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The Mediating Role of Teacher Engagement in the Effect of Green Technology Adoption and Pedagogical Technostress on Green Teaching Perfomance

Fitri Rezeki[1], Yunata Kandhias Akbar[2], Hardiansyah[3], Muhammad Sapruwan[4]
*[1]Magister Manajemen, Universitas Pelita Bangsa
[2]Magister Manajemen, Universitas Esa Unggul
[3,4]Magister Manajemen, Universitas Pelita Bangsa
e-mail: [1]fitri_rezeki@pelitabangsa.ac.id, [2]yunata.kandhias@esaunggul.ac.id,
[3]hardihardiansyah160@gmail.com, [4]msapruwan@cwe.ac.id
*Corresponding author: fitri_rezeki@pelitabangsa.ac.id

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh Adopsi Teknologi Hijau dan Teknostres Pedagogis terhadap Kinerja Pengajaran Hijau, dengan Keterlibatan Guru sebagai variabel mediasi. Penelitian ini menggunakan pendekatan kuantitatif dengan metode survei yang melibatkan 87 guru pengguna teknologi digital dalam proses pembelajaran. Teknik pengambilan sampel menggunakan saturasi sampel, sehingga seluruh populasi dijadikan sampel penelitian. Analisis data dilakukan menggunakan Pemodelan Persamaan Struktural berbasis Kuadrat Terkecil Parsial (SEM-PLS). Hasil penelitian menunjukkan bahwa Adopsi Teknologi Hijau memiliki pengaruh positif dan signifikan terhadap Kinerja Pengajaran Hijau dan Keterlibatan Guru. Teknostres Pedagogis juga memiliki pengaruh positif dan signifikan terhadap Kinerja Pengajaran Hijau dan Keterlibatan Guru. Selain itu, Keterlibatan Guru ditemukan memiliki pengaruh positif dan signifikan terhadap Kinerja Pengajaran Hijau. Hasil uji mediasi menunjukkan bahwa Keterlibatan Guru memediasi pengaruh Adopsi Teknologi Hijau dan Teknostres Pedagogis terhadap Kinerja Pengajaran Hijau. Nilai R-kuadrat sebesar 0,840 menunjukkan bahwa model memiliki kemampuan yang kuat dalam menjelaskan variasi Kinerja Pengajaran Hijau. Temuan ini menegaskan bahwa keberhasilan pembelajaran berbasis teknologi hijau tidak hanya ditentukan oleh penggunaan teknologi, tetapi juga oleh keterlibatan guru dalam proses pembelajaran.

Kata Kunci: Adopsi Teknologi Hijau; Stres Teknologi Pedagogis; Keterlibatan Guru; Kinerja Pengajaran Hijau; Kinerja Guru.

ABSTRACT

This study aims to analyze the influence of Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance, with Teacher Engagement as a mediating variable. The quantitative survey was conducted 87 teachers who had used digital technology in the learning process. The study employed saturation sampling, in which the entire population was included as the research sample. Data analysis was conducted using Partial Least Squares-

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based Structural Equation Modeling (SEM-PLS). The results indicate that Green Technology Adoption has a positive and significant effect on Green Teaching Performance and Teacher Engagement. Pedagogical Technostress also has a positive and significant effect on Green Teaching Performance and Teacher Engagement. Additionally, Teacher Engagement was found to have a positive and significant effect on Green Teaching Performance. The mediation test results indicate that Teacher Engagement mediates the effects of Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance. An R-square value of 0.840 indicates that the model has a strong ability to explain the variation in Green Teaching Performance. These findings confirm that the success of green technology-based learning is determined not only by the use of technology but also by teacher engagement in the learning process.
Keywords: *Green Technology Adoption; Pedagogical Technostress; Teacher Engagement; Green teaching Perfomance; teacher Perfomance.*

INTRODUCTION

Advances in digital technology have brought about significant changes in the education system. The learning process is no longer confined to conventional classrooms but increasingly leverages digital platforms, online learning systems, artificial intelligence, and various interactive devices. These changes are not only aimed at enhancing the effectiveness of learning but also at supporting more sustainable educational practices. In this context, green education is a crucial approach as it promotes reduced paper usage, energy efficiency, the optimization of digital resources, and the fostering of environmental awareness within the learning process. UNESCO (2024) emphasizes that education plays a vital role in driving sustainable transformation, including through the strengthening of teachers' capacity in environmentally conscious learning

