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Math Teachers' Use of Modern Teaching Strategies in Distance Learning in Jordan

Munes Adeeb Hamadneh
Faculty of Educational Sciences, Irbid National Univeristy, Jordan, Email: M2nes@yahoo.com

Abstract

This study aimed to examine the degree of math teachers' use of modern teaching strategies in distance learning in Jordan. The study used the descriptive-analytical method. The sample of the study consisted of (121) male and female teachers. A questionnaire consisting of 35 items distributed into five domains was used after assuring its validity and readability. The results showed that the degree of math teachers' use of modern teaching strategies in distance learning was high. It was also revealed that there were no statistically significant differences between the means of the study sample's responses of using modern teaching strategies in distance learning in all fields and the total score due to the variable of gender. However, significant differences were shown in the use of modern teaching strategies among math teachers due to the variable of experience, in favor of experience of less than 10 years. In the light of the results, it is recommended that there is a need to work on the use of modern teaching strategies in the teaching of Math.

Keywords: Modern Teaching Strategies, Distance Learning, Math Teachers

Introduction

The entire world is currently suffering from the spread of the Coronavirus. This made it necessary for educational institutions to switch to distance learning to ensure the continuity of the teaching and learning processes and to use the Internet, smartphones, and computers in remote communication with students. Technological changes have played a prominent role in the educational process as distance education has become a fait accompli, and education must be provided to students. On the other hand, the teacher needs to keep abreast of developments. Therefore, it has become necessary to provide teachers with knowledge and skills through training, which has become an urgent necessity imposed by the current changes of the era to develop teachers and their capabilities to keep pace with work developments.

Distance learning is one of the modern concepts and techniques for learning at all levels. This type of education has become an important pillar of the knowledge economy. It is worth noting that distance education, or what is sometimes called e-learning or online learning, does not mean teaching curricula and storing them on CDs, but the essence of distance learning is the interactive style, which means that there are mutual discussions between students and interaction with the teacher. There is always a teacher who communicates with students and defines their tasks and choices (Boumediene, 2021).

Distance learning seeks to create an interactive learning environment through new smart technologies, diversify sources of information and experience, and strengthen the relationship between parents and the school and between the school and the external environment. Also, it seeks to support the process of interaction between the parties to the educational process to exchange educational experiences, discussions, and dialogues aimed at exchanging opinions using the means of various communication, raising students' higher thinking abilities, and providing teachers and students with technical skills (Al-Qutaish, 2013).

In light of the Coronavirus crisis and the adoption of distance education, mathematics education, an abstract science based on concepts, facts, postulates, and axioms, depends on understanding and thinking. It needs to be taught following educational methods and strategies used by the teacher in a way that works to develop the student's cognitive, mental, and skill abilities. Also, it

stage and meet the needs of students and societies (Balliu & Belshi, 2017).

Due to the emergence of new concepts in the educational process, which requires keeping pace with this continuous development to reconsider teaching strategies. So, the adoption of modern and diverse teaching strategies has become a goal to develop the educational system in general, and the student in particular, turning from a passive recipient of knowledge to a strategic and active participant in the educational process. Modern teaching strategies focus on active learning for students and improving the quality of the educational process (Holubova, 2010).

Modern teaching strategies are an essential pillar of the educational process. They are an element of the curriculum in the modern and comprehensive sense. Given the importance of educational strategies, they have attracted the attention of educators in their various specializations and fields of application. The good teaching method achieves the learners' acquisition of experiences and skills, as well as that it addresses many weak points and situations in the school curriculum, and at the same time treats the weaknesses that characterize some students. Modern strategies have spread widely in teaching to develop students' creativity in all stages of education, including e-learning, active learning, self-learning, problem-solving, constructivist learning, brainstorming, and others (Janabi, 2018).

Obaid (2019) indicated that modern strategies are characterized by the independence of the learner's activity by allowing him to think and work to access information on his own. The activities also vary in modern teaching strategies to confront the individual differences between students during the teaching process. They also contribute to developing students' ability to think scientifically and critically. The role of modern strategies is highlighted in training the senses on observation as a basis for developing all abilities of the mind such as analysis, reasoning, conclusion, judgment when dealing with various issues and encouraging students to show team spirit and cooperative community work.

Among the modern teaching strategies that a mathematics teacher can choose in teaching mathematics in line with the educational situation are the following:

needs a teacher with a great deal of excellent training in the use of the Internet and communication technology, who can create an interactive electronic environment rich in situations, activities, and educational means, which motivates students to engage in discussions and sports dialogues, between students and their teacher on the one hand, and between the students themselves on the one hand. The teacher is one of the important elements on which the distance learning system is based, in addition to the student, and the Internet for communication with the teacher. The teacher constitutes the basis in the education process. He is responsible for preparing a generation capable of creativity, innovation, and integrating and dealing with technology. Therefore, the teacher has become required to practice many modern roles to improve the educational process as a whole. Distance learning also requires the teacher to possess technical and educational skills, including time management, the use of electronic means, the use of modern teaching strategies, and previous experiences that allow him to deal with the learning system based on the use of computer technology and the Internet with ease (Al-Halfawi, 2018; Zain Eddeen, 2015).

