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RESEARCH ARTICLE

Teachers and technology: Analysing online teaching acceptance among rural educators using the Technology Acceptance Model

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Abstract: This study was conducted to identify the level of teachers' acceptance of online teaching based on the Technology Acceptance Model (TAM). While previous studies have predominantly focused on students or urban settings, limited attention has been given to teachers in rural educational contexts. The study focused on three core constructs, namely perceived usefulness (PU), perceived ease of use (PEOU), and attitude towards use (AT). A total of 86 teachers participated in the study, of which 71 respondents were included in the final sample from four rural primary schools in the Seremban District. Data were collected using a TAM-based questionnaire and analysed using descriptive statistics and Pearson correlation analysis. The findings revealed that PU and PEOU were at a moderate level based on the mean scores. A strong and significant positive relationship was found between PU and AT ($r = .83$, $p < .001$), and similarly, between PEOU and AT ($r = .83$, $p < .001$). These findings suggest that although teachers' perceptions of usefulness and ease of use remain moderate, both constructs are strongly associated with the formation of positive attitudes towards online teaching. Practically, the findings highlight the need for targeted professional development, continuous technical support, and improved digital infrastructure to enhance both the functional value and usability of educational technologies among rural educators.

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1. Introduction

The rapid advancement in the field of information and communication technology (ICT) is highly significant in the realm of education. The utilization of computers, projectors, interactive whiteboards, and various other teaching media during the teaching and learning process (T&L) represents one of the many advantages brought about by technology. This also encompasses T&L conducted beyond the traditional classroom environment, such as through online learning. Online learning refers to a teaching and learning process that is internet-based, conducted within synchronous or asynchronous environments, either as a supplement to conventional learning or as a replacement for face-to-face sessions in the classroom (Dhawan, 2020).

The advantages of online learning for both teachers and students are not only flexibility and greater convenience compared to traditional methods, but also its cost-effectiveness and the emphasis on the learner-centered approaches (Almahasees et al., 2021; Alrumi, 2024; Muthuprasad et al., 2021). According to Peimani & Kamalipour (2021), other than offering students the opportunity to explore a wide range of online references for educational resources, online learning also nurtures students' capacity for self-directed learning. Students are also expected to take initiative in acquiring knowledge and relevant educational resources, show consistent motivation in completing their tasks, follow the planned schedules, as well as participate actively in online discussions (Gherghel et al., 2023; Turkkila & Lommi, 2020; Xu et al., 2020). The success of technology integration, including online learning, is strongly influenced by students' attitudes towards the adoption of technology. Factors that affect users' attitudes towards the use of technology include perceived usefulness (PU) and perceived ease of use (PEOU) (Scherer et al., 2019).

Previous studies have found that PU and PEOU significantly influence students' attitudes towards online learning (Belew et al., 2024; Chen Hsieh et al., 2017; Huang, 2023; Hussein, 2017; Saroia & Gao, 2019; Scherer et al., 2019). Furthermore, previous studies have primarily focused on investigating student-related aspects of online learning, such as changes in attitude, self-efficacy, and the acceptance of technology among students (Adedoyin & Soykan, 2023; Al Doghan & Piaralal, 2024; Tan et al., 2024). Findings from these studies lead to the need to investigate the influence of teachers' attitudes towards technology, particularly in the adoption of online teaching methods. Teachers' acceptance of technology is important, as their reluctance to use it could significantly affect the effectiveness of teaching practices.

In the Malaysian and Southeast Asian context, several studies have reported similar challenges in the implementation of online teaching, particularly in rural and underserved areas. For instance, studies in Malaysia have highlighted issues related to limited digital infrastructure, inconsistent internet connectivity, and insufficient technical support, which significantly influence teachers' readiness and acceptance of technology integration (Mohamad Khalid et al., 2021; Thannimalai et al., 2022). Similarly, research on rural education contexts has indicated that geographical disparities, resource limitations, and varying levels of digital competence continue to shape the effectiveness of online teaching practices (Dube, 2020; Mustafa et al., 2024). These regional insights underscore the importance of examining technology acceptance within specific local contexts, particularly among rural teachers who may face unique structural and pedagogical challenges.

