العلاقة بين الاتجاه نحو التعلم الإلكتروني والتحصيل الدراسي من وجهة نظر معلمي الرياضيات بمدارس التعليم الأساسي بمحافظة شمال الباطنة في سلطنة عمان

The Relationship between Attitudes towards E-Learning and Academic Achievement from the Perspective of Mathematics Teachers in Basic Education Schools in North Al Batinah Governorate, Sultanate of Oman

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الملخص:

سعت الدراسة إلى استقصاء الاتجاهات نحو التعلم الإلكتروني وعلاقتها بالتحصيل الدراسي من منظور معلمي الرياضيات في مدارس التعليم الأساسي بمحافظة شمال الباطنة في سلطنة عمان، واعتمدت الدراسة على المنهج الوصفي لتحقيق أهدافها، واستخدمت استبانة كأداة رئيسية جمعت بين محورين رئيسيين واحتوت على (17) فقرة، وتم تطبيق الاستبانة على عينة عشوائية شملت (268) معلمًا ومعلمة، وأظهرت النتائج أن اتجاهات معلمي الرياضيات نحو التعلم الإلكتروني كانت مرتفعة، حيث بلغ المتوسط العام للدرجات (3.77). كما بينت النتائج عدم وجود فروق ذات دلالة إحصائية تعزى إلى متغيري الجنس وسنوات الخبرة، وأظهرت الدراسة كذلك وجود علاقة ارتباطية إيجابية تتراوح بين المتوسطة والقوية بين الاتجاهات نحو التعلم الإلكتروني والتحصيل الدراسي، حيث بلغ معامل ارتباط بيرسون، (r = 0.612) واستنادًا إلى هذه النتائج، أوصت الدراسة بزيادة البرامج التدريبية للمعلمين حول استخدام التعلم الإلكتروني، وتحسين البنية التحتية المدرسية من خلال تعزيز التجهيزات الفنية والتكنولوجية، كما أكدت أهمية توفير الخبراء في مجال التعلم الإلكتروني والدعم الفني لحل المشكلات التقنية.

الكلمات المفتاحية: الاتجاهات، التعلم الإلكتروني، التحصيل الدراسي، الرياضيات، التعليم الأساسي، الباطنة شمال.

Abstract:

This study aimed to investigate the attitudes towards e-learning and their relationship with academic achievement from the perspective of mathematics teachers in basic education schools in North Al Batinah Governorate, Sultanate of Oman. The study adopted a descriptive methodology to achieve its objectives and used a questionnaire as the primary data collection tool. The questionnaire consisted of two main axes with a total of 17 items and was administered to a randomly selected sample of 268 male and female teachers. The results indicated that mathematics teachers' attitudes towards e-learning were high, with an overall mean score of 3.77. The findings also revealed no statistically significant differences attributed to gender and years of experience. Moreover, the study showed a positive correlation, ranging from moderate to strong, between attitudes towards e-learning and academic achievement, with a

Pearson correlation coefficient of ($r = 0.612$). Based on these results, the study recommended increasing training programs for teachers on the use of e-learning, improving school infrastructure by enhancing technical and technological equipment, and emphasizing the importance of providing e-learning experts and technical support to resolve technical issues.

Keywords: Attitudes, E-learning, Academic Achievement, Mathematics, Basic Education, North Al Batinah.

Introduction:

The present era is witnessing rapid transformations across various aspects of life due to scientific advancements and developments in information and communication technologies, such as the internet and computers. These advancements contribute to the availability of vast amounts of information through multiple sources, including electronic books and journals. Consequently, it has become essential for those involved in the educational process to keep pace with these rapid changes by updating teaching methods and techniques to enhance education and learning. This enables students to acquire new learning skills, improve their research capabilities, and promote self-learning, ultimately contributing to the quality of the educational process.

The emergence of the technological revolution in information technologies has made the world more interconnected, increasing the need for exchanging experiences and information. This has led to the necessity of having rich sources of information to support research and self-development, resulting in the rise of the concept of e-learning. E-learning is an educational approach that relies on modern technologies such as computers, the internet, multimedia, and educational software. It also includes discussions and dialogue in virtual classrooms (Al-Hasnawi, 2016).

