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Mathematics Teachers' Activation of Online Homework Via Madrasati Platform During Corona Pandemic and Its Relationship to Some Variables

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Abstract: This study aimed to identify the mathematics teachers' activation of online homework via Madrasati Platform during COVID-19 Pandemic in general education stages. A questionnaire tool was designed and used to collect quantitative and qualitative data, from (135) math teachers who participated in the study. A mixed design method was used for data analysis. The results indicated a high percentage of online homework activation via Madrasati Platform according to the opinions of the mathematics teachers. The results also showed that there are statistically significant differences between mathematics teachers' activation of online homework according to the gender variable (male and female) in favor of females. But there are no statistically significant differences according to the school stage variable (elementary, middle, and high). The results also indicated that there were some obstacles of online homework, such as: the weakness of internet speed, high cost of its infrastructure, limited follow-up of parents of their children to complete online homework. The teachers suggested some proposals to develop online homework management via Madrasati Platform, such as: development of the virtual platform so that it considers the nature of mathematics in terms of using the integration of some software, such as: GeoGebra and others. The study presented a set of future research proposals, which are an extension of the current study.

Keywords: Online homework, Madrasati platform, Mathematics teachers' perceptions, Virtual platforms.

1. Introduction

The UNICEF report (2020) "Global Knowledge" indicates that the evidence of global responses to the Covid-19 pandemic has made it clear that distance learning techniques that include platforms, online references, television, and radio must be used to address inequalities, specifically for those facing inequities. Equal opportunities for Internet connectivity and access to digital devices" [1].

The Madrasati platform is a system for managing online education, which has been officially approved by the Ministry of Education in Saudi public schools inside and outside the Kingdom, in addition to several private schools. The Madrasati platform provides a number of interactive services for managing and creating courses, in addition to learning tools and tests, And follow-up of the learner during the synchronous and asynchronous educational process, and provides more than (45,000) diverse educational resources for students, to take into account the individual differences between them, and to provide tools for communication and interaction between students and teachers through dialogue rooms, discussion forums, and e-mail. The platform also provided tools to assess knowledge and students' performance, through a system of reports and performance indicators, in addition to electronic tests and question banks, which contain more than one hundred thousand questions in most of the academic courses [2].

The Saudi Press Agency "SPA" (21st century) reported that several reliable international educational organizations praised the pioneering Saudi model in the field of e-learning at the world level. The study included comparing the "Madrasati" platform with the best 7 global platforms, and 176 countries; Explaining the remarkable superiority of the platform as an internationally leading model, and one of the e-learning solutions in developed countries during the

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Corona pandemic, through more than 6 million users, and an entry rate of 98% [1].

The homework is one of the main pillars of teaching, as it is an assessment of the extent to which the targeted learning outcomes are achieved, and it is also a tool for identifying students' weaknesses and shortcomings and thus can be addressed, and strengths until they are strengthened, and despite the importance of homework in improving and enriching the school educational process, the What is done by students is marred by incompleteness or negativity, which loses the essence for which it is given, as there are sometimes undesirable habits such as cheating or relying on others, as is the case when a student copies the assignment from a classmate's notebook, or negative tendencies towards mathematics as it is The case in some students dropping out of class, or performing some types of classroom behavior that hinders learning [3]–[5].

There are two trends in education towards giving homework or not, as the first orientation prefers not to give homework, so that students remain busy at home as well, and their argument is that good teaching work in the classroom is sufficient, and the owners of the second orientation believe that effective teaching cannot be completed Without homework, as homework achieves educational goals that cannot be achieved without it [6]–[8].

According to [7] that conducted focus interviews with 24 primary school mathematics teachers in Turkey, classroom teachers' views on teaching mathematics in distance education during the Covid-19 pandemic were mixed, but mostly negative.

According to [8], which aimed to reveal the general problems that teachers face in Turkey when teaching mathematics through distance education, including: lack of learning through experience, student indifference, lack of feedback and lack of face-to-face interaction, The study also indicated that the time students spent on social media increased when web-based learning was switched, and online education was more effective on a theoretical level and was not as efficient as face-to-face education, but distance education is only valid as a temporary solution in times of crisis.

This difference in teachers' perceptions of homework in general, will there be a difference about homework across virtual platforms as well? This is what the current study attempts to answer in detail, by examining the perceptions of a sample of mathematics teachers from different levels of study about managing homework through virtual educational platforms.

1.1. Statement of the Problem

Using Interactive mathematics learning environments (IMLE) has changed the nature of mathematics learning and instructional design. However, teachers' perceptions and beliefs remain central to improving mathematics teaching and learning. Despite the importance of homework in the educational process, and as the first link between the home and the school, and as it is a process of continuity of the learning process outside the educational institution, the results of previous studies resulted in a difference in teachers' views towards homework (based on paper and pen). By extrapolating previous studies, the researcher concluded a research gap represented in the scarcity of studies conducted with the aim of revealing the perceptions of mathematics teachers about homework management through virtual educational platforms, especially during the Corona era and beyond.

Thus, the problem of the study lies in the following question:

- To what extent did mathematics teachers activate online homework through the Madrasati platform during the Covid-19 pandemic? This question is divided into the following sub-questions:

1. What are the mathematics teachers' perceptions about the importance of online homework through the Madrasati platform during the Corona pandemic?
2. How do mathematics teachers activate online homework through Madrasati platform during the Corona pandemic?
3. To what extent does the activation of mathematics teachers for online homework through the Madrasati platform during the Corona pandemic differ according to the gender/ school stage variables?
4. What are the mathematics teachers' perceptions about the obstacles of online homework management through Madrasati platform?
5. What are the mathematics teachers' perceptions about proposals to improve online homework management through Madrasati platform?

1.2. Hypotheses

- H_o1: There are no statistically significant differences at the level of $\alpha \leq 0.05$ between the averages of mathematics teachers' activation of homework through the Madrasati platform due to the effect of the interaction between levels of gender (male/female) and grade level (Elementary / Middle / High).
- H_o2: There are no statistically significant differences at the level of $\alpha \leq 0.05$ between the averages of mathematics teachers' activation of homework through the Madrasati platform according to the gender variable (male/female).
- H_o3: There are no statistically significant differences at the level of $\alpha \leq 0.05$ between the averages of mathematics teachers' activation of homework through the Madrasati platform according to the school stage variable (Elementary / Middle / High).

1.3. Objectives

The current study aimed to determine:

- The perceptions of mathematics teachers in general education stages about the online homework through Madrasati platform.
- The importance of activating online homework through the Madrasati platform.
- The difference in the degree of activating online homework through Madrasati platform, according to the variables of gender, and school stage.
- Obstacles to managing online homework through Madrasati platform.
- Proposals for developing online homework management through Madrasati platform.

1.4. Importance

- The study presents a research tool designed considering previous studies and theoretical references for e-learning that measures male and female teachers' perceptions towards managing homework online that may benefit other researchers.
- The results of the study may contribute to presenting a clear picture of mathematics teachers' perceptions about managing homework online for education officials in the Kingdom of Saudi Arabia, including obstacles and suggestions that improve their use in the future, making it easier for them to develop plans and programs that would develop the e-learning system, which has become a necessity. Urgent considering the Corona pandemic and imposed itself in the future on the education system.

1.5. Delimitations

- *Time delimitations:* The study was applied in the first semester 2021-2022 AD.
- *Spatial delimitations:* The study was applied to a random sample of mathematics teachers in the Department of Education in Wadi Al-Wadsar and Al-Silil, Ministry of Education in Saudi Arabia.
- *Human delimitations:* The study was applied to mathematics teachers at all levels of study (primary - intermediate - secondary).
- *Objective delimitations:* The study is limited to the perceptions of mathematics teachers related to homework management as one of the elements of the mathematics lesson, in terms of importance, obstacles and suggestions.

2. Theoretical Framework& Literature Review

The theoretical framework of the current study includes a set of main elements shown in Figure 1.