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Hence, this study focuses on teachers' acceptance of information technology, particularly in the context of online teaching, following the Technology Acceptance Model (TAM). The study will also particularly focus on rural teachers, as past research has predominantly focused on urban and suburban contexts. By exploring the perspectives of the teachers from the rural educational setting, this study seeks to fill the research gap and offer valuable insights into the distinct challenges and opportunities these teachers encounter in integrating online teaching technologies into their classrooms. In this study, the concept of online learning is discussed within its broader educational context, while the empirical investigation specifically focuses on teachers' acceptance of online teaching practices in rural primary schools.

2. Literature Review

The integration of technology in education has become a significant and widely discussed topic over the past few decades. With the rapid advancement of information and communication technologies (ICT), educational institutions worldwide have adopted online teaching as an effective approach to broaden the access to education and improve the overall learning experience for learners. In addition, there are many advantages of integrating online learning including increased learning flexibility and better access to resources, and the opportunity for students to learn at their own pace, which suits their personal needs (Adedoyin & Soykan, 2023; Dhawan, 2020; Rasheed et al., 2020). Additionally, online learning also creates opportunities for students in remote areas and those with limited time to access high-quality instructional materials and resources (Passey et al., 2024). It is often viewed as a transformative approach that transcends geographical, temporal, and resource-related barriers that limit conventional educational processes in the context of traditional teaching approaches (Coman et al., 2020). Focusing on higher education, most students appreciated the flexibility offered by online learning, especially during the COVID-19 pandemic (Coman et al., 2020; Yan et al., 2022; Zheng et al., 2021).

However, the success of online learning is not only determined by the presence of technology, but also by the acceptance of technology by both the students and the teachers. According to Venkatesh and Davis (2000), the Technology Acceptance Model (TAM) has asserted that perceived usefulness (PU) and perceived ease of use (PEOU) are the key factors that influence users' acceptance of technology. Past studies by Al-Emran et al. (2018), Irni Hafizan et al. (2024), Mohammadi (2015), and Tarhini et al. (2017) have demonstrated a strong relationship between PU and PEOU with the effectiveness of online learning. In addition, consistent findings from previous research also indicate that PU and PEOU are primary factors in influencing students' intention in using e-learning. Chao (2019) and Park (2009) in their studies noted that even though PEOU has a significant role in influencing students' willingness to adopt online learning, PU turns out to be a more important contributing factor in this context. This indicates that the perception of the users towards the benefits of technology plays a more dominant role in influencing user acceptance.

Overall, previous studies have shown that perceived usefulness and perceived ease of use play an important role in influencing technology acceptance. However, most of these studies focus on students or general learning contexts, with less attention given to teachers, especially in rural settings. This suggests that further research is needed to understand how these factors influence teachers' acceptance of online teaching in more specific contexts. In addition, challenges in online learning include issues related to social interaction and student motivation. Previous studies by Afzal and Crawford (2022), Akpen et al. (2024), Chen (2023), Gillett-Swan (2017), Martin and Bolliger (2018), and Marzoli et al. (2021) found that the lack of face-to-face interaction in online learning can reduce students' engagement in the learning process. Without direct communication between the students and the teacher, online learning is prone to becoming less engaging, which can ultimately affect student motivation to learn (Gherghel et al., 2023). Therefore, enhanced and innovative teaching strategies are deemed necessary to improve social interaction among the teacher and the students, and to maintain students' motivation. Such strategies include using instructional tools that support two-way communication, providing regular feedback, and incorporating visually appealing and interactive learning contents.