Teachers' attitudes toward using e-learning in teaching subjects, especially mathematics, are crucial aspects to consider when implementing e-learning. This is due to the pivotal role of teachers in society, as any positive development achieved in the community is attributed to them. Teachers are fundamental educational inputs, and educational success cannot be achieved without them, regardless of how advanced the educational system's outputs are. A competent teacher, with their skills and competencies, can effectively utilize these tools to improve and develop the educational process. The effectiveness of a teacher is determined by their practical application in the field, not just their theoretical understanding of concepts and principles (Al-Antali & Al-Khataf, 2016).

Mathematics teachers need to adopt positive attitudes toward e-learning and overcome obstacles to enhance students' academic achievement. This reflects the effectiveness of e-learning in facilitating concept exploration and long-term rule retention (Boggan, Harper, & Bifuh-Ambe, 2009). Loe (2007) indicates that e-learning and online resources contribute to mathematics learning by simplifying mathematical concepts and enhancing student interaction, thus shifting mathematics education from traditional methods to the digital era.

Nations rely on the academic progress of their youth as a key indicator of their development and prosperity. Academic achievement is a cornerstone of the educational process and not merely an outcome. Educational researchers view academic achievement as a fundamental measure of students' academic levels, reflecting both the quantitative and qualitative outcomes of the educational process. The integration of e-learning into education systems can improve efficiency and effectiveness, thereby enhancing students' academic achievement (Naji, 2017).

Understanding the relationship between teachers' attitudes toward e-learning and academic achievement is becoming increasingly necessary.

Academic achievement is considered a crucial endpoint of the educational process, making educators the most in need of utilizing e-learning to keep up with the rapid developments of the modern age. E-learning offers numerous benefits that have enabled it to overcome many challenges and barriers hindering the expansion of education on a global scale (Hamdan, 2007).

In the teaching of scientific subjects, the shift from traditional education to e-learning is becoming more prevalent. It is important to recognize that the continuous and effective development of e-learning will not succeed without taking teachers' attitudes into account. A key factor in the success of e-learning is the positive inclination of teachers toward its use, which enhances their motivation to utilize it. Additionally, the availability of material resources contributes to improving productivity. Teachers' acceptance of e-learning and their positive attitudes toward it are critical factors in the successful implementation and sustainability of e-learning (Akbarilakeh, Razzaghi, & Moghaddam, 2019).

Research Problem:

E-learning has played a significant role in the educational system, contributing effectively to the development of teaching processes. Therefore, it is crucial to study teachers' attitudes toward e-learning and understand the relationship between these attitudes and students' academic achievement. The Ministry of Education in the Sultanate of Oman places great importance on developing this type of education and encourages educational institutions to adopt it by providing the necessary tools to achieve the required quality.

With the widespread use of e-learning worldwide, numerous studies have been conducted to examine teachers' attitudes toward this type of education. In the Sultanate of Oman, some studies have highlighted the urgent need to investigate these attitudes due to their role in activating e-

learning and understanding teachers' perspectives on its use in Omani schools. For example, the study by Al-Saadi et al. (2017) emphasized the importance of understanding teachers' attitudes toward using e-learning in teaching mathematics in basic education.

The study by Al-Sayed and Al-Mashikhi (2018) indicated that the Sultanate of Oman is making significant efforts to develop education, including reviewing its educational policies. With the introduction of e-learning in schools, it has become necessary to understand teachers' attitudes toward the implementation of this technology. Additionally, the study by Al-Salmi (2020) discussed the challenges and difficulties facing the use of e-learning and proposed solutions to overcome them, along with analyzing teachers' acceptance or rejection of e-learning in teaching. It also confirmed its success in improving students' academic achievement.

Although Omani studies on the use of e-learning in schools show optimism and provide positive indicators, there is still a need to understand the true attitudes of teachers toward this type of learning and its relationship to academic achievement. This understanding offers an opportunity to develop Omani curricula, especially in mathematics, and work on providing the necessary material, technical, and human resources to expand the adoption of e-learning in public schools in the Sultanate of Oman.

