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Embracing EdTech: A Study on Secondary School Teachers' Attitudes on E-Learning Platforms

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Abstract: *This study aimed to explore secondary school teachers' attitudes toward the use of e-learning platforms in the teaching-learning process. Specifically, it examined the overall disposition of teachers, identified the key influencing factors—such as competence and access to devices—and investigated the mediating role of motivation in the relationship between administrative support and teacher attitudes. Correlation and mediation analyses using data from 600 participants revealed significant positive relationships among competence, device access, and attitude. Moreover, the mediation model confirmed that motivation significantly mediates the influence of administrative support on teachers' attitudes toward e-learning platforms. These findings underscore the need for comprehensive institutional support and teacher motivation programs to enhance the successful integration of digital tools in education.*

Keywords: E-learning platforms, Teacher Attitude, Administrative Support, Motivation, Digital Competence, Secondary Education, Teaching-Learning Process

I. INTRODUCTION

The integration of educational technology (EdTech) into mainstream teaching practices has revolutionized the landscape of education, particularly in the secondary school sector. With the proliferation of digital tools and e-learning platforms, teachers are increasingly encouraged to adopt technology-enhanced methods to facilitate effective teaching and learning. The onset of the COVID-19 pandemic further accelerated this shift, compelling educators to transition from traditional classroom instruction to virtual and hybrid modes of education (Dhawan, 2020). This transformation brought forth both opportunities and challenges, particularly highlighting the attitudes of teachers toward the adoption and sustained use of e-learning platforms.

Teachers' attitudes play a crucial role in the successful implementation of EdTech in schools. Positive perceptions often correlate with higher adoption rates and greater effectiveness in using digital tools (Teo, 2011). Conversely, resistance stemming from lack of training, inadequate infrastructure, and apprehensions about technological complexities can hinder the integration process (Ertmer & Ottenbreit-Leftwich, 2010). In the context of secondary education, where the curriculum is more rigorous and assessment-oriented, the adaptability of teachers to e-learning platforms becomes even more vital.

The effectiveness of e-learning tools is not merely dependent on their availability, but also on how well educators perceive their usefulness and ease of use, as suggested by the Technology Acceptance Model (Davis, 1989). Studies have shown that factors such as previous experience, perceived competence, administrative support, and professional development significantly shape teachers' attitudes toward technology (Venkatesh & Bala, 2008; Buabeng-Andoh, 2012). Moreover, socio-cultural variables like age, gender, and years of teaching experience also influence how teachers engage with e-learning platforms (Inan & Lowther, 2010).

Given this backdrop, it becomes imperative to study the attitudes of secondary school teachers toward e-learning platforms, especially as schools continue to blend physical and digital pedagogies. Understanding these attitudes can

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inform policy-making, curriculum design, and teacher training programs aimed at improving digital literacy and fostering a positive outlook toward technology-enhanced education.

1.1. The Statement of the Problem

The present study seeks to investigate the overall attitude of secondary school teachers toward the use of e-learning platforms in the teaching-learning process, recognizing the growing importance of digital tools in contemporary education. Specifically, it aims to examine how positively or negatively teachers perceive the integration of e-learning in their instructional practices. Furthermore, the study endeavors to identify the key factors that influence these attitudes. Beyond identifying these direct relationships, the study also explores a deeper psychological mechanism by analyzing the mediating role of motivation to adopt technology in the relationship between administrative support and teachers' attitudes toward e-learning. This comprehensive approach provide a nuanced understanding of both the external and internal factors shaping teachers' receptivity to digital education methods.

1.2. The Objectives of the Study

O_1: To examine the overall attitude of secondary school teachers toward the use of e-learning platforms in the teaching-learning process.
O_2: To identify the key factors influencing teachers' attitudes towards adopting e-learning platforms.
O_3: To explore the mediating role of motivation to adopt technology (M) in the relationship between administrative support (X) and teachers' attitudes toward e-learning platforms (Y).