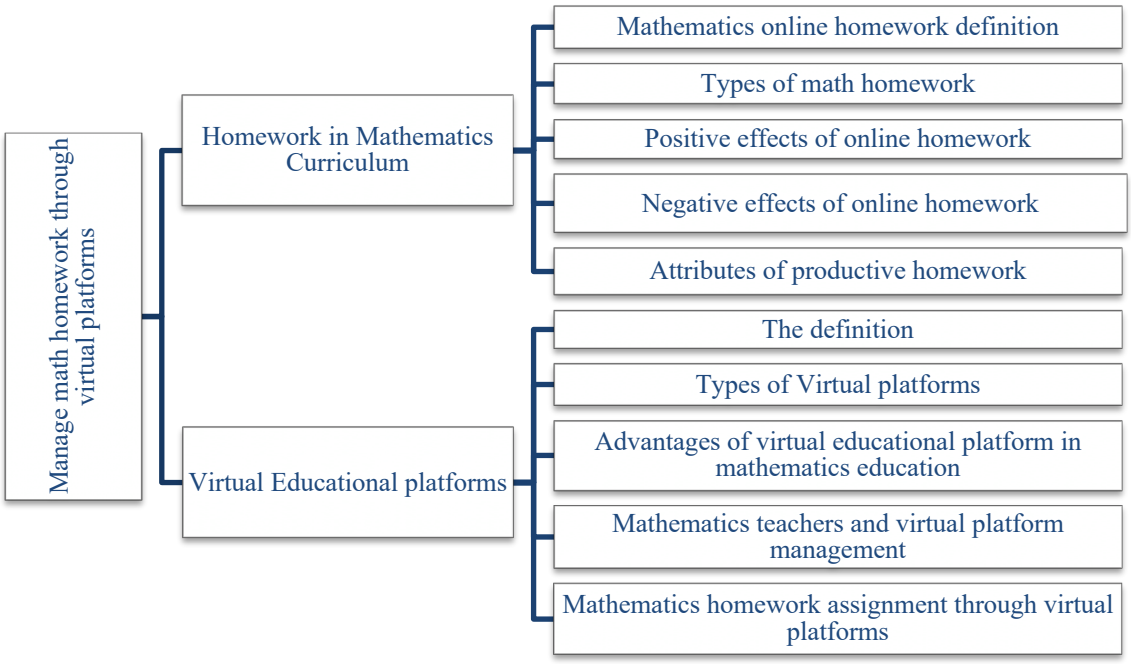

Fig. 1: Theoretical Framework of The Study

2.1. Homework in Mathematics Curriculum

Homework is one of the elements of the daily plan for math lessons, and it contributes to linking what the student has learned in the daily study program with homework outside of formal school hours. Homework is not limited to a number of exercises or questions from the textbook, but it is much broader and may include writing a story, solving mathematical problems, drawing a specific thing, bringing samples, preparing a method, planning a visit or a systematic scientific competition, watching a specific movie and writing a report. In all cases, homework should be a link between the topics studied and the following lessons [9].

Therefore, homework is an application of what the student studies in class and an affirmation of the information he acquires in school, and homework is one of the important issues in the field of education, as it is one of the most controversial topics, in terms of few or many, difficulty and ease. It is seen as burdening students without considering their abilities, mental levels, and stages of development, which had a negative impact on students' acceptance of it, which in turn negatively affected their desire and tendencies to continue studying and led to their dropping out of schools. Most teachers believe that homework improves the achievement level of students, and this is true and ensured if homework is properly planned, has clear objectives, and is linked to students' needs, abilities, and tendencies [6].

2.1.1. Mathematics online homework definition

Mathematics Online homework (MOHW) refers to any system that is designed mainly for homework submission, grading, and providing instant feedback [10].

The researcher defines procedural MOHW in this study as the planned tasks, which the mathematics teacher determines from the questions bank in the virtual educational "Madrasati platform" for students in the general education stages (elementary - middle - high) to be completed outside the classroom.

2.1.2. Types of mathematics homework

The assignment of homework varies by subject and varies according to its purpose. According to [11] There are three types of homework that a math teacher can use to create meaningful learning for her students: Practice, Preparation, and Extension.

The first type: Homework as practice: It is homework in the form of activities with the aim of practicing the mathematical knowledge learned in the previous lesson, to increase speed, achieve mastery, review work, study for exams, and retain specific skills over time. Teachers most often assign homework for practice and preparation because

it can be more convenient and less time consuming. Math and spelling practice homework is often used to increase spelling proficiency and fluency in learning math facts.

The second type: Homework as Preparation: These are assignments in the form of activities that the teacher assigns to the student to help him understand the new lesson. The homework is designed to encourage students to think and prepare to study future topics.

The third type: Homework as Extension: It is homework in the form of an extension and transition of the impact of previous learning in new situations and tasks, and this type of homework requires a higher level of abstract thinking, and teachers use this type of homework to encourage students to cooperate with their peers and be more creative During the learning process. This type of homework improves achievement and develops students' problem-solving skills in learning mathematics.

2.1.3. Positive effects of online homework

The impact of online homework on student performance is one of the main concerns of researchers in the field of mathematics education, as many studies [6], [10], [12]–[18] have indicated the importance of online homework as an essential element in the learning environment. [19] revealed that there were positive relationships between performance expectancy, average expected effort, and student attitude toward the use of online math homework tools. The results also indicated a positive relationship between students' attitudes and their actual use of online homework.

Technology has made education a continuous process, and online homework attempts to focus the student's interests on school and outside on the subjects of study, and since learning is a subjective process, homework prompts students to practice and research, and they reach knowledge by their efforts, and through homework students practically train a skill solve problems and apply rules, laws, and theories. Thus, homework connects and integrates students' experiences, and promotes meaningful learning.

Studies described the benefits of online homework for students when compared with traditional homework [15], [20]. According to [21], which it conducted through a survey of 140 graduate students on the positive impact of online homework on students' acquisition of knowledge, development of self-learning skills and academic achievement, the study emphasized the great role of the Internet in facilitating the completion of assignments and the exchange of opinions between Students, which had an impact on the development of group learning skills.

Several studies have confirmed the impact of homework feedback on developing academic achievement in mathematics for primary school students. [12] was conducted in New York State on eighth grade students, aimed to analyze the impact of four types of feedback: no feedback, effort-based teacher feedback on paper-and-pencil-based homework, ability-based teacher feedback on paper-and-pencil-based homework, and online programmed feedback on computer-based homework. Based on students' responses to the survey, students overwhelmingly (73%) prefer web-based homework over pen-and-paper homework. The students prefer this style because it's easy to work and provide solutions, get the most from notes and feedback, and increase students' math knowledge. study revealed a strong relationship between homework completion and math achievement.

Additionally, traditional homework (paper-pencil based), the students may not be able to receive feedback on-time that helps them to correct their mistakes. Without immediate feedback, misconceptions could stay with students along the way, making upcoming learning more problematic. The problems of traditional homework might be solved with online technologies using online homework tools, the negative relationship between high school students' attitude towards using online homework (OHW) and mathematics anxiety through the participation of (345) students in the study tool that included 20 items based on the 5-point Likert questionnaire. The results also confirmed the importance of (OHW) in learning mathematics [10].

2.1.4. Negative effects of online homework

The negative effects of online homework may vary depending on the measurement tool used by the researcher, according to [22] that although students' opinions about homework performance through computer software were positive, yet the test performance did not reflect these high opinions. The performance of the students of the experimental group in the computer-assisted mathematics exams was not better than the performance of the students in the control group. The researcher attributed this result to the difficulties in learning to enter mathematical symbols using the keyboard and mouse, which distracts the students and their preoccupation with the computer from learning the mathematics they are required to learn.

Regarding knowing the effectiveness of activating homework online compared to traditional homework, and their relationship to the trend towards mathematics and achievement in its teaching methods. [23] showed the ineffectiveness of giving homework through the Internet compared to traditional duties. The researcher attributed this to several reasons, the most important of which is the inability of female students to search and use the Internet correctly, or the

faculty members not directing them to do so. The results also showed the effectiveness of giving traditional homework in the direction of female students towards mathematics and achievement in its teaching methods. According to the results of several previous studies, there are some drawbacks to homework.

Although homework has been proven to be important in some studies, most studies indicate the rejection of homework, because it disrupts families and increases the burden on students, especially students with low economic incomes, who do not help them. their environments to get homework done well and suggest an extended school day instead. Some researchers have criticized both the quantity and quality of homework. They provided evidence that too much homework is detrimental to students' health and family time and assert that teachers are not well trained in how to assign homework. Researchers have suggested that individuals and parent groups should insist that teachers reduce the amount of homework, design more valuable assignments, and avoid homework entirely during breaks and holidays [24].

According to the researcher's point of view in the current study, the negative effects of homework may vary according to the way it is presented. The negative effects of traditional homework (paper-and-pencil-based) can be addressed with online homework. Therefore, the assignment of traditional homework and online homework should be varied according to the learning outcomes targeted in each math lesson. Conceptual aspects can be measured with online homework, and skill aspects can be measured by traditional homework.