Research Questions:

The research problem stems from the following research questions:

1. What is the level of mathematics teachers' attitudes toward e-learning in basic education schools in North Al Batinah Governorate in the Sultanate of Oman?
2. Are there statistically significant differences in the average ratings of mathematics teachers toward e-learning attributed to gender and years of experience variables?

3. Is there a correlational relationship between mathematics teachers' attitudes toward e-learning and students' academic achievement from their perspective in basic education schools in North Al Batinah Governorate in the Sultanate of Oman?

Research Objectives:

This study aimed to explore mathematics teachers' attitudes toward e-learning and their relationship with academic achievement in basic education schools in North Al Batinah Governorate in the Sultanate of Oman by achieving the following objectives:

1. To identify mathematics teachers' attitudes toward using e-learning in basic education schools in the Sultanate of Oman.
2. To examine the differences in mathematics teachers' attitudes toward e-learning according to gender and years of experience variables.
3. To explore the relationship between mathematics teachers' attitudes toward e-learning and students' academic achievement in basic education schools in North Al Batinah Governorate in the Sultanate of Oman.

Importance of the Study:

The significance of the current study is reflected in the following points:

1. **Enriching Omani Research:** This study contributes to enhancing knowledge related to e-learning in the Sultanate of Oman by focusing on mathematics teachers' attitudes toward this type of education.
2. **Supporting Decision-Makers:** The study provides valuable information to decision-makers in the Ministry of Education in the Sultanate of Oman regarding the level of mathematics teachers' attitudes toward e-learning, helping them make well-informed decisions.

3. **Supporting Curriculum Specialists:** The study's findings assist curriculum specialists in the Ministry of Education in understanding the relationship between mathematics teachers' attitudes and students' academic achievement, contributing to the improvement of educational strategies.

4. **Promoting Interest in E-learning:** The study's results help to promote the implementation of e-learning in schools, which may lead to its increased integration into future curricula in the Sultanate of Oman.

Theoretical Framework:

1. **Attitudes:**

The concept of attitude is fundamental in psychological, social, and educational studies and plays a significant role in various fields of knowledge. Attitudes have a profound impact on individuals and societies alike. Despite the diversity of social, economic, cultural, and media activities in society, they all aim to change, modify, or measure individuals' attitudes to achieve progress in different areas of life (Mirza, 2008).

Various definitions of attitude have emerged due to differences in researchers' perspectives. Bohner and Dickel (2011) define attitude as an individual's position based on their evaluation of objects and people, leading them to respond with certain behavioral patterns based on this evaluation. On the other hand, Zeitoun (2017) defines attitude as a positive or negative feeling toward a subject or issue; for example, a person may strongly believe in and approve of honesty.

Al-Maayta (2017) indicated that despite the differences in defining attitudes, there is consensus on the existence of two types of attitudes: positive and negative. This requires educational institutions, represented by the Ministry of Education, to reinforce positive attitudes among

teachers and reduce negative attitudes that may hinder any future educational initiatives. To achieve this, it is essential to understand the types and causes of attitudes to develop effective strategies for addressing them. Understanding teachers' attitudes toward e-learning helps predict their behaviors regarding this educational approach.

2. **Factors Influencing Teachers' Attitudes Toward E-learning:** Rhema and Miliszewska (2014) stated that determining teachers' attitudes toward e-learning is crucial for its successful implementation. In developing countries, raising technological awareness and improving attitudes toward e-learning are key factors for success. This includes enhancing knowledge and basic technological skills, improving learning content, and providing continuous training on the use of computers. Additionally, motivating teachers to utilize e-learning systems and offering substantial institutional support are essential.

