Mathematics Teachers' Attitudes Towards E-Learning in Basic Education Schools in North Al Batinah Governorate in the Sultanate of Oman

Mohammed Ahmed Alkamshaki & Muhammed Yusuf

Universiti Pendidikan Sultan Idris, Malaysia

Abstract: The study aimed to reveal the attitudes towards e-learning among mathematics teachers in basic education schools in the Governorate of North Al Batinah in the Sultanate of Oman.The researcher used the descriptive approach to achieve the objectives of the study. The study tool consisted of a questionnaire involving (11) items distributed to a random sample of (250) male and female teachers. The study results showed that the attitudes towards e-learning among mathematics teachers came to a high degree, and the total average of the scores was (3.77), with a percentage of (75.4%). The results also indicated no statistically significant differences due to gender and years of experience. Due to the results, the study recommends increasing training courses for teachers on the use of e-learning, improving infrastructure and technical and technological equipment in schools, providing experts in the use of e-learning and technical support for technical problems.

Keywords: Attitudes towards e-learning, mathematics teachers, basic education, Al Batinah North

Introduction

The present time is characterized by rapid and significant changes in all aspects of life, resulting from the rapid development of the scientific field in terms of technology and information technology. Those in charge of education keep abreast of these rapid developments in the field of education. As a result of this, they have to work on great development in their methods and techniques to keep pace and synchronize with modernity, Which in turn is an urgent need at present in order to develop teaching and learning, access to new learning skills for our students, teach them the ability to research, self-learning and use these modern technologies, to reach the desired quality in our educational institutions.

E-learning is a powerful tool that changes traditional learning systems because it strengthens the ability to teach and learn and provides interaction and active learning, which enhances cooperation and sharing of ideas between students and teachers. A study acquires knowledge or support its distribution through various technological methods such as voice chat, video conferencing, and online discussion (Diab &Elgahsh, 2020).

Teachers are the most in need of e-learning in the field of education. As well as keeping pace with the current and accelerating era in all its aspects. E-learning has many advantages that

enable it to overcome many problems and difficulties that impede the dissemination of education worldwide (Hamdan, 2007).

Mahmoud and Darraj (2020) added that educational institutions must remain efficient and quality, provide information to students through e-learning, keep pace with development in learning methods, and continuously follow e-learning platforms to benefit from their high-quality content. Educational institutions work on continuous development, including fits with the educational environment in which this educational institution is located. It is a work that requires technical and financial capabilities and continuous follow-up to build an integrated knowledge society.

In the same context, Ghenghesh, Croxford, Nagaty, and Abdelmageed, (2018) indicate that the introduction of e-learning within educational institutions should not be limited to educational resources and equipment. However, it should include all aspects of the educational process, especially the important human aspects. In contrast, the main aspect is the attitudes of learners and teachers toward e-learning. The importance of knowing attitudes toward a specific topic lies in predicting individuals' behaviors toward a specific subject. Many available published studies have shown that teachers' positive attitudes have an important role in accepting e-learning technology. When teachers have a positive attitude towards technology, they are more likely to use it.

According to Li (2007) the need of mathematics teachers to have acceptable and positive attitudes toward the use of e-learning in order to identify the obstacles of e-learning, and find appropriate solutions to these obstacles, also to achieve good academic achievement for students as a reference to the importance and feasibility of using e-learning in the classroom. E-learning contributes to exploring concepts and remembering rules in the long run. Furthermore, the contribution of e-learning and Internet resources to learn mathematics by simplifying mathematical concepts, increasing interaction between students, and moving mathematics education from the traditional level to the digital age.

The Ministry of Education in the Sultanate has made tremendous and robust progress in introducing e-learning into the educational system. The Ministry of Education in the Sultanate equipped schools with the tools necessary to use e-learning, represented by learning resource centers equipped with computers and the Internet, and providing books in most areas that serve the educational curricula, and with the use of Internet networks, communication technologies, and mobile phones to manage examinations and their results. Moreover, they included e-learning in the teaching courses, with the implementation of teacher training projects electronically, each in this educational area. And they provided the possibility of including e-book technology to support the textbook (Al-Mousawi, 2004). This path pursued by the Ministry of Education is still in its infancy, and it is still providing excellent support for introducing e-learning in the entire educational system.