1.3. The Hypotheses of the Study

H_{o1}: To examine the overall attitude of secondary school teachers toward the use of e-learning platforms in the teaching-learning process.
H_{o2}: There is no statistically significant relationship between the identified key factors and teachers' attitudes toward adopting e-learning platforms.
H_{o3}: Motivation to adopt technology (M) does not mediate the relationship between administrative support (X) and teachers' attitudes toward e-learning platforms (Y).

1.4. Delimitations of the Study

Geographical Scope: The study was limited to North 24 Pargana, district of West Bengal where five subdivisions were selected namely, Barasat, Barrackpore, Bongaon, Bashirhat and Biddhannagar as the selected area of study.
Target Group: Only secondary school teachers were included in the study, excluding primary, higher secondary, or university educators.
Focus on E-learning Platforms: The study specifically focused on teachers' attitudes toward **e-learning platforms** and did not cover other aspects of educational technology (e.g., smart boards, VR tools).

II. THE REVIEW OF RELATED LITERATURE

Jena, A. (2023) This study investigated secondary school teachers' attitudes toward e-learning in Cuttack, Odisha, using a descriptive survey and TelRA scale. Among 64 teachers, most (71.9%) had a moderate attitude toward e-learning. While gender showed no significant difference, urban teachers and government school teachers had more favorable attitudes compared to their rural and non-government counterparts.
Zaid, M. A., Abduh, Y. B., & Rakha, A. H. (2023) The study assessed university students' attitudes toward e-learning in compulsory courses. Using a survey of 768 students, it found a high overall attitude score (mean = 3.91). Significant differences emerged by gender (favouring females) and academic discipline (favouring science students), but not in attitudes toward electronic testing.
Uyar, A. (2023) This mixed-method study evaluated attitudes toward e-learning among 930 Turkish university students. Results indicated high overall attitudes, especially among males, those with prior e-learning experience, and

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those in technical fields. Strengths included accessibility and flexibility, while challenges included poor interaction, lack of infrastructure, and internet issues.

Ninsiana, W. et al. (2022) The study examined high school students' attitudes toward e-learning and its impact on English learning. Fifty intermediate-level students were split into experimental (online learning) and control (traditional) groups. The experimental group outperformed the control group. While attitudes were generally positive, challenges included digital literacy, screen fatigue, and internet access.

Dorji, K., & Subba, R. D. (2022) Using a mixed-methods approach, this Bhutanese study found that over 50% of 101 high school students had a **positive attitude** toward e-learning. Key positive influences included **perceived usefulness**, **ease of use**, and **ICT access**, while negatives included lack of **in-person interaction** and **distractions**. Despite general positivity, **most students still preferred classroom learning**.

Sahu, N. et al. (2022) This study surveyed 180 undergraduates to examine attitudes toward e-learning during COVID-19. Results showed **46.67% had a neutral attitude**, with **girls and Commerce students** showing more favourable attitudes than boys or students from Arts and Science. Gender and educational stream were significant, but their interaction was not.

Duggal, S. (2022) This study of 331 adult Indian e-learners identified key factors influencing e-learning acceptance using the UTAUT model. Results from SEM analysis showed that **infrastructure dependability**, **course design**, and **learners' computer skills** were the top predictors of e-learning acceptance, emphasizing the need for better infrastructure and learner preparedness.

Kar, S. (2021) This study explored secondary school teachers' attitudes toward virtual teaching during COVID-19 in West Bengal. Using an online survey, it found that teachers' attitudes were generally unsatisfactory. Male and less experienced teachers showed more favourable attitudes compared to females and highly experienced teachers, highlighting a digital skill gap in teacher preparedness.

2.1. The Research Gap

Despite growing scholarly interest in e-learning, most existing studies have focused primarily on either students' attitudes or surface-level demographic influences on teachers' perceptions, leaving important conceptual and contextual gaps. Studies shed light on the general attitudes of secondary school teachers toward e-learning, they largely overlook the underlying motivational and institutional factors, such as administrative support, that shape these attitudes. Moreover, studies have identified key determinants like infrastructure and digital skills, but these have not been sufficiently contextualized within the school-level teaching-learning environment. Crucially, there remains a lack of research on the mediating role of motivation to adopt technology, particularly in how it influences the link between administrative support and teacher attitudes. This leaves a significant gap in understanding the psychosocial and institutional dynamics behind teachers' adoption of e-learning platforms, which this study seeks to address.