2.1.5. Attributes of productive online homework

The mathematics teacher should ask himself a set of questions to ensure that the homework represents a productive learning experience for the student; *first question:* Is homework all about learning? The homework should be related to the lesson's behavioral objectives or standards. Homework shouldn't be just about spending time. *Second question:* Is homework necessary? Homework must be necessary for students to take time from their home lives to complete the assignment. *Third question:* Is the homework of high quality? Word searches and crossword puzzles, for example, are not good tasks instead of other activities or family time. *Fourth question:* What is the students' readiness to do the assignment? Homework is more productive when students work independently. *Fifth question:* Were students involved in determining the quality of homework? The more students participate in assigning tasks, the more productive and useful the assignments will be [25].

In this regard, five characteristics that a productive homework should have, *first:* that the homework has a clear academic purpose, such as: to practice, check understanding, apply knowledge, or master a mathematical skill, *second:* to achieve student learning efficiency, *third:* It should consider the differentiation among students. *Fourth:* The feasibility of implementation? Fifth: It should be attractive, cheerful, and interesting for students. In the sense that the mathematics teacher presents it to the students in an interesting way, such as making it in the form of quizzes or puzzles [26].

Accordingly, if the availability of all the previous features in mathematics homework in general is necessary, then homework through virtual educational platforms should be characterized by a set of advantages over these features, including determining the time to do homework available, using some software that makes it easier for students to write Math symbols, functions and drawing of geometric shapes.

2.2. Virtual educational platform

E-learning developments have made the educational process an interactive process in continuous development, and new educational terms have spread, including the education platform. There is a lot of idiomatic disagreement, according to [27] about how to name software systems that facilitate or support e-learning, and as a result, there are many names for these systems, such as: Learning Management System (LMS), Environment Virtual Learning Environment (VLE,...and some treat these terms as synonyms. There is a conflict in how the terms Virtual Learning Environment (VLE) and Management of Learning Environment (MLE) are used [28].

2.2.1. Virtual educational platform definition

Due to the wide and rapid spread of the use of the Internet, it led to the emergence of educational terms in new educational formats, such as educational platforms. The emergence of the Internet and the institutionalization of e-learning, educational platforms were established on the Internet; To manage and document the user, it also came to provide a single and consistent user interface for all aspects of the course. Several studies have emphasized the importance of using virtual learning platforms in completing the interaction between teacher and students [28]–[31].

2.2.2. Types of virtual platforms

Figure 2 shows the most important virtual educational platforms that have been used in the field of education in general. The current study adopts the Madrasati platform as a special case of the educational platforms.

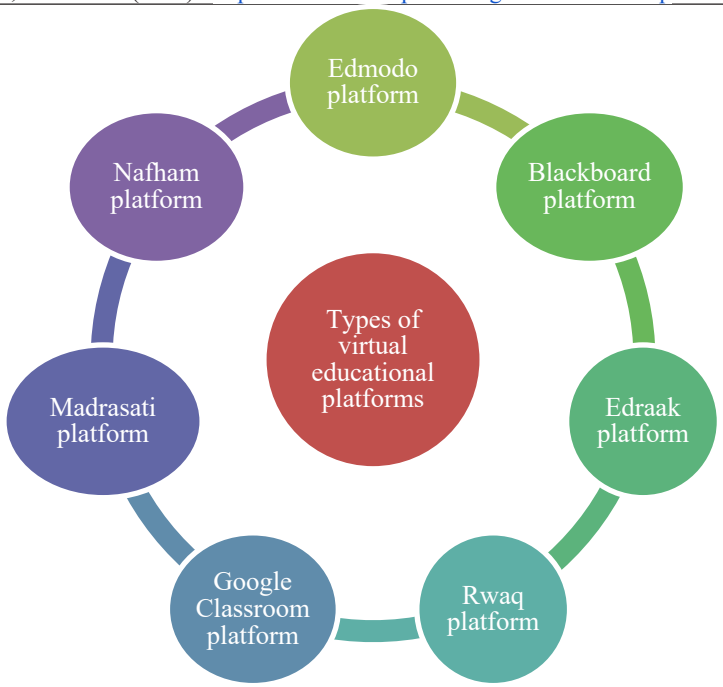

Fig. 2: Types of virtual educational platforms

Madrasati platform: It is the educational platform adopted by the Saudi Ministry of Education for distance education for the stages of general education, and it is known as the unified education system or the virtual school, and it is characterized by its simulation of the educational reality and the real school day. The Ministry of Education facilitated the login of the Madrasati platform through the Microsoft Office account Through an account on the Noor system, as well as on mobile phones through the Tawakkalna application. The Madrasati platform includes distinctive and attractive e-learning content for students, and provides educational videos, assignments, and tests for students. The Madrasati platform for distance education also includes many channels of communication with students, teachers, and parents [32].

Madrasati platform can be accessed through the website from any internet browser, or through a software application that can be downloaded to smart devices under the name "Madrasati", so that the teacher controls it by creating the virtual class, and it is possible to publish and submit the math homework to students so that students can access it Members can send and receive text messages, files, and links, participate in the homework discussion through chat, and deliver homework to the teacher at the time and date he sets, and the teacher follows up on his students and provides them with the appropriate feedback. Madrasati platform is also linked to Microsoft Teams to manage the virtual class on time according to the academic schedule announced to the students on the platform[32].

2.2.3. Advantages of virtual educational platform in mathematics education

Using educational platforms to follow up homework is raising the perceived self-efficacy and mathematics achievement for third-grade students in the middle school in Mecca, Saudi Arabia. The researcher relied on the educational platform Edmodo. The results of the study resulted in the presence of effective effect of educational platforms in raising the level of perceived self-efficacy and academic achievement in mathematics [18].

Online homework system was created for use by students while studying the calculus course. This system is designed with the specific intent of supporting student participation outside the classroom by repeating the chain of events that often occur in the teacher's presence. Evidence has been provided that this goal has been achieved, which has led to an improvement in students' overall performance. Furthermore, students' responses to the survey indicate a high level of satisfaction with the system within the classroom, and regarding the usefulness of online homework in helping students understand calculus concepts. Assignments were created online using course management software, which was already used at the campus level, so no additional hardware or software resources were required [33].

As for [6], it emphasized the need to use homework through online learning platforms, taking into account individual differences in achievement by distributing assignments in terms of ease and difficulty, and using a reasonable amount of homework so as not to burden students, coordination between teachers Other subjects when assigning homework to

students, and studying other variables such as parents' academic level and teachers' strategies for preparing homework.

Using MOODLE platform in teaching engineering to master's students, as the results showed that the students were more interactive in learning through the virtual learning environment (VLE) where they participate emotionally, socially, and cognitively. Among the various activities and resources in Moodle such as the VLE, the test has emerged with vigor and effective videos as a favorite resource for students of all types - fast and show learners. Personal computing device, Internet connectivity, teachers' proficiency in using ICT tools, and maximizing teacher presence in support of learning were found to be major challenges in the use of VLE [34].

Virtual educational platforms as a tool for academic advising to help students in math class. Using educational platforms as a resource for the subject of mathematics is not only a technological tool for educators but also provides students with an opportunity to view the subject as an academic challenge to overcome [35]. The effectiveness of using the flipped classroom strategy through the virtual platform Plataforma de Apoyo a la Docencia (PLAD) in teaching mathematics to students in the teacher preparation program [36]. While [37] used several different digital platforms (Zoom, Moodle, and WhatsApp) to teach mathematics to (31) postgraduate students in South Africa in the era of the COVID-19 pandemic. The results of the study indicate that before using digital platforms to learn mathematics, it is important to encourage students to practice and participate collaboratively within digital platforms.

The flipped classroom strategy via the Madrasati platform in developing the mathematical achievement of fifth grade students at the levels (knowledge, application, inference, as a whole) [38]. The extensive integration of the EDUKA virtual learning platform into formal education - especially in the subject of mathematics - had a significant impact on the mathematics performance of primary school children. In addition, after the experiment, he found statistically significant differences ($P < 0.05$) in primary school children with higher levels. Intervention in the experimental group (that is, integrating the virtual learning platform into the formal math learning process) had a positive effect on access to mathematics. Students' achievements in learning mathematics were positive in progressive mathematics [39].

The educational platform "Madrasati" has a positive role in developing the trends towards distance learning among secondary school students from the point of view of their teachers, and there are many factors affecting those attitudes. From the point of view of their teachers, the most important of them is the unique interface of the platform, and the various educational resources it provides [40].

