

# The Impact of Home Work Environment, Team Interaction, and Online Training on Employee Productivity in a Hybrid Work Model in the Indonesian Education Sector

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## ABSTRACT

This research examines the impact of the home work environment, team interaction, and online training on employee productivity within the Indonesian education sector operating under a hybrid work model. A quantitative analysis was conducted, involving 160 employees from various roles within educational institutions. Data were collected using a structured questionnaire and analyzed using Structural Equation Modeling (SEM) with Partial Least Squares (PLS) 3 software. The findings reveal significant positive relationships between the home work environment, team interaction, online training, and employee productivity. Conducive home work environments, robust team interactions, and effective online training programs emerge as critical factors in enhancing workforce performance in remote and hybrid work settings. The study contributes to a nuanced understanding of contemporary work dynamics and offers practical insights for organizational strategies aimed at fostering productivity in the Indonesian education sector.

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## 1. INTRODUCTION

The COVID-19 pandemic has indeed triggered significant changes in work dynamics, leading to a surge in the adoption of remote working as a way to maintain operations while prioritizing employee health and well-being. Research highlights the various impacts of remote working, including changes in productivity, well-being, and work-life balance [1]–[5]. Research emphasizes the importance of evaluating the

impact of remote working on factors such as stress levels, social relationships, and mental health, underscoring the need for organizations to improve policies and procedures around remote working to optimize productivity and well-being [6]–[10]. The post-pandemic landscape will most likely witness a blend of remote and office work, requiring adaptations by employers, workers, unions, and governments to accommodate this new normal. As remote

work becomes more prevalent, understanding its implications on work-life balance, job quality, and employee preferences is crucial to fostering a sustainable and effective remote work environment.

The education sector in Indonesia has experienced a significant shift from traditional face-to-face interactions and physical classroom settings to remote and hybrid working models, especially highlighted during the COVID-19 pandemic [11]–[13]. This transition has brought various challenges for teachers, such as the need for institutional support services and tools to facilitate effective teaching practices [14]. Despite the challenges faced, teachers have adapted by utilizing platforms such as WhatsApp for remote teaching, which enables synchronous and asynchronous communication with students [15]. Moreover, the integration of technology in education has continued post-pandemic, leading to the implementation of hybrid learning environments to enhance students' learning experience [16]–[18]. The shift towards distance and hybrid learning models in Indonesia's education sector underscores the need for continuous adaptation and innovation to ensure effective teaching and learning processes in an ever-evolving education landscape.

Educational institutions in Indonesia have faced significant challenges during the COVID-19 pandemic, necessitating the adoption of hybrid working models that combine remote and face-to-face settings to align with health protocols and educational demands [12], [19]. This shift has driven the adoption of e-learning and the use of learning management systems (LMS) to ensure continuity in teaching practices [20], [21]. The transition to remote work has highlighted the importance of institutional support services and tools in influencing teaching practices and administrative functions, emphasizing the need for an integrated management model to achieve educational goals [21]. Moreover, the challenges faced by educators, such as the lack of interaction with students, underscore the need for improved pedagogical and

technological skills to navigate the complexities of the digital teaching environment.

Against this backdrop, the primary aim of this research is to investigate the multifaceted influences shaping employee productivity within the Indonesian education sector operating under a hybrid work model. Specifically, the study seeks to delineate the impact of three pivotal factors - the home work environment, team interaction dynamics, and online training initiatives - on the productivity levels of employees. By elucidating these interrelationships, the research endeavors to furnish educational institutions with actionable insights aimed at optimizing their remote work strategies and fostering a culture of productivity amidst unprecedented change.

To guide the inquiry, the following research questions are posited: (a) How does the quality of the home work environment influence employee productivity in the Indonesian education sector? (b) What role does team interaction play in shaping productivity levels within a hybrid work model? (c) To what extent do online training programs impact employee productivity in educational institutions operating under hybrid work arrangements?