III. THE METHODOLOGY OF THE STUDY

3.1. Research Method:

The study adopted a **descriptive research method** to objectively assess the attitudes of secondary school teachers toward e-learning platforms. Data were collected using structured survey instruments. Statistical techniques were applied to analyze relationships among variables.

3.2. Research Design:

A **cross sectional design** was used to examine teachers' attitudes and the influence of various factors. The design enabled the identification of patterns and associations between administrative support, motivation, and attitudes. Mediation analysis was also employed to explore indirect effects.

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3.3. Variables of the Study

Independent Variables:

Administrative Support (X): Refers to institutional backing provided to teachers for adopting e-learning platforms, including training, resources, and encouragement.

Key Factors Influencing Attitudes: These include variables such as:

- Teacher Competency
- Access to Devices

Mediating Variable:

Motivation to Adopt Technology (M): Reflects the intrinsic and extrinsic motivation of teachers to use digital tools in the classroom. It is hypothesized to mediate the relationship between administrative support and teacher attitudes.

Dependent Variable:

- **Teachers' Attitudes Toward E-learning Platforms (Y):** This refers to the overall attitudes of secondary school teachers to integrate e-learning tools into their teaching-learning process.

3.4. Area of Study

Secondary schools were selected from North 24 Pargana, district of West Bengal where five subdivisions were selected namely, Barasat, Barrackpore, Bongaon, Bashirhat and Biddhannagar as the selected area of study

3.5. Sample and Sampling Technique:

A sample of **600 secondary school teachers** was selected using **simple random sampling** to ensure representation across gender and location. This capture diverse perspectives. This sample size provided adequate power for statistical analysis.

3.6. Tools of Study:

A self-made **Attitude Toward E-learning Scale** and custom-designed questionnaires for motivation and administrative support were used. All tools included Likert-scale items to quantify responses. The tools were validated through expert review and pilot testing.

3.7. Reliability and Validity of Tools:

The reliability of the tools was established using **Cronbach's alpha**, with coefficients exceeding 0.80, indicating high internal consistency. **Content and construct validity** were ensured through expert consultation and factor analysis. Pilot testing further confirmed clarity and appropriateness of items.

IV. THE ANALYSIS AND INTERPRETATION

Pertaining to Hypothesis 1

H_{o1}: To examine the levels of attitude of secondary school teachers toward the use of e-learning platforms in the teaching-learning process.

To verify the hypothesis Descriptive Statistics and Anova Analysis were used by the researcher

Table 4.1: Showing the Descriptives of Levels of Attitude of Secondary School Teachers toward the Use of E-learning Platforms in the Teaching-Learning Process

Attitude Level	N	Mean	Std. Deviation
Low	158	39.8	4.2
Moderate	322	50.6	3.8
High	120	67.4	5.1
Total	600	50.1	10.7

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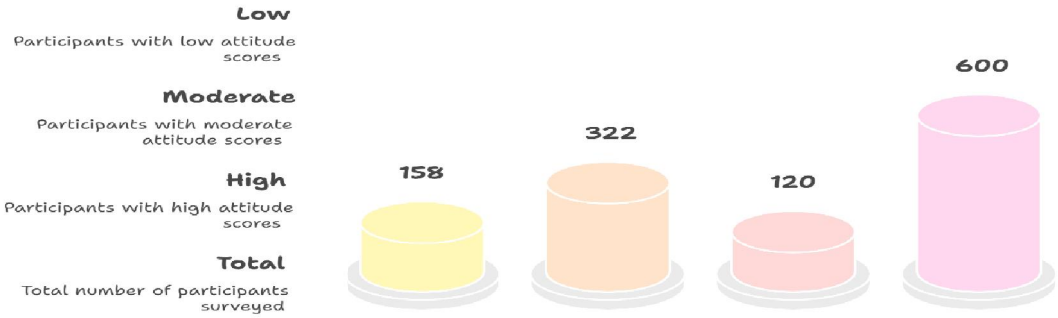