In general, the advantages of virtual educational platforms can be summarized as follows:

- Flexibility as it transcends the limits of time and place.
- Provides the possibility of learning multiple fields and learning in different ways in communicating information.
- The electronic platforms contain several languages, and there are some of them in Arabic, English and others.
- Ease of creating an electronic educational platform through which useful and useful contents are presented.
- Saving time and effort.
- Availability, publication and sharing of electronic content.
- Increase opportunities for discussion and interaction between students and teachers and between students and each other.
- Encouraging creativity by sharing opinions and ideas.

2.2.4. Mathematics teachers and virtual platform management

The teachers need continuous professional development with regard to increasing their knowledge of electronic educational platforms from a technical and pedagogical point of view, but this support and training is not available when needed in schools, while in universities it is always available, and the results also showed that there are obstacles facing teachers in their practice the educational process through electronic educational platforms, and the results showed a positive role for the use of electronic educational platforms in increasing student participation, exchanging information, and increasing their motivation towards learning [41].

The ways in which Chilean teachers integrate Khan Academy into their lessons, and how this use influences teaching and learning. After looking at and experimenting with the resources for several months, principals in the elementary teaching community and their teachers found that Khan Academy was helpful in improving procedural skills, but not necessarily in promoting deeper learning of mathematics or teaching difficult concepts; Teachers and face-to-face education are still the best at it. The expectation that students from these lower-income families will have home computers and Internet access also means that it is unrealistic to allocate Khan Academy to home use [42]. Reality of teachers' use of the Madrasati platform at the secondary level was high, and teachers believe that the most obstacles that

may limit their use of the Madrasati platform came in the following order: the lack of equipped laboratories inside schools to work on the platform, and the limited availability. High-speed internet, some technical failures on the platform, and insufficient technical support [43].

Using tools of Madrasati platform among mathematics teachers in the primary stage in Riyadh acquiring primary school teachers specializing in mathematics the skill of using the tools of Madrasati platform Among the study's recommendations is the interest in training intermediate and secondary female teachers on the training package, providing technological support for the teachers and providing them with all the necessary requirements for use with the Madrasati tools, contributing to intensive training on the lesser indicators in the axes covered in the study, and trying to conduct other similar studies applied on other educational platforms [1]. Teachers are implementing the mathematics curriculum during the COVID-19 pandemic using different teaching strategies and learning resources, in addition to their own contexts. There is a relationship between the level of technical knowledge of teachers, years of experience and the types of teaching strategies they use. Similarly, differences were found between educators in rural and urban areas according to the use of teaching strategies and the types of educational resources used [44].

Most widely available criteria used in evaluating physics at the secondary level is the e-portfolio with a high degree of agreement. Developing electronic assessment tools in online educational platforms for more safety, avoiding cheating, as well as training teachers to use them, and providing appropriate support to students [2].

2.2.5. Mathematics homework assignment through virtual platforms

Reinforcement and follow-up of students in completing homework and increasing their motivation to actively participate in classroom discussions is important for mathematics teachers. Web-based homework management systems provide alternatives to traditional pen-and-paper based approaches. Additionally, these tools facilitate the creation of a student-centered environment that allows teachers to assign homework based on students' needs using a variety of multimedia that can include animation, video, and/or audio to enhance student learning and Facilitate communication between teacher and student. These systems provide flexible learning tools that not only provide instant feedback to students, but also track student performance. The purpose of using these programs is to enhance students' understanding and learning of different mathematical concepts [45].

There are many interactive virtual platforms for teaching and learning mathematics. Figure 3 shows the most important virtual educational platforms that studies have proven to be effective in managing mathematics homework.

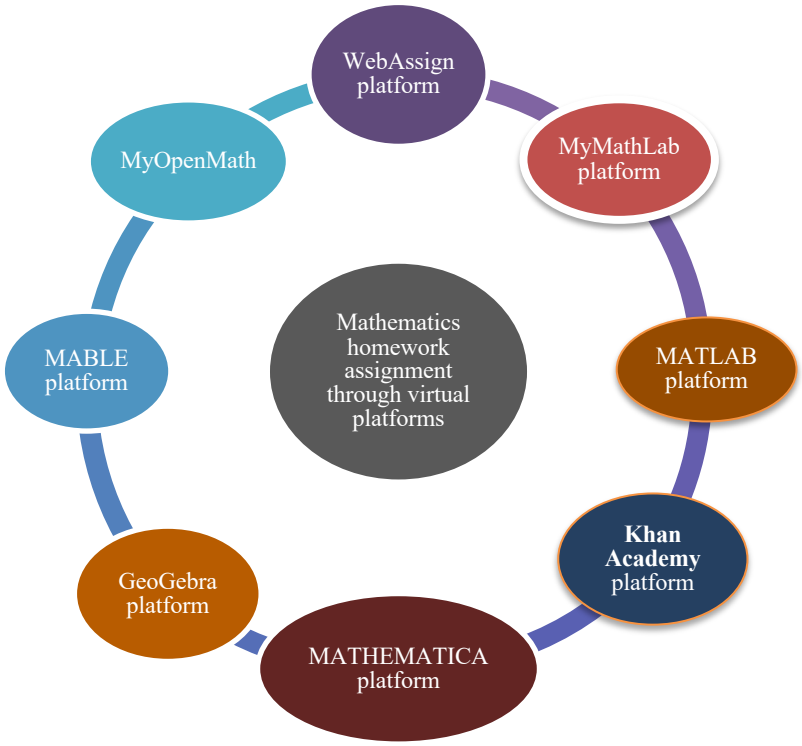

Fig. 3: Virtual platforms in mathematics

MyMathLab and WebAssign helped develop students' habits of using this software and their perception of the optimal number of attempts that should be allowed to complete homework assignments [45].

With regard to the GeoGebra program, many studies have indicated its effectiveness in managing mathematics homework, developing students' visual-spatial perception, and increasing motivation towards completing mathematics assignments [16], [46]–[48].

According to the study of Su et al. (2022) The use of virtual platforms such as: "ClassVR," "VRMath," and "GeoGebra" has a strong impact in teaching shapes and figures in engineering mathematics on students' acceptance of technology, learning motivation, learning performance and a clearer understanding of new topics [49].

Many studies have confirmed the importance of using MATLAB software in activating homework in mathematics, increasing the time spent in students' interaction with mathematics and increasing their motivation towards learning [17], [50]–[52].

Studies revealed the effectiveness of using MATHEMATICA software in gaining students a deeper understanding through their own efforts. In addition, it was understood that neither students nor teachers had any difficulty using the computer-aided mathematics education materials developed in Mathematica [53]–[55].

Xu (2016) has shown that Maple software can be used in the teaching and learning of mathematics in high school. The program can impart complex mathematics concepts using interactive models and engage in 2D and 3D visualizations, making challenging topics relevant to life and interesting. Maple is an advanced mathematical software with powerful token discounting, numerical computation, and graphical display capabilities. It is very suitable for teaching high school math class. In his study, Newton's iterative method for solving single-variable nonlinear equations was taken as an example to demonstrate how to introduce math concepts, derive formulas, teach visually, and explore in depth with Maple in a high school math class. The effect of teaching was assessed by comparing the innovative Maple-aid teaching method with the traditional multimedia teaching method. It was found that the innovative method achieved a better educational effect [56]. The study of Wu & Li (2018) confirmed the use of project-based learning using Maple software in developing mathematical thinking and linking mathematical knowledge with technological skills [57].

MyOpenMath platform is an open-source learning management system (LMS) that was developed by David Lipman intended for math classes, Sarmiento & Prudente (2019) used the features of MyOpenMath can handle the limitations of traditional homework. It includes a suite of online homework that manages algorithmically generated homework questions for each student, provides instant feedback, and gives students unlimited attempts to solve the problem correctly as a result. The MyOpenMath program had a significant impact in preventing students from copying solutions, and had a significant impact in making a significant improvement in increasing students' positive participation in solving math homework [13].

3. Research Method

3.1. Methodology

The current study used a mixed methodology. To answer the outlined research questions, phase one focused on quantitative data collection and analysis from (closed answer questionnaire tool responses), while phase two focused on qualitative data collection and analysis from (open answer questionnaire tool responses). Creswell (2014) defined mixed methods as methods which "involve combining or integration of qualitative and quantitative research and data in a research study. Qualitative data tends to be open-ended without predetermined responses. While quantitative data usually includes closed-ended responses, such as those found on questionnaires or psychological instruments" [58]. Figure 4 illustrates the study methodology design.