The application of digital technology in education provides opportunities for teachers to develop more efficient, innovative, and sustainability-oriented learning experiences. Behind these opportunities, the digitization of learning also presents new pressures for teachers. The use of digital platforms, learning management systems, demands for technological proficiency, and changes in teaching methods can create a significant burden of adaptation

Several previous studies have discussed technology adoption, technostress, teacher engagement, and teacher performance. However, most studies still examine these variables separately. Studies on educational technology tend to emphasize the benefits of technology for learning innovation, while studies on technostress generally discuss its impact on work pressure or educators' performance in general. Meanwhile, studies on teacher engagement commonly position it as a factor related to teacher performance, but few have specifically linked it to green technology adoption and technology-based pedagogical pressure in explaining Green Teaching Performance. Therefore, a study is needed that connects technology, pedagogical pressure, teacher engagement, and green teaching performance within a single research model.

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This study offers a more integrated perspective by positioning Teacher Engagement as a linking variable between Green Technology Adoption, Pedagogical Technostress, and Green Teaching Performance. Through this model, the study does not only examine whether green technology and technology-related pressure influence green teaching performance, but also explains how teacher engagement can strengthen or bridge these relationships. Thus, this study is expected to expand the discussion on technology-based and sustainable learning, while also providing a practical basis for educational institutions in designing strategies to improve teacher engagement, manage technology-related pressure, and optimize the use of green technology in the learning process.

Based on the explanation above, this study aims to analyze the role of Teacher Engagement in mediating the influence of Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance. This study is also expected to contribute to the development of a more adaptive and sustainable technology-based learning model that considers teachers' psychological readiness as the main actors in the learning process.

To clarify the relationships among the variables examined, a conceptual model was developed by positioning Green Technology Adoption and Pedagogical Technostress as independent variables, Teacher Engagement as a mediating variable, and Green Teaching Performance as the dependent variable. The conceptual model is presented in Figure 1.

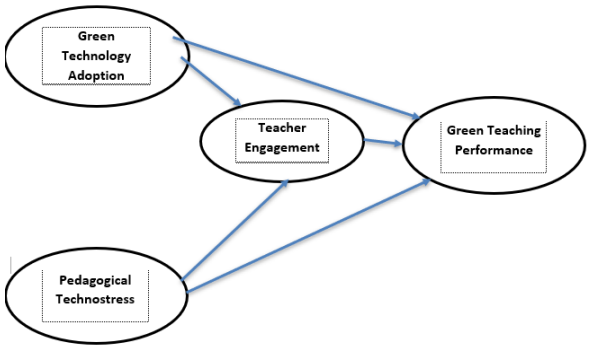

Figure 1 Conceptual Model Research

Figure 1 shows that Green Technology Adoption and Pedagogical Technostress are expected to influence Green Teaching Performance, both directly and through Teacher Engagement. This model serves as the basis for hypothesis testing using SEM-PLS.

THEORETICAL FOUNDATION AND HYPOTHESIS DEVELOPMENT

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The adoption of green technology is one way to utilize technology that supports environmentally friendly teaching practices. Through the use of digital media, learning platforms, and technology-based learning resources, teachers can reduce their reliance on printed materials and create more flexible learning processes. Mardiana (2025) explains that psychological readiness, digital competence, and institutional support are key factors in driving the adoption of green digital technology by educators. Thus, the success of implementing green technology is determined not only by the availability of devices but also by teachers' readiness to use them meaningfully.

This condition is known as technostress, which is the stress that arises from the use of technology in the workplace. In the field of education, this stress can develop into pedagogical technostress because it is directly related to the teaching process, classroom management, lesson planning, and the demands of technology-based learning. Syakina (2023) indicates that technostress can affect educators' performance because teachers are not only required to use technology but must also be able to design effective learning experiences through that technology.