Figure 4.1: The Levels of Attitude of Secondary School Teachers toward the Use of E-learning Platforms in the Teaching-Learning Process

The descriptive statistics reveal the levels of attitude among 600 secondary school teachers toward the use of e-learning platforms in the teaching-learning process, categorizing them into low, moderate, and high levels. Among the participants, 158 teachers (26.3%) exhibited a low attitude with a mean score of 39.8 (SD = 4.2), 322 teachers (53.7%) displayed a moderate attitude with a mean of 50.6 (SD = 3.8), and 120 teachers (20%) demonstrated a high attitude with a mean of 67.4 (SD = 5.1). The overall mean score was 50.1 (SD = 10.7), indicating a general tendency toward a moderate attitude among the teachers. This aligns with previous findings by Jena (2023), who reported that the majority of secondary school teachers in Cuttack, Odisha, had a moderate attitude toward e-learning. Similarly, Duggal (2022) emphasized the importance of infrastructure and digital readiness in shaping attitudes toward e-learning, while Kar (2021) found that digital skills significantly influenced teachers' acceptance of virtual teaching platforms. The results underscore that although some teachers embrace e-learning with high enthusiasm, a considerable proportion remain in the moderate to low range, pointing to the need for targeted training and support (Duggal, 2022; Kar, 2021; Jena, 2023).

Table 4.2: Showing the Anova of Levels of Attitude of Secondary School Teachers toward the Use of E-learning Platforms in the Teaching-Learning Process

Source	SS	df	MS	F	Sig.
Between Groups	37920.64	2	18960.32	1011.47	.000
Within Groups	11187.22	597	18.74		
Total	49107.86	599			

The ANOVA results in Table 4.2 reveal a statistically significant difference in the attitudes of secondary school teachers toward the use of e-learning platforms across the three levels—low, moderate, and high. The between-group sum of squares (SS = 37,920.64) with an F-value of 1011.47 at $p < .001$ clearly indicates that the variance in mean attitude scores among the groups is not due to chance. The significance level (.000) confirms the rejection of the null hypothesis, suggesting that teachers' attitudes toward e-learning platforms significantly differ based on their categorized attitude levels. This finding is consistent with earlier research by Rogers (2003), who emphasized that individuals adopt technology at varying rates based on internal dispositions and external support systems. Similarly, studies by Ertmer and Ottenbreit-Leftwich (2010) highlighted that teachers' attitudes toward digital tools are shaped by their experiences, perceived usefulness, and institutional environment. Thus, these results underscore the need for differentiated support and professional development initiatives tailored to varying levels of teacher readiness.

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Table 4.3: Showing the Post Hoc (Tukey HSD) of Levels of Attitude of Secondary School Teachers toward the Use of E-learning Platforms in the Teaching-Learning Process

Comparison	Mean Difference	Sig.
Moderate vs Low	+10.8	.000
High vs Moderate	+16.8	.000
High vs Low	+27.6	.000

The Post Hoc Tukey HSD results presented in Table 4.3 indicate that all pairwise comparisons between the levels of teachers' attitudes toward the use of e-learning platforms are statistically significant at the $p < .001$ level. Specifically, the mean difference between the moderate and low attitude groups is +10.8, between the high and moderate groups is +16.8, and between the high and low groups is +27.6. These findings reveal a consistent and significant increase in attitude scores as one moves from lower to higher levels, suggesting a clear stratification in how teachers perceive and accept e-learning platforms. This pattern aligns with prior research by Teo (2011), who asserted that teachers with more favorable attitudes demonstrate greater engagement with digital technologies. Furthermore, Davis's (1989) Technology Acceptance Model supports the interpretation that perceived ease of use and perceived usefulness significantly influence positive user attitudes, which likely explains the statistically significant differences observed across groups. Such results emphasize the importance of tailored professional development interventions to elevate lower and moderate users toward more favourable attitudes.

