

# A Proposed Conception of Technical Solutions to Address the Educational Loss in Mathematics in the Fifth Grade of Primary School

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## Abstract

The study aimed to provide a proposed conception of technical solutions to address the educational loss in mathematics in the fifth grade of primary school, and the study adopted the descriptive approach. male and female teachers, and to achieve the study objective, the researcher built a tool for the study, a "questionnaire", in which he used the comprehensive inventory method, and the results of the study showed: identifying the learning outcomes that represent an educational loss, and identifying the learning outcomes that are considered essential in teaching and learning mathematics for the fifth grade of primary school. In the event that it is not achieved by students, it is considered an educational loss that may affect the future of students' education and learning. Because it is a basis for later experiences in mathematics in other classes, and the study also found the effectiveness of the proposed visualization of technical solutions provided to address the educational loss in mathematics for the fifth grade: (short electronic tests, YouTube channel, homework, educational platform, electronic worksheets, and communication channels).

## Keywords:

*A proposed - Technical solutions - Educational loss-Mathematics*

## 1. Introduction

The phenomenon of educational loss is considered one of the most prominent problems facing the educational sector in various regions of the world, as the damages of the spread of the Corona pandemic were not limited to the global economy only, but rather affected all sectors to varying degrees, and among the most affected was education at the global level during the year 2020, which is considered a precedent. historical; The first phase of the virus outbreak disrupted learning and stopped it for a period of time, which caused damage at various levels within the educational community. According to the United Nations report ((United Nations, 2020), 190 countries were forced to stop school attendance for all students, who number one and a half billion students around the world. It became necessary to search for immediate solutions that would help to continue studying in any way, and the available option was to use a network

The Internet, so distance education came as a temporary substitute for regular education, and the phenomenon of educational loss emerged clearly during the Corona pandemic and the accompanying long closure of schools, and in the midst of these closures, technology allowed many schools and teachers to reach students, and the ability to communicate and expand access in a reliable manner. (Garnier, 2022).

As a result, the transition from regular education to distance education took place without prior readiness at the beginning of this transformation.

As a result of this transformation, many problems and difficulties faced those in charge of teaching and learning mathematics remotely in the various stages of education, especially in the primary stage. Due to the nature of the cumulative mathematics subject, and the need for those in charge of teaching to build basic concepts and skills, especially for the primary stage; Because it is a stage for establishing basic skills, which in the event that it is not achieved is considered an educational loss, and without it, students will not be able to continue their academic achievement in the following educational stages (Hassan, 2020). It must be noted that the process of rebuilding the basic knowledge and skills that have not been learned, and that can be seen as lost, needs first and foremost to determine the percentage of learning loss among learners based on what they lose or do not learn from basic knowledge and concepts due to incompleteness.

The cognitive educational course for whatever reason, the employment of effective educational measurement tools, and the reliance on a research effort directed to an in-depth study, and this also requires sufficient time for measurement and evaluation (Al-Rashidi, 2022).

This is confirmed by the Organization for Economic Co-operation and Development (OECD) that the educational loss, both qualitative and quantitative, must be seen within a long-term horizon, and not the first shock period represented by the closure of schools and the cessation of studies or the shift to educational alternatives in 2020 and 2021, where the qualitative aspect is based on Determining the amount of what students learned during the school closure period and is related to the efficiency of educational alternatives and the amount of what students learn through them. As for the quantitative aspect, it refers to the number of students who actually continued to learn during the school closure periods, and the accompanying challenges in students' discipline in attendance and the high rate of absence (2020, OECD).

And with the stages of the Corona epidemic reaching a stage of stability, and near-fixed rates, before the start of the academic year (2022-2023) in some countries, it became necessary to prepare a plan for a safe return of students to enroll in regular education, and on the other hand, the face-to-face learning option was not fully possible. Rather, it remained important to use distance education simultaneous with education within the classroom, hence the application of the technical learning system, which guarantees the continuation of study inside and outside the school, but naturally a set of obstacles arose, perhaps the most influential and important: it was in how students compensate for what they lost. Concepts, information, and outputs upon which the previous school stage was built, for their return to school education, and thus came the concept of (educational loss), which has become widely circulated in educational circles (Khidr, 2021).

The seriousness of educational loss requires those responsible for the education sector and educators to think carefully to find effective tools to measure the percentage of educational loss among students in school subjects, especially mathematics, and to present proposals and solutions to show how to work to reduce it, taking into account that educational loss has various causes and negative repercussions. Many at the level of the individual and society in the long term unless intervention is taken to address them effectively (Gibran, 2021). Education. At that time, the importance of distance education emerged as an

alternative to regular education in these exceptional circumstances through the use of several technology-based educational tools to reduce the educational loss that came as a result of this closure (Al-Shammari, et al., 2022).

