

**Mathematical communication skills and their relationship to mathematics among third-stage intermediate students**

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**Abstract**

Communication is one of the prominent instruments that are used by human in order to adapt with life requirements of life. Mathematics learning that are necessary for the individuals to complete their learning in most other specialties is necessary for them in their daily life as it provides them with the instrument to interact and communicate to have the ability to solve everyday problems in objective scientific method far from fanaticism and random .Thus mathematics occupied distinguished position in learning make use from it from its active contribution in achieving the purposes of learning . Mathematics is not mere a method to human in thinking , solve the problems and reach to results but it is an important method for thoughts exchange precisely and clearly .People live in communication world , looking at their communication as a deserved gift for them and very necessary thing as human spent his day speaking and listening , writer and reader and respondent for several symbols .The concept of Attitude is one of the most important psychological and social concepts that are related to the individual and it is the cornerstone in building social psychology .It was applied in several domains such as :Teaching , training , administration .....etc. .The Attitude as a social and psychological concept is : hypothetical form or mediator variable which are expressed by several responses either in accept or refuse Attitude about certain social debatable subject .There are several of interlocked elements that have negative or positive effects specially for making the pupils' attitudes and the most important are :Age , maturity , learner experiences , learner abilities , teachers attitudes towards the pupils , the teachers method of teaching ,.....etc. .The attitudes toward mathematics is one of the sentimental objectives that could be achieved in learning process and no less importance from other aspects ,the skill and the cognitive but may exceed them in importance .And to achieve the cognitive and the skills objectives some pupils must generate positive attitudes towards mathematics study and their attitudes must grow and estimate its importance .Some studies results indicates that that success mark in any curriculum depends on the pupils permanent and contemporary attitudes toward the study subject .Thus the work must be done on developing positive attitudes toward mathematics because negative emotions led to prevent this subject while the positive emotions led to pupils attractiveness on specialized study of mathematics followed by huge abilities for success in learning and in life .The Attitude toward mathematics is considered one of the main cases that concerned mathematic scholars give great important mathematics ,the positive attitudes developments toward mathematics as a bridge to cross in order the student / the teacher achieved some fruitful success in teaching / learning .Consequently we have an excellent student and teachers thanking their pupils. That shall not happen unless the teaching system interest in cognitive objectives and neglect sentimental objectives. Thus, the

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interest in developing pupils' attitudes is main demand and no less than developing higher thinking study.

### **The current research aimed to find out:**

1. Mathematical communication skills for third-grade intermediate students.
2. Attitude towards mathematics among third-grade students, average.
3. The relationship between mathematical communication skills and the attitude towards mathematics among third-grade intermediate students<sup>2</sup>

The research sample will consist of (100) male and female students of the third-grade average, and the results of the research will be analyzed according to the statistical analysis program (SPSS) for the social and human sciences. The problem of the current research lies in how to employ the mathematical communication skills of the third intermediate grade students, as the students use the cognitive aspect of mathematical communication, in addition to that, the extent of their orientation towards the mathematics lesson, that is, the more they have correct mathematical communication skills, the more positive their attitudes towards the mathematics lesson become.

**Keywords:** Mathematical communication skills, attitude towards mathematics, third-grade intermediate students

## **General Research Framework**

### **Introduction**

Communication is one of the most prominent tools used by man to help adapt to the demands of life. The mathematical knowledge that obliges individuals to complete their sciences in most other disciplines also obliges them in their daily lives with the tools they provide for interaction and communication to be able to solve the daily problems they face in an objective scientific way away from intolerance, haste and randomness, so mathematics in education occupies a privileged position to use from its effective contribution to the specific purposes of learning, mathematics is not a course is a way to help people think, solve problems and reach results, but it is a very important way to exchange ideas clearly and accurately. People live in a communication world, they see their connection as a grant due to them and something necessary and indispensable, man spends his day speaking and talking to him and writer and reader and responsive to many symbols, the concept of direction (Attitude) is almost one of the most important psychological and social concepts associated with the behavior of individuals, which is the cornerstone of the building of social psychology, and has been applied in many areas including Education training management, ... And others. The trend as a psychosocial concept is: a hypothetical composition or intermediate variable, expressed by a set of consistent responses, whether in the direction of acceptance or rejection, to a particular socio-dialectic psychological subject. There are a lot of overlapping

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<sup>2</sup> () Ibrahim, Hamad Al-Jubouri (2013): Mathematics Teaching Methods and Mathematical Communication Strategies, research published in the Journal of Psychological and Educational Research, No. 12, Volume 3, p. 32.