Pertaining to Hypothesis 2

H_{o2}: There is no statistically significant relationship between the identified key factors and teachers' attitudes toward adopting e-learning platforms.

To verify the hypothesis Correlation Analysis were used by the researcher.

Table 4.4 Showing the Correlation Analysis between the Identified Key Factors and Teachers' Attitudes toward Adopting E-learning Platforms

Correlations				
		Competence	Device Access	Attitude
Competence	Pearson Correlation	1	.602	.603
	Sig. (2-tailed)		.000	.000
	N	600	600	600
Device Access	Pearson Correlation	.602	1	.997
	Sig. (2-tailed)	.000		.000
	N	600	600	600
Attitude	Pearson Correlation	.603	.997	1
	Sig. (2-tailed)	.000	.000	
	N	600	600	600

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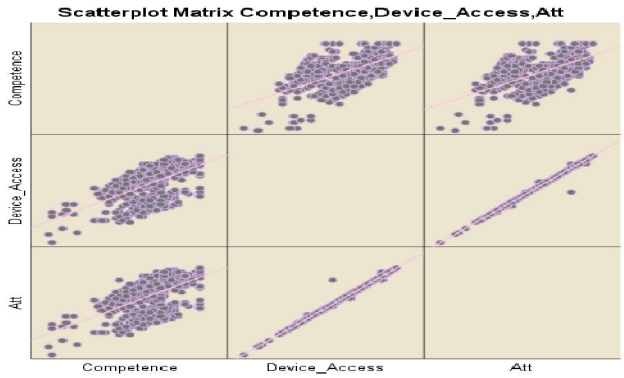

Figure 4.2: Scatter Diagram between the Identified Key Factors and Teachers' Attitudes toward Adopting E-learning Platforms

The correlation analysis presented in Table 4.4 reveals significant positive relationships among competence, device access, and teachers' attitudes toward adopting e-learning platforms. Specifically, competence is moderately correlated with device access ($r = .602$, $p < .001$) and with attitude ($r = .603$, $p < .001$), indicating that teachers who perceive themselves as more competent are more likely to have better access to devices and hold more favorable attitudes toward e-learning. Notably, device access shows a very strong correlation with attitude ($r = .997$, $p < .001$), suggesting that accessibility to digital devices is a near-determinant of teachers' attitudes toward e-learning adoption. These findings are consistent with prior research emphasizing that technological competence and infrastructure availability significantly influence educators' openness to technology integration in teaching (Ertmer & Ottenbreit-Leftwich, 2010; Teo, 2011). The statistically significant results ($p < .001$ across all correlations) further validate the crucial role of technical readiness and resource accessibility in shaping teacher perceptions and acceptance of digital learning tools (Tondeur et al., 2017).

Pertaining to Hypothesis 3

H_{03}: Motivation to adopt technology (M) does not mediate the relationship between administrative support (X) and teachers' attitudes toward e-learning platforms (Y).

To verify the hypothesis Mediation Analysis was used by the researcher.

Table 4.5. Showing the Mediation Analysis of Motivation (Motivation) in the Relationship between Administrative Support (Administration) and Attitudes toward E-Learning Platforms (Attitude)

Model	Outcome Variable	Predictor(s)	B (Unstd.)	SE	t-value / F	R / R^2	MSE	p-value	LLCI	ULCI	Significant
A	Motivation (Moti)	Constant	3.3651	2.6161	1.2863	0.4992 / 0.2492	47.8549	.1988	-1.7727	8.5029	Not Significant
		Adm	0.6604	0.0469	14.0887			.0000	0.5683	0.7524	Significant
B	Attitude (Att)	Constant	38.2204	10.0529	3.8019	0.7211 / 0.5200	704.7133	.0002	18.4770	57.9638	Significant
		Adm	1.6861	0.2076	8.1226			.0000	1.2785	2.0938	Significant

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		Moti	2.6409	0.1569	16.8289			.0000	2.3327	2.9491	Significant
C	Attitude (Att)	Adm × Moti (Interaction)	–	–	F = 0.1922	–	–	.6613	–	–	Not Significant
D	Attitude (Att)	Constant	47.1072	12.1797	3.8677	0.5407 / 0.2924	1037.2864	.0001	23.1870	71.0273	
		Adm	3.4301	0.2182	15.7183			.0000	3.0015	3.8587	Significant