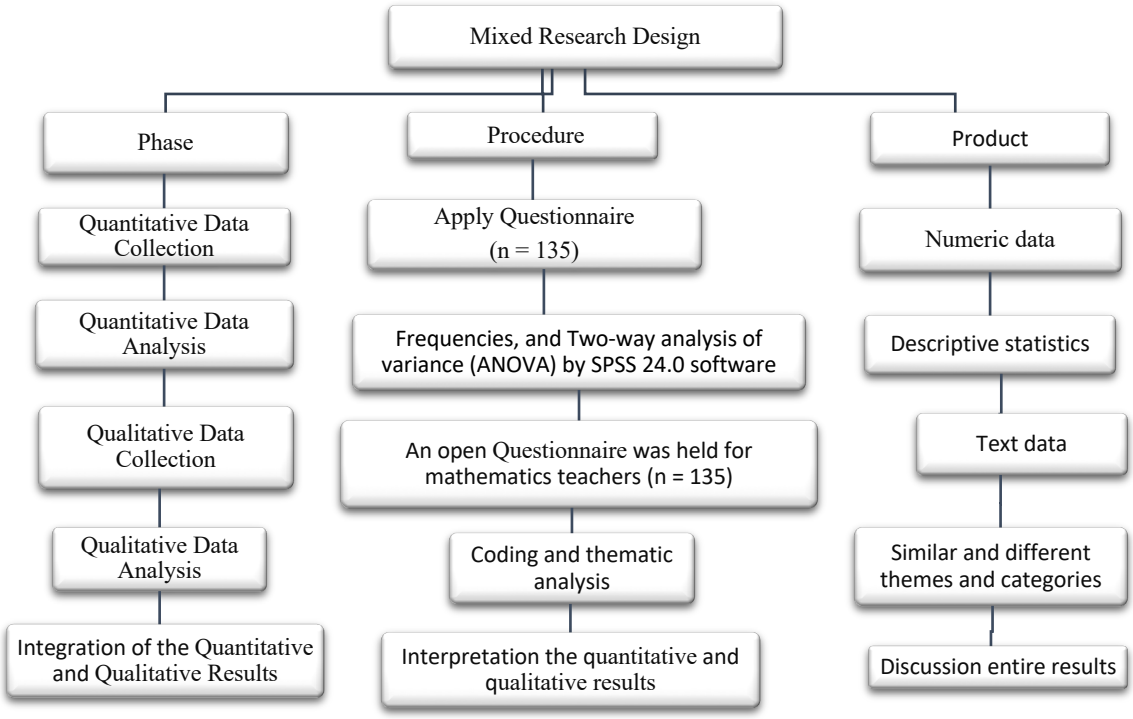

Fig. 4: Mixed study design

3.2. Participants

The study participants (135) were randomly selected among the mathematics teachers in general education stages (Elementary, Middle, and High) in the Department of Education in the governorates of Wadi Al-Dawasir and Al-Silil in the first semester of academic year 2021/2022 AD. Table 1 shows the demographic distribution of the study sample.

Table 1: Demographic distribution of the Participants

School Stage	Gender				Total
	Male		Female		
	Code	F	Code	F	
Elementary School	T8, T9, T10, T14, T16, T19, T20, T21, T22, T23, T27, T28, T29, T32, T34, T36, T38, T42, T46, T51, T52, T54, T55, T57, T58, T59, T66, T115, T116, T117, T124	31	T1, T2, T62, T65, T68, T69, T70, T72, T74, T78, T79, T81, T82, T83, T84, T85, T86, T87, T89, T90, T91, T92, T93, T94, T95, T96, T97, T98, T99, T101, T103, T105, T106, T109, T110, T111, T114, T118, T121, T123	40	71
Middle School	T5, T6, T12, T15, T17, T26, T33, T35, T39, T43, T45, T48, T49, T50, T56, T88, T125, T128, T132	19	T60, T61, T63, T67, T75, T76, T77, T80, T100, T102, T104, T107, T108, T113, T119, T120, T122, T129, T130	19	38
High School	T3, T4, T7, T11, T13, T18, T24, T25, T30, T31, T37, T40, T41, T44, T47, T53, T126, T127, T133, T134, T135	21	T64, T71, T73, T112, T131	5	26
Total		71		64	135

Note. T1: Mathematics teacher who is the first participant in the questionnaire (via Google Forms)

As seen in table 1, 71 male and 64 female mathematics teachers participated in the study. 71 of the teachers are in elementary school, 38 of them teach in middle school, and 26 of them teach in high school.

3.3. Data Collection Tools

3.3.1.Questionnaire

The objective of the questionnaire: This questionnaire aimed to collect quantitative and qualitative data about mathematics teachers' beliefs about managing homework via the Internet, and to identify the difficulties they faced during the Corona period, in addition to collecting teachers' suggestions about developing educational platforms (Madrasati platform).

Validity and reliability of the questionnaire is to ensure the statistical efficiency of the questionnaire, the following steps were followed: Questionnaire was presented in its initial form to (5) specialists in mathematics education and educational technology to ensure the validity of its vocabulary, and the questionnaire was modified considering the specialists' modifications. Then the questionnaire was applied to an exploratory sample consisting of (32) mathematics teachers to calculate the reliability of the questionnaire, based on the responses (Cronbach's alpha coefficient = 0.954). This reassured us to use the questionnaire as a tool for gathering data and trusting the results of its application.

The questionnaire in its final form: The questionnaire in its final form consists of 22 items (20 closed items, and 2 open items).

4. Results

4.1. Quantitative results related to the questionnaire

Q1: What are the mathematics teachers' perceptions about the importance of homework management through Madrasati platform?

To answer the first question, five-point Likert questionnaire data was used (Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5). Mean and Standard Deviation (SD) were calculated as shown in Table 2.

Table 2: Descriptive Statistics of mathematics teachers' perceptions about the importance of homework management through Madrasati platform (N= 135)

Rank		Strongly Disagree		Disagree	Neutral	Agree	Strongly Agree	Mean	SD
1	I find that math homework management through Madrasati platform is more flexible than traditional (pen and paper) homework.	N	4	12	12	57	50	4.01	1.044
		%	3%	9%	9%	42%	37%		
9	I find that math homework management through Madrasati platform measures students' mastery of mathematical knowledge.	N	14	44	22	43	12	2.96	1.193
		%	10%	33%	16%	32%	9%		
7	I see that math homework through Madrasati platform eases the load of responsibility on parents.	N	5	39	19	52	20	3.32	1.150
		%	4%	29%	14%	39%	15%		
10	I see that math homework through Madrasati platform contributes to reducing the chances of sharing solutions between students.	N	11	42	33	41	8	2.95	1.088
		%	8%	31%	24%	30%	6%		
2	I find that math homework through Madrasati platform encourages students to complete tasks on time.	N	6	17	11	69	32	3.77	1.085
		%	4%	13%	8%	51%	24%		
6	I find that math homework through Madrasati platform increases students' class participation.	N	5	29	15	71	15	3.46	1.063
		%	4%	21%	11%	53%	11%		
3	I find that homework through Madrasati platform develops higher-order thinking skills in mathematics.	N	6	19	27	54	29	3.60	1.108
		%	4%	14%	20%	40%	21%		
4	Homework through Madrasati platform develops students' responsibility in learning mathematics.	N	6	18	21	65	25	3.63	1.070
		%	4%	13%	16%	48%	19%		
5	I see that assigning homework through Madrasati platform is commensurate with the nature of mathematics.	N	6	18	30	60	21	3.53	1.050
		%	4%	13%	22%	44%	16%		
8	I see the diversity of mathematics	N	9	36	46	28	16	3.04	1.105

	homework through Madrasati platform indicative of the teacher's competence.	%	7%	27%	34%	21%	12%	aasd	asf
Weighted Mean								3.4281	
Std. Deviation								0.77283	

Note. SD: Standard deviation

Table 2 illustrates that there is agreement between math teachers about the importance of homework through Madrasati platform (Weighted Mean = 3.43/5, SD = 0.773): The item "I find that math homework through Madrasati platform is more flexible than traditional (pen and paper) homework" has the first rank of importance (Mean = 4.01, SD = 1.044), the item "Math homework through Madrasati platform encourages students to complete tasks on time" has the second rank of importance (Mean = 3.77, SD = 1.085), the item "Homework through Madrasati platform develops higher-order thinking skills in mathematics" has the third rank of importance (Mean = 3.60, SD = 1.108), whereas the item "I see that math homework through Madrasati platform contributes to reducing the chances of sharing solutions between students" has the last rank of importance (Mean = 2.95, SD = 1.088).

Q2: How do mathematics teachers activate online homework through Madrasati platform during the Corona pandemic?

To answer the second question, three-point Likert questionnaire data was used (Rarely = 1, Sometimes = 2, Always = 3). Mean and Standard Deviation (SD) were calculated as shown in Table3.