One of the most prominent transformations of education in the post-Corona era is the strongly rising trend towards the use of technology and the important role of some of the solutions it offers, such as blended learning during and after the Corona period, in addition to creating more educational technical platforms for the various stages of education, especially after they have proven their effectiveness and feasibility. Education in the Kingdom is moving towards the expansion of technical learning, as the repercussions of the pandemic imposed the maximization of this aspect, in order to continue the progress of educational processes, and an attempt to bridge the educational loss (Al-Ghamdi, 2021). This was confirmed by (Al-Dahshan 2020; Al-Sayed and Al-Bishi 2021; Al-Zaki and Swelim 2021, Shasha'a, 2022) when they mentioned that during the Corona pandemic, all schools were disrupted, students stopped learning, it was difficult for students to return to school, and it was not clear to what extent this pandemic would last.

It was necessary to use technical solutions as one of the solutions that must be applied in a situation where it is difficult to return to regular studies for any reason, instead of leaving students without education throughout this period because of its negative effects on the student and society, as it is flexible by setting the time and controlling the time Lesson, discussion and presentation of projects and homework related to mathematics for the fifth grade of primary school; Where the way the learner received the information differed, which resulted in a gap between what he is supposed to acquire and what the students actually gained, which is what he called the educational loss, which was reflected in the student's lack of mastery of some basic skills in mathematics, which had an impact on students' achievement and the continuity of the educational process and the student's acquisition of skills New.

Given the nature of teaching mathematics in writing mathematical solutions in successive steps that include mathematical equations and the creation of

engineering drawings, the importance of providing electronic and interactive tools and software that support teaching and learning mathematics from a distance (Hassan, 2020); Therefore, teaching and learning mathematics has been closely linked to technology. Because it provides advanced tools and software geared towards teaching and learning mathematics within contexts that enable students to understand concepts in a meaningful way, master mathematical skills, and interact with them more (Bulut et al, 2016).

This is what was shown in the study (Saal, Graham, & Van Ryneveld, 2020), which aimed to identify the relationship between the integration of technology in the regular mathematics classes of fourth-grade students in Germany through the joint use of digital devices and the Internet in school classrooms, as well as at home for related purposes. The process of teaching and learning mathematics, where the results of the study showed that there is a statistically significant positive relationship between the uses of educational technology for certain activities in mathematics and the achievement of the student who owns digital devices. As a motivational and complementary tool to improve the teaching process and develop students' thinking and problem-solving skills. In the same context, many previous studies were conducted, the most important of which is: Al-Zoghaibi study (2021), which aimed to estimate the effects of educational loss through three methods: time in months, percentile ranks, and the achievement gap percentage). Its results concluded that the educational loss in mathematics is more than Language, and the loss in mathematics is estimated to be at least two months or up to eight months, and it is learned from the countries' orientations that the rectification of the losses will require several years, and therefore some countries have approved some general educational policies to rectify it, and they have attracted experts to determine strategies based on evidence that are effective in redressing the educational losses Among the most prominent of these strategies is the rapid return to blended education, and the study recommended continuing to invest in digital solutions and the development of smart data systems in collecting and analyzing data related to student levels, and improvements in technical infrastructure and educational platforms.

One of these solutions is software applications. Bin Saeed (2021) conducted a study aimed at knowing the effectiveness of the (teach me) application in addressing educational loss among second-grade female students and their attitudes towards it in scientific courses, namely mathematics, biology, physics, chemistry and computer through the following tools: Achievement test And a questionnaire to measure the attitude towards the application of (teach me), and these tools were applied to the study sample consisting of (30) female students, and they were divided into two groups; An experimental group, and a control group, where the number of students in each group is (15) students, and the study found that there are statistically significant differences at the level of significance ( $0.05 \geq \alpha$ ) between the scores of the students of the experimental group and the scores of the control group in the achievement test in favor of the experimental group, and an increase in the positive effect Towards the use of the (teach me) application in addressing educational loss.

Al-Ghamdi study (2021) sought to assess the digital divide and its impact on educational loss, and to identify the different methods that help bridge the digital divide in the educational system in primary schools, with a focus on weaknesses in student achievement among some teachers, students and parents of Kaab bin Zaid school students. Elementary School in Nairiyah, through the method of observation, and the results of the study showed that the digital gap and its impact on the educational loss came to a moderate degree from the point of view of the sample, and the study recommended the need to focus on enhancing the follow-up of students' achievement by parents and following up on their continuous presence on the virtual platform, in addition to Work on developing the IT infrastructure, especially in remote neighborhoods. As education is currently being managed according to the distance learning or e-learning system in most countries of the world during the Corona pandemic.