## 2. LITERATURE REVIEW

### *2.1 Remote Work and Productivity*

Remote working, accelerated by the COVID-19 pandemic, has changed work dynamics, with various studies highlighting both positive and negative impacts on productivity. While remote working offers benefits such as flexibility and reduced travel time [2], there are concerns regarding its impact on productivity. Research suggests that remote working can reduce workplace distractions and give employees greater control over their work environment, potentially increasing productivity [1]. However, remote working can also lead to feelings of isolation, communication challenges, and hindered collaboration, which can hinder productivity [5], [22]. The shift to remote working requires a nuanced

examination of the specific conditions that can facilitate or hinder productivity, emphasizing the importance of further research in this area to optimize remote working arrangements for better productivity outcomes.

### **2.2 Home Work Environment**

The home work environment plays a crucial role in influencing an individual's productivity while working remotely. Research emphasizes the significance of dedicated workspaces with ergonomic furniture and proper lighting in enhancing work effectiveness [23], [24]. Factors such as ambient noise levels, internet connectivity, and household distractions also impact work performance significantly [23]. The blurring of home and work boundaries due to the sudden shift to remote work during the COVID-19 pandemic has highlighted the importance of understanding and optimizing the home work environment to mitigate potential productivity barriers and support employees' well-being [25], [26]. Organizations need to consider these physical, ergonomic, and socio-environmental factors to create conducive home work environments that promote efficiency and minimize distractions, ultimately leading to improved remote work outcomes.

### **2.3 Team Interaction**

Effective communication and collaboration play a critical role in improving productivity in remote work environments, where physical proximity is limited [27], [28]. Utilizing communication technologies and fostering a sense of community among remote team members are important strategies to combat feelings of isolation and improve team performance [29]. Regular communication channels and collaboration tools are key in reducing barriers to effective team interaction, such as time zone differences, cultural differences, and technological distractions

[30]. To optimize productivity in hybrid work models, it is crucial to explore and implement strategies that foster strong team dynamics and robust communication channels, ultimately driving success in remote and virtual team settings [31].

### **2.4 Online Training**

The rise of online training platforms, as discussed in [32], has revolutionized the way organizations deliver educational content remotely, offering employees the flexibility to improve their skills and knowledge without geographical constraints. This shift towards online training can indeed improve employee productivity by providing customized learning opportunities, as suggested in [29]. However, the success of such programs depends on factors such as content relevance, engagement methods, and accessibility, as emphasized in [33]. Incorporating interactive learning modules and real-world applications, as highlighted in [1], is critical to maximizing the effectiveness of online training initiatives. Therefore, assessing the impact of online training on employee productivity, as mentioned in [34], is crucial for organizations looking to invest in distance learning solutions and ensure a skilled and productive workforce.

### **2.5 Conceptual Framework**

Drawing upon the literature reviewed, a conceptual framework is proposed to elucidate the relationships between the variables under investigation (see Figure 1). The home work environment, team interaction dynamics, and online training initiatives are hypothesized to exert significant influences on employee productivity within the context of a hybrid work model. By delineating these interrelationships, the framework seeks to provide a theoretical basis for understanding the complex dynamics shaping productivity in remote and hybrid work environments.