Therefore, the teacher must be aware of all the activities he practices to help students achieve the desired change in their behavior, performance, and abilities, and their acquisition of information, knowledge, habits, tendencies, and values. Hence, he should use good teaching strategies that are appropriate for the lesson and that enable students to understand and relate facts (Al-Omiri, 2020).

The use of teaching strategies represents a qualitative transition in the world of modern education, especially after the shift in educational thought, from focusing on the role of the teacher as a transmitter of knowledge to his role as a facilitator, supervisor, and director. The old strategies based on memorization, filling students' brains with information, and measuring the portfolio are no longer feasible as the horizons of knowledge widen, and the world has turned into a small village due to knowledge and technological progress. This necessitated the use of more modern and effective strategies that contribute to the development of thinking and self-development to serve the goals of the

Play learning strategy: It is one of the most interesting and attractive educational means. With the possibility of using audio-visual effects, it provokes more than one sense in the human being, which makes learning more effective and increases the learner's motivation because it satisfies his innate inclination. It is one of the most effective ways to stimulate the learner's thinking and increase his mental development, especially creative thinking. The importance of using educational games in distance education also lies in stimulating the focus and attention of the learner. In addition, it provokes contemplation and thinking, improves academic achievement, and encourages the transfer and dissemination of knowledge among learners and their desire to obtain information. Electronic games are powerful educational tools because they create an integrated learning environment that focuses on the learner and develops his cognitive skills (Jaber, 2020).

Differentiated education strategy: This strategy is based on the teacher's response to the diverse needs of learners, one of the aspects of equitable education that gives learners equal opportunities to learn. Learners have multiple intelligences. They come from diverse environments and learn with different learning styles. This requires the teacher to take into account those differences and meet their needs through diversifying teaching (Mosa, 2021).

Modern teaching strategies and methods have gained great attention in various educational systems in the world because of their impact on students and fulfilling their needs, characteristics, and abilities. Alawat (2017) recommended the teachers' use of positive attitudes towards modern teaching strategies through forums and training workshops, highlighting their importance and effective role in improving the educational process, allocating sufficient time and space to apply modern teaching strategies in teaching, and providing appropriate means to activate strategies, and urging the activation of their use within the educational institution.

Therefore, knowing the extent to which mathematics teachers apply modern teaching strategies in distance learning contributes to supporting the creative teacher on the one hand. On the other hand, it diagnoses weaknesses and achieves one of the most important objectives of the educational

Remote survey strategy: This strategy is one of the most important strategies of modern learning. It is based on defining the problem or situation. This step is based on asking a problem or questions or raising some contradictions and differences that work to motivate students to think. The teacher must take care and attention, prepare, collect information, and impose hypotheses. Information is collected, and hypotheses are proposed that are related to the problem to ensure the validity and accuracy of the information and proposed hypotheses through experimentation. In this step, it becomes clear that the students' questions are considered initial hypotheses that can be true or false. Therefore, through the process of experimentation, the student can reach a situation in which he investigates the information he was aiming at in the problem. In the final stage in applying the results, students present scientific explanations and clarifications, solutions to the problem, and work on implementing the application process to new situations between them and the problem of the investigation topic (Janabi, 2018).

Project learning strategy: The project is a rich and in-depth experience that engages the student in activities that are enjoyable for him and related to the curriculum. It is performed in full or in part outside the school. Project-based learning is a collective curve of teaching and learning. Through project-based learning, students are placed in real situations where they use their skills and abilities to achieve the desired goals, plan and work on complex tasks, and evaluate their performance and progress. The project is designed around issues, questions, or needs that students challenge (Embosaidi and Al Blushi, 2015).

Discussion strategy: It is a planned educational situation in which an issue or a problem is raised to reach a solution based on the learners' previous experiences. Opinions are presented under the supervision and guidance of the teacher and between the teacher and learners, or between the learners themselves. Various questions are used to consult the learners' previous experiences. It also works on stimulating effective mental activity for learners and develops cooperation, a democratic atmosphere, and teamwork (Mosa, 2021).

in teaching science, and they realized the importance of using modern strategies in science teaching. Some difficulties hinder the use of modern strategies in teaching science, most notably the high cost of producing and purchasing modern means and techniques and employing them in the application of modern strategies in teaching science. There were statistically significant differences in the science teachers' point of view in using modern strategies in teaching science according to the gender variable in favor of females. However, there were no statistically significant differences in the science teachers' point of view in using modern strategies in science teaching according to the variable of qualification level and years of experience.

Mosa (2021) conducted a study that aimed to identify the degree to which modern teaching strategies are used in distance learning among primary school teachers in private schools in the capital, Amman. The descriptive survey method was used, and the study sample was randomly selected, which numbered (427) teachers of the basic stage in the capital, Amman. The researcher prepared a questionnaire consisting of (52) items. The results showed that the degree of primary school teachers' use of the modern teaching strategy in distance learning in private schools was high. Also, there were no statistically significant differences in the degree of use of modern teaching strategies in distance learning due to the variables of gender and the number of years of experience in teaching.