Therefore, the Al-Salam study (2021) indicated that technology-based education is gradually being used, which is an educational indicator that is continuously measured at the individual or group level in many study programmes. Therefore, all students must be prepared, particularly students with disabilities. In the stages of education, the need to use

technology mainly from an early age in education to ensure sustainability in education. Therefore, Chen et al. (2021) suggest several steps to reduce and address the educational damage resulting from the pandemic, represented in improving the quality of distance learning for those students who are still learning virtually, and providing assistance to students who need it to compensate for the losses that have already occurred, along with Providing more support to students who are late through lessons through more personalized and proficiency-based programs, and students may need to spend additional time in the classroom. As for teachers and their role in dealing with educational loss, it is necessary to train them well, taking into account that it may be School systems that invested in excellent teachers and helped them succeed before the crisis are most effective in reducing educational loss.

The study (Yohannes et al, 2021) also proposed some solutions to overcome the difficulties that secondary school mathematics teachers may face in implementing online learning during the Covid-19 pandemic, as the sample included (20) teachers, through a questionnaire prepared for this purpose. The results of the study indicate that there are a number of difficulties faced by teachers, the most important of which are; The transition to distance education directly without preparing the educational field as a result of the pandemic contributed to the instability of the educational process and the absence of interaction and motivation, which caused an educational loss in many basic learning outcomes, especially since the nature of mathematics is cumulative and abstract topics that require effective and meaningful distance learning solutions and strategies. Among the important study proposals that can overcome these difficulties are enhancing the use of media and platforms that support two-way interaction, providing training for mathematics teachers at the secondary level on technology and the use of software, preparing learning activities and providing various assessment resources, and increasing the coordination of effective communication between teachers, students and parents in a similar way. Clear and easy instructions.

The study (Cigdem et al, 2021) explored how the loss of mathematics learning occurred among Turkish middle school students during school closures through the practices, challenges, and efforts of self-

taught mathematics teachers while trying to support their students' learning. The interviews conducted with (19) mathematics teachers from the public sector indicated and (9) of mathematics teachers in private middle schools indicated that there were certain differences in teachers' practices and revealed inequalities that existed between schools, classrooms, and students, such as the lack of student participation, teachers' limited use of mathematics teaching methods, the socioeconomic status of families, and their lack of cooperation with Teachers are among the reasons for losing out on learning mathematics. Among the technical solutions that were proposed to address the educational loss in mathematics is the study (Khalil, 2022), which aimed to identify how to treat the educational loss in mathematics at the intermediate stage from the point of view of teachers, through questionnaires and individual and group interviews with a sample of (40) male and female teachers. In the first stage and (25) teachers in the second stage, where she indicated the use of technology tools: blogs, video clips, and YouTube clips that deal with specific learning loss related topics. Based on the foregoing, and the completion of research efforts on the subject of the study, in addition to the fact that there is a lack of Arab studies that dealt with the educational loss of mathematics in the primary stage; Therefore, the effectiveness of applying some technical solutions to address the educational loss of mathematics for the fifth grade of primary school, and the preparation of a proposed vision to treat this problem of the study.

## 2. Methodology

Hence, the problem of the study arises, which is represented in answering the following questions:

- 1- What are the learning outcomes that represent an educational loss for fifth-grade students in mathematics from the point of view of teachers, supervisors, and mathematics experts?
- 2- What are the technical solutions provided to address the educational loss in mathematics for the fifth grade of primary school from the point of view of teachers, supervisors and mathematics experts?
- 3- Are there statistically significant differences in learning outcomes that represent an educational loss

for fifth grade students in mathematics due to the gender variable?

- 4- Are there statistically significant differences in learning outcomes that represent an educational loss for fifth grade students in mathematics due to the nature of work variable?
- 5- What is the proposed scenario for technical solutions to address the educational loss in mathematics in the fifth grade of primary school?

In the light of the objectives of the study, the appropriate and appropriate approach to its nature is the descriptive approach, which means describing the educational loss, collecting facts, information and observations about it, describing its conditions, assessing its condition as it exists in reality, and proposing appropriate technical solutions that can treat it, to reach the image that Should be on it.

### 3. Objectives of the study:

#### The study aimed to:

- Determining the learning outcomes in fifth grade mathematics, which represent an educational loss for students.
- Identifying the proposed technical solutions to address the educational loss in mathematics for the fifth grade of primary school.
- Studying the differences between the average responses of the research sample in learning outcomes that represent an educational loss for fifth grade students in mathematics due to the gender variable.
- Studying the differences between the average responses of the research sample in the learning outcomes that represent an educational loss for fifth grade students in mathematics due to the nature of work variable.
- Identifying the proposed vision of technical solutions to address the educational loss in mathematics, the fifth grade of primary school.