Problem Statement

Oman Vision 2040 defines a series of national priorities that will be built upon and that will determine the position of the Sultanate of Oman in various fields over the next two decades. The strategic strategy for education, learning, scientific research, and national capabilities is the pursuit of comprehensive education, sustainable learning, and scientific research that leads to a knowledge society, competitive national capabilities, and an educational system characterized by quality, while providing the necessary funding for its sustainability and all that is needed to develop it to keep pace with the developments of the current era (Oman Vision, 2019).

The importance of spreading the culture of e-learning in educational institutions, and drawing plans to keep pace with this technology and contemporary with all new technologies in the future, and we believe at this time that it is necessary to take advantage of these capabilities in the Sultanate of Oman in the fields of education and training. Moreover, the government in the Sultanate of Oman has realized the impact of good information and communication technologies on individual and societal development, the economy and raising its capacity.The Ministry of Education directed many of its efforts in this context to qualify human cadres, students, and school buildings in proportion to the significant technological progress witnessed by the educational system worldwide (Al-Rawahi, 2001).

Many worldwide studies dealt with the study of teachers' attitudes towards e-learning. However, in the Sultanate of Oman, some studies proved the need to study teachers' attitudes towards e-learning because of their role in using e-learning in teaching and working on a greater understanding of teachers' acceptance or rejection. To use e-learning in Omani schools, the study of Al-Saeedi et al. (2017) referred to the understanding and assimilation of mathematics teachers' attitudes towards using e-learning in teaching mathematics from basic education. The study of Al-Sayed and Al-Mashakhi (2018) also indicated great efforts in developing education and the work on developing educational and educational policies. Therefore, it showed the need to understand teachers' attitudes toward the application of technology in education, especially e-learning. Al-Salmi's study (2020) referred to the extrapolation and analysis of challenges and difficulties associated with using e-learning and how to overcome these challenges in the future. It also showed the understanding of the teachers' attitudes in charge of teaching regarding accepting or rejecting e-learning and understanding the reasons. The study also showed the success of e-learning in the academic achievement of students and the extent of their acceptance of it.

However, Al-Azawei, Parslow, and Lundqvist (2016) showed that there are negative trends that stand in the way of applying e-learning by faculty or students alike, which does not enable them to apply e-learning, the success of any e-learning effort depends on positive trends towards e-learning.

The current study, with the great developments taking place in the Sultanate of Oman in the field of education and the widespread use of e-learning in the schools of the Sultanate of Oman, came to reveal the attitudes of mathematics teachers towards e-learning in basic

education schools in North Al Batinah Governorate in the Sultanate of Oman. The study questions are the following:

1. What are the mathematics teachers' attitudes towards e-learning in basic education schools in the North Al Batinah Governorate in the Sultanate of Oman?
2. Are there statistically significant differences in the attitudes of mathematics teachers towards e-learning in basic education schools in the North Al Batinah Governorate in the Sultanate of Oman due to the variable of gender or years of experience?

Literature Review

E-learning

e-learning is an interactive learning method presented to the student using communication and information technologies. Although, there is a difference in the definition of e-learning among those interested in e-learning researchers and those interested in e-learning because the perspective of the concept varies. E-learning has been considered as a means of transferring scientific material to students using educational media, and it can be defined as a mode of learning based on the use of e-learning media for educational purposes and the delivery of the scientific material to students without time or spatial constraints (Al-Maawi, 2021).

Khan (2005) defines e-learning as a modern and innovative way to communicate learning environments in an accessible, interactive, well-designed, learning-centered way to anyone, anytime, anywhere, by utilizing the characteristics and resources of many digital technologies together with other types of learning materials appropriate for open, flexible, and structured learning environments. However, Malkawi et al. (2009) define it as learning that presents instructional content in multimedia using the Internet, CDs, audio, and video tapes, or computer-based teaching.

Kumpikaite&Duoba (2012) add that e-learning uses modern multimedia technology and the internet to improve the quality required in education and exchange and collaboration between the student and the teacher. E-learning is the process of online information processing and other information technologies. E-learning can be interpreted as it is based on flexibility in learning. It relies on modern learning aids from the internet and computers, all of which share the content of teaching in a flexible and interactive manner between the student and the teacher, anywhere and at any time, to achieve the desired quality of the learning process and the goals of the educational institution.