() . Zainab Mahmoud Atifi (2015): Developing the necessary sports communication skills for student teachers (Mathematics Division) at the Faculty of Education, Amman, Jordan

factors that have a positive or negative impact on it especially for the formation of student trends and the most important of these factors: age, level of maturity, learner experiences, abilities, teacher trends towards their pupils, the way the teacher is taught, ... And others.<sup>3</sup>

The trend towards mathematics is one of the emotional goals that are hoped to be achieved in the field of the educational process, and it is no less important than the rest of the cognitive and skill aspects, but may even exceed them in importance. towards it and to appreciate its importance.; Hence, the results of some studies indicate that the degree of success in any academic course depends on the students' fixed or temporary tendencies and tendencies towards the subject matter. Therefore, work must be done to develop positive attitudes towards mathematics. Because negative feelings often lead to avoiding this subject, while positive feelings lead to students' interest in specialized in-depth study of mathematics, Thus, the issue of trends towards mathematics is a major issue on which those interested in school mathematics attach great importance, and the development of positive attitudes towards mathematics is therefore a transit bridge for the student/teacher to achieve some fruitful successes in learning/education; We will not be able to do so if our education system is concerned with cognitive goals and neglects emotional goals, so attention to the development of student attitudes is a key requirement, no less important than the development of higher thinking skills, but we can say that it is integrated with both those skills, creating an educational environment based on the satisfaction of pupils with their learning, and thus more educational outcomes hoped for.

### **First; Research Problem**

Learning mathematics should include reading, writing, listening to its concepts and theories, discussing its subjects and understanding and understanding the rules of expression, so teaching and learning mathematics should provide opportunities for communication and communication, as emphasized by the U.S. National Council of Mathematicians (NCTM); sports communication is one of the most important criteria for learning mathematics at present, it contributes to improving the thinking of learners, creating a common understanding of mathematical ideas, motivating their learning and providing a positive educational atmosphere, their ability to solve sports issues. Hence the need for mathematicians to develop their sports communication skills due to their need to use these skills in the lesson, and this is what forced the teacher to be able to achieve sports communication and invest effectively through classroom discussion, encourage learners to it, and develop it with a variety of teaching methods and strategies, so that they can solve mathematical problems, answer their questions in clear language and so that they can treat weaknesses in mathematics resulting from students' weaknesses in skills Sports communication and their attitudes towards the study of mathematics.<sup>4</sup>

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<sup>3</sup> . Badawi, Ramadan Massad. (2003) Strategies in the education and evaluation of mathematics learning. . Hassan Ali Salameh (1995): Methods of teaching mathematics between theory and practice, Cairo, Al-Fajr Publishing and Distribution House.

<sup>4</sup> Ibrahim, Hamad al-Jubouri (2013): Methods of teaching mathematics and sports communication jackets, research published in the Journal of Psychological and Educational Research, Issue 12, Volume 3, p. 32.

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The problem of the current research lies through how to employ sports communication skills among middle third grade students as students use the cognitive aspect in sports communication, in addition to the extent to which they tend to study mathematics i.e. the more they have the correct mathematical communication skills whenever their attitudes towards the study of mathematics become positive, and in light of this the researcher was able to raise **the following question :**

- **What is the nature of the relationship between sports communication skills and the trend towards mathematics in the third average students?**

### **Second: The importance of research**

Communication is one of the most important criteria for learning mathematics at the time of harm, and this is confirmed by many educational literatures on mathematics education.

Sports communication is one of the components of mathematical ability that enables students to use the language of mathematics when confronting a written, decreed, readable or concrete position and interpret and understand it through oral or written sports discussions between him and others.