### 4. The importance of studying:

The importance of this study stems from the fact that it is a scientific study that proposes some technical solutions to address the educational loss in mathematics for the fifth grade of primary school. Corona so far.

#### The theoretical significance is:

- Identifying the concept of educational loss, its types and causes (considered in discussing the results), and treatment proposals.

- This study can be useful in giving proposed technical solutions to address the educational loss in mathematics for the fifth grade of primary school for male and female teachers in teaching mathematics, characterized by its suitability for learning outcomes.
- The study provides room for researchers to add information and suggestions on topics related to the study.

### 5. Applied importance:

- This study is one of the first Arab studies - within the limits of the researchers' knowledge - that deals with the treatment of educational loss in mathematics for the fifth grade of primary school. - Thus, the study will open the way for further research on this topic in the future.
- Providing information to those in charge of the curricula and decision-makers at the Ministry of Education about educational losses in the field.
- Providing suggestions and possible solutions from teachers, supervisors and mathematics experts in the field.
- Improving the level of achievement of students and ensuring the continuity of education in the mathematics course for the fifth grade of primary school.

### 6. Search limits:

- **Temporal limits:** The study was applied in the first semester of the academic year (1444 AH - 2022).
- **Spatial limits:** The study was limited to primary schools in Riyadh.
- **Human limits:** The study was limited to teachers, supervisors and mathematics experts at the primary stage in Riyadh.
- **Objective limits:** This study was limited to identifying all learning outcomes for fifth grade mathematics according to the three-semester system, which represents an educational loss when it is not achieved.

### 7. Search terms:

#### Technical solutions:

They are means of implementing education that can be applied in regular face-to-face education or distance education, and through which various interactive activities can be provided between students with each other, and between teachers and students (Albano, 2006).

Technical solutions are defined procedurally as: "a group of educational technical solutions that address the educational loss of learning outcomes in mathematics for the fifth grade of primary school through some interactive practices such as: blended learning and distance learning."

### Learning Loss:

(Pier et al, 2021) defined the learning loss in its simplest form as: "the difference between what students are supposed to acquire and what students actually acquire.

" (Azevedo et al, 2020) believes that the educational loss is "a set of skills, knowledge, concepts, and ideas that are not acquired by the student during the specified period within curricula or curricular or extra-curricular activities, which causes a decrease in academic achievement and a shortage of the student in various skills."

". The educational loss is defined procedurally as: "what was lost or lost in the learning of the fifth grade primary students of mathematics, and thus the failure to achieve the learning outcomes that were planned (between the reality of what the student learned and the student's ownership, and what he should be able to do in mathematics).

As a result of the presence of educational problems resulting from the Corona pandemic," which are determined through a questionnaire prepared for that.

## 8. The study sample and population:

The study population consisted of all male and female teachers of mathematics at the primary stage in schools affiliated to the General Administration of Education in the Riyadh region, and their number was (3463); Of them, (1255) male teachers and (2208) female teachers, according to official statistics from (Department of Planning and Development in Riyadh, 2022).

The study sample consisted of a group of male and female teachers and mathematics experts at the primary stage in schools affiliated to the General Administration of Education in the Riyadh region. As this sample was chosen using the simple random sample method, by sending a text message from the Information Technology Department of Education in the Riyadh region to each male and female teacher from the original community; In order for each of them to have an equal opportunity to be included in the target sample, and their number reached (362) male and female teachers, and (6) were excluded for not teaching the fifth grade of primary school in mathematics, and thus the number becomes (356) male and female teachers. Table 1 shows a description of the study sample.

## 9. Study tool:

After reviewing the literature and previous studies related to the subject and nature of the study, the questionnaire is the appropriate tool to achieve its objectives, and the study tool was built according to the following steps:

- Reviewing educational literature and previous studies related to the subject of the current study. Preparing the study tool in its initial form.
- Introducing amendments in the light of the arbitrators' notes.

Components of the study tool:

In its final form, the questionnaire consisted of four sections:

The first section: It includes primary data on the study sample, namely: gender, nature of work, educational qualification, and years of teaching experience.

The second section: It includes learning outcomes that represent an educational loss for fifth grade students in mathematics for each semester. The first semester consists of (7) learning outcomes, the second semester consists of (8) learning outcomes, and the third semester consists of (11) learning outcomes. Each statement is assigned a quadruple response scale according to a Likert scale (4) very high, (3) high, (2) low, (1) very low. Section Three: Technical solutions presented according to multiple choices and freedom of choice for more than one solution.