Student engagement and motivation in online learning can also be improved through the integration of appropriate teaching approaches, particularly relevant methods that support self-directed learning. Chang et al. (2023) in their study highlighted the importance of self-directed learning in the context of blended online learning, specifically within flexible digital learning environments. Students who engage in self-directed learning are prone to have greater autonomy over their learning processes, which contributes to higher motivation. This aligns with the nature of online learning, which allows learners to progress at their own pace. Similarly, Cheng et al. (2025) found that students who are not constrained by time and space tend to have greater responsibility over their own learning. Learners with self-directed learning strategies such as planning, monitoring, and reflecting their own learning processes tend to show higher learning engagement and better academic achievement. The study also highlighted that students who are capable of learning independently are more likely to sustain motivation, develop self-confidence, and actively participate in learning activities. Hence, teaching methods that nurture self-directed learning should be prioritized to improve students' readiness and the overall effectiveness of online learning.

While students' engagement in self-directed learning plays an important role in improving the effectiveness of online learning, external factors such as teachers' support and attitudes towards technology determine the overall success of the learning process, with teachers' attitudes towards technology being a critical factor in determining the success of online education. Teachers who demonstrate positive attitudes towards technology are more likely to integrate technology effectively into their teaching practices (Peng et al., 2023; Tondeur et al., 2017, 2019; Wijnen et al., 2023). Teo (2011) found that PU and PEOU also contribute to the teachers' intentions to integrate technology into their future teaching, which are further supported by Scherer et al. (2019), who highlighted that other than PU and PEOU having direct and indirect relationships with teachers' intentions to adopt technology, PU emerges as the strongest key factor in influencing teachers' intentions. This implies that teachers who believe technology enhances their job performance and is easy to use

are more inclined to integrate it into their lessons. As a result, professional development and training programs are essential to improve teachers' readiness and confidence in using technology within online or blended learning environments.

However, teachers in rural areas often face greater challenges in employing technology for online teaching, including issues related to the lack of technological infrastructure and limited technical support (Mohamad Khalid et al., 2021). Research by Ahiaku et al. (2025), Dube (2020), Mustafa et al. (2024), and Thannimalai et al. (2022) indicated that teachers in rural areas frequently lack sufficient ICT skills that can help them to fully utilize online learning technologies in the classrooms. This results in the teachers opting for traditional teaching methods which may overlook the effectiveness of online learning. Although these studies highlight important challenges in the use of technology, the discussion is often centred on external factors such as infrastructure and access. Less emphasis is given to teachers' perceptions and attitudes, and how these may interact with contextual challenges. This indicates the need to examine both individual and contextual factors when understanding teachers' acceptance of online teaching.

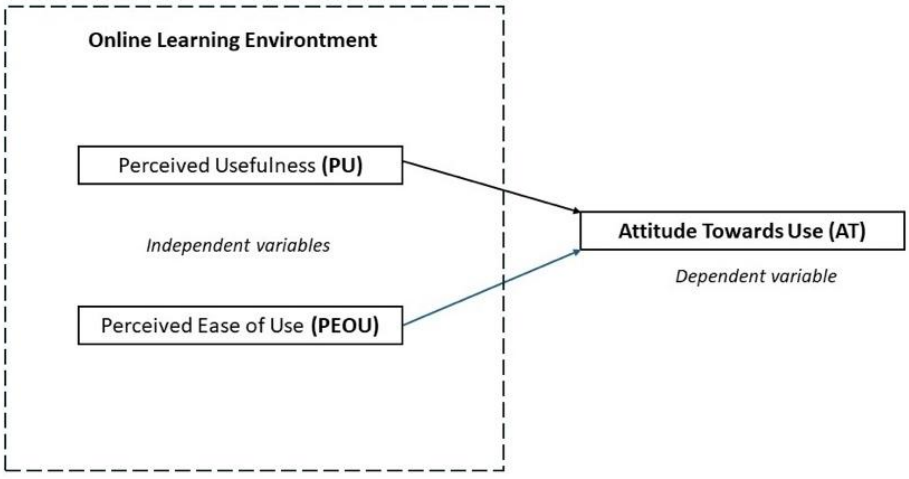
Thus, this study will focus on rural teachers' acceptance of information technology applications, particularly in relation to online teaching, based on the Technology Acceptance Model (TAM). By understanding the factors influencing teachers' technology acceptance, more effective strategies can be developed to support teachers in integrating technology into their teaching practices, ultimately improving the quality of education and student learning outcomes. In summary, previous studies have confirmed the importance of perceived usefulness and perceived ease of use in influencing technology acceptance. However, there is still a need to examine how these factors operate within specific contexts, particularly among teachers in rural areas where various challenges may affect the use of technology. Therefore, this study focuses on teachers' acceptance of online teaching in rural schools based on the Technology Acceptance Model (TAM).