Fetler was introduced. M, 1999) A study on the results of mathematics tests for high school students was aimed at determining the relationship between the skills of the mathematics teacher and the performance of students, in the state of California, USA, and it became clear that there is a strong relationship between the quality of teaching performance of mathematicians and the standard of performance of students in the tests prepared for it.

Although it is important to develop sports communication skills as a component of sports ability, and because it is one of the objectives of teaching mathematics and stipulated by the national standards of the National Council of Mathematicians, there was a weakness in the level of sports communication skills among middle third grade students.

The concept of trends is one of the most common concepts in the humanities and social sciences because it is an organized way of thinking and feeling and is associated with reactions to attitudes around it from individuals or social issues.

The individual acquires his values and ideals and trends from the society in which he lives through an interactive process between him and society through the alerts that call him to attention and if society does not focus on these alarms we find that these topics do not fall within his circle of attention but unfortunately sometimes society paves the way for the growth of negative trends and thus away from the seriousness of science, thinking and humanity we find that society fuels topics that may lead to then unsung and make The children of his society are groups that threaten each other and when society deals with this mentality, this is an indication of its backwardness and more serious when it comes to the beliefs and affiliations of the individual, which he found himself on in nature and amplified by the family through child-rearing and experience, and has developed roots that are difficult to change if they are negative in the advanced stages of life and it is joy if the family promotes positive trends because the trends are educated (acquired) and not genetic as the family has a role in the family Gaining directions because she has gone through a variety of

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experiences wants to see her children follow her approach and any difference will be strongly rejected.

**This research derives its importance from the fact that**

1. Helps learners in mathematics in terms of recognizing contemporary professional standards, and working to link their performance to them.
2. Its benefits students in terms of raising their academic and educational level as a result of their influence on mathematicians who are trained in contemporary professional standards.
3. Mathematicians benefit by using contemporary professional standards in evaluating the performance of mathematics teachers in sports communication skills.
4. Helps those who prepare mathematics teachers in the faculties of education by working to develop students' attitudes about mathematics.
5. This research is a response to modern educational trends that call for attention to modern methods of teaching mathematics and trends towards subject matter.

**Third: Search objectives**

**The current search aimed to identify:**

1. Sports communication skills of third grade students average.
2. The trend towards mathematics among third-grade students is average.
3. The relationship between sports communication skills and the trend towards mathematics in third grade students average

**Fourth: The limits of research**

1. Objective limits: Knowing the relationship between sports communication skills and the trend towards mathematics in third grade students average by promoting theoretical literature for variable sports communication skills and the trend towards mathematics, and applied procedures based on research tools and analysis of their results.
2. Spatial Boundaries: A random sample of middle-grade third graders from a school
3. Time Limits: School Year 2019-2020.

**Fifth: Defining terms**

**1) Sports communication skills:**

Communication can be defined as the process in which ideas and information are transmitted using multiple means and methods such as spoken words, written words, images, models, graphs, maps, mathematical equations, and graph tables.

The National Council of Mathematicians defines sports communication as the ability of the individual to use mathematical vocabulary and symbols and their structure in expressing and understanding ideas and relationships.

Sports communication means the ability of the learner to use the language of mathematics with its symbols, terms and expressions to express, understand and clarify ideas and relationships to others. From the point of view of the NCTM Board of Mathematicians on Sports Communication (Communication): The National Council of Mathematicians has 10 main criteria, five of which

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relate to sports processes and procedures, each with several specific objectives achieved across the classroom, **these criteria are:**

- Problem solving
- Explanation and proof
- Communication
- Bonding
- Representation

**It has been reported that communication serves the student as:**

- Regulates and supports mathematical thinking through communication.
- Conveys his athletic thinking coherently and clearly to his peers and other teachers.
- Analyzes and evaluates mathematical thinking and other people's strategies.
- Uses the language of mathematics to accurately express mathematical ideas.

Procedural definition: Is the total degree that the respondent receives on the paragraphs of the mathematical communication skills scale used in the current research.

