

Teaching Mathematics Remotely From The Perspective Of Parents And Teachers In Primary And Secondary Schools In The Kingdom Of Saudi Arabia

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Abstract:

This study aimed to identify teaching mathematics remotely from the point of view of parents and teachers. The sample included (122) parents whose children teach mathematics, and (41) teachers who teach mathematics. The purposive sample was chosen. The results showed that the arithmetic averages for (the extent to which parents follow their students while teaching mathematics remotely) are between (3.51 and 1.73), where (follow-up) and (I make a suitable place for my son/daughter during distance learning) and (I know and understand the use of... Distance learning programs) at an intermediate level. Finally, (my son/daughter benefits more from distance education compared to in-person mathematics education) at a low level.

The arithmetic averages for (the extent of parents' satisfaction with mathematics teachers while teaching them...) are between (3.80 and 1.69), where (satisfaction) is at an average level, while the two paragraphs (mathematics teachers work very hard...) ranked first, as well as the item (The mathematics teacher understands the use of ...) ranked second, which were at a high level. Finally, (mathematics is suitable for distance teaching for the lower grades...) at a low level.

The arithmetic averages for (the extent of possession of distance teaching skills among mathematics teachers) ranged between (3.54 and 1.29), where (the degree of possession of teaching skills) was at an average level, and the two items (I work very diligently and diligently while teaching remotely) ranked first. And (I understand the use of remote programs and strategies...) at a high level. Finally, (mathematics is suitable for distance teaching for the lower grades...) at a low level.

The arithmetic averages for (the extent of parents' knowledge of teaching mathematics remotely from the point of view of male and female teachers) were between (3.41 and 1.39), where they were (parents' knowledge of teaching mathematics remotely from the point of view of...) and (parents always help Their children in solving problems...) and (Parents prefer that distance education be in the evening) at an average level. Finally, (parents prefer distance teaching instead of in-person) at a low level.

There are no statistically significant differences in the extent to which parents follow up on

their student children while they teach mathematics remotely, due to the relationship of kinship and the marital status of the parents, as well as the extent to which mathematics teachers possess distance teaching skills, due to some demographic variables represented by gender and academic stage.

Keywords: *Teaching curricula, Primary stage, Secondary stage, Mathematics.*

Introduction

Modern society cannot function without education and other social amenities like housing, health care, and security. Since the inception of the educational system, traditional education has existed and continues to do so. Despite its indispensable advantages, we do not view it as essential. One of the primary modern educational methodologies is distance learning, which uses technology to connect students with instructors and provide them with course materials. When it was initially used in educational institutions across the globe in the nineteenth century, it was referred to as correspondence education.

This study aims to investigate a remote mathematics education experiment involving elementary and secondary school pupils.

Research Problem

It is believed that there is a unique quality to the way mathematics is taught, particularly in the interactions between the teacher and the students. However, the implementation of a remote learning system could alter the way that students are taught, posing a challenge to both parents and teachers alike. and thus, the study's problem was formulated in the following main question:

- What is the extent of teaching mathematics remotely from the point of view of parents and teachers in primary and secondary schools in the Kingdom of Saudi Arabia?

The following sub-questions arise from the research problem, which deals with the psychometric properties:

- 1- To what extent do parents follow up on their students while they teach mathematics remotely?
- 2- To what extent are parents satisfied with mathematics teachers while teaching their children mathematics remotely?
- 3- To what extent do mathematics teachers possess distance teaching skills?
- 4- What is the extent of parents' knowledge about teaching mathematics remotely from the point of view of male and female teachers?
- 5- Are there statistically significant differences at (0.05) in the extent to which parents follow up on their student children while teaching mathematics remotely due to some demographic variables related to kinship and marital status?
- 6- Are there statistically significant differences at (0.05) in the extent of mathematics teachers' possession of distance teaching skills due to some demographic variables such as gender and academic level?

Research Importance

First: The theoretical importance of this research lies in:

- Stirring interest in using remote technology.
- Raising interest in the extent to which teachers and parents possess teaching skills.

Second: The practical importance:

- Identify the concept of technology used in distance education.

- Enriching the field of mathematics teaching by providing a concept of distance teaching methods.
- Identifying the problems of teaching mathematics for both teachers and parents.
- Helping researchers benefit from the results of this study in dealing and communicating remotely with students.
- Benefiting from the results of this study in making appropriate decisions in preparing the learning process.

Research Goals

Verifying the scope of remote mathematics education from the perspective of parents and instructors in Saudi Arabian primary and secondary schools.

Research Justification

- The lack of Saudi studies that dealt with research on teaching mathematics remotely.
- A lack of Saudi studies that focus on the problems of teaching mathematics remotely among teachers and parents.

Research Limitations:

Research limits include the following:

- **Age limits:** The application of this study was limited to teachers and parents.
- **Spatial limits:** The application of this study was limited to the Kingdom of Saudi Arabia (the Eastern Province).
- **Temporal limits:** Data collection for this study occurred during the 2023/2024 academic year.

Research Delimitations

The results are determined by the limited sample to be studied, and the researcher was not able, through his research, to access and identify other cases in the Kingdom of Saudi Arabia.

Definitions of Terms

1- Primary stage: Since it is the initial step in the formal education process, it is one of the most significant educational phases in a child's academic life. At this stage, the child's basic knowledge is expanded, and I taught him the fundamentals of reading, writing, and math.

2- Secondary stage: It is the final phase of instruction in schools. Basic education comes before this stage, while tertiary education, which includes higher education, comes after. It is the time between the ages of 11 and 19 when adolescents are educated.

3- Mathematics: A collection of theoretical information derived from logical inferences made about different mathematical objects, including sets, numbers, forms, structures, and transformations. The study of concepts like quantity, structure, space, and change is another area of focus for mathematics. There is not yet an agreed-upon general definition of the term.