2.1 Conceptual Framework

The conceptual framework of this study is grounded in the Technology Acceptance Model (TAM) developed by Davis (1989). It proposes that two key factors, namely Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), influence users' Attitudes towards Technology Use (AT). In the context of this research, PU refers to the degree to which teachers believe that online teaching will enhance their teaching effectiveness and productivity, while PEOU refers to the extent to which teachers perceive online teaching technologies as easy and straightforward to use. Both PU and PEOU are hypothesised to have a direct and positive relationship with teachers' attitudes (AT) towards the adoption of online teaching practices. A more favourable perception of the usefulness and ease of use of technology is expected to result in a more positive attitude towards its integration into teaching practices. This conceptual framework guided the formulation of the research hypotheses and the selection of variables for analysis. The framework is illustrated in Figure 1.

Figure 1

Conceptual framework based on the Technology Acceptance Model (TAM), illustrating the relationships between Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude Towards Use (AT)



3. Methodology

This study employed a quantitative approach and adopted a survey design to examine the acceptance of technology application in online teaching among primary school teachers in rural areas. The study population comprised 86 rural primary school teachers within the Seremban district in Negeri Sembilan, Malaysia. A simple random sampling technique was employed, whereby each individual in the population had an equal chance of being selected. Based on Krejcie and Morgan (1970) sample size table, the minimum required sample size for this study was determined to be 70 respondents. The researchers endeavoured to recruit the entire population as the study sample to minimise potential errors arising from non-responses, incomplete or inaccurate answers, missing data, or damaged data. Out of the total 86 teachers approached,

71 respondents completed the distributed questionnaires. This number was deemed sufficient for the purposes of the study, as it exceeded the minimum requirement of 70 respondents.

The research utilized the Technology Acceptance Model (TAM) questionnaire as the primary data collection instrument. The TAM questionnaire, introduced by Davis (1989), was employed to obtain information regarding the levels of Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and attitudes towards the application of technology in online teaching among rural schoolteachers. A four-point Likert scale was employed to minimise neutral responses and encourage respondents to express a clear level of agreement or disagreement. This approach helps reduce central tendency bias and is considered appropriate in attitude measurement studies (Garland, 1991). Descriptive analysis was conducted to address the first and second research questions by determining mean scores and standard deviations. The interpretation of the scores referred to the guidelines proposed by Pallant (2011), as illustrated in Table 1. To ensure content validity, the questionnaire items were reviewed by experts in the field of educational technology and instructional design. Minor revisions were made based on their feedback to improve clarity, relevance, and alignment with the study context. In addition, the construct validity of the instrument is supported through the adaptation of well-established TAM constructs that have been widely validated in previous studies.

Table 1

Interpretation of mean scores for levels of ease of use and usefulness

Mean score	Interpretation
1.00 – 2.33	Low
2.34 – 3.66	Medium
3.67 – 5.00	High

Correlation analysis was employed to determine the relationship between attitudes and perceived usefulness (PU) and perceived ease of use (PEOU) towards online teaching among primary school teachers. This method was selected as it is appropriate for examining the strength and direction of relationships between variables, without implying causal or structural relationships. The strength of the relationship is indicated by the correlation coefficient values between the two variables. Table 2 below presents the correlation coefficients alongside the interpretation of the strength of the relationships between the variables tested (Cohen, 1988).