### **2) The trend towards mathematics:**

There is no unified definition of the concept of psychological trends, and although social psychology researchers do not fully agree on the so-called trend, there is a common denominator that combines the most contemporary definitions of the term, as most of them suggest that the trend "is a set of ideas, feelings, perceptions and beliefs on a subject, guiding the behavior of the individual and determining his position on that subject".

The most accurate and comprehensive definition of psychological orientation is that of psychologist Gordon Allport, who describes the trend as "one of the cases of mental preparedness and neuropsychic organization by experience, and what the trend hardly proves to be moving forward and directing the individual's responses to different things and attitudes, which is thus generally dynamic." The tendencies and feelings of the individual towards a certain sex and from this definition shows that the psychological trend is influenced by tendencies and feelings that may be selfish and at the same time influenced by convictions based on prior experiences and these convictions prevail cognitively"

**Procedural definition: The total score obtained by the respondent on the paragraphs of the measure of direction towards mathematics used in the current research.**

### **Research approach and procedures**

#### **First: Research approach:**

The researcher adopted a descriptive research approach focused on investigating a psychological phenomenon that currently exists with the intention of diagnosing it, exposing its aspects and identifying relationships between its elements or between them and other phenomena. (Abdelhamid and Mustafa, 2000: 83).

**Second: The research community: -**

The research community includes third-grade students average for the 2019-2020 academic year

**Third, the search sample:**

Select the research sample by means, from the third average student. Being a stage where students take the most math subjects in general

**Fourth: Search tools: -**

Testing sports communication skills: The process of building the test paragraphs for communication skills requires several steps:

- Drafting of test paragraphs.
- Test instructions.
- Make sure the test is true.
- Correct the test paragraphs.
- Make sure the test building is true.

**1- Drafting the test paragraphs**

The test paragraphs for sports communication skills for the research sample were formulated in its initial form of (29) paragraphs of the type of pans divided into skills in proportion to the skill developed and the mathematical material and in accordance with the levels of the third average students and their mental ability. Table 1.

**Table (1)**

**Table of distribution of test paragraphs to skill type**

Number of paragraphs	Type of skill	T
3	Sports Listening	1
7	Sports Reading	2
7	Sports writing	3
4	Sports Discussion	4
8	Riyadh Representation	5
29	Total	

These skills and paragraphs or ink were then presented to a group of arbitrators and specialists in the fields of measurement, evaluation and methods of teaching mathematics supplement (1). To verify the virtual honesty of the test and judge the validity of each paragraph in measuring the area allocated to measure it as well as to judge its logic and suitability to the requirements of the search sample and after making adjustments to the paragraphs all received the approval of the most arbitrators and thus the test is ready to be applied to the sample..

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2- Test instructions asked the sample members to answer all paragraphs and not to leave any paragraph unanswered and to pay attention to the examples and the answer be on the same test paper supplement (3).

3- Honesty:

- Virtual honesty: The test paragraphs were presented to a group of arbitrators and specialists in the fields of measurement, evaluation and methods of teaching mathematics supplement (1) for the purpose of determining the following:
- The validity of paragraphs to measure sports communication skills. The validity of its formulation and its harmony with the purpose for which it was developed.
- The extent to which the test paragraphs can be applied to the stage developed. The number of arbitrators was table 1, and after classifying the paragraphs in the light of the opinions and proposals of the arbitrators, it was found that most of the paragraphs had obtained an approval rate (89%) and more, with the amendment and deletion of paragraphs that did not receive a approval rate and the number of test paragraphs (29) and after the amendment became (26) paragraphs. Table (2).

**Table (2)**

**Expert opinions on the validity of sports communication skills test paragraphs**

Statistical function	Ca box value calculated	Number of paragraphs	Test paragraph		Agreement rate	Number of agreed	Number of experts
			Paragraph	Skill			
function	15	9	1	Listen	100%	15	15
			7,5,2	reading			
			5,1	handwriting			
			1	discussion			
function	11,26	6	2,1	Representation	98%	14	15
			3,2	Listen			
			6,2	handwriting			
function	8,06	7	8,4	Representation	86%	13	15
			6,4,1	reading			
			7	handwriting			
function	5,4	4	3	reading	80%	12	15

			4	handwriting			
			3,2	discussion			
Non-function	3,26	1	3	handwriting	73%	11	15
Non-function	1,66	2	4	discussion	66%	10	15
			7	Representation			

4- Correct the test:

A typical answer was developed for all the test paragraphs and relied on in the test correction to subject each of the typical answer steps to the bulletstick that is to correct the answers of the skills paragraphs (sports reading, mathematical writing, and mathematical representation). Table (3).