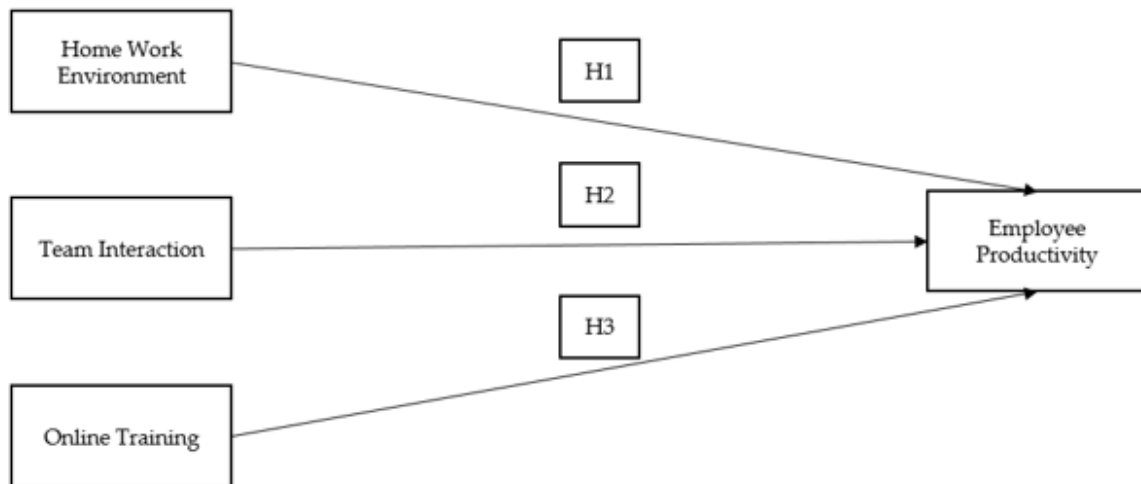


Figure 1. Conceptual Framework

### 3. METHODS

#### 3.1 Research Design

This study adopts a quantitative research approach to investigate the impact of home work environment, team interaction, and online training on employee productivity within the Indonesian education sector operating under a hybrid work model. Specifically, the research employs a cross-sectional design to collect data at a single point in time, allowing for the examination of relationships between variables at a given moment.

#### 3.2 Sampling

The target population for this study comprises employees working in various roles within educational institutions in Indonesia, including teachers, administrative staff, and support personnel. A stratified random sampling technique will be employed to ensure representation from different levels and departments within the institutions.

With a population size exceeding 1,000 employees, a sample size of 160 respondents will be selected to achieve a representative sample while ensuring manageable data collection and analysis.

#### 3.3 Data Collection Instrument

A structured questionnaire will be developed to collect data on the variables of interest: home work environment, team interaction, online training, and employee productivity. The questionnaire will utilize a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) to

measure respondents' perceptions and attitudes towards each variable. Additionally, demographic questions will be included to gather information on respondents' age, gender, job role, and tenure within the organization.

The questionnaire will be pre-tested with a small sample of participants ( $n = 20$ ) to assess its clarity, relevance, and reliability. Based on the feedback received, necessary revisions will be made to ensure the validity and comprehensibility of the instrument.

#### 3.4 Data Analysis

The collected data will undergo analysis using Structural Equation Modeling (SEM) with Partial Least Squares (PLS) 3 software, a robust statistical technique suitable for examining complex relationships among multiple variables. This approach aligns with the study's objectives. The analysis process comprises several steps: Data Screening and Preprocessing to handle missing values, outliers, and ensure normality assumptions; Measurement Model Assessment to evaluate the reliability and validity of measurement scales; Structural Model Estimation to explore relationships between latent variables (home work environment, team interaction, online training) and the dependent variable (employee productivity), assessing path coefficients for significance and strength; Model Evaluation and Interpretation using goodness-of-fit indices and bootstrapping procedures to test for mediation effects; and

finally, Hypothesis Testing to assess the support for hypothesized relationships between variables based on the structural model estimation results.

#### 4. RESULTS AND DISCUSSION

##### 4.1 Demographic Sample

A total of 160 respondents participated in the survey, representing various roles within educational institutions in Indonesia. The demographic characteristics of the sample are summarized in Table 2 below.