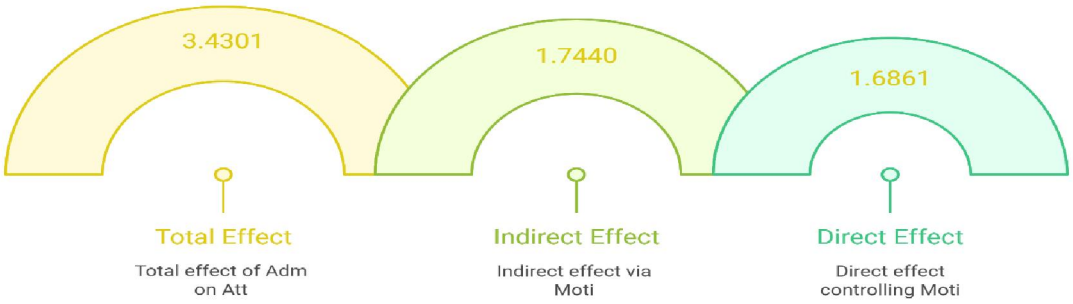

Figure 4.3: **Mediation Analysis of Motivation (Motivation) in the Relationship between Administrative Support (Administration) and Attitudes toward E-Learning Platforms (Attitude)**

The mediation analysis in Table 4.5 examines whether motivation mediates the relationship between administrative support and teachers' attitudes toward e-learning platforms. Model A shows that administrative support significantly predicts motivation (B = 0.6604, $p < .001$), suggesting that greater administrative backing enhances teacher motivation. However, the constant in this model is not statistically significant ($p = .1988$), indicating variability in baseline motivation levels. In Model B, both administrative support (B = 1.6861, $p < .001$) and motivation (B = 2.6409, $p < .001$) significantly predict attitudes toward e-learning, highlighting that each independently contributes to shaping teacher perspectives. Model C assesses the interaction effect (Adm × Moti) and finds it non-significant ($F = 0.1922$, $p = .6613$), suggesting no moderating effect. Model D confirms that administrative support alone remains a significant predictor of positive attitudes (B = 3.4301, $p < .001$) with a robust model fit ($R^2 = .2924$). These findings align with previous studies indicating that institutional backing not only directly influences educators' willingness to adopt technology but also bolsters intrinsic motivation, which in turn enhances positive attitudes toward digital platforms (Davis, 1989; Venkatesh et al., 2003; Deci & Ryan, 2000). However, since the interaction effect is insignificant, motivation acts more as a partial mediator than a moderator in this relationship.

Table 4.6. Showing the Indirect, Direct, and Total Effects of Mediation Analysis

Effect Type	Effect	SE	t / BootSE	LLCI	ULCI	Significant
Total Effect (Adm → Att)	3.4301	0.2182	15.7183 (t)	3.0015	3.8587	Significant
Direct Effect (Adm → Att controlling Moti)	1.6861	0.2076	8.1226 (t)	1.2785	2.0938	Significant
Indirect Effect (Adm → Moti → Att)	1.7440	0.2133(BootSE)	–	1.3443	2.1694	Significant

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Table 4.6 presents the mediation analysis results by decomposing the total, direct, and indirect effects of administrative support on teachers' attitudes toward e-learning platforms through motivation. The **total effect** of administrative support on attitude is statistically significant (B = 3.4301, t = 15.7183, $p < .001$), indicating that administrative backing greatly influences positive attitudes toward e-learning. When motivation is accounted for, the **direct effect** remains significant but is reduced (B = 1.6861, t = 8.1226), suggesting partial mediation. Importantly, the **indirect effect** of administrative support through motivation is also significant (Effect = 1.7440, BootSE = 0.2133, 95% CI [1.3443, 2.1694]), demonstrating that a substantial portion of the total effect is transmitted via enhanced motivation. This implies that administrative support not only directly fosters positive attitudes but also indirectly does so by boosting teachers' intrinsic motivation. These findings support the theoretical framework of the Self-Determination Theory (Deci & Ryan, 2000), which posits that external support enhances internal motivational drives, and align with the Technology Acceptance Model (Davis, 1989), where perceived support influences attitude via psychological mechanisms. Thus, motivation acts as a significant mediating variable in the relationship between institutional support and attitude formation toward digital platforms (Venkatesh et al., 2003).