The fourth section: It includes an open question about technical solutions provided to address the educational loss from the point of view of the male or female teacher.

The questionnaire was applied to the sample of the exploratory study consisting of (187 male and female teachers in the field of mathematics at the primary stage); To calculate the validity and reliability of the questionnaire.

Validity of the study tool:

To ensure that the paragraphs of the questionnaire measure what they were set to measure, the following were verified:

The apparent validity of the questionnaire:

The questionnaire was presented in its initial form to a group of experts in teaching and learning mathematics curricula, who numbered (8) arbitrators, to benefit from their observations and opinions regarding the questionnaire's phrases, in terms of the accuracy of the linguistic formulation, the extent of the clarity of the phrase and its suitability for the field to which it belongs, and to make adjustments or Additions, deletions or mergers of phrases, modifications have been made in the light of their comments.

The validity of the internal consistency of the questionnaire:

The validity of the questionnaire statements was calculated by calculating the Pearson correlation coefficient between the score of each statement and the total score of the statements, as in Table 2.

## 10 . Statistical methods:

The data were unloaded and entered into the computer using the Statistical Packages for Social Sciences (SPSS) program to answer the study's questions by conducting the appropriate statistical operations, which included: arithmetic mean, percentages, standard deviations, frequencies, and Pearson's correlation coefficient; To calculate the internal consistency of the research tools, Cronbach's alpha coefficient; to check stability.

In order to facilitate the interpretation of the results, the level of response to the items of the tool

was determined, as a weight was given to the four alternatives: (very high = 4, high = 3, low = 2, very low = 1), then those answers were classified into four levels of equal extent through The following equation: class length = (largest weight - least weight) ÷ number of resolution alternatives =  $(4-1) \div 4 = 0.75$ ; To access the following classification to interpret the results:

## 11 . Comparative Analysis :

First: The results of the answer to the first question: What are the learning outcomes that represent an educational loss for fifth grade students in mathematics from the point of view of teachers, supervisors, and mathematics experts? And to answer this question; Arithmetic means, standard deviations, and frequencies were extracted to estimate the responses of the study sample towards the areas of learning outcomes that represent educational losses in each semester according to the three-semester system for the year 1444 AH corresponding to 2022 AD, as shown in the following tables.

**Table 7:** Learning outcomes that represent learning losses in the third semester.

N	Phrase	The degree of the learning outcome represents an educational loss if it is not achieved				The arithmetic mean	The standard deviation	arrangement
		very high	high	low	very high			
1	Add and subtract fractions with different denominators.	125	133	48	50	2.94	1,023	2
2	Choose an appropriate metric unit to measure length.	134	110	59	53	2.91	1.065	5
3	Convert between metric units of length.	107	142	57	50	2.86	1.003	10
4	Converting between metric units of measurement (mass - capacity).	122	121	63	50	2.88	1,035	9
5	Add and subtract units of time in different time periods.	110	140	59	47	2.88	0.995	7
6	Knows the characteristics of shapes (four-dimensional - three-dimensional).	135	105	61	55	2.90	1.078	6
7	Name and represent points on the coordinate plane.	106	138	58	54	2.83	1,021	11
8	Draw an image of a shape (withdrawal - reflection - rotation) on the coordinate plane.	131	112	63	50	2.91	1,050	4

9	Solve mathematical problems using appropriate strategies (determining the reasonableness of the answer, logical reasoning, investigating the solution of the problem, creating a model) while following the four steps.	117	133	54	52	2.88	1,027	8
10	Find the area of (rectangle, square).	141	110	52	53	2.95	1,067	1
11	Find the volume of a quadrilateral.	139	106	55	53	2.94	1,068	3

It is clear from Table 7 that the value of the arithmetic averages of the learning outcomes that represent a learning loss in the second semester ranges between (2.83) to (2.95), which represents a high learning loss in the event that it is not achieved by the students of the fifth grade of primary school. For phrase No. (10) “finding the area of (rectangle, square) came.” ranked first, with an arithmetic mean of 2.95. While phrase No. (7) "Naming and representing points on the coordinate plane" came last, with an arithmetic mean of 2.83. This means that these outcomes are considered essential in the teaching and learning of mathematics for the fifth grade of primary school, and in the event that they are not achieved by students, they are considered an educational loss that may affect the future of students’ teaching and learning. It is noted that these outcomes are mostly within the field of engineering content.