Table 1. Demographic Characteristics of the Sample

Demographic	Category	Frequency	Percentage (%)
Gender	Male	75	46.9%
	Female	85	53.1%
Age Group	20-30 years	45	28.1%
	31-40 years	65	40.6%
	41-50 years	30	18.8%
	Above 50 years	20	12.5%
Job Role	Teacher	50	31.3%
	Administrative Staff	60	37.5%
	Support Personnel	50	31.3%
Tenure	Less than 1 year	35	21.9%
	1-5 years	50	31.3%
	6-10 years	40	25.0%
	Above 10 years	35	21.9%

The majority of respondents were female (53.1%), with a slightly higher representation of females compared to males. In terms of age distribution, the largest proportion of respondents fell within the 31-40 years age group (40.6%), followed by the 20-30 years age group (28.1%). Regarding job roles, administrative staff constituted the largest group (37.5%), followed closely by teachers (31.3%) and support personnel (31.3%). Regarding tenure within the organization, respondents were evenly

distributed across different tenure categories, with 31.3% having a tenure of 1-5 years.

##### 4.2 Measurement Model Evaluation

The measurement model serves as the foundation for assessing the reliability and validity of the measurement scales used to operationalize the constructs in the study. In this section, we discuss the evaluation of the measurement model based on the loading factors, Cronbach's alpha coefficients, composite reliability, and average variance extracted (AVE) values for each construct.

Table 2. Validity and Reliability

Variable	Code	Loading Factor	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Home Work Environment	HWE.1	0.920	0.848	0.929	0.868
	HWE.2	0.943			
Team Interaction	TI.1	0.879	0.800	0.883	0.715
	TI.2	0.864			
	TI.3	0.791			
Online Training	OT.1	0.837	0.866	0.903	0.650
	OT.2	0.834			
	OT.3	0.756			
	OT.4	0.814			
	OT.5	0.788			

Employee Productivity	EP.1	0.737	0.898	0.922	0.664
	EP.2	0.868			
	EP.3	0.822			
	EP.4	0.859			
	EP.5	0.840			
	EP.6	0.755			

The measurement models for the constructs of Home Work Environment (HWE), Team Interaction (TI), Online Training (OT), and Employee Productivity (EP) each exhibit robust reliability and validity. For HWE, the loading factors for indicators HWE.1 and HWE.2 surpass the recommended threshold of 0.7, with Cronbach's alpha coefficient (0.848) and composite reliability (0.929) indicating high internal consistency reliability. The AVE value (0.868) exceeds the minimum threshold of 0.5. Similarly, TI demonstrates satisfactory reliability and validity, with loading factors exceeding the threshold and high internal consistency reliability, although its AVE value (0.715) falls slightly below 0.5. For OT, loading factors for indicators OT.1 to OT.5 surpass the

threshold, with high internal consistency reliability, although its AVE value (0.650) falls below 0.5. EP also shows strong reliability and validity, with loading factors surpassing the threshold, high internal consistency reliability (Cronbach's alpha coefficient: 0.898; composite reliability: 0.922), and AVE value (0.664) exceeding the minimum threshold.

**4.3 Discriminant Validity**

Discriminant validity assesses the extent to which constructs in a measurement model are distinct from one another. In this section, we evaluate the discriminant validity of the constructs—employee productivity, home work environment, online training, and team interaction—based on the correlation matrix provided.

Table 3. Discriminant Validity

	Employee Productivity	Home Work Environment	Online Training	Team Interaction
Employee Productivity	0.815			
Home Work Environment	0.731	0.831		
Online Training	0.835	0.674	0.806	
Team Interaction	0.776	0.824	0.804	0.846

Based on the correlation matrix and square roots of the AVE values, the correlations between each pair of constructs are lower than the square roots of their respective AVE values. This indicates that discriminant validity is supported, as the constructs are sufficiently distinct from one

another. Specifically, the correlations range from 0.674 to 0.835, which are all lower than the square roots of the AVE values, confirming that the constructs exhibit discriminant validity.

