills while fostering religious awareness. This is what makes the effect of training on IPTAQ stronger than its effect on productivity.

Teacher IPTAQ on Teacher Productivity

Teachers' IPTAQ has been shown to have a significant influence on teacher productivity (T-statistic = 4.497 > 1.96; P-value = 0.000 < 0.05). Teachers who have a balance between knowledge and piety are more disciplined, responsible, and demonstrate better performance. This finding reinforces the theory of productivity (Sumanth, 1984; Sedarmayanti, 2017) that productivity is measured not only by output efficiency but also by its underlying quality and values. This study also in line with Iis Uun Fardiana (2015) who found that the integration of IMTAQ and IPTEK improves teacher performance.

Mediation of Work Environment on Teacher Productivity through IPTAQ

The work environment did not play a significant moderating role (T-statistic = 1.767 < 1.96; P-value = 0.077 > 0.05). However, through mediation, the work environment still contributed to teacher productivity through IPTAQ. This means that a positive work environment first fosters spiritual awareness, which then drives productivity. This is in line with Sharma & Jyoti (2021), who stated that organizational support is often insignificant without psychological or spiritual variables.

Mediation of Job Training on Teacher Productivity through IPTAQ

Job training was also insignificant as a moderating factor (T-statistic = 0.634 < 1.96; P-value = 0.526 > 0.05). However, as a mediator, training influenced productivity through IPTAQ. This means that training attended by teachers only impacts productivity if it strengthens religious awareness. In other words, the effectiveness of training in Islamic boarding schools is measured not only by technical competence, but also by the extent to which the training strengthens teachers' IPTAQ.

CONCLUSION

This study found that both the work environment and job training significantly and directly enhanced students' *IMTAQ* (faith and piety) and *IPTEK* (science and technology) at the Islamic Center Vocational High School, although neither factor had a significant direct effect on teacher productivity. Teacher productivity itself was a significant direct contributor to strengthening *IMTAQ* and *IPTEK*, functioning more as an outcome rather than a mediator, and did not moderate the effects of work environment or training. This suggests that while a supportive environment and relevant training are important for student development, other factors such as intrinsic motivation, leadership, or compensation may more directly influence teacher productivity. Future research should consider including variables like leadership style, compensation, motivation, and organizational culture, and use mixed-methods approaches to gain deeper insights into factors affecting productivity in pesantren-based vocational schools. Expanding the study to a larger and more diverse sample across multiple Islamic institutions and employing longitudinal designs could enhance the understanding of causal relationships and the sustained impact on student outcomes.

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