Table 3: Descriptive Statistics of mathematics teachers' activation of online homework through Madrasati platform during the Corona pandemic (N= 135)

Rank	Item		Rarely	Sometimes	Always	Mean	SD
6	I design online homework for math lessons through Madrasati platform daily.	N	14	62	59	2.33	0.658
		%	10%	46%	44%		
2	I put announcements about homework for math lessons through the Madrasati platform.	N	4	33	98	2.70	0.522
		%	3%	24%	73%		
5	I find it easy to prepare daily homework for math lessons through Madrasati platform.	N	9	48	78	2.51	0.621
		%	7%	36%	58%		
10	Most of the students finish their daily math homework through Madrasati platform on time.	N	24	88	23	1.99	0.592
		%	18%	65%	17%		
1	I follow up on students' performance of daily mathematics homework through Madrasati platform.	N	4	29	102	2.73	0.510
		%	3%	21%	76%		
4	I promote outstanding students in solving homework for mathematics lessons through Madrasati platform.	N	9	34	92	2.61	0.611
		%	7%	25%	68%		
3	I assign a grade to the student for each daily math homework through Madrasati platform.	N	8	31	96	2.65	0.590
		%	6%	23%	71%		
8	I communicate with parents periodically about their children's progress in homework through Madrasati platform.	N	36	52	47	2.08	0.783
		%	27%	39%	35%		
7	I provide feedback in the class about students' solutions to daily homework assignments in mathematics through Madrasati platform.	N	19	60	56	2.27	0.696
		%	14%	44%	41%		
9	I present a periodic report to the school principal about students who do not interact in daily homework in mathematics through Madrasati platform.	N	41	47	47	2.04	0.809
		%	30%	35%	35%		
Weighted Mean						2.3926/3	
Std. Deviation						0.36254	

Table 3 illustrates that there is agreement between math teachers about the activation of online homework through Madrasati platform during the Corona pandemic (Weighted Mean = 2.39/3, SD = 0.363): The item "I follow up on students' performance of daily mathematics homework through Madrasati platform" has the first rank of activation (Mean = 2.73, SD = 0.510), the item "I put announcements about homework for math lessons through the Madrasati platform" has the second rank of activation (Mean = 2.70, SD = 0.522), the item "I assign a grade to the student for each daily math homework through Madrasati platform" has the third rank of activation (Mean = 2.65, SD = 0.590),

whereas the item "Most of the students finish their daily math homework through Madrasati platform on time" has the last rank of activation (Mean = 1.99, SD = 0.592).

Q3: To what extent does the activation of mathematics teachers for online homework through the Madrasati platform during the Corona pandemic differ according to the gender/ school stage variables?

To answer the third question, Two-way analysis of variance (ANOVA) was calculated to exploring possible interaction between factors, as shown in Table 4, Table 5, and Figure 5.

Table 4: Descriptive Statistics of dependent variable: Math teachers' activation of online homework through the Madrasati platform

Gender	School Stage	Mean	Std. Deviation	N
Male	Elementary Stage	2.2774	0.40964	31
	Middle Stage	2.2789	0.32245	19
	High Stage	2.2667	0.43512	21
	Total	2.2746	0.39087	71
Female	Elementary Stage	2.5725	0.24806	40
	Middle Stage	2.5000	0.28868	19
	High Stage	2.2200	0.30332	5
	Total	2.5234	0.27703	64
Total	Elementary Stage	2.4437	0.35766	71
	Middle Stage	2.3895	0.32198	38
	High Stage	2.2577	0.40809	26
	Total	2.3926	0.36254	135

Table 5: Tests of Between-Subjects Effects of dependent variable: Math teachers' activation of online homework through the Madrasati platform

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.652[a]	5	.530	4.574	0.001	0.151
Intercept	485.805	1	485.805	4189.043	0.000	0.970
Gender	0.537	1	0.537	4.634	0.033	0.035
School Stage	0.433	2	0.216	1.866	0.159	0.028
Gender * School Stage	0.384	2	0.192	1.654	0.195	0.025
Error	14.960	129	0.116			
Total	790.420	135				
Corrected Total	17.613	134				
a. R Squared = 0.151 (Adjusted R Squared = 0.118)						

Table 5 indicates that there is no statistically significant interaction between the two independent variables (gender and school stage), as the value of (F =1.654, p = 0.195). Which makes the researcher to accept the null hypothesis Ho1: There are no statistically significant differences at the level of $\alpha \leq 0.05$ between the averages of mathematics teachers' activation of homework through the Madrasati platform due to the effect of the interaction between levels of gender (male/female) and school stage (Elementary/ Middle/ High).

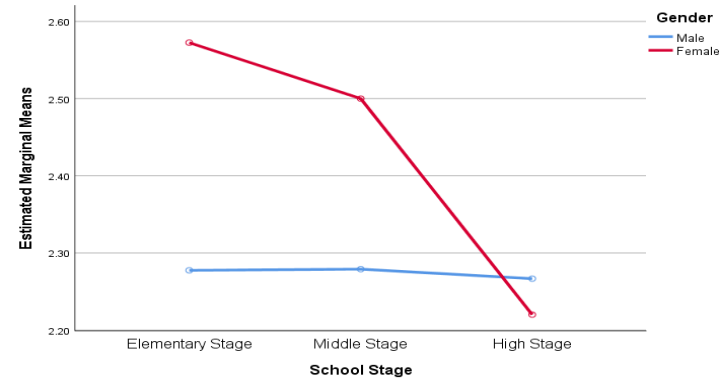

Fig. 5: Estimated marginal means of math teachers' activation of online homework through Madrasati platform

Figure 5 shows that there is an interaction between gender and the school stage, but Table 3 indicates that this interaction is not statistically significant, as it is noted that females outperform males in activating online math homework through Madrasati platform in the elementary and middle stages, while males outperform females in the high stage.

Since the interaction between the two independent variables (gender and school level) is not statistically significant, we look at the main effect for gender variable, and school stage variable separately. Accordingly, it is concluded that there are statistically significant differences between males and females in favor of females (F = 4.634, p = 0.033). Table 4 indicates that females (Mean = 2.52, SD = 0.277), and males (Mean = 2.27, SD = 0.391). Therefore, the null hypothesis (H_o2: There are no statistically significant differences at the level of $\alpha \leq 0.05$ between the averages of mathematics teachers' activation of homework through the Madrasati platform according to the gender variable (male/female)) is rejected.

Table 5 indicates that the main effect of the school stage variable (Elementary / Middle / High). We conclude that there are not statistically significant differences between elementary, middle, and high stage (F =1.866, p = 0.159). Table 4 indicates that elementary stage (Mean = 2.44, SD =0.357), middle stage (Mean = 2.38, SD = 0.322), and high stage (Mean = 2.26, SD = 0.408). Therefore, the null hypothesis (H_o3: There are no statistically significant differences at the level of $\alpha \leq 0.05$ between the averages of mathematics teachers' activation of homework through the Madrasati platform according to the school stage variable (Elementary/ Middle / High) is accepted.

4.2. Qualitative results related to the open questionnaire.

Q4: What are the mathematics teachers' perceptions about the obstacles of online homework management through Madrasati platform?

To answer this question, an open questionnaire was used. After collecting data, the data is divided into themes, and each theme includes a subset of categories. Emphasis was placed on data related to the topic of the research, which explain some of the results and increase the depth of the study [59].

After analyzing the responses of mathematics teachers participating in the open questionnaire, they were encoded according to five basic themes, the results were as follows:

4.2.1. Data coding

T1, T2, T3, …T135: Mathematics teacher in general education schools (elementary - middle - high).

Theme1: Obstacles related to e-learning infrastructure.

Theme2: Obstacles related to the virtual educational platform.

Theme3: Obstacles related to parents.

Theme4: Obstacles related to students.

Theme5: Obstacles related to mathematics teachers.

Table 6: Mathematics teachers' perceptions about the obstacles related to managing homework through Madrasati platform.