**Table (3)**

**Graded point scale of skills test paragraphs (reading, writing, mathematical representation)**

Actual performance shape	Grade
The whole performance is incorrect or the paragraph has not been answered at all.	zero
Partial approach to the solution	1
Complete the solution correctly	2

**Table (4)**

Actual performance shape	Grade
The whole performance is incorrect or the paragraph has not been definitively answered.	zero
Answering one demand	1
Answer two demands	2
A whole answer - about three demands	3

A graded point scale was used for mathematical listening skills test paragraphs, and table sports discussion (4)

The progressive live scale of mathematical listening skills test paragraphs, and mathematical discussion) statistical analysis of test paragraphs: for statistical indicators to examine the paragraphs of the sports communication skills test followed steps:1. After correcting the answers, the overall score of the test was determined (52). 2. Students' grades were ranked downwards from the highest score and were (52) to the lowest grade and were) 50% upper and 50% minimum

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4. the number of correct answers for the upper and lower groups and the following statistical analyses were calculated and carried out

**Distinctive power**

The ability of the paragraph to distinguish individual differences between individuals who have the measured status or know the answer and those who do not have the measured status or do not know the correct answer to each paragraph of the test. The equation for the discrimination factor was used for a paragraph that took into account partial knowledge that all test paragraphs had the ability to distinguish, with the proportion of such factors ranging from (0.08-52)

Within the permissible range, the results of the discrimination transactions for table 5 paragraphs appeared to show that all test paragraphs were as discriminatory. - Difficulty and ease factors for paragraphs: The difficulty factor paragraphs can be estimated by the percentage of students who answered the wrong answers about the paragraph of the students who performed the test, so: the difficulty factor of the paragraph + the factors of its ease = 1 and the equation for article paragraphs that take into account partial knowledge was used in correcting their answers and the results ranged from (0.12-0.76) and the analysis of paragraphs showed that they fall within the acceptable range and paragraphs (3, 4,7) The three obtained low difficulty transactions and were therefore removed from the test and table (5) explaining the difficulty and ease factors of the test paragraphs

**Table (5) Discrimination, difficulty and ease of testing sports communication skills**

Ease factors	Difficulty factor	Discrimination factors	Paragraphs	Type of skill
0.68	0.32	0.24	1	Sports Listening
0.71	0.29	0.21	2	
0.52	0.48	0.32	3	
0.44	0.56	0.32	1	Sports Reading
0.24	0.76	0.28	2	
0.36	0.64	0.28	3	
0.81	0.19	0.22	4	
0.81	0.19	0.42	5	
0.58	0.42	0.52	6	
0.47	0.53	0.34	7	
0.32	0.68	0.44	1	Sports writing
0.72	0.28	0.24	2	
0.82	0.18	0.08	3	
0.55	0.45	0.46	4	
0.48	0.52	0.52	5	
0.6	0.4	0.24	6	
0.56	0.44	0.45	1	Sports Discussion
0.50	0.50	0.26	2	

0.58	0.42	0.24	3	Sports Representation
0.56	0.44	0.36	1	
0.44	0.56	0.24	2	
0.55	0.45	0.26	3	
0.29	0.71	0.22	4	
0.26	0.74	0.36	5	
0.59	0.41	0.22	6	
0.88	0.12	0.08	7	

**The construction is true**

Using the Pearson correlation coefficient by correlation coefficient per item with the total testing total, the results ranged from (0. 80559-0. 50511) and this indicates the internal consistency of the test paragraphs. These results are effective at the level of significance (0.05) and the two paragraphs (3.7) of the skill of sports communication, which gave weak positive links and were deleted and table. (6)