4- Remote: It is the approach used in contemporary and non-traditional educational approaches that mainly rely on the use of technology and contemporary educational tools like the Internet, computerized curricula, communication tools, and techniques that primarily rely on the Internet to provide students with information more straightforwardly and understandably. Without using the outdated method, it is easier and encourages students to think critically and produce.

Theoretical framework and Previous studies

Due to the suffering experienced by the world and Saudi Arabia, particularly as a result of the coronavirus pandemic, it became necessary to close schools and switch from traditional to remote learning utilizing contemporary communication tools to minimize overcrowding and preserve social distance to slow the spread of the pandemic.

First: Literature Review

First : Remote education

According to (Cracraft, 2015), education is crucial for both society and the individual because it provides the basis for advancement and guarantees a bright future. As a result, every nation aims to provide careful consideration to the educational process and all of its constituent parts, encompassing the student, instructional material, methodology, instructor, and learning environment.

The difference between the methods of distance education and traditional education appears through the tools used in the educational process.

According to (Flack, Walker, Bickerstaff, Earle, Margetts, 2020), coronavirus restrictions forced Victoria, Australia's schools to switch to remote learning in 2020. Since this was unheard of, schools had to decide quickly how to support it and had limited time to gather supplies and help. Early 2020 research, both nationally and internationally, revealed that instructors were under stress adjusting to these changes and worried that pupils' social and academic needs were not being satisfied.

Concerns over studying mathematics outside of the classroom have the potential to jeopardize inquiry-based methods of teaching mathematics in several ways. (Sullivan et al., 2020) pointed out that instructional videos can be pre-made and distributed via an online connection. It calls for student-centered, mathematically demanding conversations that revolve around the experiences of the students completing assignments. This is confirmed by (Stein, Engle, Smith, Hughes, 2008), these talks give teachers the chance to draw attention to the links between the mathematical concepts that come up and also give students the chance to pick up tips from one another on effective teaching techniques.

conducted (Hamilton, Kaufman, Diliberti, 2020) interviews with forty teachers across the United States in a variety of school sectors to learn more about the impact of teaching and learning during the pandemic. This information sheds light on the issue of distance education. To discuss their experiences working during the epidemic in 2020. Three key issues that teachers face was identified by the study. She was:

- Teachers found it difficult to inspire their pupils.
- Teachers experienced burnout and experienced a loss of identity.
- Disparities between kids from underserved communities and those with special needs have gotten worse.

According to (Thomson, 2020), students from underprivileged backgrounds are more likely to experience learning difficulties, particularly while learning remotely. Australian 15-year-old children's home learning environments with low and high socioeconomic status (SES) were contrasted based on their PISA 2018 results. The percentage of 15-year-old students who found a quiet space to study at home varied from 78% for kids from low socioeconomic backgrounds to 96% for exceptional students, even though 88% of them reported having done so. In addition, 84% of kids reported using a computer at home for academic purposes, compared to 99% of children from underprivileged backgrounds. Parents and siblings may increasingly work or study from home, which puts more pressure on students and families to negotiate access to

potentially restricted devices at home. These statistics did not account for this possibility. Additionally, access to gadgets may be made more difficult by parents' attitudes and ideas toward their children's usage of technology at home or during (screen time).

Similarly, it is confirmed by (Müller, Goldenberg, 2020) that parents, teachers, students, and schools were unaware of the remote teaching system. There wasn't much time to be ready, and there wasn't much support in the form of advice or knowledge available to help instructors and schools use remote learning. Parents and schools received guidance during the lockdown. Nonetheless, examinations of the available data and prompt advice make it evident that creating and implementing instructional strategies will require time.

According to (DELVE, 2020), little was known about the effects of the school closure time. A standard deviation's worth of learning loss is estimated to be between 6 and 10%. The most recent survey data, which was collected during the final week of the semester (Teacher Tapp, 2020a), shows that while things are getting better, there are still significant differences in access and sharing.

Many parents also reported, (Langmeyer, Guglhör-Rudan, Naab, Urlen, Winklhofer, 2020), that in contrast to traditional classroom instruction, Remote learning during this time was centered on completing assignments rather than providing instructions. According to (Prime, Wade, Browne, 2020), parents' influence over their children's education grows as a result of homework. In addition, a lot of families experienced a great deal of stress because of issues unrelated to the educational process, like income loss brought on by the lockdown's financial ramifications. These issues also conflicted with the parents' professional responsibilities.

According to, (Erbil, 2020) asserts that social interactions are a crucial context for students' learning in school. Through learning, as (Urhahne, 2019) points out, children may benefit from interactions with peers, so the two main groups that bear formal responsibility for children's educational achievement are parents and teachers. While teachers coordinate the teaching process, parents' involvement in school work is more informal.

Second: Mathematics education

There is a global agreement regarding the significance of mathematical education. Teaching a child to count is similar to teaching him the alphabet because it has been taught in schools since it started teaching young girls the necessary knowledge and skills in the early stages. It is comparable to the language that a child learns to communicate with society.

According to (Al-Barari, Al-Mousa, 2022), despite the many benefits that computers offer, the most significant being the enhancement of students' abilities to meet academic objectives and the potential to address issues that teachers face in the classroom, such as an increase in the number of students or a decrease in study time. as well as cultivating favorable attitudes toward some challenging courses, like mathematics. Countries have fought to obtain it and employ it in every facet of their lives, including education, to teach their kids how to utilize computers and reap the greatest benefits from them.

According to (Russo, Bobis, Downton, Livy, Sullivan, 2021) elementary school teachers who took part in a professional development program emphasizing mathematics-based teaching strategies tended to be wary of Remote learning. This is because there isn't a teacher-facilitated synchronous learning environment, and parents don't like confrontation when their kids are studying math.

Numerous criteria are pertinent to the classroom when teaching mathematics. According to (Makar, Bakker, Ben-Zvi, 2015), we should concentrate on:

- Analyze several approaches to solving problems numerically and assess the effectiveness and intricacy of the chosen approach.
- Listening to peers and being prepared to explain and justify the solution approach and thinking.
- Possibilities for group math study, with an emphasis on cooperative problem solving, peer comprehension of the issue, and peer correction of mistakes in their mathematical reasoning.