Kasasbeh and Ibdah's (2020) study aimed to identify the degree of effectiveness of the new teacher program in applying modern teaching strategies to the teachers of the first three grades in the Directorate of Education for the second Amman region in Jordan. The sample of the study consisted of (15) male and (171) female teachers. The descriptive approach was used, and a questionnaire consisting of (21) was developed. The results showed that the degree of effectiveness of the new teacher program in applying modern teaching strategies for teachers of the first three grades was moderate. Also, there were statistically significant differences in the degree of effectiveness of the new teacher program in applying modern teaching strategies due to the variable of teaching experience in favor of experienced teachers (6 years or above). In institution, which is teaching and what this goal creates in terms of certain results in achieving the other goals that one aspires to achieve. Also, the degree of the teacher's use of strategies helps in showing the weaknesses in the teacher's performance and his shortcomings to pass a judgment on the efficiency of this work, and the quality and effectiveness of his performance in achieving the goals formulated by the education system to improve the level of his performance and adapt it to serve and develop the educational process. Based on the foregoing, this study attempted to identify the degree to which mathematics teachers use modern teaching strategies in distance learning in Jordan from their point of view.

Previous studies

Previous studies related to the variables of the current study were reviewed in Arabic and foreign languages. Among the most important of these studies were the following:

Malak (2022) conducted a study in Algeria that aimed to reveal the relationship of the modern teaching strategy to educational communication and to identify the differences in the modern teaching strategy and educational communication in terms of experience among middle education teachers with some intermediate schools in Jijel state. The sample of studies amounted to 70 male and female teachers of intermediate education. The study revealed a positive and statistically significant relationship between the degrees of the modern teaching strategy and educational communication among middle school teachers. Also, there were statistically significant differences between average grades of less than five years and average grades of more than five years among teachers of intermediate education in teaching strategies. In addition, there were statistically significant differences between average grades of less than five years and average grades of more than five years among teachers of intermediate education in educational communication.

Boshi (2021) explored the reality of using modern strategies in science teaching in Syria. To achieve the research objectives, a questionnaire was designed and applied to a sample of (75) science teachers in Lattakia Governorate. The studies concluded that all sample members indicated their positive attitude towards their use of modern strategies

hypotheses of the study, which state that there are no statistically significant differences in the obstacles to applying modern teaching strategies in teaching Sharia science subjects according to the variables: academic qualification and years of experience were accepted.

Al-Sharari and Weshah's (2018) study aimed to identify the obstacles to the use of modern teaching strategies that face female home economics teachers in the secondary stage from the point of view of female teachers in Al-Jouf region. The sample of the study consisted of (104) female teachers. A questionnaire consisting of (36) items and distributed over five domains was used. The study revealed several results, including that the obstacles from the point of view of the teachers came to a medium degree in total and for all domains.

Janabi (2018) explored the obstacles to the use of modern strategies in teaching literature and texts at the intermediate stage from the point of view of Arabic language teachers in Iraq. The study sample consisted of (78) teachers who responded to a questionnaire consisting of (43) items. Some obstacles prevent the use of modern strategies in teaching literature and texts at the intermediate stage, the first of which was the field of school organization and the last of which was the field of the student.

Faraj's (2016) study identified the extent to which art education teachers use modern strategies in art education teaching methods. The research population included primary school teachers and three teaching strategies: (cooperative learning, brainstorming, and problem-solving). The descriptive research method was used. The results showed that the cooperative learning strategy was the most used in teaching, followed by the brainstorming strategy. Finally, the problem-solving strategy was considered weak or unrealized as it was less than the approved standard.

Omolara (2015) examined the teachers' attitudes towards the use of modern teaching strategies in social subjects. The study consisted of (345) male and female teachers from Ilorin city schools in Nigeria, who responded to a questionnaire. The results of the study showed that teachers' attitudes towards modern teaching strategies were was positive. There were also statistically significant addition, there were no statistically significant differences due to the academic qualification variable.

Al-Omiri (2020) examined the degree to which biology teachers use modern teaching strategies and its relationship to the degree of their use of methods for developing scientific thinking among students in secondary schools in Iraq. A questionnaire consisting of (19) items was distributed to a sample of (234) male and female teachers. The results showed that the degree of use of biology teachers at the secondary stage in Iraq for modern teaching strategies from their point of view came to a medium degree. Also, the degree of biology teachers' use of methods for developing scientific thinking among students from their point of view was moderate. In addition, there were no significant differences in the participants' responses to the degree of using modern teaching strategies due to the gender variable.