**Table (6)**

**Link coefficients of each mathematical communication skills test paragraph in total**

Link coefficient degree	Paragraph	Type of skill
0,80559	1	Sports Listening
0,51688	2	
0,88608	3	
0,64944	1	Sports Reading
0,52251	2	
0,50511	3	
0,50863	4	
0,68125	5	
0,71592	6	
0,55944	7	
0,70688	1	Sports writing
0,52833	2	
0,14891	3	
0,65929	4	
0,68824	5	
0,54737	6	
0,5291	1	Sports Discussion
0,73714	2	
0,78981	3	
0,5291	1	Sports Representation
0,54233	2	

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0,63939	3
0,54609	4
0,53698	5
0,74145	6
0,37457	7

**constancy**

**Half retail:**

The test paragraphs were divided into conjugal and individual, and the result of the half-retail stability was (0.851) and using the Spearman-Brown corrective equation, the value of the stability factor (0.919) became high. Accordingly, this test is appropriately stable. Second: - the measure of the direction towards mathematics:1 - the goal of the scale. The scale aims to identify the trends of the third average student towards mathematics.

**2- Scale dimensions: -**

After reviewing the educational researches and studies that dealt with the measures of trends, the following was drawn:

- The orientation towards the nature of mathematics.
- The trend towards the value of mathematics.
- The direction towards learning mathematics.
- The direction towards enjoying the subject of mathematics.
- Heading towards the math teacher.

**3. Drafting the paragraphs of the scale:**

The paragraphs of the scale were formulated in the light of the five dimensions of the scale, where each after six paragraphs included the students answer each paragraph according to a graded scale of five categories according to the method of Lykert quintile) to measure trends (strongly approved - OK - no mind - jealous ok - strongly disagreed) the number of paragraphs of the scale as a whole (30) became in its final form after being presented to the arbitrators where some paragraphs were deleted from the scale, Table (8).

**Table (8)**

**Dimensions of the measure of trends towards mathematics and the number of paragraphs and numbers in its initial form**

Number of paragraphs	Paragraph numbers	Dimensions	T
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6	1---6	The trend towards the nature of mathematics	1
6	7---12	The trend towards the value and importance of mathematics	2
6	13---18	The trend towards learning mathematics	3
6	19---24	The trend towards enjoying mathematics	4
6	26---30	The trend towards a math teacher	5
30	Total		

**4- Correcting the scale**

The paragraphs were corrected according to the five-year eckert method of measuring trends due to their ease and they also give a greater degree of stability to the direction and the grades were distributed by giving (4, 1, 2, 3, 5) responses (I strongly agree, ok, no objection, disapproval, strongly disapproved) respectively table (9).

**Table (9)**

**Distribution of grades on scale paragraphs**

Total	Totally disagree	disagree	I don't mind.	agree	Totally agree	Type of paragraph
15	1	2	3	4	5	Positive-oriented paragraphs
15	5	4	3	2	1	Negative-trend paragraphs
30	6	6	6	6	6	Total

**5- Honesty: -**

**Virtual sincerity:**

A number of arbitrators, specialists in measurement, evaluation, curriculum and methods of edification were presented to a number of arbitrators and specialists. To the number of paragraphs (30). Supplement.2 Statistical analysis of paragraphs

**Scale: - Paragraph discrimination factor:**

The factor of excellence of the paragraph means the ratio of the difference in the number of respondents to the paragraph correctly in both categories to the number of students in one of the

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categories. (Return, 1999: 287). According to the discrimination factor for each paragraph, the number ranged from (0.24-084), so all the paragraphs of the scale have an acceptable discrimination factor.

### View and interpret the results:

The first hypothesis: There is no statistically significant difference at the level of significance (0.05) between the average arithmetic grades of the students of the research sample and the hypothetical average to test the skills of sports communication"

The grades obtained by the research sample students were observed on the sports communication skills test, with the average arithmetic of the grades of students as a whole (32.837) out of 52 degrees. By comparing the average calculation of real performance of students (32.837) with the hypothetical average (26), the researcher noted that real performance exceeds the level of hypothetical performance and is driven by this

Until it is concluded that the average third students have sports communication skills compared to the hypothetical performance of the academic year 2012-2013 and to test the validity of the hypothesis above, the researcher used the t-test for one interconnected sample, and the results were as in table (10).