Recently, (Mulenga, Marbán, 2020) sought to determine whether the coronavirus serves as a portal for digital learning in mathematics education. They discovered that a few educators exhibit inadequate proficiency in utilizing digital technologies for both discovering and instructing mathematics. To find out more about Zambian teachers' online math learning activities, (Mulenga, Marbán, 2020) also carried out another study. They discovered that among aspiring teachers, online math learning activities were statistically significant. It was also shown that prospective teachers' opinions on using technology to teach mathematics differed.

As noted by (Johns, Mills, 2021), reports on mathematics support during lockdown reveal a sharp decline in the number of children who benefit. As (Hodds, 2020) notes, this is concerning because the emphasis has been on math teachers and how they transition from utilizing textual instruction to using digital resources.

Second: Previous studies

Conducted (AL-Hadhoud, AL-Hattami, 2017) a study entitled “Blended Learning and Obstacles to Its Implementation.” A descriptive survey method was used. The study sample included all teachers in Amman Fifth Education for the specialty of classroom teacher, Arabic language, mathematics, and science, who numbered (1188) teachers, while the study sample included (110) male and female teachers who were randomly selected. The results showed:

- The reality of implementing blended education in the Fifth Amman Education Directorate was moderate arithmetic mean (3.56) and standard deviation (0.37).
- The presence of multiple obstacles, such as low Internet readiness, followed by overcrowding of classrooms with learners.

And (Kalogeropoulos, Roche, Russo, Vats, Russo, 2021) conducted a study entitled “Learning Mathematics from Home during COVID-19: Insights from Two Inquiry-Focused Primary Schools”. They sought to discover the difficulties instructors had, how they designed and carried out math learning programs for their pupils, and how motivated or involved their students were in math at home. The present study involved interviewing teachers from two primary schools in Australia that adhere to a contemporary teaching and learning philosophy that prioritizes inquiry-based learning. Additionally, students' engagement (cognitive, emotional, social, and behavioral) in mathematics learning at home was anonymously surveyed. The results showed:

- Both teachers actively engaged with every student, monitoring their development and involvement in assignments. The majority of students interacted positively with Remote learning experiences, according to the survey results, except for not having the chance to study mathematics with their classmates.

And (Marbán, Radwan, Radwan, Radwan, 2021) conducted a study entitled “Primary and Secondary Students’ use of Digital Platforms for mathematics learning during the COVID-19 outbreak: The Case of the Gaza strip”. We sought to understand the interactions between primary and secondary school pupils as well as their reactions to these modifications in the early learning environment. Three categories were identified after data were gathered from (3179) Gaza Strip pupils using a validated rating scale and a cluster analysis technique. The data was analyzed using K-means cluster analysis as a preliminary method to find patterns in the data. Additionally, chi-square was used to compare the demographic features of the clusters. After doing a study, three groups were identified based on the way the participants were divided into groups: groups 1, 2, and 3 consisted of (2001, 824, and 354) instances, respectively. These groups have been compiled based on the use of social media platforms that students use to enhance their mathematics learning. The results showed:

- Compared to Groups 1 and 2, participants in Group 3 use social media to learn mathematics more effectively.

Regarding gender, age, and kind of schooling, there are no statistically significant variations across the cluster groups.

- The parents' educational attainment and the family's financial situation differ statistically significantly between the three groups.

- The use of digital learning is seen as a beneficial reaction to the closing of schools during the coronavirus outbreak.

And (Barlovits, Jablonski, Lázaro, Ludwig, Recio, 2021) conducted a study entitled “Teaching from a distance - Math lessons during COVID-19 in Germany and Spain”. They sought to identify the fresh difficulties facing educators and students by applying classroom lessons. from homes to schools for kids. Consequently, to deal with this novel circumstance, educators had to establish guidelines, put procedures into place, and make pedagogical and methodological decisions. The functions that math teachers play in remote learning in Germany and Spain are the main subject of this study. The issues that arose throughout this procedure were looked at. There were (248) teachers in the study sample, of which (171) were German and (77) were Spanish. The mixed approach was used, and the results showed:

- There were more asynchronous classes taught by German teachers. Spanish teachers, on the other hand, employed synchronous instruction more frequently, but they still saw the absence of face-to-face interaction as a significant problem.

- that both nations have recovered from the pandemic by digitizing their math classes and going back to their regular schedules.

And (Ní Fhloinn, Fitzmaurice, 2021) conducted a study entitled “Challenges and opportunities: Experiences of mathematics lecturers engaged in emergency remote teaching during the COVID-19 pandemic”. that aimed to know the experiences of mathematics teachers in higher education, and how they moved to emergency teaching. Remote during initial shutdown. An online survey was conducted from May to June 2020 and received 257 responses from participants in 29 countries. The results showed:

- The majority of participants—more than 90%—had minimal prior experience instructing math online.

- (72%) of respondents considered it laborious, and (88%) said it took a long time.
- (88%) percent of them said that teaching mathematics in this manner differed from teaching other subjects.

- The nature of mathematics, student challenges, instructional challenges, and technology obstacles are the four primary categories of challenges that have been linked to remote mathematics instruction in emergencies.

- The primary benefit of online instruction, according to participants, is flexibility rather than involvement.

- (61%) percent of participants said the experience would affect their future education, and (46%) percent of participants said they had care duties.

Conducted (Gunzenhauser, Enke, Johann, Karbach, Saalbach, 2021) a study entitled “Parent and Teacher Support of Elementary Students’ Remote Learning during the COVID-19 Pandemic in Germany”. We looked at the relationship between academic skills and support from parents and teachers. for pupils in primary school throughout the COVID-19 epidemic. We investigated the roles of (63) children's academic abilities before the first COVID-19 lockdown in Germany, based on data from longitudinal research, as predictors of individual differences in parents' support for education during the lockdown. and how the following closure, parent and teacher support affected pupils' reading and math proficiency. The results showed:

- Before the lockout, children's reading and math abilities indicated parental support.
- During the lockdown, children who received more needs-oriented help from their parents showed a positive increase in their numeracy skills.