Pedagogical Technostress has become an important issue because it can affect teachers' comfort, engagement, and effectiveness in teaching. Sandoval-Obando et al. (2026) found that technostress is associated with digital fatigue, decreased energy, and reduced dedication to teaching. Joseph and Thomas (2021) also explained that technology readiness and technostress are related to teacher engagement. These findings indicate that technological pressure in learning should not be viewed merely as a technical issue, but also as a psychological issue that can influence teachers' engagement in carrying out their teaching responsibilities.

Green Teaching Performance is an important aspect of sustainable education because it reflects teachers' ability to implement learning practices that support resource efficiency and environmental awareness. This performance can be seen through the effective use of digital media, the reduction of printed materials, the integration of environmental issues into learning, and teachers' ability to develop learning activities that support sustainability principles. Bhastary et al. (2024) explained that green teacher performance is related to educators' behaviors and abilities in supporting learning practices that align with environmental values. Therefore, improving Green Teaching Performance cannot rely solely on technology, but also requires teachers' active engagement in managing the learning process.

Teacher Engagement is an important factor in explaining teachers' success in facing changes in technology-based learning. Teacher Engagement reflects teachers' emotional, cognitive, and behavioral involvement in carrying out their teaching responsibilities. Teachers with a high level of engagement tend to be more adaptive, more motivated, and more capable of optimizing technology in the learning process. Christiana and Hartini (2022) showed that teacher

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engagement influences teachers' task performance. With strong engagement, teachers can be better prepared to face the demands of digitalization while also using technology to support more environmentally friendly learning.

Hypothesis Development

H1: Green Technology Adoption positively influences Green Teaching Performance.

H2: Green Technology Adoption positively influences Teacher Engagement.

H3: Pedagogical Technostress positively influences Green Teaching Performance.

H4: Pedagogical Technostress positively influences Teacher Engagement.

H5: Teacher Engagement positively influences Green Teaching Performance.

H6: Teacher Engagement mediates the relationship between Green Technology Adoption and Green Teaching Performance.

H7: Teacher Engagement mediates the relationship between Pedagogical Technostress and Green Teaching Performance.