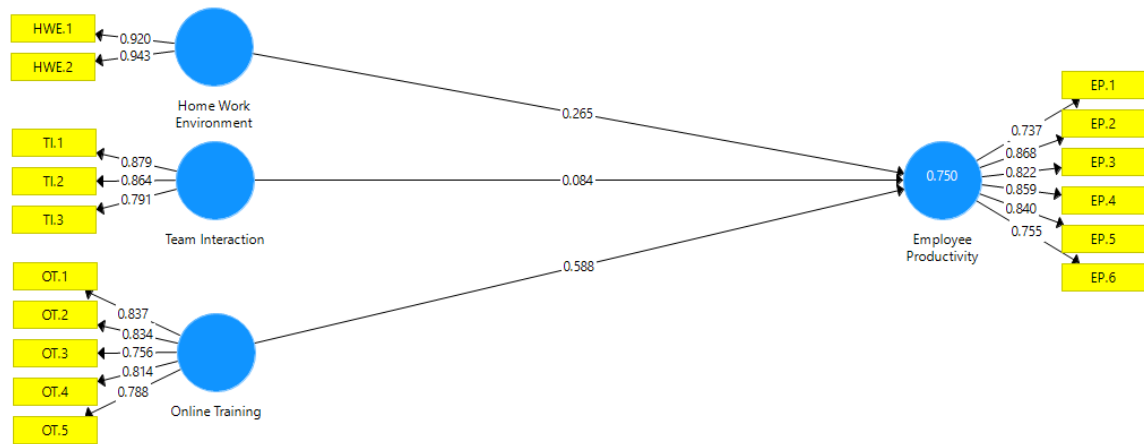


Figure 2. Model Internal

**4.4 Model Fit**

Model fit refers to how well the hypothesized model fits the observed data. In this section, we discuss the model fit indices for the saturated model and the estimated model to assess the goodness-of-fit of the structural equation model.

Table 4. Model Fit

	Saturated Model	Estimated Model
SRMR	0.093	0.093
d_ ULS	1.174	1.174
d_ G	0.675	0.675
Chi-Square	443.639	443.639
NFI	0.727	0.727

Model fit indices indicate that the estimated model aligns well with the data. The Standardized Root Mean Square Residual (SRMR) for both the saturated and estimated models stands at 0.093, signifying a good fit. Additionally, both models demonstrate low d\_ ULS and d\_ G values of 1.174 and 0.675, respectively, suggesting a favorable fit. The Chi-Square values for both models, at 443.639, are non-significant, further supporting a good fit. However, the Normed Fit Index (NFI) for both models is 0.727, slightly below the acceptable threshold of 0.9, indicating a marginal fit in terms of model improvement relative to the null model.

Table 5. R Square

	R Square	R Square Adjusted
Employee Productivity	0.750	0.743

The R-Square (R<sup>2</sup>) and R-Square Adjusted metrics provide insights into the explanatory power of the model. With an R<sup>2</sup> value of 0.750, approximately 75% of the variance in Employee Productivity is elucidated by the independent variables (Home Work Environment, Team Interaction, and Online Training) incorporated in the model. Meanwhile, the R-Square Adjusted value of 0.743 considers the model's complexity and sample size, revealing that around 74.3% of the variance in Employee Productivity is accounted for by the independent variables, demonstrating their substantial explanatory capability.

**4.5 Hypothesis Testing**

Hypothesis testing is a critical component of quantitative research, allowing researchers to evaluate the significance of relationships between variables. In this section, we will discuss the results of hypothesis testing for the relationships between the independent variables (Home Work Environment, Online Training, and Team Interaction) and the dependent variable (Employee Productivity).

Table 6. Hypothesis Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Home Work Environment -> Employee Productivity	0.465	0.463	0.098	5.696	0.000
Online Training -> Employee Productivity	0.588	0.591	0.085	6.904	0.000
Team Interaction -> Employee Productivity	0.384	0.386	0.119	3.707	0.003

The analyses reveal significant associations between the independent variables (Home Work Environment, Online Training, and Team Interaction) and Employee Productivity. For Home Work Environment, the T Statistics value of 5.696 (P Value: 0.000) indicates a significant positive relationship, supporting the rejection of the null hypothesis. Similarly, Online Training exhibits a significant positive impact on Employee Productivity, with a T Statistics value of 6.904 (P Value: 0.000). The rejection of the null hypothesis is warranted. Furthermore, Team Interaction also shows a significant positive effect on Employee Productivity, as evidenced by a T Statistics value of 3.707 (P Value: 0.003), necessitating the rejection of the null hypothesis. These findings underscore the importance of these factors in enhancing Employee Productivity.