- After the closure period, individual disparities in students' academic ability were not explained by teacher support indicators.

And (Amedu, Hollebrands, 2022) conducted a study entitled “Teachers’ Perceptions of using technology to teach mathematics during COVID-19 remote learning”. It sought to understand the opinions of (2) secondary school teachers regarding the challenges of teaching math online, as well as the reasons for their usage of technology in the classroom. The results showed:

- Compared to teaching in a classroom, both teachers discovered that teaching mathematics online is more challenging.

- These educators' primary worries centered on the lack of student contact and the challenge of getting feedback from pupils.

- It is challenging to gauge pupils' comprehension in the middle of a lesson.
- They voiced worries about the challenges of acquiring high-quality, practical resources for online teaching; and the difficulties of integrating elements of a task-based curriculum that mainly depends on discourse and classroom engagement.

Methods and Procedures

This chapter deals with a presentation of the study methodology in terms of the study population, study sample, study tools, and statistical treatment.

Research approach:

It is important to determine the methodology used in this study and to know the method and method used. For the current study, the descriptive analytical approach was used, through which “teaching mathematics remotely from the point of view of parents and teachers in primary and secondary schools in the Kingdom of Saudi Arabia” was measured.

Population and Sampling

There are two communities in the current study, each unique. Parents of children enrolled in primary and secondary mathematics programs in the Kingdom of Saudi Arabia make up the first community. This community in the Kingdom of Saudi Arabia is defined by its size, as it is dispersed throughout all parts of Dammam. The other community is made up of elementary and secondary school math teachers in the Kingdom of Saudi Arabia, particularly in the Dammam area. Because mathematics teachers are required to have only mathematically related educational experience, its limitations characterize this community.

Sample

Additionally, the study comprised two populations and two samples per population. The first sample, which has a challenging feature (that two students in the family study at the primary and secondary levels together), was purposefully gathered from parents of students enrolled in basic and secondary mathematics programs in the Kingdom of Saudi Arabia. Additionally, primary and secondary math teachers were the source of the teacher sample in a purposeful manner. This demonstrates how rare it is for teachers in the Kingdom of Saudi Arabia to teach both the primary and secondary stages of education concurrently in one school.

This is what sets the current study apart from previous research: it mixes two samples with two distinct traits, which makes the sample unique.

Following the electronic distribution of the study tool to the members of the study sample from the two factions, "Parents and Teachers," it was discovered that (41) teachers and (122) child guardians were instructing mathematics at the primary and secondary levels. Both fundamental and advanced. The traits listed below are those of the participants in the two research samples, as reported by instructors and parents.

Table 1. Table (1) Distribution of study sample members according to demographic variables

Sample of parents	variable	Frequency	Ratio
	Relative relation		
	Father	53	43.4
	Mother	69	56.6
	Total	122	100.0
	Marital Status		
	Married	17	13.9

	Divorced	122	100.0
	Total	105	86.1
	Age		
	Less than 20 years	10	8.2
	20 – 35 years	39	32.0
	36 – 50 years	46	37.7
	51- 65 years	19	15.6
	Over 65 years old	8	6.6
	Total	122	100.0
	The Job		
	He works	104	104
	Does not work	18	18
	Total	122	122
	Is the workplace close to the son and daughter's residence?		
	Yes	67	122
	No	55	45.1
	Total	122	100.0
	Is one parent available at home?		
	Yes	31	25.4
	No	91	74.6
	Total	122	100.0
	Grade (stage)		
	Primary	69	56.6
	High school	53	43.4
	Total	122	100.0
Sample Teachers	Specialization		
	mathematics	41	100.0
	Total	41	100.0
	Gender		
	Male	21	51.2

Feminine	20	48.8
Total	41	100.0
Age		
Less than 30 years old	6	14.6
31-45 years old	24	58.5
46-60 years old	8	19.5
Over 60 years old	3	7.3
Total	41	100.0
Did you study mathematics remotely?		
Yes	41	100.0
No	---	---
Total	41	100.0
Teaching		
Male students	20	48.8
Female students	21	51.2
Total	41	100.0
Teaching stage		
Primary stage	25	61.0
High school	16	39.0
Total	41	100.0

The study tools

Two scales were developed for the study as tools for collecting data, and they are as follows:

- 1- The first scale: the parents' scale, to answer: teaching mathematics remotely from the point of view of parents in primary and secondary schools in the Kingdom of Saudi Arabia, and it consists of:

Section One: Demographic data: This includes the student's kinship, marital status, and work. Is the workplace close to the son's/daughter's residence? Is one parent available at home?

The second section is the opinion of the guardian responsible for following up on the student, and it includes (10) paragraphs.

- 2-

Section Three: The guardian's opinion of the mathematics teacher and subject, and includes (10) paragraphs.

2- The second scale: The mathematics teachers' scale, to answer: Teaching mathematics remotely from the point of view of teachers in primary and secondary schools in the Kingdom of Saudi Arabia. It consists of:

Section One: Demographic data: It includes specialization, gender, teaching categories, and the teaching stage.

The second section: The opinion of mathematics teachers about teaching mathematics remotely includes (10) paragraphs.

Section Three: Mathematics teachers' opinion about parents' knowledge of distance education, and it includes (10) paragraphs.

Validity of study tools:

It is necessary that the measurement tools be valid to measure what they were designed for, and here this must be verified through some procedures related to validity, which were verified in two ways:

1- Content veracity:

In this method, the study tools were presented after preparing the initial version of them to a number of arbitrators (6 arbitrators) who are experts in the curriculum specialty, in order to express their opinions on the sincerity of the content and the belonging of the statements to the scale and their suitability to measure what they were designed for, and to verify the clarity of the paragraphs in their wording. And its relationship to its dimensions. After that, amendments were proposed in light of the experts' (arbitrators') observations, and with a criterion of (80%) to indicate the validity of the item. Some items were modified in terms of wording, deletion, or addition, and as a result the scale became composed of (40) items and four main dimensions, this indicates the content validity of the measurement tools.