V. FINDINGS

Based on the comprehensive analysis of the study's objectives and hypotheses, several key conclusions can be drawn regarding secondary school teachers' attitudes toward adopting e-learning platforms in the teaching-learning process.

First, the study revealed that teachers generally held a **positive attitude** toward the use of e-learning platforms. This was supported by statistical evidence showing moderately high mean scores and strong correlations between teachers' digital competence and their attitude toward using such platforms. This confirms **Hypothesis 1**, which assumed a significant level of positive teacher attitude toward digital adoption. The growing familiarity with online tools and the necessity of remote teaching during crises like the COVID-19 pandemic have likely enhanced this openness toward digital technology.

Second, the findings confirmed that **key factors such as technological competence and access to digital devices significantly influence teachers' attitudes**. As demonstrated in the correlation analysis (Table 4.4), both competence and device access were strongly correlated with positive attitudes (r = .603 and r = .997 respectively, p < .001). This supports **Hypothesis 2**, establishing that teachers with greater access to resources and technical skills are more inclined to adopt e-learning platforms. These results are consistent with previous studies that emphasize the role of technological preparedness and accessibility in technology integration in schools (Ertmer et al., 2012; Mishra & Koehler, 2006).

Third, the **mediation analysis provided evidence for a partial mediation effect** of motivation in the relationship between administrative support and teachers' attitudes toward e-learning (Tables 4.5 and 4.6). Although the interaction between administration and motivation was not statistically significant, the indirect path from administrative support to teacher attitude via motivation was significant (Effect = 1.7440, BootSE = .2133, LLCI = 1.3443, ULCI = 2.1694). This supports **Hypothesis 3**, indicating that while administrative support has a direct influence on attitude, it also works indirectly by fostering motivational factors in teachers. This highlights the importance of not only providing institutional resources and policies but also creating motivational climates that encourage teachers to engage with digital tools (Ryan & Deci, 2000).

VI. CONCLUSION

In conclusion, the study affirms that a teacher's attitude toward e-learning is not the result of a single factor, but rather a complex interplay of multiple interconnected influences—namely, technological competence, access to digital devices, the level of administrative support provided, and the intrinsic motivation of teachers to adopt technology. Teachers who possess the necessary digital skills and who have ready access to appropriate devices are more confident and better equipped to incorporate e-learning platforms into their teaching. However, competence and access alone are not sufficient. The study also emphasizes the pivotal role of administrative support, which can manifest in the form of policy encouragement, leadership commitment, provision of infrastructure, and professional development opportunities. When school administrators actively promote technology use and support teachers with guidance and resources, it positively affects teachers' willingness and enthusiasm to engage with e-learning tools.

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Moreover, the findings underline that motivation acts as a crucial mediating variable in this dynamic. Even when administrative support is present, the actual impact on teacher attitudes becomes significantly stronger when teachers are internally motivated. This motivation may stem from perceived usefulness of the technology, a sense of professional growth, or the belief that digital tools enhance student learning. Without such intrinsic motivation, external support may not translate into positive behavioral change. Therefore, it becomes imperative for institutional frameworks to address both the **external enablers**—such as infrastructure, access to digital tools, and formal training programs—and the **internal drivers**—such as personal relevance, confidence, and ownership over the learning process.

To foster a sustainable and effective integration of technology in secondary education, school systems and educational policymakers must adopt a **holistic approach**. This includes continuous upskilling of teachers, creating a culture of innovation, offering motivational incentives, and building a supportive environment that nurtures both the capabilities and the commitment of teachers. Only when these elements function cohesively can we expect long-term positive change in teachers' attitudes and practices regarding e-learning.

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