The factors influencing teachers' attitudes toward e-learning include:

a. Use of Technology and Skills:

Over the past years, there has been a noticeable increase in the use of computers within educational institutions. The use of the internet, computers, modern devices such as tablets and mobile phones has gained significant attention among teachers, who utilize them for educational and social communication purposes. This indicates a degree of proficiency in handling these technologies. Studies have confirmed a strong correlation between technology use and positive attitudes toward e-learning, as well as proficiency in using technological tools (Papaioannou & Charalambous, 2011).

b. Demographic Characteristics:

Studies have shown that demographic factors, such as gender, play a crucial role in understanding differences in perceptions of technology usefulness and attitudes toward e-learning. Liaw and Huang (2011) found that males exhibit more positive attitudes toward e-learning than females. In contrast, Egbo, Okoyeuzu, Ifeanacho, and Onwumere (2011) found that females tend to accept information and communication technologies, leading to positive attitudes toward e-learning. However, Suri and Sharma (2013) indicated no gender superiority regarding e-learning attitudes, and studies suggest that the gender gap in this field is gradually narrowing (Gillwald, Milek, & Stork, 2010; Isaacs, 2012).

c. Teachers' Satisfaction with Technology:

Teachers' satisfaction with technology significantly affects the learning environment. Positive expectations play a pivotal role in enhancing satisfaction. If teachers perceive that e-learning improves the efficiency and effectiveness of the educational process, their attitudes toward it will be positively reinforced. Understanding these attitudes helps expand the use of e-learning systems and meet teachers' needs, ultimately improving their satisfaction with the educational process. Aixia and Wang (2011) found that most teachers satisfied with the e-learning environment exhibited positive attitudes toward it.

d. Accessibility to Technology:

Access to technology is a critical factor influencing teachers' attitudes toward e-learning and their readiness to use it. When reliable and accessible information and communication technologies are available, they positively impact teachers' attitudes toward using e-learning. The availability of adequate ICT infrastructure is vital for evaluating progress in this field. Despite the widespread acceptance of e-learning, providing suitable digital content and necessary infrastructure remains a significant challenge in many educational institutions.

Teachers' positive attitudes toward e-learning are closely related to their level of technology use. When technology is readily available, teachers are more willing to use it in teaching. Conversely, limited access to technology restricts teachers' abilities and poses challenges to their attitudes toward e-learning (Agyei & Voogt, 2011).

Factors that facilitate or hinder attitude change have been discussed by Salama (2007), who highlighted that weak attitudes, the presence of equally strong alternative attitudes, and superficial attitudes may contribute to easier attitude modification. On the other hand, Al-Ansari and Mahmoud (2007) pointed out that certain factors make changing attitudes more difficult, such as the strength and clarity of attitudes among teachers, as well as intellectual rigidity and resistance to change, which complicate the process of changing teachers' attitudes on an individual rather than collective basis.

The researcher summarizes the factors influencing teachers' attitudes toward e-learning, illustrating how these factors affect the acceptance or rejection of technology.

Academic Achievement:

Academic achievement is considered a fundamental criterion for identifying the causes of failure or underperformance among students who struggle to achieve the same educational level as their peers. This often leads to dissatisfaction among teachers, school administration, and parents. In many cases, students are blamed for their perceived inability to learn, without understanding the underlying reasons behind their academic decline. This lack of insight ultimately results in persistent failure without offering effective and comprehensive solutions to address the issue and its causes.

Importance of Academic Achievement:

Academic achievement has received significant attention from educators and scholars in general, and from specialists in educational psychology in particular, due to its importance in students' lives and its impact on teachers and families. It is one of the primary criteria for assessing student learning across various educational levels. Educational psychologists have studied academic achievement from multiple perspectives, including its relationship with personality traits and cognitive factors, while others have examined the influence of school and non-school environmental factors.

Parents place great importance on academic achievement as it is seen as a key to their children's academic and intellectual development, whereas students perceive it as a means of achieving self-realization and self-esteem (Younesi, 2012).

Ramdhani (2015) states that academic achievement holds a vital place in a student's life, as it helps them acquire coping skills that enable them to adapt to their peers. It contributes to social development and civilization progress and serves as a tool for evaluating students' transition between educational stages, identifying their capabilities and potential, and motivating them to exert greater effort in their studies. Moreover, it plays a role in assessing cognitive achievement and determining the extent to which students have achieved the required level of learning. The results of academic achievement are also used to enhance teaching methods, as effective educational strategies can significantly improve student performance.