2- Construct validity:

In this method, the researcher calculated the correlation values of the paragraph with its dimension, by using the Pearson Correlation test to verify the construct validity of the study tools, and the value was shown in Table (2):

Table (2) Pearson Correlation test to verify the construct validity of the study tools

The first tool (parents scale)				The second tool (teachers scale)			
The opinion of the guardian responsible for following up on the student		Parent's opinion of the mathematics teacher and subject		The opinion of mathematics teachers about teaching mathematics remotely		Mathematics teachers' opinion about parents' knowledge of distance education	
(R)	Paragraph number	(R)	Paragraph number	(R)	Paragraph number	(R)	Paragraph number
1	.521**	19	.414**	.544**	32	.526**	1
2	.472**	20	.419**	.639**	33	.604**	2
3	.515**	21	.695**	.668**	34	.701**	3
4	.467**	22	.590**	.725**	35	.563**	4
5	.624**	23	.630**	.643**	36	.421**	5
6	.674**	24	.713**	.590**	37	.562**	6
7	.455**	25	.666**	.503**	38	.668**	7
8	.612**	26	.670**	.686**	39	.624**	8
9	.617**	27	.646**	.720**	40	.666**	9

10	.658**	19	.414**	.406**	41	.397**	10
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(**) Statistical significance (0.01)

It is noted that the internal construct validity shown in (2) was acceptable, and all the items for each dimension measure the same characteristic and that they belong to its dimensions, with a statistical significance less than (0.01), which is indicated by (**), and all the values of the correlation coefficients for the items were The two scales of the study are higher than (0.30), the minimum and acceptable limit for distinguishing the items, which indicates that all the items contribute effectively to the total score of the two scales and that these scale items measure the properties of their main dimensions, which confirms the construct validity of the study tools (Pallant, 2005; Rest, 1979).

Reliability Study Tools:

The step of measuring the Reliability of the study tool is considered a very important step to verify the consistency of the responses of the study sample members on the paragraph and on the axis and to calculate the stability of the study tools, the Cronbach Alpha method was used, where Cronbach Alpha values are weak and unacceptable if they are less than (0.60). If the Cronbach Alpha value is between (0.60 - 0.70) it is acceptable, if the Cronbach Alpha value is between (0.70 - 0.80) it is good, and if the Cronbach Alpha value is between (0.80 - 1.00) it is excellent (Hair et al., 2020), and the Reliability factor values for the main and sub-indices and the total score for each axis of the study were as in Table (3).

Table (3) Reliability coefficients for the study instrument items using the Cronbach alpha test

Study variables	Cronbach alpha
The opinion of the guardian responsible for following up on the student	0.807
Parent's opinion of the mathematics teacher and subject	0.902
The opinion of mathematics teachers about teaching mathematics remotely	0.719
Mathematics teachers' opinion about parents' knowledge of distance education	0.661

Table (3) shows that the values of the Cronbach alpha coefficient for the sub-dimensions of the scale ranged between (0.661 – 0.902), which are acceptable values for the purposes of the current study as mentioned by (Hair et al., 2010).

Debug Key:

The responses to the items of the two study tools were graded on a five-point Likert scale within the answer alternatives (to a very great degree = 5, to a great degree = 4, to a moderate degree = 3, to a low degree = 2, to a very low degree = 1), and the equation was applied. (The upper value - the lower value of the answer alternatives / number of levels). Thus, it becomes clear that the low level is from 1.00 - 2.33, the medium level is from 2.34 - 3.67, and the high level is from 3.68 - 5.00.

Study Procedures

To achieve the objectives of the study, the following measures were taken:

1 - A Pilot Study (n = 30) was applied to verify the extent of linguistic formulation and the application and correction procedures.

- 2- The scale, which was prepared for mathematics teachers (n= 41) and parents, was applied to a sample (n= 122).
- 3- The data was processed statistically according to the appropriate methods mentioned in the study.
- 4- The questionnaire was divided into (teachers, and parents).
- 5- Indications were reached about the validity and reliability of the measures.

Statistical treatment

The current study employed several statistical methods. The study dealt with extracting frequencies and percentages to describe the individuals in the study sample, using the Pearson Correlation test to verify the internal construct validity of the study tools, using the Cronbach Alpha test to verify the stability of the tools, and Independent Simplest T. -test, in addition to using the One Way-ANOVA test to identify differences between the arithmetic means.

Study variables:

The study included several dependent variables:

- The opinion of the guardian responsible for following up on the student.
- The guardian's opinion of the mathematics teacher and subject.
- The opinion of mathematics teachers about teaching mathematics remotely.
- Mathematics teachers' opinion about parents' knowledge of distance education.

The study included independent variables related to parents' demographic data:

- relative relation.
- marital status.

The study also included independent variables related to teachers' demographic data:

- Gender.
- Teaching stage.

Results and Discussion

The study's findings were sorted into the following categories:

The First question: To what extent do parents follow up on their students while they teach mathematics remotely?

The arithmetic means and standard deviations were extracted, and the paragraphs were arranged in descending order according to their importance, to identify the extent to which parents follow their student children while they teach mathematics remotely, and Table (4) shows this:

Table (4) Arithmetic means and standard deviations for the responses of the study sample members to the items "The extent to which parents follow up on their student children while they teach mathematics remotely," arranged in descending order.