Table 2

Strength of relationship according to correlation values

r value	Interpretation of relationships
0.10 – 0.29	Low
0.30 – 0.49	Medium
0.50 – 1.00	High

where +1.00 > r > -1.00, Source: Cohen (1988)

The conceptual framework of this study is grounded in the Technology Acceptance Model (TAM) developed by Davis

3.1 Instrument Reliability

A pilot study was conducted to assess the reliability and internal consistency of the research instrument measuring Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude Toward Use (AT). The pilot involved 30 school teachers who were excluded from the main study. Data were analysed to evaluate the precision and reliability of the instrument. The reliability analysis yielded Cronbach's alpha coefficients of 0.91 for PU, 0.86 for PEOU, and 0.95 for AT. All values exceeded the recommended threshold of 0.7 ($\alpha > 0.7$), indicating high reliability (Goh et al., 2023). These results confirm strong internal consistency across all constructs and support the suitability of the questionnaire as the main research instrument. Overall, the high reliability coefficients validate the applicability of the adapted Technology Acceptance Model (TAM) instrument for examining teachers' acceptance of online teaching technologies, particularly within rural educational contexts, and support its use in future empirical research.

4. Results

The descriptive analysis of perceived usefulness (PU) indicated that teachers' perceptions of the effectiveness of technology in online teaching were at a moderate level (M = 3.47, SD = 0.93) (Table 3). This suggests that rural primary school teachers generally recognise the benefits of technology, although their perceptions are not strongly positive. Among the items, "Online learning makes my teaching aids more effective and engaging" recorded the highest mean score (M = 3.70, SD = 0.95), indicating that teachers particularly value the role of technology in enhancing teaching materials. In contrast, relatively lower mean scores were observed for items related to teaching effectiveness and performance, suggesting that teachers may still have reservations about the broader impact of technology on their teaching outcomes.

Table 3

Mean scores and standard deviations (SD) for perceived usefulness (PU)

No	Items	Mean (M)	Standard Deviation (SD)
1.	Online teaching will enhance the effectiveness of my teaching	3.37	1.03
2.	Online teaching will improve my teaching performance.	3.40	1.05
3.	Online teaching will increase my productivity in my duties.	3.44	1.07
4.	I find online teaching to be very useful.	3.45	1.00
5.	Online learning makes my teaching aids more effective and engaging.	3.70	0.95
	Overall perceived usefulness (PU)	3.47	0.93

The descriptive analysis of perceived ease of use (PEOU) showed that teachers' perceptions were also at a moderate level (M = 3.49, SD = 0.91) (Table 4), indicating that technology is generally perceived as manageable but not without challenges.

The highest mean score was recorded for the item related to the preparation of teaching materials (M = 3.65, SD = 1.00), while the lowest mean score was associated with student assessment (M = 3.18, SD = 1.11). This suggests that although technology supports certain teaching tasks, challenges remain in more complex aspects such as assessment in online environments.

Table 4

Mean scores and standard deviations (SD) for perceived ease of use (PEOU)

No.	Item	Mean (M)	Standard Deviation (SD)
1.	Online learning is easy to learn	3.41	1.05
2.	Online learning facilitates my preparation of teaching materials	3.65	1.00
3.	Online learning makes it easier for me to update teaching materials from time to time	3.58	1.00
4.	Online learning simplifies the process of assigning tasks to students	3.62	1.03
5.	Online learning makes it easier for me to assess students	3.18	1.11
	Overall perceived ease of use (PEOU)	3.49	0.91

4.1 The Relationship between Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) towards Teachers' Attitudes (AT) in the Implementation of Online Teaching

The relationship between perceived usefulness (PU) and teachers' attitudes was analysed using Pearson correlation as shown in Table 5. The findings indicated a strong positive relationship between the two variables, $r(71) = .83$, $p < .001$, which is less than 0.05. This positive relationship indicates that as the perceived usefulness increases, teachers tend to demonstrate more favourable attitudes towards the implementation of online teaching. Therefore, the null hypothesis (H01), which stated that there is no significant relationship between PU and teachers' attitudes (AT) in the implementation of online teaching, is rejected.