Al-Qahtani (2019) conducted a study that aimed to identify the degree to which Islamic education teachers practice modern teaching strategies in the State of Kuwait from their point of view. To achieve the objectives of the study, the descriptive approach was used. A questionnaire consisting of (40) items was distributed to a sample of (107) male and female teachers. The results showed that the teachers of Islamic education practice modern teaching strategies to a high degree. Also, the results showed a statistically significant difference in the means responses of the study sample to the degree of Islamic education teachers practicing modern teaching strategies due to the gender variable in favor of females whereas no significant difference appeared due to the academic qualification variable.

Al-Maqati (2018) investigated the application obstacles of modern teaching strategies in teaching Sharia science subjects at the secondary stage to the courses system from the teachers' point of view. A random sample of (53) teachers was selected to respond to a questionnaire consisting of (32) items, distributed over four domains. The study concluded that the level of the degree of obstacles in all the domains of the study came to a large degree. The obstacles related to the learning environment came in the first place, and in the final place came the obstacles related to the academic courses. Also, the two

distance learning process. Also, the studies of Mosa (2021), Al-Maqati (2018), Al-Sharari and Weshah (2018), and Janabi (2018) recommended that teachers should use modern teaching strategies. Therefore, the current study examined the following main question: What is the degree to which mathematics teachers use modern teaching strategies in distance learning in Jordan from their point of view?

Research questions

1- What is the degree to which mathematics teachers use modern teaching strategies in distance learning in Jordan from their point of view?

2- Are there statistically significant differences at ($\alpha = 0.05$) in the degree to which mathematics teachers use modern teaching strategies in distance learning due to the variables of gender and experience?

Objectives of the study

The study aimed to explore the degree to which mathematics teachers use modern teaching strategies in distance learning in Jordan from their point of view. Also, it examined the differences in the study sample's degree means to which mathematics teachers use modern teaching strategies in distance learning due to the variables of gender and experience.

Significance of the study

The study is significant because it comes at a time when the study has been suspended, and education in Jordan has become dependent on distance learning. Hence, there is a need to prepare qualified teachers with distance learning skills. It is hoped that the results of the study will be used on both the theoretical and applied levels. At the theoretical level, the significance appears in improving teaching practices, especially the modern teaching strategies of mathematics teachers, which affect the improvement of students' different mathematical learning outcomes. At the applied level, its importance lies in light of its results, which can contribute to providing feedback to decision-makers and those in charge of preparing mathematics teacher training programs to focus on modern teaching strategies.

Key terms of the study

Modern teaching strategies: They are the processes that are based on modern educational philosophies, in which the teacher performs differences towards the use of modern teaching strategies due to the variables of gender and academic qualification.

Through the review of the previous studies, their objectives varied, including a search to identify the use of modern teaching strategies in various academic subjects such as Boshi's (2021) in teaching science, Mosa's (2021) in teaching the basic stage in private schools, Kasasbeh and Ibdah's (2020) study in teaching the first three grades, Al-Omiri's (2020) study in teaching biology, Al-Qahtani's (2019) in teaching Islamic education, Faraj's (2016) study in teaching art education, and Omolara's (2015) study about teachers' attitudes towards using modern teaching strategies in teaching social subjects. Other studies aimed to reveal the obstacles to applying modern teaching strategies such as Al-Maqati (2018), Al-Sharari and Weshah (2018), and Janabi (2018). The current study is similar to all previous studies in the use of the questionnaire to collect data. They are similar in addressing the topic of modern teaching strategies. However, the current study differed from previous studies in examining the degree to which mathematics teachers use modern teaching strategies in distance learning in Jordan from their point of view. It is the first study in the field of mathematics – according to the researcher's best knowledge - that was concerned with this field. Previous studies were made use of in formulating the problem of the current study and the appropriate procedures to achieve its objectives in choosing the curriculum, preparing the theoretical framework, and designing the questionnaire.

Statement of the study

Societies all over the world have suffered from the consequences of the spread of the Coronavirus in various aspects of life. Several sectors have stopped, but they quickly realized how to deal with the current situation, including the educational field. The accepted alternative was distance education, which obliged the Ministry of Education in Jordan to rely on distance education as an alternative to face-to-face education after the Coronavirus pandemic imposed the closure of schools and social distancing. Therefore, the use of distance learning needs to develop modern teaching strategies such as survey, project, play, discussion, and simulation, which are necessary and important for the success of the

-Topic: The study was limited to the degree to which mathematics teachers use modern teaching strategies in distance learning.
-Place: The study was limited to the North Eastern Badia public schools in Jordan.
-**Time**: This study was implemented during the first semester of the year 2021/2022.
-**Human**: The study instrument was applied to mathematics teachers in the North Eastern Badia public schools.
-The generalization of the results of this study is determined by the availability of the psychometric properties of the instrument used and the response degree of the study sample to the instrument.

Methods

The descriptive approach was used.