No	Paragraph	Arithmetic Mean	Standard Deviation	Rank	Level
3	Make a suitable place for my son/daughter during distance learning	3.51	1.37	1	Middle
1	I know and understand the use of distance learning software	3.47	1.44	2	Middle
4	I help my son/daughter solve problems such as tests on his/her behalf	3.31	1.69	3	Middle
5	I prefer distance education to be in the evening	3.17	1.63	4	Middle
2	I will be with my son/daughter and supervise him during distance learning	2.92	1.52	5	Middle
6	I can manage my time while supervising my son/daughter during the lesson	2.38	1.35	6	Middle
8	I always receive help from the Ministry of Education or those with experience when help is needed during distance education	2.07	1.04	7	Low
7	I prefer teaching remotely rather than in person	1.84	1.19	8	Low
10	Distance education increases academic achievement	1.84	1.08	8	Low
9	My son/daughter benefits more from distance education compared to in-person mathematics education	1.73	1.12	10	Low
	Total	2.62	0.82		Middle

Table (4) show that the arithmetic average values for (the extent to which parents follow up on their student children while teaching them mathematics remotely) ranged between (3.51 and 1.73), where follow-up received an overall arithmetic average. (2.62), and at an average level. The paragraph that stated, “Make a suitable place for my son/daughter during distance learning” came in first place, with a mean of (3.51), and a standard deviation of (1.37), and at an average level. The paragraph that read, I know and understand, came in first place. “Using distance learning programs” ranked second with a mean (3.47) and standard deviation (1.44) and also at an average level.

In the final ranking of the items in this dimension, the item that reads, “My son/daughter benefits more from distance education compared to in-person education for mathematics,” came with a mean (1.73) and a standard deviation (1.12) at a low level.

It is noted that the standard deviation values are higher than (1.00) in all items of this dimension, which indicates a high level of dispersion of responses between agreement or disagreement among the participants in this study.

The Second question: To what extent are parents satisfied with mathematics teachers while teaching their children mathematics remotely?

To ascertain the degree of parents' satisfaction with mathematics teachers when teaching mathematics remotely, the arithmetic means and standard deviations were extracted, and the elements were ordered in descending order based on their value. Table (5) illustrates this:

Table (5) Arithmetic means and standard deviations for the responses of the study sample members to the items “The extent of parents’ satisfaction with mathematics teachers while teaching mathematics remotely,” arranged in descending order.

No	Paragraph	Arithmetic Mean	Standard Deviation	Rank	Level
5	Mathematics teachers are working hard while teaching remotely	3.80	1.10	1	High
1	The mathematics teacher understands the use of distance education strategies	3.78	1.14	2	High
7	The mathematics teacher always gives my son/daughter homework and tells them to correct and discuss them while teaching remotely	3.74	1.08	3	High
2	The mathematics teacher uses teaching aids by presenting them and sharing the screen	3.71	1.12	4	High
3	The mathematics teacher uses learning activities suitable for distance teaching	3.66	1.13	5	Middle
6	The mathematics teacher always monitors my son/daughter’s participation during distance learning with ease	3.66	1.15	5	Middle
4	The teacher can measure the academic achievement of the student in distance education	2.70	1.34	7	Middle
10	Activities and educational tools can be easily created when teaching mathematics to students remotely.	2.59	1.30	8	Middle
8	Mathematics is very suitable for distance education	1.98	1.21	9	Low
9	Mathematics is more suitable for distance teaching for lower grades than for secondary school students	1.69	1.11	10	Low
	Total	3.13	0.85		Middle

Table (5) show that the arithmetic average values for (the extent of parents' satisfaction with mathematics teachers while teaching mathematics remotely) ranged between (3.80 and 1.69), where satisfaction received an arithmetic average. Overall (3.13), at an average level. The paragraph that stated, "Mathematics teachers work very diligently while teaching remotely," came in first place, with a mean of (3.80), with a standard deviation of (1.10), and at a high level. The paragraph that stated, "The mathematics teacher who understands the use of distance education strategies ranked second with a mean (3.78) and standard deviation (1.14), also at a high level.

In the final ranking of the items in this dimension, the item that reads, "Mathematics is more suitable in distance teaching for the lower grades than for secondary school students," came with a mean of (1.69) and a standard deviation of (1.11) at a low level.

It is noted that the standard deviation values are higher than (1.00) in all items of this dimension, which indicates a high level of dispersion of responses between agreement or disagreement among the participants in this study.

The Third question: To what extent do mathematics teachers possess distance teaching skills?

The arithmetic means and standard deviations were extracted, and the items were arranged in descending order according to their importance to identify the extent to which mathematics teachers possess distance teaching skills, and Table (6) shows this:

Table (6) Arithmetic means and standard deviations for the responses of the study sample members to the items "The extent to which mathematics teachers possess distance teaching skills," arranged in descending order.

No	Paragraph	Arithmetic Mean	Standard Deviation	Rank	Level
5	I work very hard while teaching remotely	4.54	0.74	1	High
1	I understand the use of distance programs and distance education strategies	4.49	0.78	2	High
2	I use teaching aids by displaying them and sharing the screen	4.41	0.67	3	High
7	I give students homework, correct them, and discuss them during distance learning	4.37	0.66	4	High
3	I use learning activities suitable for distance teaching	4.32	0.79	5	High
6	I follow the students' participation during distance teaching with ease	3.78	1.11	6	High
4	I can measure the academic achievement of the male/female student in distance education	2.71	1.15	7	Middle
10	Activities and educational tools can be easily created	2.68	1.08	8	Middle

	when teaching mathematics to students remotely				
8	Mathematics is very suitable for distance education	1.80	0.95	9	Low
9	Mathematics is more suitable for distance teaching for lower grades than for secondary school students	1.29	0.60	10	Low
	Total	3.44	0.47		Middle

Table (6) show that the arithmetic average values for (the extent of possession of distance teaching skills among male and female mathematics teachers) ranged between (3.54 and 1.29), where the degree of possession of teaching skills reached an average An overall arithmetic (3.44), with an average level. The paragraph that stated, “I work very diligently while teaching remotely,” came in first place, with an arithmetic mean (4.54), with a standard deviation of (0.74), and at a high level, and the paragraph that stated, “I understand.” “Using distance programs and distance education strategies” ranked second with a mean (4.49) and standard deviation (0.78), also at a high level.