**Table (10)**

**The results of the T-test to measure the difference between real and individual average performance to test the skills of sports communication as a whole in the student's sample research**

Scheduling value	ت قيمة المحسوبة	Standard deviation	Real average	Degree of freedom	Hypothetical average
2	13,427	5,365	32,837	72	26

**Note from table (10) above that the calculated value (13.427)**

It is greater than the scheduling value (2) which means rejecting the zero hypothesis and accepting the alternative hypothesis, i.e. there is a statistically significant difference at the level of significance (0.05) between the average real performance of the students and their average hypothetical performance (26) on the test of sports communication skills. Hypothesis 2: There is no statistically significant difference at the indicative level (0.05) between the hypothetical average and the mathematical average of the grades of the students of the study sample on the measure of the trend towards mathematics.

The grades obtained by the students of the research sample were observed on the measure of orientation towards mathematics, with the average calculation of the students' grades in the test (91.81) of the 150 degrees. By comparing the average calculation of real performance of students (91.81) with the hypothetical average (26), the researcher noted that real performance exceeds the

level of hypothetical performance, which leads to the conclusion that the students of the research sample have a trend towards mathematics compared to the hypothetical average.

**Table (11)**

**Results of the T-test of the trend towards mathematics in the students of the research sample**

Scheduling value	Calculated value	Standard deviation	Degree of freedom	Real average	Hypothetical average
2	0,414	9,712	72	91,81	26

**Results of the T-test of the trend towards mathematics in the students of the research sample**

The value of the calculated "T" (2) is greater than the scheduling value (1). 98) This rejects the zero hypothesis and the acceptance of the alternative hypothesis, i.e. there is a statistically significant difference at the level of significance (0.05) between the average real performance of students (9181) and their average hypothetical performance (26) on the scale of the orientation towards mathematics. Chance 3: There is no statistically significant correlation at the indication level (0.05) between the research sample scores in the mathematical communication skills test and their grades in the measure of direction towards mathematics. Use of the I Pearson i-Erpa coefficient (. Pearson cor) to calculate the correlation factor between students' grades on the test prepared to measure mathematical communication skills and their grades on the math-oriented scale and to measure the correlation indication, the T-link test was used to test the validity of the third hypothesis and the results were shown in table 12.

**Table (12)**

**The value of the correlation factor between sports communication skills in general and the measure of the trend towards mathematics and the correlation indication of the research sample**

The ratio of correlation between mathematical communication skills was 0.495, which is a positive but average correlation factor because the correlation transaction values ranged from

(0.1) The closer their values to (1) were strong, however, this i-grade coefficient was statistically significant at the indication level (0.05) and the degree of freedom (72) because the T value of the correlation coefficient indicated

(4.495) (which is greater than the t-table value of (2), which indicates the rejection of the previous zero hypothesis regarding the trend towards mathematics and its relationship to sports communication skills in general and acceptance of the alternative hypothesis i.e. that there is a correlation between the two variables but this relationship is moderate.

**Second: conclusions**

**In light of the search results you can infer what comes- :**

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1. The third students are average, possessing sports communication skills as a whole.
2. Having a correlation between sports communication skills and the trend towards mathematics.

### **Third: Recommendations:**

**In the light of the findings and conclusions of the research, the following recommendations can be come up with**

1. The need to increase the focus of mathematics curricula on sports communication skills.
2. Pay more attention to the objectives of sports communication in the stages of public education because of the importance of this
3. The concept is to increase the participation of learners within the classroom and their attitude towards mathematics and the objectives of teaching it at the general education levels.
4. The need to educate third-graders on average the importance of the concept of sports communication in activating the factor of direct influence on their students in the future.

### **Fourth; Proposals: -**

**The researcher suggests conducting the following studies:**

1. Conduct a pilot study to find out the availability of sports communication skills and the orientation towards mathematics in students of teachers' institutes.
2. Conducting other studies that use the experimental method to detect the impact of sports communication on improving achievement and mathematical thinking.

### **Arabic Sources**

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