Al-Issawi (2002) asserts that the importance of academic achievement lies in bringing about behavioral, emotional, or social changes in students, which are known as learning. Learning is an invisible process that results from changes in cognitive structures and can be identified through academic achievement, which serves as a tangible indicator of learning outcomes. Its

importance is highlighted by its progressive role in preparing individuals for better opportunities. Academic achievement is also used as a tool for evaluating students' progression through educational levels, helping them recognize their abilities and potential, and boosting their self-confidence. Furthermore, it reduces anxiety and stress, contributing positively to their mental well-being.

The Relationship between Academic Achievement and E-learning:

The world has witnessed significant developments that have altered many concepts governing individual interactions. One of the most prominent changes is e-learning, which is closely linked to the internet and emerged in response to social and cultural transformations in the era of globalization. Given this transformation, educational institutions must invest in technology to support the learning process.

The educational sector has significantly benefited from these modern technologies, with schools integrating technology and internet applications as supportive learning tools to leverage vast informational resources and enhance curricula. These technologies have had a substantial impact on the educational process, leading to changes in the roles of teachers and students within the school environment, as well as updating curricula and teaching methods. In response to these developments, there has been a focus on introducing innovative teaching methods to improve students' academic achievement through advanced tools and programs (Naji, 2017).

Mothibi (2015) highlights that e-learning systems significantly contribute to improving learning outcomes and raising achievement levels. Studies have shown that students who effectively utilize e-learning achieve better results compared to their peers who rely on traditional classroom learning and direct teacher interaction. Advances in learning technology have facilitated higher academic performance, and e-learning is increasingly gaining attention in the education sector, prompting many

institutions to adopt e-learning programs. These institutions now fully recognize the positive impact of e-learning on students' academic performance.

A country's progress is often measured by the academic achievement levels of its students, as such progress is based on accumulated knowledge and experiences. Since technological advancement is achieved through learning, it has become imperative to pay attention to all aspects of the educational process, with a focus on the human element to address modern developments that enhance students' intellectual and cognitive levels.

The integration of information technology and the internet into education is one of the key indicators of a society's transition to an information society. This contributes to enhancing the efficiency and effectiveness of learning systems, raising academic achievement levels, and increasing information awareness. Today, the goal of education is no longer limited to mere instruction; it now focuses on equipping students with knowledge, abilities, and skills, fostering critical and creative thinking, problem-solving, and research skills to improve academic achievement (Naji, 2017).

Study Methodology and Procedures:

1. **Study Methodology:** The current study adopted the descriptive method to examine social and human phenomena. A questionnaire was used as the primary tool, designed to measure mathematics teachers' attitudes toward e-learning and its relationship with students' academic achievement from the perspective of mathematics teachers in basic education schools in North Al Batinah Governorate, Sultanate of Oman.
2. **Study Population:** The study population consisted of all mathematics teachers in the second cycle of basic education schools in North Al

Batinah Governorate, Sultanate of Oman. According to the Ministry of Education's statistical report for the academic year 2023/2024, the total number of teachers was 891 (Ministry of Education, 2024).

3. **Study Sample**: The study sample was selected using a simple random sampling method from the original population. The sample size was 268 teachers, representing 30% of the study population. Table 1 presents the frequency distribution and percentage distribution of the sample members.

Table 1:

Frequency Distribution and Percentage of Sample Members

Variable	Category	Frequency	Percentage (%)
Gender	Male	135	50.4
	Female	133	49.6
Experience	15 years or less	73	27.2
	More than 15 years	195	72.8

4. **Study Tool**: The study aims to explore mathematics teachers' attitudes toward e-learning and its relationship with students' academic achievement in basic education schools in North Al Batinah Governorate, Sultanate of Oman. Therefore, the questionnaire was used as the primary data collection tool, which consisted of two parts:
    - The first part covered basic demographic data such as gender and years of experience.
    - The second part included 6 statements measuring attitudes toward e-learning and 9 statements measuring academic achievement.