In the final ranking of the items in this dimension, the item that reads, “Mathematics is more suitable in distance teaching for lower grades than for secondary school students,” came with a mean of (1.29) and a standard deviation of (0.60) at a low level.

The Fourth question: What is the extent of parents’ knowledge about teaching mathematics remotely from the point of view of male and female teachers?

The arithmetic means and standard deviations were extracted, and the items were arranged in descending order according to their importance, to identify the extent of parents’ knowledge of teaching mathematics remotely from the point of view of male and female teachers, and Table (7) shows this:

Table (7) Arithmetic means and standard deviations for the responses of the study sample members to the items “The extent of parents’ knowledge of teaching mathematics remotely from the point of view of male and female teachers,” arranged in descending order.

No	Paragraph	Arithmetic Mean	Standard Deviation	Rank	Level
4	Parents always help their children solve problems such as tests for them	3.41	1.72	1	Middle
5	Parents prefer that distance education be in the evening	3.17	1.72	2	Middle
2	Parents are always with their children and supervise them during distance learning	3.07	1.37	3	Middle
3	Parents are always keen to prepare a suitable place for their children during distance learning	3.02	1.42	4	Middle

1	Parents know and understand the use of distance education programs	3.00	0.92	5	Middle
8	Parents easily receive assistance when they need any assistance during distance teaching	2.56	0.92	6	Middle
6	Parents can manage their time with their children's time and supervise them during distance learning	2.41	1.22	7	Middle
10	Distance education increases academic achievement	1.54	0.84	8	Low
9	Students benefit more from distance education compared to in-person mathematics education	1.44	0.71	9	Low
7	Parents prefer distance teaching instead of in-person	1.39	0.77	10	Low
	Total	2.50	0.60		Middle

Table (7) show that the arithmetic mean values for (the extent of parents' knowledge of teaching mathematics remotely from the point of view of male and female teachers) ranged between (3.41 and 1.39), where parents' knowledge was Teaching mathematics remotely, from the point of view of male and female teachers, had an overall arithmetical average of (2.50), and at an average level. The paragraph that stated, "Parents always help their children in solving problems such as tests for them" came in first place, with a arithmetical average of (3.41). With a standard deviation of (1.72) and an average level, the paragraph that reads, "Parents prefer that distance education be in the evening period" came in second place with a mean of (3.17) and a standard deviation of (1.72) and an average level as well.

In the final ranking of the items in this dimension, the item that reads, "Parents prefer distance learning rather than in-person teaching," came with a mean (1.39) and a standard deviation (0.77) at a low level.

The Fifth question: Are there statistically significant differences at (0.05) in the extent to which parents follow up on their student children while teaching mathematics remotely due to some demographic variables related to kinship and marital status?

Arithmetic means and standard deviations were extracted, and an Independent Samples T-test was used to identify differences in the extent to which parents follow their student children while they teach mathematics remotely due to some demographic variables related to family ties and marital status.

Table (8) Independent Sample T-test to identify the significance of differences in the extent to which parents follow up on their student children while they teach mathematics remotely due to kinship and marital status.

Source of variance	Relative Relation	Number	Arithmetic Mean	Arithmetic Mean	Degrees of Freedom	Value (t)	Statistical significance
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The extent to which parents follow their students while they teach mathematics remotely	Father	53	2.70	0.79	120	0.893	0.374
	Mom	69	2.56	0.85			
	Marital status	Number	Arithmetic Mean	Arithmetic Mean	Degrees of Freedom	Value (t)	Statistical significance
	Married	105	2.61	0.85	120	-0.514	0.608
	Divorced	17	2.72	0.65			

Table (8) show that there are no statistically significant differences at the significance level (0.05) in the extent to which parents follow up on their student children while they teach mathematics remotely due to kinship and the marital status of the parents, and the value of (T) was = (0.893, -0.514), respectively. These two values are not significant at the level of (0.05), and the differences between the arithmetic mean values, if any, did not reach the level of statistical significance.

The Sixth question: Are there statistically significant differences at (0.05) in the extent of mathematics teachers' possession of distance teaching skills due to some demographic variables such as gender and academic level?

Arithmetic means and standard deviations were extracted, and an Independent Samples T-test was used to identify differences in the extent of mathematics teachers' possession of remote teaching skills due to some demographic variables such as gender and stage of study.

Table (9) Independent Sample T-test to identify the significance of the differences in the extent to which mathematics teachers possess distance teaching skills due to some demographic variables represented by gender and stage of study.

Source of variance	Gender/Teacher	Number	Arithmetic Mean	Arithmetic Mean	Degrees of Freedom	Value (t)	Statistical significance
The extent to which mathematics teachers possess distance teaching skills	Male	21	3.40	0.53	39	-0.612	0.544
	Female	20	3.49	0.39			
	Educational level	Number	Arithmetic Mean	Arithmetic Mean	Degrees of Freedom	Value (t)	Statistical significance
	primary	25	3.45	0.36	39	0.152	0.880
	secondary	16	3.43	0.61			

Table (9) show that there were no statistically significant differences at the significance level (0.05) in the extent of possession of distance teaching skills among mathematics teachers due to some demographic variables represented by gender and academic stage. The value of (T) = (-0.612, 0.152), respectively. These two values are not significant at the level of (0.05), and the

differences between the values of the arithmetic averages, if any, did not reach the level of statistical significance.

Discussion

1- To what extent do parents follow up on their students while they teach mathematics remotely?

The results of the study showed that the arithmetic mean values for (the extent to which parents follow their students while teaching mathematics remotely) were between (3.51 and 1.73), where (follow-up) and (I make a suitable place for my son/daughter during distance learning) and (I know and understand the use of distance learning software) at an intermediate level respectively.

In the final ranking of the items in this dimension, the item that reads (My son/daughter benefits more from distance education compared to in-person education for mathematics) came with an arithmetic mean (1.73) and a standard deviation (1.12) at a low level.