Population and sample of the study

The study population included all mathematics teachers who teach in public schools affiliated with the North Eastern Badia Directorate of Education, totaling (241) male and female teachers according to the statistics of the North East Badia Education Directorate for the academic year 2021/2022. The number of the study sample was (121) male and female teachers, representing a percentage of (50%) of the study population. They were chosen following the random method as shown in Table 1.

special procedures based on directing students' activity to enable them to learn on their own. The greatest burden is placed on the students themselves while the teacher's role is limited to creating the appropriate educational atmosphere, directing students' activity, and supervising upon and assessing them. (Al-Juhaimi, 2009). Procedurally, they are a set of strategies that mathematics teachers use and follow during the educational situation to have an active interaction between the learner or the teacher on the one hand, and the students themselves on the other hand, which appears through the teachers' response to each item of the questionnaire prepared for this purpose.

Distance learning: It is an interactive system related to the educational process. This system attempts to communicate between the teacher and the learner remotely at different geographical points through educational or training programs such as teleconferencing, the Internet, education platforms, computers, television channels, e-mail, and others. (Mustafa, 2021).

Mathematics teacher: it is the person officially designated by the Jordanian Ministry of Education to carry out the task of teaching mathematics to students.

Delimitations and limitations of the study:

Table 1. Distribution of the study sample according to the variables

Variable	Category	Frequency	Percentage
Gender	Male	53	%44
	Female	68	%56
Years of experience	Less than 10 years	70	%58
	10 years or above	51	%42

items, the strategy of project-based learning (7) items, the discussion strategy (7) items, the strategy of play-based learning (7) items, and the strategy of differentiated education (7) items.

Validity of the study instrument

To ensure the validity of the study instrument, it was reviewed by (9) experts with experience and competence in the field of curricula and methods of teaching mathematics.The experts judged the degree of language appropriateness and the extent to which each item belongs to the related domain, in addition to deletion or addition, and making the necessary modifications. Based on the consensus of the majority of experts, the questionnaire was modified based on their observations and

Instrument of the study

The study developed a questionnaire as an instrument to collect data to achieve the objectives of the study and answer its questions based on previous studies related to the topic of the study (Boshi, 2021; Mosa, 2021; Kasasbeh & Baddah, 2020; Al-Omiri, 2020; Al-Qahtani, 2019; Faraj, 2016). It consisted of two parts. The first part included the personal and job variables of the study sample (gender, years of experience). The second part included (35) items that measure the degree to which mathematics teachers use modern teaching strategies in distance learning. They were divided into five dimensions: The strategy of distance survey (7)

-Independent variables:
a. gender: male, female
b. years of experience: less than 10 years, 10 years or above
-Dependent variable: The degree to which mathematics teachers use modern teaching strategies in distance learning.

Data analysis

To answer the study questions, appropriate statistical methods were adopted through the (SPSS) program.Means, standard deviations, and ranks were used to answer the first question. To answer the second question, means, standard deviations, and binary analysis of variance were used.

Results

Results of the first research question: What is the degree to which mathematics teachers use modern teaching strategies in distance learning in Jordan from their point of view?

This question was answered through extracting means, standard deviations, rank, and scores for each domain as displayed in Table 2.

suggestions and was approved in its final version.

Reliability of the study instrument

To verify the reliability of the instrument, the test-retest method was used. The questionnaire was applied to (30) male and female teachers from outside the sample of the study. The reliability coefficient of the internal consistency was also extracted according to the Cronbach Alpha equation. It reached (0.89).

The correction criterion of the study instrument

The items of the questionnaire were rated according to the five-point Likert scale in the correction as follows: degree (1) very low, degree (2) low, degree (3) medium, degree (4) high, and degree (5) very high. Rely on the following classification to judge the arithmetic averages as follows: (1-2.33) low, (2.34-3.67) medium, (3.68-5) high. Also, the following classification was used to judge the means as follows: (1-2.33) low, (2.34-3.67) medium, (3.68-5) high.

Variables of the study

Table 2. Descriptive results of the study sample's responses to the domains of distance learning modern teaching strategies

Rank	Domain no.	Domain	Means	Standard deviations	Degree
1	3	Discussion strategy	3.96	0.78	High
2	2	Project-based learning strategy	3.89	0.87	High
3	1	Remote survey strategy	3.80	0.83	High
4	4	Play-based learning strategy	3.62	0.91	Medium
5	5	Differentiated education strategy	3.31	1.02	Medium
		Total	3.72	0.81	High

the domain of differentiated education strategy scored a means of (3.31), a standard deviation of (1.02), and a medium degree. These results are due to the realization of mathematics teachers of the need to follow modern teaching strategies because they have a clear impact on students' experiences and attitudes towards the learning process and improve the effectiveness of teaching, as well as the keenness of mathematics teachers to implement the directives of the Ministry of Education in applying modern methods in teaching and diversity in the delivery of lessons. This was in response to the continuous calls by the training courses held outside or inside the educational institution as well as the recommendations of the educational supervisors during their supervisory visits, and the teachers' awareness of the importance of the discussion strategy in