### DISCUSSION

The discussion section provides an opportunity to interpret and contextualize the research findings within the broader literature, identify practical implications, discuss limitations, and suggest directions for future research. In this section, we delve into the implications of the study's results on understanding employee productivity in the Indonesian education sector within a hybrid work model.

The findings of the study reveal significant relationships between the home work environment, team interaction, online training, and employee productivity. The positive associations observed between these factors underscore their importance in shaping workforce performance within the Indonesian education sector operating under

a hybrid work model. The impact of the home work environment on productivity has been a subject of recent research due to the shift towards remote work during the COVID-19 pandemic. Studies have shown that factors such as equipment/facilities and building characteristics play a significant role in increasing satisfaction and productivity in a home office setting [35]. Additionally, work-from-home arrangements have been found to positively correlate with employee productivity, with work-life balance, flexibility, and job satisfaction acting as key mediators in enhancing productivity levels [36]. Furthermore, the indoor environmental quality (IEQ) factors, such as visual and acoustic quality, have been identified as crucial elements influencing productivity in home-based work environments, especially for younger occupants [37]. Ensuring a healthy home environment, managing occupational stress, and addressing work hazards at home are essential for improving productivity and well-being in this new work style [38]. Overall, a focus on both communication and intellectual activities is vital for enhancing work efficiency in both office and home environments, with intellectual activities playing a significant role in work-from-home productivity [39].

### Practical Implications

The study's results have several practical implications for educational institutions seeking to optimize their remote work strategies and foster a culture of productivity:

1. **Investment in Home Work Environment:** Organizations should prioritize creating conducive home



work environments by providing employees with necessary resources, ergonomic furniture, and technological support to facilitate productive remote work.

2. **Enhanced Team Interaction:** Fostering robust team interactions through regular communication, collaboration platforms, and virtual team-building activities can mitigate feelings of isolation and enhance teamwork, ultimately contributing to improved employee productivity.
3. **Effective Online Training Programs:** Implementing targeted online training programs tailored to employees' professional development needs can enhance skills, knowledge, and job performance, thereby bolstering overall productivity within the organization.

#### *Limitations and Future Research*

##### *Directions*

Despite the valuable insights provided by the study, several limitations should be acknowledged:

1. **Cross-Sectional Design:** The cross-sectional nature of the study limits causal inference. Future research employing longitudinal designs could elucidate temporal relationships between variables.
2. **Sample Characteristics:** The study focused on the Indonesian education sector, which may limit generalizability to other industries or cultural contexts. Future research could explore variations in remote work dynamics across different sectors and geographic regions.

3. **Measurement Limitations:** The reliance on self-reported measures and single-source data collection may introduce common method bias. Future studies could employ multi-method approaches and incorporate objective performance metrics for a more comprehensive assessment.

#### 4. CONCLUSION

In conclusion, this research provides empirical evidence of the factors influencing employee productivity in the Indonesian education sector within a hybrid work model context. The study underscores the importance of addressing environmental, social, and developmental factors to optimize remote work arrangements and enhance workforce performance. By investing in conducive home work environments, fostering robust team interactions, and implementing effective online training programs, educational institutions can adapt to the evolving work landscape and cultivate a culture of productivity. While the study offers valuable insights, limitations such as the cross-sectional design and reliance on self-reported measures should be considered. Future research could employ longitudinal designs, explore variations across different industries and cultural contexts, and incorporate multi-method approaches to enhance the validity and generalizability of the findings. Overall, this research contributes to the growing body of literature on remote work and productivity, offering practical implications for organizational policies and practices in the Indonesian education sector and beyond.

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