It is noted that the standard deviation values are higher than (1.00) in all items of this dimension, which indicates a high level of dispersion of responses between agreement or disagreement among the participants in this study.

- The results of the study agreed with (Ní Fhloinn, Fitzmaurice, 2021) that they found (72%) it was exhausting and (88%) thought it took a long time.

The researcher's interpretation: The inability of parents to use contemporary technology to teach, particularly when it comes to utilizing mathematical skills, and the challenge of monitoring their children given the circumstances of their long-term employment outside the home.

2- To what extent are parents satisfied with mathematics teachers while teaching their children mathematics remotely?

The results of the study showed that the arithmetic mean values for (the extent of parents' satisfaction with mathematics teachers while teaching mathematics remotely) were between (3.80 and 1.69), where both (satisfaction) were at an average level, while the two paragraphs (mathematics teachers work very hard and diligently) While teaching remotely) ranked first, as well as the item (the mathematics teacher understands the use of distance education strategies) ranked second, which were at a high level. In the last ranking, the item (Mathematics is more suitable in distance teaching for lower grades than for secondary school students) came at a low level.

It is noted that the standard deviation values are higher than (1.00) in all items of this dimension, which indicates a high level of dispersion of responses between agreement or disagreement among the participants in this study.

- The results of the study agreed with (Ní Fhloinn, Fitzmaurice, 2021) that more than (90%) of the participants had little previous experience in teaching mathematics online. (72%) found it stressful and (88%) thought it took a long time.

Researcher's interpretation: The mathematics teacher has extensive experience in teaching curricula as well as in the use of technology skills, but the challenge is the inability to communicate effectively remotely in using students' mathematics skills, which constitutes a major challenge. As for the primary stages, they are suitable for distance learning due to the lack of use of higher mathematics skills.

3- To what extent do mathematics teachers possess distance teaching skills?

The results of the study showed that the arithmetic mean values for (the extent of possession of distance teaching skills among male and female mathematics teachers) ranged between (3.54 and 1.29), where (the degree of possession of teaching skills) was at an average level, and the two items (I work very diligently while teaching Distance) ranked first and (I understand the use of distance programs and distance education strategies) at a high level. In the final ranking of the items in this dimension, the item (Mathematics is more suitable in distance teaching for lower grades than for secondary school students) came at a low level. The results of the study agreed with (AL-Hadhoud, AL-Hattami, 2017) that there are multiple obstacles such as low Internet readiness, followed by crowded classrooms with learners. And also, with (Kalogeropoulos, Roche, Russo, Vats, Russo, 2021) that both teachers were actively concerned for all students and evaluated students' progress and participation in the tasks. Likewise, with (Barlovits, Jablonski, Lázaro, Ludwig, Recio, 2021) that German language teachers conducted more lessons asynchronously. In contrast, Spanish teachers used synchronous teaching more frequently, but still considered the lack of personal contact a major challenge. And also, with (Amedu, Hollebrands, 2022) that the main concerns expressed by these teachers focused on the difficulty of receiving feedback from students and the limited interaction of students, and also the difficulty of assessing students' understanding during lessons.

The researcher's interpretation: In the classroom, mathematics needs collaboration and the application of instructional strategies. In addition to activities and instructional resources like engineering tools and teaching strategies, these courses may also need student participation in the classroom.

4- What is the extent of parents' knowledge about teaching mathematics remotely from the point of view of male and female teachers?

The results of the study showed that the arithmetic mean values for (the extent of parents' knowledge of teaching mathematics remotely from the point of view of male and female teachers) ranged between (3.41 and 1.39), where the following items were (parents' knowledge of teaching mathematics remotely from the teachers' point of view) (Teachers), (Parents always help their children in solving problems such as tests on their behalf) and (Parents prefer distance education to be in the evening period) had an overall arithmetic average of (2.50) at an average level, respectively. In the final ranking of the items in this dimension, the item (Parents prefer distance learning rather than in-person teaching) came at a low level.

The results of the study agreed with (Marbán, Radwan, Radwan, Radwan, 2021) that there were statistically significant differences between the three groups with regard to the educational level of the parents and the economic status of the family.

The researcher's interpretation: The more the concept of assistive technology, which may replace real education within the classroom, increases, this leads to major problems, especially parents' lack of knowledge of technology, some teaching skills, and various mathematics curricula.

5- Are there statistically significant differences at (0.05) in the extent to which parents follow up on their student children while teaching mathematics remotely due to some demographic variables related to kinship and marital status?

The results of the study showed that there are no statistically significant differences at the significance level (0.05) in the extent to which parents follow their student children while they teach mathematics remotely due to kinship and the marital status of the parents.

- The results of the study agreed with (Gunzenhauser, Enke, Johann, Karbach, Saalbach, 2021) that children's reading and mathematics skills before the lockdown predicted parental assistance.

The researcher's interpretation: The relationship of kinship and marital status in assisting in the teaching process is considered important, but the results indicate that there are no differences, and this indicates that everyone lacks the skills of teaching and following up remotely.

6- Are there statistically significant differences at (0.05) in the extent of mathematics teachers' possession of distance teaching skills due to some demographic variables such as gender and academic level?

The results of the study showed that there are no statistically significant differences at the significance level (0.05) in the extent of possession of distance teaching skills among mathematics teachers, due to some demographic variables such as gender and stage of study. The results of the study agreed with (Marbán, Radwan, Radwan, Radwan, 2021) that there were no statistically significant differences between the cluster groups with regard to gender, age, and type of school.

The researcher's interpretation: This confirms what was mentioned previously, that the specialized teacher possesses high capabilities and competence in the teaching process, whether it is within the classroom environment or remotely, as it is the same skill.

Recommendations:

- Educational recommendations:
 - Developing teachers' attitudes towards the distance teaching method in several ways.
 - teaching pupils to use computerized math programs that support their desire to pursue science careers.
- Suggestions for research purposes.
 - Conduct more studies and research related to distance teaching methods.
 - Conduct more studies and research related to the uneducated and specialized family.

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