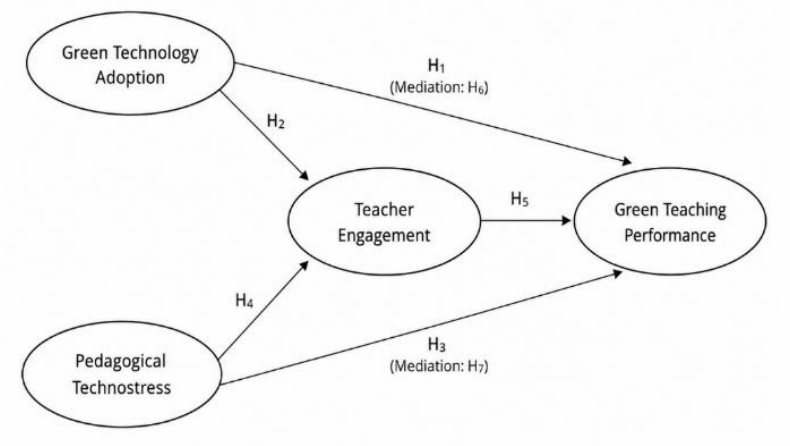

Figure 2 Hypothesized Research Model

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RESEARCH METHOD

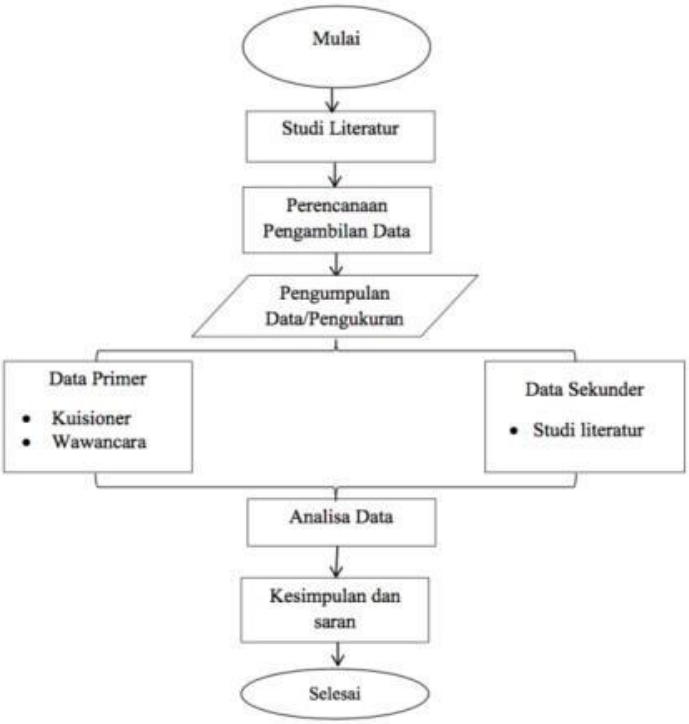

Figure 3 Conceptual Research Framework

This study uses a quantitative approach with a survey method. The population of this study consists of 87 teachers who have used digital technology in the learning process, including online learning platforms, digital media, learning administration systems, and other technological devices that support teaching practices. The sampling technique used is non-probability sampling with a saturated sampling method, in which all members of the population are included as the research sample.

Research data were collected through a structured questionnaire developed based on the indicators of each variable, namely Green Technology Adoption, Pedagogical Technostress, Teacher Engagement, and Green Teaching Performance. The collected data were then analyzed using Partial Least Squares-based Structural Equation Modeling (SEM-PLS). The analysis began with the evaluation of the measurement model or outer model, which included convergent validity testing through outer loading values, discriminant validity testing through cross loading, and reliability testing through Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE).

Furthermore, this study evaluated the structural model or inner model through R-square, f-square, model fit, and path coefficient values. Path coefficient testing was conducted to

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determine the direction, strength, and significance of the direct relationships among variables. In addition, indirect effect testing was carried out to analyze the role of Teacher Engagement as a mediating variable in the influence of Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance. All stages of testing were conducted to address the research objectives and examine the theoretical model that had been developed.

RESULT AND DISCUSSION

Outer Model Evaluation

Data analysis in this study was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. The initial stage involved evaluating the measurement model or outer model to ensure that each indicator was able to represent the construct being measured. The evaluation of the measurement model was carried out through convergent validity, discriminant validity, and construct reliability testing.

Outer Loading

Convergent validity testing was conducted by examining the outer loading value of each indicator. An indicator is considered to meet the criteria if it has an outer loading value above 0.70 (Hair et al., 2021; Yarsasi et al., 2025). The results of the outer loading test are presented in Table 1.

Table 1. Result of Outer Loading

Indicator	Green teaching Perfomance	Green tehnology Adoption	Pedagocial Technostress	Teacher Engagement
GP_1	0,864			
GP_2	0,851			
GP_3	0,841			
GP_4	0,870			
GP_5	0,874			
GT_1		0,864		
GT_2		0,851		
GT_3		0,841		
GT_4		0,870		
PT_1			0,855	
PT_2			0,856	
PT_3			0,819	
PT_4			0,831	
PT_5			0,853	
TE_1				0,829
TE_2				0,739
TE_3				0,853

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TE_4				0,860
TE_5				0,822

Based on Table 1, all indicators of the Green Teaching Performance, Green Technology Adoption, Pedagogical Technostress, and Teacher Engagement variables have outer loading values above 0.70. The outer loading values for Green Teaching Performance range from 0.841 to 0.874. Green Technology Adoption has outer loading values ranging from 0.841 to 0.870. Furthermore, Pedagogical Technostress has outer loading values ranging from 0.819 to 0.856, while Teacher Engagement ranges from 0.739 to 0.860. These results indicate that all indicators have met the convergent validity criteria and are able to represent their respective constructs.

Cross Loading

After convergent validity was fulfilled, the testing continued with discriminant validity through cross loading values. This test was conducted to ensure that each indicator has the highest loading value on its original construct compared to other constructs. The cross loading results are presented in Table 2.