Themes	Sub-themes	F	%
Obstacles related to e-learning infrastructure	1.1. The Internet web does not cover all residential areas	25	19%
	1.2. There is no electronic math lab in the school	11	8%
	1.3. Low specifications of electronic devices used by low-income students.	5	4%
	1.4. The high cost of Internet services.	14	10%
	1.5. Sometimes power outages	4	3%
Obstacles related to the virtual educational platform	2.1. The presence of a unified pattern of questions on the platform from which to choose, which are objective questions (true and false - multiple choice - ...); This causes the student to choose the solution at random.	12	9%
	2.2. Difficulty assigning some math homework that includes certain mathematical symbols, equations, and geometric shapes.	8	6%
	2.3. The wording of the assignment questions on the default platform is inaccurate, and there are some errors in the sample answers.	5	4%
	2.4. Technical problems of the platform and its lack of continuous development.	3	2%
	2.5. Having uniform times and periods for all students of one stage to enter the platform, which causes severe pressure on the platform and the absence of assignments	7	5%

	for many students.		
	2.6. The standardized questions on the platform do not fit the nature of the differentiation between the categories of students	2	1%
	2.7. There are errors in the answers of some students because of the lack of clarity in the graphics included in the questions.	6	4%
	2.8. As for sending the assignment as a document or photo, the student is only allowed one photo, which forces the student to send the completion of the assignment by mail.	1	1%
Obstacles related to parents	3.1. Parents' involvement in solving the homework completely instead of the student.	27	20%
	3.2. Lack of attention and follow-up from parents while their children do homework.	18	13%
	3.3. Low educational level of some parents.	13	10%
	3.4. Having family disorders that do not provide a home environment that helps the student complete homework through the virtual platform.	5	4%
Obstacles related to students	4.1. Low level of computer skills among many students.	7	5%
	4.2. Many students rely on exchanging homework solutions through social media or obtaining ready-made solutions for assignments from some websites.	9	7%
	4.3. Some students were not keen to follow up on the homework of the platform and did not take responsibility.	12	9%
	4.4. Weak student motivation towards interacting with electronic homework.	6	4%
	4.5. Some students were unable to complete the assignments on time due to the study load and the large number of assignments in subjects other than mathematics.	9	7%
	4.6. The student does not enter the platform because of some problems he is facing, such as forgetting the password or username.	2	1%
	4.7. Some students are preoccupied with other occupations after the school day, which negatively affects their interaction with homework through the virtual platform.	3	2%
	Classes with many students do not allow to follow up on assignments well.	5	4%
Obstacles related to mathematics teachers	5.1. The teacher's lack of familiarity with active e-learning strategies, especially distance learning skills.	12	9%
	5.2. Some teachers are not specialized in mathematics	2	1%
	5.3. The teacher's weakness in mathematics.	3	2%
	5.4. The teacher's lack of interest in giving students assignments, to reduce the effort to follow up and correct them.	3	2%
	5.5. The large number of teaching loads hinders the teacher in activating electronic duties.	2	1%
	5.6. The teacher was late in providing immediate feedback to the students about homework solutions through the virtual platform.	7	5%
	5.7. Excessive homework in other subjects, which affects the student, he cannot solve all of them in the time available.	7	5%

Note. F: Frequency of response

As seen in table 6, mathematics teachers' perceptions about the obstacles of homework management through Madrasati platform were grouped under five themes: Obstacles related to e-learning infrastructure, obstacles related to the virtual educational platform, obstacles related to parents of students, obstacles related to students, and obstacles related to mathematics teachers.

With some brevity it is concluded that the highest obstacles related to e-learning infrastructure were "the Internet web does not cover all residential areas" with f (25) and "high cost of Internet services" with f (14). Regarding obstacles related to the virtual educational platform "Having uniform times and periods for all students of one stage to enter the platform, which causes severe pressure on the platform and the absence of assignments for many students" with f (7), "There are errors in the answers of some students because of the lack of clarity in the graphics included in the questions." with f (6). Regarding obstacles related to parents "Parents' involvement in solving the homework completely instead of the student" with f (27), "Lack of attention and follow-up from parents while their children do homework" with f (18). Regarding obstacles related to students "Some students were not keen to follow up on the homework of the platform and did not take responsibility" with f (12), "Many students rely on exchanging homework solutions through social media or obtaining ready-made solutions for assignments from some websites" and "Some students were unable to complete the assignments on time due to the study load and the large number of assignments in subjects other than mathematics" with f (9). Regarding obstacles related to teachers "The teacher's lack of familiarity with active e-learning strategies, especially distance learning skills" with f (12), and "The teacher was late in providing immediate feedback to the students about homework solutions through the virtual platform" and "Excessive homework

in other subjects, which affects the student, he cannot solve all of them in the time available" with f (7).

Q5: What are the mathematics teachers' perceptions about proposals to improve online homework management through Madrasati platform?

To answer this question, the perceptions of mathematics teachers in the open questionnaire was analyzed. It was encoded according to five basic themes; the results were as follows:

Data coding

T1, T2, T3, …T135: Mathematics teacher in general education schools (elementary - middle - high).

Theme1: Proposals related to the Madrasati platform.

Theme2: Proposals related to turning homework into class activities.

Theme3: Proposals related to parents.

Theme4: Proposals related to students.

Theme5: Proposals related to mathematics teachers.

Table 7: Mathematics teachers' perceptions about proposals to improve homework management through virtual educational platforms.

Themes	Sub-themes	F	%
Proposals related to the Madrasati platform	1.1. I suggest that Madrasati platform should be developed in line with the nature of mathematics, by including some tools or software that enable the teacher to write symbols or draw geometric shapes and allow the student to solve the assignment easily.	5	4%
	1.2. I suggest that homework through the Madrasati platform should be done once at the end of each unit of study, and that the homework of daily lessons is done on paper and pen.	8	6%
	1.3. I suggest activating successive messages and notifications to alert the student before the deadline for the assignment has expired.	4	3%
	1.4. I suggest that the assignments in the Madrasati platform be in the form of individual and group projects related to the student's daily life, to develop inquiry and thinking and consider the differentiation among students.	10	7%
	1.5. Madrasati platform should be including question banks of various levels and content, so that it is easy for the teacher to activate and choose from among them according to the level of his students.	7	5%
	1.6. It is preferable that the homework in the Madrasati platform is variable and outside the textbook; So, it is not allowed to transfer answers from sites or platforms dedicated to it	3	2%
	1.7. I suggest that homework be activated through the Madrasati platform in the form of individual and group competitions among students.	2	1%
	1.8. Allow students to do assignments in writing and submit files instead of directly on the platform; So that students can easily clarify the steps of the solution.	3	2%
	1.9. Allocate a virtual class to follow the student's homework solution, and the camera is activated whenever possible.	3	2%
	1.10. I suggest that the student is allowed to submit more than one document through a link in the virtual platform.	1	1%
Proposals related to turning homework to class activities	2.1. To ensure credibility in solving homework, time is devoted to solving assignments within the daily school program in the math lab and leaving home for the student's special hobbies and communication with family and friends; This, in turn, has a significant impact on building the student's emotional and skillful personality, and building the cognitive aspect in the school.	2	1%
	2.2. I suggest that the assignments be class activities within the class, and that the class time is increased; So that the teacher can follow the interaction of the students during the solution.	9	7%
	2.3. I suggest that you can divide the lesson into two parts, the first part to explain the lesson, and the second part to solve the homework under the supervision and direction of the teacher.	1	1%
	2.4. I suggest that the assignment be two or three times per week (or unit of study)	5	4%

	through which students' proficiency is measured and a participation score is assigned to it.		
	2.5. I suggest that homework be a combination of objective questions through my homework link via the virtual platform, and essay questions through class activities from the student's book. This helps to measure the student's familiarity with the learning aspects of the mathematics lesson (concepts - generalizations - skills).	5	4%
Proposals related to parents	3.1. Parents should be educated about the importance of students relying on themselves in solving homework, whether solving textbook assignments, or solving Madrasati platform homework.	7	5%
	3.2. Establishing training programs for parents to educate them about the techniques of following up their children in solving homework through the virtual platform.	4	3%
	3.3. The parent should submit a weekly report to the school administration on the follow-up of his child while solving homework through the virtual platform.	3	2%
Proposals related to students	4.1. I suggest discussing homework solutions with students; In order to ensure that the student has accomplished it based on his own activity.	2	1%
	4.2. Conducting awareness programs for students to enhance the concept of student self-reliance and taking responsibility in solving homework and tasks assigned to him.	5	4%
	4.3. Establishing training programs for students on homework solving techniques through the Madrasati platform.	9	7%
	4.4. I suggest that homework be brief; In order not to cause an excessive cognitive burden on the student.	7	5%
Proposals related to mathematics teachers	5.1. The math teacher should provide immediate feedback through the Madrasati platform for each homework, to correct alternative perceptions.	5	4%
	5.2. The teacher should urge the student and encourage him to enter the virtual platform, enhance his learning, and praise the one who solved the assignment, regardless of whether his solution was right or wrong.	3	2%
	5.3. The student can be provided with a clear weekly map that includes activities, tasks, and homework; So that the student can follow up on matters by himself in case he is unable to attend, such as absence, network interruption, or device failure.	3	2%
	5.4. Implementation training programs for mathematics teachers on the skills necessary to activate homework through Madrasati platform.	5	4%
	5.5. Implementation training programs for mathematics teachers on the practice of active e-learning.	2	1%

turn in table 7, mathematics teachers' perceptions about proposals to improve homework management through Madrasati platform were grouped under five themes: Proposals related to the Madrasati platform, proposals related to turning homework to class activities, proposals related to parents of students, proposals related to students, and proposals related to mathematics teachers.