Mahmoud and Aboul Nour (2017) summarized several e-learning goals, such as e-learning offers an educational environment of diverse sources that is enriching to all axes of the learning process, finding a variety of ways for channels of communication that provide the expertise required without being tied to a specific location and keeping abreast of global developments and helping educate society electronically.

The goals of e-learning are in keeping with the rapid development in all its aspects that are taking place in the current era. Educational institutions must keep up with this subsequent development and find solutions to the many problems facing the educational process. The use of e-learning has become urgent to give students the skills of the future that will help them keep up with modernity and development.

The Sultanate of Oman, represented by the Ministry of Education, is making significant efforts to improve the field of e-learning.The most important of which is spreading the culture of using e-learning, modern technologies in teaching among students and teachers, besides, forming committees specialized in e-learning in academic areas, with training and supervision to activate its roles. Additionally, working on the production of educational software that serves the school curricula which activate some areas of e-learning via the internet, and include the educational portal with some applications in the field of e-learning.Furthermore, the ministry of education strives to convert the school curricula into digital formats, and provide support in the field of employing and applying e-learning systems, and it is attempting to involve teachers and educators in international and local conferences and training courses related to e-learning. In addition, it is implementing a number of workshops and specialized training courses for teachers in the field of electronic content and the use of the Internet, and providing schools with modern technological tools related to the employment and application of e-learning (Ministry of Education, 2020).

Al-Shakily (2010) adds that the Ministry of Education in the Sultanate of Oman has excellent ambitions for further progress and modernization in the field of e-learning in the future. For this reason, there were plans sought by the Ministry of Education, including expanding the application of e-learning and learning in the educational portal, introducing e-learning into most curricula, building e-learning programs, and spreading the culture of e-learning in the educational environment.

The Ministry of Education in the Sultanate of Oman has taken significant strides in preparing and planning to introduce e-learning in all educational regions. It has also provided all the necessary support for e-learning, including tools, computers, communication technologies, the internet and connecting schools toan internal network. All this is to modernize and comprehensively develop education and introduce e-learning throughout the educational system.

Attitudes Towards

Many concepts and definitions have gone into attitudes; Bohner and Dickel (2011) referred to the attitude as: a position that an individual takes based on his assessment of objects and persons; These forces him to respond with specific behavioral patterns based on his assessment of these objects and people. Attitudes are essential in our daily lives, as they represent an significant rank in social psychology, because attitudes are considered one of the most important scientific outcomes of socialization. They are specific directives that control and organize social behavior. Trends facilitate our response in situations in which we have

unique attitudes. We do not look for new behavior every time we encounter these situations, just as psychological attitudes benefit us in knowing and examining various fields and fields. (Al-Omari, 2017).

As well as the importance of attitudes is also evident through what is presented to the social adaptation of the individualand through the individual's acceptance of the trends that prevail in the group, so these trends are shared and then they have sense of harmony with them, and the trends give meaning, significance, and importance to the life of the individual when his behavior agrees with his trends. The behavior is based onsatisfying these tendencies, as psychological tendencies work to satisfy many psychological and social needs and motives. Among these needs are the need for social appreciation, belonging to a particular group, and the need for emotional participation, and here the individual accepts the values and standards of the group. The tendencies facilitate the responses of the individual in the situations he has special directions towards it (Houhou& Lamamra, 2021).

Attitudes are among the important topics studied by psychology.They have a major role in influencing the acceptance or rejection of technology, including e-learning, as it is the real influence that pushes the teacher to practice e-learning and continue to practice it continuously. Thus, improving this type of learning, and giving the importance of trends towards e-learning, we had to pay attention to it and work to provide teachers with positive attitudes towards it and invest energies in this learning. Besides, its importance in directing the teacher's behavior and stimulating his motivation, as it constitutes an important component in the educational process.

Methodology

Study design

The current study has benefited from previous studies in choosing the appropriate study design. The study has followed the descriptive approach in view of the fact that it is one of the most appropriate approaches when studying social and human phenomena, besides it is one of the tools of this approach is the questionnaire, where a questionnaire was designed to detect attitudes towards e-learning among mathematics teachers in basic education schools in the governorate North Al Batinah in the Sultanate of Oman.