Table 2. Result of Discriminant Validity (Cross Loading)

Indicator	Green teaching Perfomance	Green tehnology Adoption	Pedagocial Technostress	Teacher Engagement
GP_1	0,864	0,698	0,703	0,720
GP_2	0,851	0,713	0,772	0,785
GP_3	0,841	0,709	0,678	0,674
GP_4	0,870	0,726	0,770	0,705
GP_5	0,874	0,647	0,776	0,714
GT_1	0,733	0,863	0,684	0,532
GT_2	0,687	0,908	0,677	0,621
GT_3	0,593	0,825	0,590	0,675
GT_4	0,744	0,803	0,750	0,574
PT_1	0,752	0,715	0,855	0,650
PT_2	0,760	0,720	0,856	0,629
PT_3	0,719	0,585	0,819	0,606
PT_4	0,702	0,674	0,831	0,600
PT_5	0,701	0,660	0,853	0,742
TE_1	0,663	0,569	0,608	0,829
TE_2	0,686	0,597	0,661	0,739
TE_3	0,741	0,585	0,664	0,853
TE_4	0,661	0,510	0,606	0,860

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TE_5	0,681	0,631	0,603	0,822

Based on Table 2, all indicators have the highest loading values on their original constructs compared to other constructs. The indicators of Green Teaching Performance, Green Technology Adoption, Pedagogical Technostress, and Teacher Engagement more strongly represent the constructs they measure. Thus, discriminant validity based on cross loading is considered to have been fulfilled. These results indicate that each construct in the model has distinct measurement characteristics and does not excessively overlap with other constructs.

Construct Reliability dan Validity

The next test was conducted to assess construct reliability and validity. This test used Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE) values. A construct is considered reliable if the Cronbach's Alpha and Composite Reliability values are above 0.70, while convergent validity is fulfilled if the AVE value is greater than 0.50 (Hair et al., 2021). The results of the construct reliability and validity test are presented in Table 3.

Table 3. Result of Construct Reliability and Validity

Indicator	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Green Teaching Performance	0,912	0,913	0,934	0,740
Green Technology Adoption	0,872	0,872	0,913	0,724
Pedagocial Technostress	0,898	0,899	0,925	0,711
Teacher Engagement	0,879	0,879	0,912	0,675

Based on Table 3, all constructs have Cronbach's Alpha values above 0.70, namely Green Teaching Performance at 0.912, Green Technology Adoption at 0.872, Pedagogical Technostress at 0.898, and Teacher Engagement at 0.879. The Composite Reliability values also show good results, as all values are above 0.70. In addition, the AVE values for each construct are above 0.50, with Green Teaching Performance at 0.740, Green Technology Adoption at 0.724, Pedagogical Technostress at 0.711, and Teacher Engagement at 0.675. These results indicate that all constructs have met the criteria for reliability and convergent validity.

Inner Model Evaluation

After the measurement model was declared valid and reliable, the next stage was to evaluate the structural model or inner model. This evaluation was conducted to determine the model's ability to explain endogenous variables and to test the relationships among variables

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(Yarsasi et al., 2025). Structural model testing was carried out through R-square, f-square, model fit, path coefficient, and indirect effect values.

R-Square

The R-square value was used to determine the ability of the independent variables to explain the endogenous variables. The higher the R-square value, the greater the model's ability to explain the variation in the dependent variable (Hair et al., 2021; Setiawan & Eko Prasetyo Utomo, 2024). The results of the R-square test are presented in Table 4.

Table 4. Result of R-Square

Indicator	R-square	R-square adjusted
Green Teaching Performance	0,840	0,834
Teacher Engagement	0,614	0,604

Based on Table 4, Green Teaching Performance has an R-square value of 0.840 and an adjusted R-square value of 0.834. This means that Green Technology Adoption, Pedagogical Technostress, and Teacher Engagement are able to explain 84.0% of the variation in Green Teaching Performance, while the remaining 16.0% is explained by other variables outside the research model. Meanwhile, Teacher Engagement has an R-square value of 0.614 and an adjusted R-square value of 0.604. These results indicate that Green Technology Adoption and Pedagogical Technostress are able to explain 61.4% of the variation in Teacher Engagement. Thus, the research model has strong explanatory power for the endogenous variables.

F-Square

In addition to R-square, the structural model was also evaluated through f-square values. This test was used to determine the size of the contribution of each independent variable to the endogenous variable. An f-square value of 0.02 indicates a small effect, 0.15 indicates a medium effect, and 0.35 indicates a large effect (Hair et al., 2021). The results of the f-square test are presented in Table 5.