Table 5

Pearson correlation analysis (r) between PU and AT

Variable		Perceived Usefulness (PU)
Attitude (AT)	Pearson Coefficient (r)	0.83
	p-value	<0.001
	N	71

Table 6

Pearson correlation analysis (r) between PEOU and AT

Variable		Perceived Ease of Use (PEOU)
Attitude (AT)	Pearson Coefficient (r)	0.83
	p-value	<0.001
	N	71

The relationship between perceived ease of use (PEOU) and teachers' attitudes was similarly analysed using Pearson correlation as shown in Table 6. The results revealed a strong positive relationship between the two variables, $r(71) = .83$, $p < .001$, which is less than 0.05. This positive association suggests that a higher level of perceived ease of use is

positively linked to more favourable teacher attitudes towards the implementation of online teaching. Consequently, the null hypothesis (H02), which stated that there is no significant relationship between PEOU and teachers' attitudes (AT) in the implementation of online teaching, is rejected.

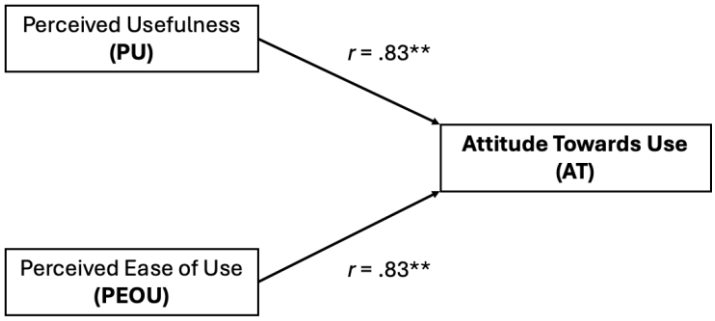
4.2 Analysis of Relationships among TAM Constructs

Figure 2 presents a conceptual representation of the relationships among Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude Toward Use (AT), based on the correlation analysis. Both PU and PEOU demonstrated strong, positive, and statistically significant relationships with AT ($r = .83$, $p < .001$), suggesting that teachers who perceive online teaching as both useful and easy to use are more likely to develop favourable attitudes towards its adoption. These findings suggest that PU and PEOU are strongly associated with teachers' attitudes, thereby supporting the fundamental assumptions of the Technology Acceptance Model (TAM) (Davis, 1989). Teachers' acceptance of technology may be influenced by their beliefs regarding pedagogical value and their perceptions of usability. Within rural educational contexts, this suggests that technology adoption becomes more plausible when teachers recognise clear instructional benefits while experiencing minimal operational difficulty.

The similarly high correlation coefficients observed for both PU–AT and PEOU–AT relationships further indicate a strong association among these constructs within the TAM framework. This pattern may reflect the potential interaction between cognitive judgements of usefulness and affective responses associated with ease of use, reinforcing the mediating role of attitude in translating beliefs into behavioural readiness. When perceived usefulness and usability are simultaneously present, rural teachers may be more psychologically prepared to navigate infrastructural and contextual challenges related to online teaching. From a practical perspective, the findings provide preliminary insights that may inform the design of targeted interventions to enhance technology acceptance. The presence of two strong associations suggests that professional development initiatives should address both perceived usefulness through evidence of pedagogical effectiveness, and perceived ease of use through continuous technical support and context-sensitive training. Such an approach is consistent with extended TAM perspectives (Venkatesh & Davis, 2000), which emphasise the importance of external facilitation and experiential reinforcement in sustaining technology adoption. Overall, the findings not only reaffirm the applicability of TAM within rural educational settings but also offer an empirical foundation for developing effective teacher capacity-building strategies. However, the proposed relationships were inferred from correlation analysis rather than structural modelling, and future studies employing regression or structural equation modelling are recommended to further validate the causal structure of TAM in rural educational contexts.