Study population

The study population consisted of all mathematics teachers in basic education schools. The second cycle is in the Governorate of North Al Batinah in the Sultanate of Oman. The number of teachers who joined is (891) male and female, according to the statistics of the Ministry of Education in the Sultanate of Oman and according to the statistical guide for 2021/2022 (Ministry of Education, 2021).

study sample

The sample has been chosen for the study using the simple random method from the original population of the study. The study's sample size was (250) male and female teachers, and it was 28% of the study population. Table (1) shows the sample size according to the gender variable, and Table (2) shows the sample size according to the years of experience.

Table 1. sample size according to the gender

Gender	N	Percentage %
Male	124	49.6%
Female	126	50.4%
Total	250	100%

Table 1 shows that males (124) are marked, representing 49.6% of the sample size as a whole, while the female sample size (126) is marked, and the proportion (%50.4) of the sample size as a whole.

Table 2. sample size according to the years of experience

Years of experience	N	Percentage %
Less than 15 years	70	28%
More than 15 years	180	72%
Total	250	100%

Table (2) shows the distribution of the sample by years of experience, where years of experience represented less than 15 years (70) of the sample size as a whole and by (%28). In comparison, years of experience represented more than 15 years (180) of the sample size as a whole, and by (%72).

Study instrument

The current study aims to reveal attitudes towards e-learning among mathematics teachers in basic education schools in North Al Batinah Governorate in the Sultanate of Oman. Therefore the questionnaire was adopted as a main tool for data collection after referring to previous studies such as the study of Shalash and Herz Allah (2021), the study of Al-Rushoud (2021), the study of Hamadneh and Al-Shawahin (2019), and the study of Hamutoğlu, Savaşçi, &Sezen-Gültekin (2019), and the study of Al-Shehri (2019). The study's instrumentconsisted of two parts, the first part of the demographic variables such as gender and years of experience, and the second part of (11) items were chosen according to the opinions of the

experts, which represented attitudes towards e-learning, where the items were chosen to be simple, appropriate, and specific.

Validity of the study instrument

The instrument's validity was verified by presenting it in its initial form to a group of university professors with experience and specialization.The number of refereed professors was (5) professors. The number of items of the tool in its initial form was (23) items in order to test the appropriateness of data collectionand to consider the comments of the arbitrators regarding the appropriateness of the questionnaire, as well as the clarity of the wording in a clear and understandable language. In light of the observations received, the paragraphs were amended by deleting (12) itemsand merging some items with other items, and the questionnaire in its final form consisted of (11) items.

Reliability of the study instrument

The questionnaire does not contradict itself, so it gives the same results if it is re-applied again on the same sample, and to find thereliability coefficients for the axes of the questionnaire, the researcher used the Cronbach alpha coefficient of the questionnaire, which was (0.904), and it can be said that the reliability and reliability coefficient were suitable for the application of the study.

Scale used in the instrument

The Likert Scale has been adopted to measure attitudes towards e-learning among mathematics teachers in basic education schools in North Batinah Governorate in the Sultanate of Oman. It is appropriate for the current study (Abdel Fattah, 2008). The answer alternatives for each statement were as follows: very few (1), few (2), medium (3), high (4), and very high (5).

Criterion for judging the responses of the study sample

Table 3. Criteria for judging the responses of the study sample

Mean score	Response score
1- 2.33	Low
2.34- 3.67	Medium
3.68- 5	High

Findings and discussion

Results related to answering the first research question: What are the attitudes towards e-learning among mathematics teachers in basic education schools in North Batinah Governorate in the Sultanate of Oman?

To answer this question, the researcher used arithmetic mean scores, percentages, standard deviations, and ranks for the estimates of mathematics teachers; Table (4) illustrates this.