Table 5. Result of F-Square

Indicator	F-square
Green Technology Adoption -> Green Teaching Performance	0,132
Green Technology Adoption -> Teacher Engagement	0,064
Pedagocial Technostress -> Green Teaching Performance	0,252
Pedagocial Technostress -> Teacher Engagement	0,297
Teacher Engagement -> Green Teaching Performance	0,336

Based on Table 5, Green Technology Adoption has a small effect on Green Teaching Performance at 0.132 and on Teacher Engagement at 0.064. Pedagogical Technostress has a medium effect on Green Teaching Performance at 0.252 and on Teacher Engagement at 0.297.

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Meanwhile, Teacher Engagement has a medium effect approaching a large effect on Green Teaching Performance at 0.336. These results indicate that Teacher Engagement is the variable with the strongest contribution in explaining Green Teaching Performance, followed by Pedagogical Technostress and Green Technology Adoption.

Model Fit

After the f-square test, the next stage was to assess the overall model fit. Model fit was used to determine whether the developed model had an adequate level of fit in explaining the relationships among variables. The results of the model fit test are presented in Table 6.

Table 6. Result of Model Fit

Indicator	Saturated model	Estimated model
SRMR	0,072	0,072
d_ULS	0,983	0,983
d_G	0,856	0,856
Chi-square	373,685	373,685
NFI	0,758	0,758

Based on Table 6, the SRMR value for both the saturated model and the estimated model is 0.072. This value is below the recommended threshold of 0.08, indicating that the model has a good level of fit. The NFI value of 0.758 indicates that the model has an adequate fit in explaining the relationships among variables. Meanwhile, the d_ULS, d_G, and Chi-square values are used as additional information in assessing model fit. Thus, the research model is generally appropriate for testing the relationships among variables.

Path Coefficient

After the model was declared appropriate, the next stage was to test the direct relationships among variables through path coefficient analysis. This test was conducted to determine the direction, strength, and significance of the effects among variables in the research model. The relationships among variables are considered significant if the T-statistics value is greater than 1.96 and the p-value is less than 0.05. The results of the path coefficient test are presented in Table 7.

Table 7. Result of Path Coefficient

Indicator	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Green Technology Adoption -> Green Teaching Performance	0,248	0,246	0,088	2,811	0,005

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Green Technology Adoption -> Teacher Engagement	0,260	0,261	0,088	2,946	0,003
Pedagocial Technostress -> Green Teaching Performance	0,378	0,382	0,099	3,837	0,000
Pedagocial Technostress -> Teacher Engagement	0,560	0,563	0,088	6,339	0,000
Teacher Engagement -> Green Teaching Performance	0,373	0,372	0,095	3,908	0,000

Based on Table 7, all direct relationships among variables have positive and significant effects. Green Technology Adoption has a positive and significant effect on Green Teaching Performance, with an original sample value of 0.248, T-statistics of 2.811, and p-value of 0.005. Green Technology Adoption also has a positive and significant effect on Teacher Engagement, with an original sample value of 0.260, T-statistics of 2.946, and p-value of 0.003.

Furthermore, Pedagogical Technostress has a positive and significant effect on Green Teaching Performance, with an original sample value of 0.378, T-statistics of 3.837, and p-value of 0.000. Pedagogical Technostress also has a positive and significant effect on Teacher Engagement, with an original sample value of 0.560, T-statistics of 6.339, and p-value of 0.000. In addition, Teacher Engagement has a positive and significant effect on Green Teaching Performance, with an original sample value of 0.373, T-statistics of 3.908, and p-value of 0.000. Thus, all direct effect hypotheses are accepted.

Indirect Effect

After the direct effects among variables were tested, the next stage was to analyze the indirect effects through Teacher Engagement as a mediating variable. The indirect effect test was conducted to determine whether Teacher Engagement could serve as a linking path in the influence of Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance. The results of the indirect effect test are presented in Table 8.