Figure 2

Conceptual representation of the relationships among PU, PEOU, and AT



5. Discussion

This study was carried out to examine teachers' acceptance of online teaching among rural primary school teachers. The findings indicate that perceived usefulness (PU) and perceived ease of use (PEOU) are closely associated with teachers' attitudes towards technology adoption. This suggests that both the perceived benefits of technology and its usability play an important role in shaping teachers' willingness to integrate online teaching into their practices. These findings are consistent with the Technology Acceptance Model (TAM), which proposes that perceived usefulness and perceived ease of use are key determinants of technology acceptance (Davis, 1989; Venkatesh & Davis, 2000). The results reinforce the view that teachers who perceive technology as useful and easy to use are more likely to develop positive attitudes towards its adoption. This is further supported by previous studies, which indicate that positive perceptions of technology are closely linked to teachers' intention to integrate it into their teaching practices (Scherer et al., 2019).

The results also support the view that teachers with positive attitudes towards technology tend to integrate technology in their classrooms effectively (Scherer et al., 2019; Tondeur et al., 2019). Such positive attitudes are important in enhancing teaching effectiveness and have the potential to improve learning outcomes among students. The findings indicate a strong association among Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude Toward Use (AT). However, these relationships are based on correlation analysis and should not be interpreted as causal or structural relationships. The equally strong associations observed ($r = .83$) indicate that favourable teacher attitudes may emerge from the interaction between perceived usefulness and perceived ease of use. When teachers experience online systems as intuitive and efficient, their perceptions of pedagogical value may be strengthened, leading to more positive

attitudes towards adoption. This interaction is consistent with Venkatesh and Davis's (2000) proposition that perceived ease of use indirectly enhances perceived usefulness, with both constructs converging to strengthen behavioural readiness. Accordingly, the findings offer a holistic perspective by illustrating how cognitive evaluations and affective responses may jointly shape teachers' preparedness for technological integration.

Beyond theoretical validation of TAM, the findings highlight important implications for rural educational contexts. These findings suggest that perceived usefulness alone may be insufficient to sustain positive attitudes when infrastructural and technical constraints persist. Instead, technology acceptance may depend on a balanced enhancement of usability and demonstrable instructional benefits. This underscores the need for professional development initiatives that address both functional and affective dimensions of technology use—moving beyond technical skill acquisition to include confidence-building and the cultivation of self-efficacy. In this regard, the findings provide useful insights for designing context-sensitive interventions that strengthen teachers' adaptive capacity in the face of rural digital challenges. Nevertheless, while the findings highlight the positive cognitive–affective mechanisms underpinning technology acceptance, it is necessary to acknowledge that contextual constraints in rural settings may limit the extent to which these mechanisms can be fully realised. However, the findings also show that rural teachers face bigger challenges in integrating technology, consistent with the results by Adedoyin and Soykan (2023), who investigated challenges such as infrastructure constraints, lack of tools, and limited internet access. These factors reduce the effectiveness of technology integration in online learning within rural contexts. Moreover, a lack of teacher training and technical support was recognised as a major barrier to technology acceptance among teachers in rural areas. These findings align with those of Adedoyin and Soykan (2023), of which the authors highlighted the need for continuous training and technical support that serve as prominent strategies for enhancing technology acceptance in education.