Table 2 shows that the degree of mathematics teachers' use of modern teaching strategies in distance learning from their point of view as a whole was high. The total means was (3.72) with a standard deviation of (0.81). The means of the domains ranged between (3.31 - 3.96). The domain of discussion strategy ranked first with a mean of (3.96) and a standard deviation of (0.78), rating high. Then, came the domain of project-based learning strategy came with a means of (3.89) and a standard deviation of (0.87), rating high. The domain of remote survey strategy came in third place with a mean of (3.80), a standard deviation of (0.83), indicating a high degree. In the fourth place, the domain of play-based learning strategy came with a means of (3.62) and a standard deviation of (0.91), ranking medium. Finally,

teachers' use of modern teaching strategies was high. However, it differs from the studies of Kasasbeh and Ibdah (2020), and Al-Omiri (2020), which showed that the degree of teachers' use of modern teaching strategies was moderate. The following is a detailed presentation of the domains of modern teaching strategies in distance learning and the items that make up each domain:

First domain: remote survey strategy

Table 3. Means and standard deviation of remote survey strategy items

Rank	No.	Item	Means	Standard deviation	Degree
1	1	I work to make students an active element in discovering information.	3.92	0.93	High
2	3	I ask students to perform tasks that enhance their cognitive and research skills.	3.87	1.01	High
3	6	I stimulate students' motivation towards self-learning.	3.83	1.07	High
4	7	I give students a situation that presents a problem.	3.82	0.98	High
5	5	I provide students with a set of open-ended questions to generate creative scientific ideas.	3.75	0.92	High
6	4	I employ technological techniques for experimental investigation such as virtual laboratories and scientific trips.	3.73	0.94	High
7	2	I direct students to acquire different thinking skills.	3.69	1.04	High
Total			3.80	0.83	High

Table 3 shows that all items of the domain of remote survey strategy were highly rated. The means ranged between (3.69-3.92). Item (1), "I work to make students an effective element in discovering information," came in the first place, with a means of (3.92) and a standard deviation of (0.93) with a high degree. Item (2) "I direct the students to acquire different thinking skills" with a means (3.69), a standard deviation (1.04), with a high degree. This result is because the constructivist theory builds knowledge from the activity of the learner, and he builds with what he learns by himself. The best conditions for learning are achieved when the learner faces a real problem. From individual learning activities to cooperative learning activities. This is in harmony with the nature of investigative science and from the centrality of the teacher to the centrality of the learner, the builder of knowledge from individual learning activities to cooperative learning activities

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Second domain: project-based learning strategy

Table 4. Means and standard deviation of project-based learning strategy items

Rank	No.	Item	Means	Standard deviation	Degree
1	11	I use electronic applications to invest the time allocated for distance learning.	4.11	0.93	High
2	14	I am aware of students' spirit of teamwork.	4.05	1.01	High
3	10	I explain the importance of project-based learning.	4.01	1.07	High
4	8	I vary in the application of different projects	3.86	1.09	High

the e-learning environment through the use of electronic discussions. They are imperative for the distance education of students as a result of the current circumstances imposed by the Coronavirus pandemic, which requires teachers to move towards distance learning. The result of this question is consistent with the studies of Musa (2021) and Al-Qahtani (2019), which showed that the degree of

Rank	No.	Item	Means	Standard deviation	Degree
		(constructivism, enjoyment, problems, and skill acquisition).			
5	13	I ask a motivating question for learners as a prelude to announcing the idea of the project.	3.76	0.92	High
6	9	I provide feedback after students have finished evaluating their work.	3.74	0.94	High
7	12	I focus on developing a spirit of free competition directed at individual projects.	3.69	1.04	High
Total			3.89	0.82	High

Table 4 shows that all the items of the project-based learning strategy domain were highly rated. The means ranged between (3.69 - 4.11). Item (11) "I use electronic applications to invest the time allocated for distance learning" came in first place with a means of (4.11) and a standard deviation of (0.93) with a high degree whereas item (12) "I focus on developing the spirit of free competition directed at individual projects" came in last place with a means of (3.69) and a standard deviation of (1.04) with a high degree. This may be due to teachers' keenness to use electronic applications in various teaching tasks, and these applications are available on electronic platforms that have recently become a trend for distance learning. They also allow teachers and students to use them in project learning.

Third domain: discussion strategy

Table 5. Means and standard deviation of discussion strategy items

Rank	No.	Item	Means	Standard deviation	Degree
1	18	I work on developing students' abilities to analyze and criticize.	4.29	0.82	High
2	21	I take into account the logical sequence in discussing ideas.	4.17	0.91	High
3	15	I constantly work on making students aware of the value of their ideas.	4.03	0.96	High
4	20	I vary the types of discussion (investigative, group, small group).	3.89	1.02	High
5	16	I provide students with appropriate learning resources (websites, textbooks, worksheets, pictures, videos).	3.87	1.26	High
6	19	I care about supporting students' ideas.	3.80	1.15	High
7	17	I encourage students to express themselves freely in the synchronously virtual class.	3.68	1.07	High
Total			3.96	0.78	High

Table 5 shows that all items of the discussion strategy domain were highly rated. The means ranged between (3.68 - 4.29). Item (18) "I work on developing students' abilities to analyze and criticize" came in the first place with a means (4.29) and a standard deviation (0.82) raking a high degree whereas item (17) "I encourage students to express themselves freely in the synchronously virtual class" with a mean of (3.68) and standard deviation of (1.07), with a high degree.This may be attributed to the development of thinking skills as one of the strategic objectives of the educational process in mathematics. Most of the attention of modern education has become focused on the learner's mastery of these skills because it enables the learner to acquire various knowledge.