5. **Validity of the Study Tool**: The validity of the questionnaire was verified by presenting the initial version to a group of experienced university professors to gather their opinions and feedback regarding the appropriateness of the statements and their relevance to each questionnaire axis. Their feedback also ensured that the statements were clearly worded in an easy-to-understand language. Based on the received feedback, the questionnaire was revised to include a final version with 15 items.

6. **Reliability of the Study Tool**: Reliability refers to the consistency of the questionnaire, ensuring it yields the same results when applied to the same sample. Cronbach's Alpha reliability coefficient was used to calculate the reliability scores for the questionnaire axes. The reliability coefficient for the attitude toward e-learning was (0.89), and for academic achievement, it was (0.92), indicating that the validity and reliability measures were suitable for the study.

7. **Response Scale**: A five-point Likert scale was adopted to measure mathematics teachers' attitudes toward e-learning and its relationship with students' academic achievement in basic education schools in North Al Batinah Governorate, Sultanate of Oman. The Likert scale was considered appropriate for the current study (Abdel-Fattah, 2008). The response options for each statement were as follows, as shown in Table 2.

Table 2:

Likert Scale Response Options

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

8. **Statistical Methods Used in the Study**: A set of appropriate statistical methods were used for data analysis, including the following:

9. Cronbach's Alpha correlation coefficient to measure questionnaire reliability, in addition to the T-test.

10. Calculation of means and standard deviations to determine central tendency and dispersion.

11. Pearson correlation coefficient to analyze the relationship between variables.

Presentation and Discussion of Study Results:

Answer to the First Research Question:

What is the level of mathematics teachers' attitudes toward e-learning in basic education schools in North Al Batinah Governorate, Sultanate of Oman?

To answer this question, the researcher used arithmetic means, percentages, standard deviation, and ranking to estimate teachers' attitudes, as shown in Table 3.

Table 3:

Arithmetic Means, Standard Deviations, and Percentages of Study Sample Responses Regarding Attitudes Toward E-learning (Ranked in Descending Order)

No.	Statements	Mean	Standard Deviation	Percentage (%)	Rank	Attitude Level
2	I believe e-learning is beneficial in	3.82	0.88	76.4	1	High

No.	Statements	Mean	Standard Deviation	Percentage (%)	Rank	Attitude Level
	teaching mathematics					
1	E–learning is an aid in teaching mathematics	3.79	0.86	75.8	2	High
3	I believe the technical capabilities of e–learning simplify mathematics teaching	3.78	0.90	75.6	3	High
6	I believe e–learning achieves the educational objectives of mathematics	3.78	0.87	75.6	4	High
5	E–learning overcomes	3.74	0.86	74.8	5	High

No.	Statements	Mean	Standard Deviation	Percentage (%)	Rank	Attitude Level
	the challenges of traditional learning					
4	Practicing e-learning makes teaching mathematics enjoyable	3.72	0.91	74.4	6	High
Overall Score		**3.77**	**0.88**	**75.4**	-	**High**

Results of Table (3):

The results of Table (3) show that the arithmetic mean for the overall score of mathematics teachers' attitudes toward e-learning in basic education schools in North Al Batinah Governorate, Sultanate of Oman, was (3.77), corresponding to a percentage of (75.4%). This indicates a high level of positive attitudes toward e-learning, with arithmetic means for the items ranging between (3.72-3.82) and percentages between (74.4%-76.4%). These findings suggest a general agreement among the study sample on the high positive attitudes, which can be attributed to teachers' awareness of the importance of e-learning and their keenness to learn and apply new e-learning technologies in their classrooms. Moreover, the

acquired skills in using e-learning contribute to its wider application in Omani basic education schools.

These results align with studies by Hamadneh and Al-Shawahneh (2019), Hamutoğlu, Savaşçi, and Sezen-Gültekin (2019), Al-Shehri (2019), and Ghenghesh, Croxford, Nagaty, and Abdelmageed (2018), which indicated teachers' satisfaction with e-learning as a complementary tool to traditional learning. These studies also highlighted that e-learning helps save time and effort in teaching the mathematics curriculum.