Table 4. Means, standard deviations and percentages of responses of the study sample related to attitudes towards e-learning

N	Items	Mean	standard deviation	percentages	Rank	Response score
9	E-learning neglects the pedagogical aspects of the learning process	3.86	0.87	%77.2	1	High
10	I believe that e-learning limits my role in the educational process	3.83	0.87	%76.6	2	High
3	I think e-learning is useful in teaching mathematics	3.82	0.88	%76.4	3	High
11	The school currently needs to use e-learning in teaching mathematics	3.81	0.87	%76.2	4	High
1	E-learning is an assistant in teaching mathematics	3.79	0.86	%75.8	5	High
4	I believe that the technical potential of e-learning contributes to simplifying mathematics teaching	3.78	0.90	%75.6	6	High
8	I believe that e-learning achieves the goals of education for mathematics	3.78	0.87	%75.6	7	High
7	E-learning overcomes traditional learning problems	3.74	0.86	%74.8	8	High
5	Practicing e-learning makes me feel the joy of teaching mathematics	3.72	0.91	%74.4	9	High
2	I feel the support of the school administration for using e-learning in teaching mathematics	3.68	0.90	%73.6	10	High
6	E-learning develops students' self-learning skills	3.68	0.90	%73.6	11	High
Overall		3.77	0.88	%75.4		High

Table (4) shows results of the arithmetic mean of the total score of the attitudes towards e-learning among mathematics teachers in basic education schools in the North Al Batinah Governorate in the Sultanate of Oman. The score amounted to (3.77), with a percentage of (75.4%), and with a high degree, as all the paragraphs have gotten a high degree, and with

arithmetic averages that ranged between (3.68-3.86), and with a percentage that ranged between (73.6-77.2%).It indicates the presence of high and positive trends among mathematics teachers. Basic education, may be attributed to the feeling among mathematics teachers of the importance of using e-learning, as well as learning everything new in its application in the classroom, with the presence of some skills acquired by teachers in the use of e-learning, and the presence of positive attitudes among teachers towards e-learning that help expand its application in basic education schools in the Sultanate of Oman.This findingis consistent with the studies of (Hamadna& Al-Shawahin, 2019; Hamutoğlu, Savaşçi, &Sezen-Gültekin, 2019; Al-Shehri, 2019; Ghenghesh, Croxford, Nagaty&Abdel-Majid, 2018), which is the satisfaction of mathematics teachers with e-learning and considers it a useful tool because it complements traditional learning and saves time and effort in teaching the mathematics curriculum.

Since all items came with a high level, as item (9) was represented by the highest average (3.86), which states that "e-learning neglects the educational aspects of the learning process", with a percentage of (77.2%), and with a high degree, followed by item (10) " I believe that e-learning limits my role in the educational process", with an average of (3.83), with a percentage of (76.6%), with a high degree, and item (3) which states "I believe that e-learning is useful in teaching mathematics", with an average of (3.82), and a percentage (76.4%), with a high degree, and item (11), and it stipulated that "the school needs at the present time to use e-learning in teaching mathematics," with an arithmetic average of (3.81), and a percentage (76.2%), and with a high level, and it came items (1, 4, 8, 7, 5, 2, 6), respectively, came with a high level, and the researcher attributes this to the mathematics teachers' feeling of the importance of e-learning and that it does not affect the educational aspect in the learning process, and does not limit the rolesplayed by the teacher. Moreover, Mathematics in the classroom as there is a general feeling among mathematics teachers that e-learning is useful, as it serves the educational process, and leads to raising the level of achievement. Through what teachers see in mathematics, e-learning also represents an urgent need for the school in the current period in which we live in terms of development, which includes all aspects of contemporary life, and this is consistent with the studies of (Shalash&Herzallah, 2021; Hamadneh& Al-Shawahin, 2019; Hamutoğlu, Savaşçi, &Sezen-Gültekin, 2019; Malkawi, Nawafleh& Al-Saqqar, 2015).

Results related to answering the second research question: Are there statistically significant differences at the significance level ($0.05 \geq \alpha$) in the attitudes of mathematics teachers towards e-learning in basic education schools in North Batinah Governorate in the Sultanate of Oman according to the gender and years of experience variables?

To answer this question, the means, standard deviations, and (T) test were calculated for two independent groups to study the significance of the differences in the responses of the study sample on attitudes towards e-learning, according to the gender variable, years of experience, and Table (5) and Table (6) illustrate the results.