Second: The results of the answer to the second question: What are the technical solutions provided to address the educational loss in mathematics for the fifth grade of primary school from the point of view of teachers, supervisors and mathematics experts? And to answer this question; Frequencies and percentages were extracted to estimate the responses of the study sample towards the technical solutions provided to address the educational loss in mathematics for the fifth grade of primary school in each semester according to the three-semester system for the year 1444 AH corresponding to 2022 AD, as shown in the following tables.

**Table 8:** Technical solutions provided to address educational loss in mathematics for the fifth grade of primary school in the first semester.

M	Provided Technical Solutions	Repetition	Percentages
1	Satellite channel live broadcast	98	11.3
2	YouTube channel	122	14
3	educational platform	122	14
4	electronic homework	133	15.3
5	Short electronic tests	141	16.2
6	Social media channels	77	8.8
7	Electronic working papers	103	11.8
8	Visual social programs such as: Zoom and Microsoft Teams	75	8.6

It is clear from Table 8 that the technical solutions provided to address the educational loss in mathematics for the fifth grade in the first semester, according to the following order according to its importance to address the educational loss (homework, short electronic tests, YouTube channel, educational platform, electronic worksheets, broadcast satellite channel Mubasher, social media channels, visual social programs).

**Table 9:** Technical solutions provided to address educational loss in mathematics for the fifth grade of primary school in the second semester.

M	Provided Technical Solutions	Repetition	Percentages
1	Satellite channel live broadcast	87	10
2	YouTube channel	118	13.5
3	educational platform	126	14.4
4	electronic homework	130	14.9
5	Short electronic tests	124	14.2
6	Social media channels	83	9.5
7	Electronic working papers	114	13.1
8	Visual social programs such as: Zoom and Microsoft Teams	90	10.3

It is clear from Table 9 that the technical solutions provided to address the educational loss in mathematics for the fifth grade in the second semester, according to the following order according to its importance to address the educational loss (homework, educational platform, short electronic tests, YouTube channel, electronic worksheets, visual social programs, satellite channel, live broadcast, social media channels).

**Table 10:** Technical solutions provided to address educational loss in mathematics for the fifth grade of primary school in the third semester.

M	Provided Technical Solutions	Repetition	Percentages
1	Satellite channel live broadcast	88	9.8

**Table 11:** Learning outcomes that represent learning losses according to the gender variable.

Differences vary	the group	the number	The arithmetic mean	The standard deviation	value (T)	significance level
Learning outcomes that represent learning losses in the first semester	male	207	2.85	0.864	1.574	not significant
	feminine	149	3.02	1,082		

2	YouTube channel	131	14.6
3	educational platform	123	13.7
4	electronic homework	125	14
5	Short electronic tests	141	15.8
6	Social media channels	97	10.8
7	Electronic working papers	112	12.5
8	Visual social programs such as: Zoom and Microsoft Teams	78	8.7

It is clear from Table 10 that the technical solutions provided to address the educational loss in mathematics for the fifth grade in the third semester, according to the following order according to its importance to address the educational loss (short electronic tests, YouTube channel, homework, educational platform, electronic worksheets, social media channels Live broadcast satellite channel, visual social programs).

**Third: The results of the answer to the third question:** Are there statistically significant differences in the learning outcomes that represent an educational loss for fifth grade students in mathematics due to the gender variable? And to answer this question; The (T) test was used to indicate the differences between two independent samples. To calculate the differences in the learning outcomes that represent an educational loss for fifth grade students, according to gender, for each semester separately, as shown in Table 11.

Learning outcomes that represent educational losses in the second semester	male	207	2.82	0.884	1.979	significant
	feminine	149	3.03	1,026		
Learning outcomes that represent learning losses in the third semester	male	207	2.81	0.901	2.143	significant
	feminine	149	3.03	1,028		

It is clear from Table 11 that there are no statistically significant differences at the level of significance (0.05) in the responses of the study sample according to gender in determining the learning outcomes that represent an educational loss in the first semester. Perhaps this is due to the nature of the learning outcomes in the first semester, as they are organized in The field of numbers and operations. While there are statistically significant differences at the significance level (0.05) or less in determining the learning outcomes that represent an educational loss in the second and third semesters. That female teachers show interest in learning outcomes and practice teaching more than their male counterparts, as indicated by a study (Robertk, & Ongati, 2013).

**Fourth: The results of the answer to the fourth question:** Are there statistically significant differences in the learning outcomes that represent an educational loss for fifth grade students in mathematics due to the nature of work variable? And to answer this question; The (T) test was used to indicate the differences between two independent samples. To calculate the differences in learning outcomes that represent an educational loss for fifth

**The actual stage; It consists of the following:**

- Carrying out diagnostic evaluation tests at the school level that reflects the specific learning outcomes as essential learning losses. It must be ensured that the student has sufficient level of acquisition.
- Identifying and classifying the learning outcomes recorded in this study, including what is included in each unit or chapter of the fifth grade mathematics book separately.
- Preparing remedial plans with clear objectives and a specific time period - scheduling them - during the semester to treat the lost learning outcomes throughout the academic year.
- Modifying and adapting applied plans on an ongoing basis according to the need for them and the repercussions of special emergency circumstances.