Furthermore, since all statements received a high rating, this can be attributed to mathematics teachers' awareness of the importance of e-learning and their understanding of its effective role in improving the educational process without compromising pedagogical aspects or reducing their roles in the classroom. This awareness reflects a general belief that e-learning is an effective educational tool that enhances students' academic achievement and meets the needs of schools in light of ongoing developments in various life domains. These findings are consistent with studies by Shalash and Harzallah (2021), Hamadneh and Al-Shawahneh (2019), Hamutoğlu, Savaşçi, and Sezen-Gültekin (2019), and Malkawi, Nawafleh, and Al-Saqqar (2015).

Answer to the Second Research Question: *Are there statistically significant differences in the average ratings of mathematics teachers toward e-learning attributed to gender and years of experience?*

To answer this question, statistical analyses were conducted, including arithmetic means, standard deviations, and the T-test to examine differences in the study sample's responses regarding attitudes toward e-learning based on gender and years of experience. The results are presented in Tables (5) and (6).

Table (5):

T-test Results for Differences in E-learning Attitudes by Gender

Gender	Sample Size (n)	Mean	Standard Deviation	T-value	Significance Level (p)	Statistical Significance
Male	135	3.76	0.70	-0.036	0.97	Not Significant
Female	133	3.77	0.56			

The results in Table (5) indicate that there are no statistically significant differences at the significance level ($\alpha = 0.05$) attributed to the gender variable in mathematics teachers' attitudes toward e-learning in North Al Batinah Governorate. The p-value was (0.97), suggesting that both male and female teachers exhibit equally high attitudes toward e-learning.

This finding can be attributed to teachers' shared desire to improve performance within the available resources and the role of training programs in fostering positive attitudes toward e-learning. These results are consistent with studies such as those conducted by Hamutoğlu, Savaşçi, and Sezen-Gültekin (2019), Abu Aqil (2014), Nachimuthu (2020), Al-Shehri (2019), and Xhaferi, Farizi, and Bahiti (2018), which confirmed no significant gender-based differences.

However, the current study's findings contradict the results of Shalash and Harzallah (2021), which reported significant differences favoring males. It also differs from studies by Al-Rashoud (2021), Hamadneh and Al-Shawahneh (2019), and Malkawi, Nawafleh, and Al-Saqqar (2015), which indicated significant differences favoring females. These studies attributed their findings to the tendency of female teachers to adopt e-learning despite facing considerable obstacles, such as weak network infrastructure and limited access to technology for many female students, which impacted their use of e-learning in girls' schools.

Table (6):

T-test Results for Differences in E-learning Attitudes by Years of Experience

Years of Experience	Sample Size (n)	Mean	Standard Deviation	T-value	Significance Level (p)	Statistical Significance
Less than 15 years	73	3.78	0.64	1.43	0.89	Not Significant
More than 15 years	195	3.77	0.62			

The results in Table (6) show no statistically significant differences at the significance level ($\alpha = 0.05$) attributed to the years of experience variable regarding mathematics teachers' attitudes toward e-learning in North Al Batinah Governorate. The p-value was (0.89), indicating that teachers with both less and more than 15 years of experience exhibit similarly high attitudes toward e-learning.

The researcher attributes this to the absence of significant challenges hindering the use of e-learning, reflecting teachers' acceptance of technological changes. These findings are consistent with studies by Shalash and Harzallah (2021), Al-Shehri (2019), and Xhaferi, Farizi, & Bahiti (2018).

However, the current study differs from the findings of Hamadneh and Al-Shawahneh (2019), Al-Azawei et al. (2016), and Malkawi, Nawafleh, and Al-Saqqar (2015), which indicated that years of experience influence the use of e-learning. These studies found that teachers with longer experience tend to prefer traditional teaching methods, whereas less experienced teachers are more inclined to embrace e-learning. They also noted that experienced teachers face challenges in transitioning from traditional to digital learning due to their familiarity with conventional

methods and resistance to change, which may contribute to a lack of proficiency in using e-learning.

Answer to the Third Research Question: *Is there a correlational relationship between mathematics teachers' attitudes toward e-learning and students' academic achievement from their perspective in basic education schools in North Al Batinah Governorate, Sultanate of Oman?*

Pearson's correlation coefficient was used to address this question to determine the relationship between attitudes toward e-learning and academic achievement from the perspective of mathematics teachers.