Table 5. Results of Test (T) to indicate the differences between the average responses of the study sample on attitudes towards e-learning according to the gender

Gender	N	Mean	standard deviations	T(test)	Sig
Male	124	3.76	0.70	- 0.036	0.97 Not significant
Female	126	3.77	0.56		

Table (5) shows that there are no statistically significant differences at the level (α = 0.05) due to the gender variable about the attitudes towards e-learning among mathematics teachers in North Al Batinah Governorate, where the value of the level of significance of the attitudes towards e-learning among teachers according to the gender variable is clear that the attitudes towards e-learning are high for males and females. The researcher attributes this to what is observed in schools, to the presence of high trends among male and female mathematics teachers resulting from the desire to raise performance as high as possible according to the available capabilities and the tools that schools can provide for the use of e-learning, and the role of female participants in courses to help to develop the use of e-learning, and what this leads to in raising the positive attitudes of mathematics teachers towards e-learning, and this is consistent with what was shown by the studies of (Hamutoğlu, Savaşçi&Sezen-Gültekin, 2019; Abu Aqil, 2014). The courses have a noticeable role in directing individuals to positive attitudes towards e-learning, as the current study agreed with the study of Nachimuthu (2020), the study of Al-Shehri (2019), and the study of Chaferi, Frizi, and Bahiti (Xhaferi, Farizi, &Bahiti, 2018), which showed that there were no significant differences according to the gender.

The current study also did not agree with the study of Shalash and Herzallah (2021), which showed significant differences in favour of males. Further, the result does not agree with the study of Al-Rashoud (2021), the study of Hamadneh and Al-Shawahin (2019), and the study of Malkawi, Nawafla and Al-Saqqar (2015), which showed significant differences according to the gender in favour of females. According to this result, with the tendency of females to use e-learning, they may encounter significant obstacles in the weakness of the network infrastructure to use e-learning and with the lack of network availability for many female students in girls' schools.

Table 6. Results of Test (T) indicate the differences between the average responses of the study sample on attitudes towards e-learning according to years of experience

years of experience	N	Mean	standard deviations	T(test)	Sig
Less than 15 years	70	3.78	0.64	1.43	0.89 Not significant
More than 15 years	180	3.77	0.62		

Table (6) shows that there are no statistically significant differences at the level (α = 0.05) due to the years of experience about attitudes towards e-learning among mathematics teachers in North Al Batinah Governorate.The value of the level of significance of attitudes among teachers according to the years of experience variable was (0.89).It turns out that mathematics teachers who have less than 15 years of experience, and those who have more than 15 years of experience have high attitudes towards e-learning. Hence, there is no effect of years of experience on attitudes towards e-learning among mathematics teachers in North Al Batinah Governorate in the Sultanate of Oman, and the researcher attributes. This is due to the presence of apparent difficulties that could constitute one of the obstacles to the use of e-learning, and it affected the attitudes of mathematics teachers towards e-learning. This indicates that mathematics teachers accept the significant change in the use of e-learning according to the years of experience they have, and that mathematics teachers may prefer to develop their teaching processes while benefiting from the great services provided using e-learning. The researcher attributes this to the absence of clear difficulties in the transition from traditional learning to the use of e-learning among mathematics teachers with different experiences, and this is consistent with the studies of (Shalash&Herzallah, 2021; Al-Shehri, 2019; Xhaferi, Farizi, &Bahiti, 2018).

The current study did not agree with the studies of (Hamadna& Al-Shawahin, 2019; Al-Azawei, et al., 2016; Malkawi, Nawafleh& Al-Saqqar, 2015), which showed that years of experience had an impact on the use of e-learning and attitudes towards e-learning. Those with more years of experience prefer using traditional methods of teaching over using e-learning, and those with less years tend to benefit from using e-learning, also it showed that it is difficult for teachers with more years of experience to switch from traditional learning to e-learning, due to their familiarity with the methods used. In addition, their lack of acceptance of change significantly contributes to their lack of ability and competence in the use of e-learning.

Recommendations and suggestions

According to the study results, the researchers recommend and suggest the following:

1. Increasing teacher training courses on e-learning and its use because it raises teachers' attitudes towards e-learning.

2. Providing a network infrastructure that supports the use of e-learning.

3. Increasing the moral incentives provided to teachers, encouraging them to use e-learning, and supporting incentives for further work on developing the use of e-learning in schools.

4. Providing experts in the use of e-learning.

5. Providing technical support for technical problems that may occur to teachers and students while using e-learning.
6. Providing laboratories equipped with modern devices that meet the requirements of using e-learning.
7. Carrying out future studies on mathematics teachers' attitudes towards e-learning and its relationship to students' academic achievement.

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