Notably, while past studies by Almahasees et al. (2021) and Peimani and Kamalipour (2021) focused mainly on students' attitudes towards online learning, this study closely examines teachers' attitudes, which is an aspect that remains insufficiently explored, especially within the context of local rural education. This highlights the need to expand the discussion on the significance of implementing tailored support strategies for teachers. Although the findings of this study are consistent with existing models and previous research, it is possible that other factors not examined in this study also influence teachers' acceptance of technology. These factors, including organizational culture, subjective norms, and administrative support, as proposed in Technology Acceptance Model 2 (TAM2) by Venkatesh and Davis (2000), may profoundly impact user acceptance, but they were not tested within this study's framework. Furthermore, even though the study establishes the relationship between PU, PEOU, and teachers' attitudes, it does not examine, through empirical evidence, the effect of technology integration on students' academic performance, which should be explored in future research. Overall, this study suggests that in order to enhance the acceptance and effective use of technology in online teaching, it is essential to strengthen teachers' perceptions of the benefits of technology and to reduce barriers related to ease of use. Continuous professional development, reliable technical assistance, and sufficient infrastructural support are fundamental to ensuring the effective integration of technology in educational settings, particularly in rural areas. From a practical perspective, the findings highlight several important implications for rural education. First, teacher training programmes should focus not only on technical skills but also on demonstrating the pedagogical value of online teaching to enhance perceived usefulness. Second, continuous technical support and user-friendly platforms are essential to improve perceived ease of use, particularly for teachers with limited digital experience. Third, policymakers should prioritise infrastructure development, including reliable internet access and adequate digital resources, to support effective technology integration in rural schools. These efforts are critical to strengthening teachers' confidence and readiness to adopt online teaching practices in resource-constrained environments.

6. Conclusion

This study examined rural primary school teachers' acceptance of online teaching through the Technology Acceptance Model and provided empirical evidence from the Malaysian rural educational context. The findings demonstrated that teachers' attitudes toward online teaching are strongly associated with their perceptions of usefulness and ease of use, indicating that both pedagogical value and operational simplicity play essential roles in shaping technology acceptance among rural educators. These results reinforce the continued relevance of the Technology Acceptance Model in explaining teachers' behavioural orientation toward technology mediated instruction within underrepresented rural settings. Beyond confirming established theoretical relationships, this study contributes context-specific insights into the challenges and opportunities of online teaching adoption in rural schools. The findings highlight the importance of sustained pedagogical support, accessible technical infrastructure, and context-sensitive professional development in strengthening teachers' readiness to implement online teaching practices effectively. From an international perspective, the study extends current understanding of technology acceptance by demonstrating how structural and environmental conditions influence teachers' responses to digital learning initiatives in geographically and resource constrained educational environments. Despite limitations related to sample size and the use of correlational analysis within a single regional context, the findings provide a valuable foundation for future research employing larger samples, longitudinal designs, and more advanced analytical approaches. Future research may further explore mediating and moderating factors that shape technology acceptance among rural teachers across diverse educational systems. Overall, this study offers practical and theoretical implications for policymakers, school leaders, and researchers seeking to strengthen equitable access to effective online teaching in rural education worldwide.

However, the findings of this study is subject to several limitations. Firstly, the sample was confined to rural primary school teachers within a specific district, which may limit the generalizability of the findings to other educational contexts,

particularly urban or suburban settings. Secondly, while the Technology Acceptance Model (TAM) provided a robust theoretical framework, other influential factors such as organizational support, infrastructure quality, and administrative encouragement were not explored in depth. Future research should consider adopting a mixed-methods approach and expanding the sample across broader geographic regions to gain a more comprehensive understanding of technology acceptance among teachers.

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Conflict of Interest
The authors declare no conflicts of interest.

Author Contributions
Hairul Nissah Zainuddin: Research leader.
Muhammad Ihsan Rokeman: Research supervisor.
Mazlina Mat Rabi: Investigation and data analyst.
Nur Khaulah Mohd Ghazali: Reviewing, Language editor.
Ezatul Marini Ghazali: Reviewing, Editing.

Ethics Statement
Artificial intelligence assisted language tools were used solely to improve grammatical accuracy and clarity of expression during manuscript preparation. All aspects of study design, data collection, data analysis, interpretation of findings, and scholarly conclusions were conducted entirely by the authors in accordance with academic integrity and publication ethics standards. Participation in this study was voluntary, and informed consent was obtained from all respondents prior to data collection. Respondents were assured of confidentiality and anonymity, and the data were used solely for academic research purposes. The study was conducted in accordance with accepted ethical principles for educational research involving human participants.

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