Table (7):

Pearson's Correlation Coefficient Between Attitudes Toward E-learning and Academic Achievement

Independent Variable	Dependent Variable	Pearson's Correlation (r)	Significance Level (Sig.)	Relationship Significance
Attitudes toward e-learning	Academic achievement	0.612	0.000	Statistically Significant Positive Relationship

The results in Table (7) show a statistically significant moderate to strong positive correlation between attitudes toward e-learning and academic achievement, with a Pearson correlation coefficient of ($r = 0.612$). This indicates that enhancing positive attitudes toward e-learning is associated with improved student achievement. The relationship is statistically significant at ($Sig. = 0.000$), confirming that it is not random but rather a real and meaningful relationship.

These results emphasize the importance of fostering positive attitudes toward e-learning to improve students' academic performance, highlighting

the need to develop effective strategies to support its integration into the educational process.

The importance of mathematics teachers' positive attitudes toward e-learning lies in their critical role in enhancing students' academic performance. E-learning enables students to access various educational tools and resources tailored to their needs and preferences, ultimately boosting their academic performance. Numerous studies, such as Al-Saidi et al. (2017), Zare, Sarikhani, Salari, & Mansouri (2016), and Abu Aqil (2012), have confirmed the effectiveness of such attitudes in promoting academic achievement. They assert that e-learning applies psychological principles based on scientific foundations, making teachers' roles pivotal in guiding students to achieve high levels of academic success.

The study's findings align with those of Mahmoud and Abu Al-Noor (2017), Al-Hassan and Ibrahim (2014), which found that e-learning, supported by positive teacher attitudes, provides a rich and individualized learning environment, enabling students to learn effectively and navigate through digital content seamlessly. This enhances their motivation for learning, develops their cognitive skills, and encourages creativity, positively impacting their academic performance.

The reviewed literature suggests a general consensus that teachers' positive attitudes toward e-learning play a significant role in improving students' academic achievement. Studies by Al-Saidi et al. (2017), Mahmoud and Abu Al-Noor (2017), Al-Shakili (2010), and Al-Sahli (2009) emphasized that e-learning contributes to improving students' motivation, fostering mathematical thinking, and encouraging creativity. These studies also highlighted that reducing reliance on traditional teaching methods and adopting e-learning approaches help address various academic weaknesses, especially in mathematics, by providing students with a more engaging and motivational learning environment.

The consensus from previous research indicates that teachers' positive attitudes toward e-learning are essential for enhancing students' academic performance. Multiple studies, including those by Al-Saidi et al. (2017), Mahmoud and Abu Al-Noor (2017), Al-Shakili (2010), and Al-Sahli (2009), have shown that e-learning increases students' motivation, fosters creative thinking, and enhances their ability to explore and engage with learning materials. Additionally, these studies noted that minimizing the dependence on traditional teaching methods and incorporating e-learning techniques effectively address students' academic challenges, particularly in mathematics, by fostering greater interaction between students and teachers and enhancing learners' enthusiasm and motivation to achieve higher academic success.

Recommendations and Suggestions:

1. It is essential to provide specialized training programs for teachers in North Al Batinah Governorate to enhance their competence in effectively using e-learning.
2. Strengthening the technological infrastructure by providing the necessary devices and software to support the implementation of e-learning in educational institutions.
3. Raising awareness about the importance of e-learning among teachers through organizing specialized workshops and educational seminars.
4. Offering targeted support and training for teachers with limited experience to improve their skills in using e-learning tools.
5. Encouraging the exchange of experiences between highly experienced teachers and new teachers to enhance their technological skills and promote collaborative learning.
6. Promoting positive attitudes toward e-learning by equipping teachers with the necessary resources to teach effectively.

7. Conducting periodic evaluations of the impact of e-learning on students' academic achievement and implementing improvements based on evaluation results.
8. Utilizing the research findings to develop educational policies and integrate e-learning more widely into curricula.
9. Exploring additional factors that influence teachers' attitudes toward e-learning, such as administrative support and the school environment.

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