**The Support stage; It consists of the following:**

- Forming a working group of mathematics teachers in the school.
- Involving teachers of digital skills or those with a background in dealing with technology skills in a professional manner to benefit from their opinions, experiences and technical practices.
- Involving the family in addressing the educational loss.

**The reinforcement stage; It consists of the following:**

- Cooperation and integration between the school work team and the mathematics supervisors in the education office that supervises the school in the success of achieving learning outcomes and bridging educational losses.
- Employing the technology solutions presented in this study through distance education, blended education, and regular education through the mathematics laboratory to provide sustainable use of technology in the regular classroom.
- Determining part of the grades to evaluate the educational loss as an essential part of the course evaluation.
- Encouraging and motivating students and the family (parents) on an ongoing basis.
- Follow-up of students' results and the level of achievement and performance based on the applied treatment plans (post-evaluation).
- Promoting e-learning through an educational platform (for example: My school platform of the Ministry of Education in the Kingdom of Saudi Arabia) in providing the solutions presented in this study to address the missing learning outcomes for mathematics in the fifth grade of primary school.
- Employing a virtual math lab that enhances the simplification of mathematical concepts through technical applications that employ mathematical representations and manuals in a digital way.

**Evaluation stage; It consists of the following:**

- The evaluation tools should be diverse and reflect the alternative (realistic) evaluation, such as: paper

tests, electronic tests, regular and electronic worksheets, pamphlets, short tests, and not be limited to one type.

- The availability of an electronic question bank based on the learning outcomes of this study is available at any time and place.

- Measuring the impact according to specific periods by comparing the results of the diagnostic test in the actual reality stage and the post-test in the reinforcement stage.

- A sustainable calendar via an e-learning platform with specific periods throughout the school year.

#### **Components of the proposed visualization:**

1- A work guide for the work team directed to each school.

2- Employing the technical solutions provided based on the results of the current study.

3- Issuing evaluation reports to address educational loss.

4- Recommendation of the participants (the work team) for development.

## **11 . Conclusion:**

### **The results of this study indicate:**

- The learning outcomes are considered essential in the teaching and learning of mathematics for the fifth grade of primary school, and in the event that they are not achieved by students, they are considered an educational loss that may affect the future of students' teaching and learning; It is the basis for later experiences in mathematics in other classes. This result is consistent with the Common Core Standards of the United States of America (CCSSM, 2010) in three essential areas, the first: developing the skill of adding and subtracting fractions with dissimilar denominators, the second field: developing multi-digit multiplication and division operations, and the third field: identifying the concept of size and its measurement .

- There are differences in determining learning outcomes that represent learning losses according to the gender variable, due to the nature of some learning outcomes that are organized in the field of statistics, probability and engineering in favor of female teachers.

- Determining the learning outcomes that represent an educational loss according to the nature of work variable, for the benefit of male and female teachers.

- The technical solutions provided to address the educational loss in mathematics for the fifth grade were: (short electronic tests, YouTube channel, electronic assignments, educational platform, electronic worksheets, social media channels, satellite channel live broadcast, social-visual programs) with different order and degree of impact The most important are short electronic tests, electronic assignments, and an educational platform.

- The responses of the study sample in the open-ended question supported the technical solutions provided to address the educational loss in mathematics for the fifth grade of primary school, in addition to the fact that there are responses that provide other technical solutions based on experience and technical practice in the field of mathematics education, and these solutions were represented in:

1- Software applications in the treatment of educational losses, including the Autograph program, which is one of the software applications in the treatment of educational losses in the field of geometry and algebra; especially in the processing of learning outcomes "drawing a picture of a shape (withdrawal - reflection - rotation) on the coordinate plane". Therefore, teaching and learning mathematics has been closely linked to modern technology, due to the availability of software oriented towards teaching and learning mathematics within contexts that enable students to understand concepts in a meaningful way, master mathematical skills, and interact with them more.

2- Electronic assessment to address educational loss in learning outcomes, including the digital application Seesaw class. It helps in documenting the learning process and not just the final result. It is also useful in documenting the assessment process in its various types: diagnostic, formative, summative, and levels of progress of the student in treatment plans.