Fourth domain: play-based learning strategy

Table 6. Means and standard deviation of play-based learning strategy items

Rank	No.	Item	Means	Standard deviation	Degree
1	24	I take into account the audio-visual effects when designing the game.	3.96	1.17	High
2	26	I focus on the level of the game and its relevance to the students' tendencies and interests.	3.79	0.87	High
3	25	I strive to make lessons interesting through language.	3.68	0.89	High
4	28	I care about students' attitudes in choosing electronic games.	3.62	1.11	Medium
5	27	I work to create a suitable atmosphere for the performance of the game.	3.51	0.95	Medium
6	22	I break the shyness of playing games in the virtual classroom.	3.42	0.98	Medium
7	23	I use special software and applications such as Poll, Word wall, wheel Names	3.37	0.85	Medium
Total			3.62	0.91	Medium

visual effects attract the learner's attention while using them, stimulate his thinking, and expand his imagination. Playing contributes vitally to the formation of the student's personality with its various dimensions and characteristics. Also, it is an important educational mediator that works on his education, growth, and fulfillment of his needs. Playing in general and electronic educational games, in particular, is a basic entrance to the student's growth from the mental, physical, social, emotional, skill, and linguistic aspects.

Table 6 shows that the items of the paly-based learning came with high and medium ratings. The means ranged between (3.37 - 3.96). Item (24) "I take into account the audio-visual effects when designing the game" came in the first place with a means (3.96), a standard deviation of (1.17), and a high degree whereas item (23) "I use special software and applications such as Poll, Word wall, wheel Names" came in the last place with a means of (3.37), a standard deviation of (0.85), a medium degree. This may be because audio-

Fifth domain: differentiated education strategy

Table 7. Means and standard deviation of differentiated education strategy items

Rank	No.	Item	Means	Standard deviation	Degree
1	30	I take into account the individual differences between students (mental, psychological, physical and social abilities).	3.67	1.26	Medium
2	35	I vary the types of tasks and activities assigned to students.	3.31	1.35	Medium
3	29	I pay attention to students' learning styles.	3.64	0.98	Medium
4	33	I evoke the skills and abilities of each student.	3.34	1.05	Medium
5	32	I offer the lesson according to the students' desire and attitudes.	3.23	1.24	Medium
6	31	I check that each student has different experiences.	3.17	1.30	Medium
7	34	I determine appropriate assessment strategies based on students' abilities.	2.83	0.95	Medium
Total			3.31	1.02	Medium

medium rating. The means ranged between (2.83 - 3.67). Item (30) "I take into account the

Table 7 shows that all the items of the strategy of differentiated education came with a

They come from diverse environments and learn with different learning styles, and this is what requires the teacher to take into account those differences and meet their needs through diversification of teaching.

Results of the second research question: Are there statistically significant differences at (α = 0.05) in the degree to which mathematics teachers use modern teaching strategies in distance learning due to the variables of gender and experience?

To answer this question, the means, standard deviations, and binary variance analysis of the study sample's responses according to the variables of gender and experience were extracted as shown in Table 8 and Table 9.

individual differences between students (mental, psychological, physical, and social abilities)" came in the first place with a means of (3.67), a standard deviation of (1.26), and a medium degree whereas item (34) "I determine appropriate assessment strategies based on students' abilities." came in the last place with a means of (2.83), a standard deviation of (0.95), and a medium degree. This result is attributed to the basis of the differentiated education strategy as the teacher's response to the diverse needs of learners and their awareness that it is one of the aspects of equitable education to give learners equal learning opportunities. Learners have multiple intelligences according to Gardner's theory.

Table 8. Means, standard deviations of the samples' responses according to the variables of gender and experience

Variable	Category		Remote survey strategy	Project-based learning strategy	Discussion strategy	Play-based learning strategy	differentiated education strategy	Total
Gender	Male	Means	3.75	3.86	3.94	3.61	3.32	3.70
		Standard deviation	0.82	0.81	0.75	0.89	1.02	0.79
	Female	Means	3.85	3.92	3.99	3.62	3.28	3.73
		Standard deviation	0.81	0.84	0.84	0.95	1.02	0.83
Experience	Less than 10	Means	3.94	3.98	4.06	3.78	3.46	3.85
		Standard deviation	0.83	0.86	0.78	0.86	1.03	0.79
	10 years & above	Means	3.70	3.80	3.88	3.48	3.19	3.61
		Standard deviation	0.79	0.87	0.78	0.93	1.09	0.80

of experience.To find out whether the external differences in the means were statistically significant at (α = 0.05), a two-way analysis of variance was carried out as displayed in Table (9).