The results concluded that the highest proposals related to the Madrasati platform is "I suggest that the assignments in the Madrasati platform should be in the form of individual and group projects related to the student's daily life, to develop inquiry and thinking and consider the differentiation among students" with f (10) and "I suggest that homework through the Madrasati platform be done once at the end of each unit of study, and that the homework of daily lessons is done on paper and pen" with f (8). Regarding proposals related to turning homework to class activities "I suggest that the assignments be class activities within the class, and that the class time is increased; So that the teacher can follow the interaction of the students during the solution" with f (9). Regarding proposals related to parents "Parents should be educated about the importance of students relying on themselves in solving homework, whether solving textbook assignments, or solving virtual platform homework" with f (7). Regarding proposals related to students "Establishing training programs for students on homework solving techniques through the virtual platform" with f (9), and "I suggest that homework be brief; In order not to cause cognitive overload on the student" with f (7). Regarding proposals related to teachers "The math teacher should provide immediate feedback through the Madrasati platform for each homework, to correct alternative perceptions" with f (5), and "Implementation training programs for mathematics teachers on the skills necessary to activate homework through Madrasati platform" with f (5).

5. Discussion

Within the framework of the wise leadership's tireless efforts in the Kingdom of Saudi Arabia to control and limit the spread of the new Corona virus (COVID19), and its concern for the safety of students and the accompanying suspension in all schools, public, private and university educational institutions, and in order to ensure the continuity of the

educational process, it provided appropriate alternatives for the continuity of distance education, and that using digital enrichment materials, including the Madrasati platform, as an emergency means to confront the pandemic, and therefore teachers in all their specialties had to deal with this method for the progress of the educational process. Its importance as a distance learning platform and the features it includes for the student, teacher, and parent, as it provides the learner and teacher with an enriching distance learning experience characterized by flexibility and ease of use.

The first result showed that the mathematics teachers' perceptions about the importance of homework management through Madrasati platform in general were moderate. These results may be due to the fact that some mathematics teachers, despite their use of the Madrasati platform; However, they are convinced of the need to manage homework through traditional face-to-face methods instead of virtual educational platforms. This result is consistent with the findings of [6], [40] which emphasizes the positive role for the educational platform "Madrasati" in developing the trend towards distance learning among high school students from the point of view of their teachers.

The second result illustrates that there was agreement between math teachers about their activation of online homework through Madrasati platform during the Corona pandemic, that was high (80%). These results may be due to Madrasati platform providing a number of interactive services for managing and creating courses, in addition to learning tools and tests, And follow-up of the learner during the synchronous and asynchronous educational process. This result is consistent with the findings of [43] which indicated that the reality of teachers' use of the Madrasati platform at the secondary level was high, [2] which showed that the most widely available criteria used in evaluating physics at the secondary level is the e-portfolio with a high degree of agreement.

The third result showed that there are statistically significant differences between mathematics teachers' activation of homework through the Madrasati platform according to the gender variable (male/female) in favor of females. But there are no statistically significant differences between the averages of mathematics teachers' activation of homework through the Madrasati platform according to the school stage variable (Elementary/ Middle / High). This result may be attributed to the interest of female teachers in attending training programs on activating educational platforms, and this was confirmed by the results of the open questionnaire, which indicated the tendency of many female teachers to employ educational platforms, which are commensurate with the nature of the environment in Saudi society.

According to the fourth result, which refer to some obstacles of math homework management through Madrasati platform; Including what is related to the Madrasati platform, such as: the weak internet speed and the high cost of its infrastructure, and some of them are related to parents, such as: not following closely the performance of homework through virtual platforms, or solving assignments instead of students, including those related to students, such as exchanging solutions among them, or relying on educational websites specialized in solving assignments, including those related to teachers, such as: failure to provide immediate feedback on students' solutions to homework, or poor technical skills in managing virtual platforms. This result is consistent with the findings of [18], [43] which showed that the level of obstacles to using educational platforms was significantly higher.

Accordingly, the fifth result introduced some proposals by mathematics teachers to develop online homework management through Madrasati platform, the most important of which are: that the homework in the Madrasati platform be in the form of individual and group projects related to the student's daily life, that the Madrasati platform is developed so as to take into account the nature of mathematics from Where the use of integrating some software, such as: GeoGebra and others; To facilitate dealing with writing mathematics. This result is consistent with the findings of [16], [43], [45]-[46], [49], [53]-[55], which refer to the importance of integrating mathematics software (i.e., GeoGebra, Mathematica, Maple, MATLAB, etc) into virtual educational platforms. Another proposals refer to homework is performed through the Madrasati platform once at the end of each study unit, time is allocated to solve homework during classroom activities in the computer lab, and the learning time is increased; So that the teacher can follow up on students' interaction during the solution, and parents must be educated about the importance of students relying on themselves in solving homework, implementing training programs for students and teachers on homework management techniques through virtual platforms. This result is consistent with the findings of [1]-[2], [41], [44].

6. Limitations And Conclusion

One of the main limitations of the current study is that the data collection was done considering the perceptions of (135) mathematics teachers in the three stages of education (elementary, middle, and high) regarding an element of the Madrasati platform, which is homework management only in terms of importance, obstacles, and suggestions. Therefore, future studies must consider the interaction between the elements of the Madrasati platform, such as: virtual classrooms, chat rooms, enrichment activities, etc. The study was also limited to one region in the Kingdom of Saudi Arabia. Therefore, future studies should cover other areas with diverse characteristics. In addition, the current study addressed the impact of independent variables, such as: gender, grade level, and does not address the teachers' experience and their technical competence level on their perceptions of homework management through virtual

platforms. Therefore, future studies should consider this by making an interactive model between these variables.

The current study indicated that mathematics teachers' perceptions of the importance of online homework management through Madrasati platform were moderate; It was expected to be even higher. This result is attributed to several reasons, depending on the teachers' responses to the open questionnaire, including, for example: all students of one stage pressed on the platform at the same time, and some questions that include illustrative pictures did not appear, which causes poor student participation in solving assignments through the platform, because of errors that the platform may cause. The study found that there are some obstacles that hinder mathematics teachers when managing homework through virtual educational platforms, such as: limited follow-up of students by parents, poor Internet speed in some areas, and limited student participation in solving homework. The current study also revealed a set of implicit recommendations, including: the need to take into account teachers' perceptions when building the elements of the mathematics curriculum through the virtual educational platform, as well as the diversity between traditional and electronic homework over the Internet; Because some aspects of mathematics are measured only through careful observation of the student's solutions, in addition, the Madrasati platform needs to be developed and improved to suit the individual differences between students, and take into account the diversity in learning styles. In addition to the importance of increasing the learning time during the school program; To monitor and guide students and provide the necessary support.

The results of the study also indicated the need to design training programs concerned with the competencies of designing electronic activities through Madrasati platform. In addition to orientation programs for students to introduce them to the advantages available through the Madrasati platform, and how to carry out online homework easily. One of the most important proposals from the researcher's point of view is to link the Madrasati platform with the mathematics software, which previous studies have proven effective in deepening mathematical knowledge, Like GeoGebra and others.

7. Recommendations Suggestions for Future Studies

Considering the study findings, the researcher recommends the following:

- The necessity of developing Madrasati platform in line with the nature of mathematics in terms of writing symbols and drawing geometric shapes.
- The necessity of educating mathematics teachers about the importance of activating the Madrasati platform in managing homework.
- Working to provide incentives for teachers to employ the Madrasati platform with the best teaching practices.
- Providing teacher training programs to design electronic lessons and publish them on the Madrasati platform.
- The necessity of employing virtual classes through the Madrasati platform to provide immediate feedback to students about homework solutions.
- Work on preparing computer labs inside schools to use the Madrasati platform for direct follow-up.
- The necessity of providing quick technical support for the problems of the Madrasati platform.
- The necessity of training students to use mathematics software in completing homework and verifying their solutions.
- Using mathematics software to improve mathematics online homework management.
- Developing Madrasati platform considering international best practices in designing virtual educational platforms.
- Parents' perceptions of math homework management via virtual educational platforms.

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