3- Enriching technical applications to create digital interactive activities that simulate regular evaluation tools of objective questions of all kinds, and essays with short or specific answers. Such as: (Word wall), (Kahoot), and (Quiz Alize).

4- Short video clips of one skill, characterized by effective influences in drawing attention and focus on how to perform mathematical skill and procedures fluently.

**These technical solutions provided to address the educational loss in mathematics for the fifth grade of primary school must take into account the following:**

- Mathematical representations and design of real situations to understand math concepts.
- Charts and computer graphics to master mental mathematical skills.
- Traditional and computer simulations to master manual mathematical skills.
- Programs specialized in graphics and mathematical tables.
- Applied programs in mathematics to solve mathematical exercises and applications.
- Self-learning programs or with the help of a teacher or computer.
- Research and survey trips via the Internet or digital libraries.
- The value of these technical solutions depends on the extent to which students actually interact with some of the technologies in a way that enhances the building of understanding, mathematical reasoning, and understanding of meaning.

The results of the current study are consistent with the results of the study of Al-Qahtani (2018) and Al-Salem (2021), which emphasized the study of needs, and the low level of use of them, with the need to develop the performance of mathematics teachers in the light of educational digital innovations by using these tools as an input in the training and professional development of teachers, and attracted experts To identify evidence-based strategies that are effective in redressing educational loss, and among the most prominent of these strategies is the rapid return to technical blended education, and recommended continuing investment in technical solutions and developing smart data systems in collecting and analyzing data related to educational loss. It also agrees with the results of the studies of Al-Zoghaibi (2021), Al-Ghamdi (2021), and Bin Saeed (2021) about the prevalence of educational loss in learning mathematics in the primary stage, and that one of its main factors is the traditional teaching treatments that most teachers adhere to, as it leads to the presence of educational loss in the fields The Academy, with the need to move towards directing technical strategies, emphasized the positive impact of using technical applications in addressing the educational loss of mathematics.

## **12. Recommendations:**

**In light of what the study results indicated, the study recommends the following:**

1. The need to take advantage of "technical solutions" through holding meetings and workshops and forming collective links for teachers and supervisors of mathematics at the primary stage and those concerned with teaching and learning mathematics, as follows: (developing study plans to address waste, choosing the best among the technical solutions provided, and working to activate the solutions technology availability of resources and resources and make them available at any time).
2. Benefiting from the technical solutions provided in the treatment of educational loss in fifth grade mathematics, in terms of its activation in educational platforms, with the availability of technical links suitable for addressing educational loss according to this study.
3. Directing the attention of specialists in the field of curricula and methods of teaching mathematics and learning techniques to benefit from the technical solutions provided to address educational loss.
4. Including in school curricula (the fifth grade mathematics textbook) the technical solutions provided for each learning output, in order to treat it effectively.
5. The need for those in charge of professional development programs for mathematics teachers to pay attention to holding courses and workshops for mathematics teachers. To train them to use the technical solutions provided to address the educational loss in mathematics for the fifth grade of primary school as a technical novelty aimed at defining its importance and ways of employing it in education.
6. Enhancing blended learning among fifth-grade students to address educational loss in mathematics.
7. Employing technology tools in the regular teaching of mathematics teachers to enhance the treatment of educational losses in an interactive manner with meaning and awareness of the conceptual understanding of learning outcomes.
8. Allocate a specific time in the classroom to assess educational loss as an essential part of the assessment of the learning outcomes of fifth grade mathematics.
9. Establishing a national big data site containing technical resources and sources to address the educational loss in mathematics in general, and fifth-grade mathematics in particular, available on the

Internet at any time and place characterized by classification, updating, follow-up, development, and easy access to these resources.

10. Employing interactive technical educational games through special applications to enhance the treatment of educational loss in mathematics for the fifth grade of primary school within educational situations to understand the mathematical concept.

11. Provide periodic feedback in classroom interactions to students through evaluation technology applications.

12. Taking into account that educational losses may be different from one student to another; therefore, the technical solutions provided should not be automatically applied to all students.

13. Determine the educational loss according to scientific bases based on diagnostic assessments that reflect the learning outcomes recorded according to this study.

### Suggestions:

**Based on the results of the current study, the following proposals can be made:**

1. Experimenting with the technical solutions provided to address the educational loss in fifth grade mathematics in developing academic achievement and higher thinking skills among fifth grade students.

2. A similar study on other technical solutions that the current study did not address: such as: technical software related to teaching and learning mathematics.

3. A training program based on technical solutions in developing the competencies of primary school mathematics teachers in how to deal with educational loss.

4. Conducting a study to design technical applications to address the educational loss in fifth grade mathematics in the light of the results of the study, designed specifically for primary school students in public education, taking into account people with special needs.

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