Table 8. Result of Test Indirect Effect

Indicator	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Green Technology Adoption → Teacher Engagement → Green Teaching Performance	0,097	0,097	0,043	2,265	0,024
Pedagogical Technostress → Teacher Engagement → Green Teaching Performance	0,209	0,209	0,061	3,434	0,001

Based on Table 8, Green Technology Adoption has an indirect effect on Green Teaching Performance through Teacher Engagement, with an original sample value of 0.097, T-statistics of

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2.265, and p-value of 0.024. Pedagogical Technostress also has an indirect effect on Green Teaching Performance through Teacher Engagement, with an original sample value of 0.209, T-statistics of 3.434, and p-value of 0.001. Since both p-values are below 0.05, the indirect effects are considered significant. Thus, Teacher Engagement serves as a mediating variable in the relationship between Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance.

The results show that Green Technology Adoption has a positive and significant effect on Green Teaching Performance. This finding indicates that the use of green technology in learning can help teachers improve teaching practices that are more efficient, environmentally friendly, and supported by digital resources. This result is in line with the view that technology adoption in education not only supports learning effectiveness but can also strengthen sustainable education practices when supported by teachers' digital readiness and competence (Mardiana, 2025). This finding also indicates that the effectiveness of green technology depends on teachers' ability to integrate it according to learning objectives.

Green Technology Adoption is also proven to have a positive and significant effect on Teacher Engagement. This means that the better the use of green technology, the higher the teachers' engagement in the learning process. Relevant and easy-to-use technology can encourage teachers to be more active, creative, and adaptive in managing learning. This is consistent with the finding that technology readiness and institutional support play an important role in increasing educators' engagement in the use of learning technology (Joseph & Thomas, 2021). Therefore, institutional support is needed to ensure that technology facilitates teachers' work.

The next result shows that Pedagogical Technostress has a positive and significant effect on Green Teaching Performance and Teacher Engagement. This finding indicates that technological pressure in learning does not always become a barrier, but can serve as an adaptive driver when teachers are able to manage digital demands properly (Wahyuni et al., 2023). Nevertheless, this result needs to be interpreted carefully because uncontrolled technostress can trigger stress, anxiety, and reduce teachers' comfort in using educational technology (Fernández-Batanero et al., 2021). Therefore, training support and mentoring are still needed so that technological pressure can be directed toward a productive adaptation process. This result indicates that pedagogical technostress can serve as an adaptive stimulus that encourages teachers to respond to technological demands by strengthening their motivation, adaptability, and digital competence.

Teacher Engagement also has a positive and significant effect on Green Teaching Performance. This indicates that teacher engagement is an important factor in improving green teaching performance (Zhou & Zeng, 2024). Teachers with high engagement tend to be more enthusiastic, focused, and able to integrate technology and sustainability values into learning.

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This finding is supported by Sandoval-Obando et al. (2026), who emphasized that engagement plays an important role in explaining teachers' readiness and quality in facing the demands of technology-based learning.

The indirect effect results show that Teacher Engagement serves as a mediating variable in the influence of Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance. This means that green technology and technology-based pedagogical pressure can improve green teaching performance when teachers have strong engagement in the learning process. Thus, the success of Green Teaching Performance does not only depend on the availability of technology, but also on teacher engagement as a psychological factor that connects technology, work pressure, and sustainable teaching practices. Therefore, educational institutions need to balance technological development with efforts to strengthen teacher engagement and adaptive capacity.

CONCLUSION

Based on the research results, it can be concluded that Green Technology Adoption, Pedagogical Technostress, and Teacher Engagement play a role in explaining Green Teaching Performance. The test results show that all direct relationships among variables have positive and significant effects, with p-values below 0.05. In addition, Teacher Engagement is proven to serve as a mediating variable in the influence of Green Technology Adoption and Pedagogical Technostress on Green Teaching Performance. The R-square value of Green Teaching Performance of 0.840 indicates that the model is able to explain 84.0% of the variation in Green Teaching Performance, while Teacher Engagement has an R-square value of 0.614. These findings indicate that green teaching performance is not only determined by the use of green technology, but also by teacher engagement and the ability to manage technology-based pedagogical pressure. he findings also contribute to strengthening the understanding of the relationship among Green Technology Adoption, Pedagogical Technostress, Teacher Engagement, and Green Teaching Performance. Practically, the results of this study emphasize the importance of support from educational institutions through technology training, assistance in using digital platforms, and strategies to improve Teacher Engagement so that the implementation of green technology in learning can run more optimally.

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