Table 8 shows that there were external differences between the means for the performance of the sample towards the degree to which mathematics teachers use modern teaching strategies in distance learning according to the variables of gender and years

Table 9. Two-way analysis of variance for the degree of mathematics teachers' use of modern teaching strategies in distance learning according to the variables of gender and experience.

Variance	Domains	Sum of squares	df	Means of squares	P value	Sig-tailed-2
GenderH Hotelling's Trace=0.010 V=0.059	Remote survey strategy	0.297	1	0.297	0.445	0.505
	Project-based learning strategy	0.042	1	0.042	0.062	0.803
	Discussion strategy	0.025	1	0.025	0.040	0.841
	Play-based learning strategy	0.063	1	0.063	0.077	0.782
	Differentiated education strategy	0.176	1	0.176	0.169	0.681
	Total	0.002	1	0.002	0.003	0.953

Variance	Domains	Sum of squares	df	Means of squares	P value	Sig-tailed-2
Years of experienceHotelling's Trace =0.765 V=0.010	Remote survey strategy	5.115	1	5.115	7.669	*0.006
	Project-based learning strategy	2.739	1	2.739	4.008	*0.046
	Discussion strategy	1.781	1	1.781	2.858	*0.029
	Play-based learning strategy	6.660	1	6.660	8.032	*0.005
	Differentiated education strategy	5.399	1	5.399	5.175	*0.024
	Total	4.125	1	4.125	6.316	*0.013
Error	Remote survey strategy	176.745	118	0.667		
	Project-based learning strategy	181.084	118	0.683		
	Discussion strategy	165.174	118	0.623		
	Play-based learning strategy	219.727	118	0.829		
	Differentiated education strategy	276.477	118	1.043		
	Total	173.097	118	0.653		
Total	Remote survey strategy	4076.889	120			
	Project-based learning strategy	4262.333	120			
	Discussion strategy	4404.250	120			
	Play-based learning strategy	3765.361	120			
	Differentiated education strategy	3246.028	120			
	Total	3905.074	120			

*significant at (**α= 0.05)**

conditions within the school in terms of material and technical capabilities and are subject to the same regulations and instructions. The result of this study agrees with those of the studies by Mosa (2021) and Al-Omiri (2020), which indicated that there were no statistically significant differences due to the gender variable. However, it differs from the results of Boshi (2021) and Al-Qahtani (2019), which showed statistically significant differences due to the gender variable in favor of females.

Table 9 shows that there were no statistically significant differences at (α = 0.05) between the means of the study sample's responses to the degree of mathematics teachers' use of modern teaching strategies in distance learning due to the experience variable in the total score based on the calculated value of (P). It scored (6.316) with a significance level of (0.013) in favor of the experience of less than 10 years. Also, there were statistically significant differences at the (α = 0.05) in all domains in favor of those with experience (less than 10 years). The statistical significance values were less than the level of statistical significance (α

Table 9 shows that there were no statistically significant differences at (α = 0.05) between the means of the study sample's responses to the degree of mathematics teachers' use of modern teaching strategies in distance learning due to the gender variable in the total score based on the calculated value of (P). It scored (0.003) with a significance level of (0.953). Also, there were no differences in all domains as these values were not statistically significant because the calculated significance level value was greater than (0.05). This may be because mathematics teachers of all genders have the same perception about modern teaching strategies in distance learning. Mathematics teachers are also committed to applying distance education at present as a result of the Coronavirus pandemic. In addition, the universities in which the study was mixed of both genders. This means that they graduated from one educational system because education in universities is based on the constructivist theory of education. Knowledge in distance education has unified foundations in software and multimedia. Teachers, regardless of their gender, live similar

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= 0.05). This may be attributed to the fact that mathematics teachers with experience (less than 10 years) are more interested in the teaching profession by adhering to the instructions that encourage the use of distance learning. In addition, less experienced teachers are more willing to compete for self-affirmation by seeking to obtain training courses in the field of using e-learning applications that lead to improving their professional and financial level through the current system of ranks that grants financial incentives to teachers who obtain different training courses, especially in the field of using modern teaching strategies. The result of this study agrees with the result of Kasasbeh and Ibdah's (2020) study, which showed statistically significant differences due to the variable of teaching experience in favor of teachers with experience (6 years or more). However, it differs from the results of the studies by Boshi (2021) and Mosa (2021), which indicated that there were no statistically significant differences due to the variable of experience.

Recommendations

In light of the results of this study, it is recommend that there is a necessity to work on the use of modern teaching strategies in teaching mathematics. Also, there is a need to hold more training courses on modern teaching strategies by specialists in this field, especially for more experienced teachers.In addition, more development is needed for modern teaching and assessment methods and strategies, especially the differentiated education strategy and training teachers on it. Furthermore, electronic educational games should be considered as one of the most effective education means in teaching mathematics. Also, mathematics teachers need to be direct towards developing the spirit of competition among students in individual projects. Finally, conducting similar studies on other areas that include teachers' use of modern teaching strategies in distance learning are suggested.

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