(IJASSH) 2019, Vol. No. 8, Jul-Dec **e-ISSN: 2455-5150, p-ISSN: 2455-7722**

NUMERICAL SENSE AND ITS RELATION TO ACADEMIC ACHIEVEMENT AMONG MIDDLE SCHOOL STUDENTS

Asst. lecturer AFRAH TUAMA RADHI
Presidency of Al-Mustansiriya University
department of control and internal audit

ABSTRACT

The present research aims to identify the correlation between numerical sense and the academic achievement of mathematics among first grade students. In order to achieve this goal, the researcher adopted a measure (Hasan, 2013) to measure the numerical sense. The researcher also constructed an achievement test for mathematics. After identifying the research community represented by the first grade students in the six districts in Baghdad governorate, (200) students, and applied research tools. After the application of the tools and data collection, the data were analyzed by statistical package for social sciences (SPSS). The results were as follows:

1. There is a low level of numerical sense among students in the first grade average

2. There is a low level of academic achievement in mathematics among students in the first grade average

3. There is a relationship of statistical significance between the numerical sense and the academic achievement of students in the first grade average

The research concluded with a set of conclusions, recommendations and proposals.

CHAPTER ONE: DEFINITION OF RESEARCH

First: Research problem

The educators emphasize that there are problems that occupy all the staff in the field of education, including the problem of low level of students' achievement in formal education in Iraq and the Arab world. This is confirmed by the results of some studies and researches that dealt with the subject of achievement among students, (F) Al-Qaoud (1995), Al-Ghazali (2001), Al-Shukri (2005) and Al-Baawi (2007) and (2007 increases). Mathematics is the language of the age, which is related to various branches of other sciences because of the nature of making them unique and unique always seeks to distinguish in the realization of the mind to meet the needs and requirements of human, this increases the importance among the other branches. Jadallah Abu al-Makarem (1998, 21-22) explains that it was and still is a matter of trust and certainty among most thinkers of its accuracy and frankness, which we find no parallel in any other branch of human knowledge. , And every thinker who wants accuracy and confidence in his studies.

Mathematics is one of the branches of knowledge science, which seeks to develop logical thinking and solve problems in students, and the advantage of mathematics in its cumulative structural nature, which helps the student to access multiple ways to the same solution, and mathematics as a material rich in problems that seek to find solutions to find solutions.

The nature of mathematics is now different from those that were taken as a substance free of (sense), after the scientific and technological progress, which contributed too many tasks without human intervention confirmed the trends in modern mathematics. It is noticeable that the level of students in mathematics with various skills is low, and this may be due to several things, including the rigid view of the

Presented at Wings' International Conference on English Literature and Linguistics 2019 (WICELL-2019)
Held on 21st July, 2019 at New Delhi, India

material by the students, including the lack of awareness of parents and educational supervisors and athletes of the value of this article, subject. Numerical sense in mathematics is one of the modern perceptions in education in order to improve the level of awareness and treatment of students with the article out of the weakness of the article.

The current research problem can be summed up in the following question:

The current research problem can be summed up in the following question:

What is the nature of the relationship between numerical sense and academic achievement among middle school students?

A number of questions stem from this question:

1- What is the level of numerical sense among first grade students?

2 - What level of educational achievement among first grade students is average.

3 - What is the nature of the relationship between numerical sense and academic achievement among students of the first intermediate.

Second: The importance of research

Smith Smith (106-123, 2006) believes that numerology depends on the development of mental skills. Students are given the opportunity to brainstorm and understand numbers in a general sense and to understand them in terms of absolute relative quantity. This grows by focusing on examples associated with motivations and discussion that develop mental skill For the student rather than mental models. Several studies have confirmed the importance of numerology in the teaching of sense to mathematics, such as Markovits & Sowder (1994), Robert & Ching (1998), Munir Karmah (1999), Yusuf al-Imam (2000), Mahmoud al- (2005), Makkah al-Banna and Muftat Kamal (2007), Yang et al., Yang et al. (2008), and Al-Din Sa`d and Abd al-Nasir Muhammad (2003), Deruchun et al. Since ancient times, societies have given great importance to scholastic achievement, and it is still the yardstick for which we indicate the extent to which the individual has mental abilities and intelligence. The urge to attain academic achievement is the focus of everyone from the family, society, teacher and student himself. The intelligence and superiority of the individual. (Ismail, 1989, p. 33)

We call the student who gets high grades intelligent student and the name of the stupid student on the student who gets low grades, but this measure is now not true in the eyes of many of the modern educational studies, but the researcher supports the idea of not relying entirely on The grade scale that a student receives in the course of the examination to judge the success of the individual may exceed that student significantly in non-academic areas. The importance of this age is because the students are subjected to the beginning of mental, physiological, social and psychological changes resulting from adolescence, in the sense that it is a new stage of psychological birth, according to some psychologists (Abdel Rahim, 1986, p. 277).

From the foregoing, the importance of the current research can be highlighted as follows:

1. Numerical sense is an urgent necessity for qualifying students for life in mathematics, as we live in the era of information revolution characterized by rapid development in all aspects of life.
2. The preparation of the numerometer in mathematics for first grade students can be used to measure the ability of students to measure their ability to feel normal.
3. This research opens the door for subsequent studies and research within the field of specialization.

Third: Research objectives

The current research seeks to identify:

1. The level of numerical sense among students in the first grade average.
2. The level of academic achievement among first grade students is average.
3. The nature of the relationship between numerical sense and academic

achievement among students of the first intermediate.

Fourth: Research limits

Current search is determined by a set of limits:

1. Limits of humanity: middle school students
2. Spatial level: middle school schools
3. Temporal limits: the academic year 2018-2019

Fifth: the challenge of terminology

First: Numerical Sense Number Sense:

- (NCTM, 2001) Numerical sense can be referred to as a type of thinking used to describe mental processes as well as to provide facts, basic knowledge, problem solving, contemplative thinking, causal and approximation
- (NCTM, 2001: 3-4) (Said, 2005): The sense can be referred to as the area in mathematics that describes the student's ability to process and manipulate mathematical knowledge, as well as the flexible use of this knowledge in dealing with digital outcomes and judgments and related subjects (Al-Saeed, 2005: 5).
- He knew (Said and others, 2008) "Is the general understanding of the preparation and computations associated with it, which includes the ability to understand this ability and use it flexibly in dealing with numbers, in addition to the preparation of cognitive strategies to deal with the numbers and processes associated with it, this sense is also linked to the ability to use quantitatively in the interpretation And addressing the information provided (Said and others, 2008: 11)

Second: Achievement

Known by:

- Code 1973: "Achievement or efficiency in the performance of a particular skill or knowledge" (Code, 1973, p6).
- (Kala and Mukhtar 1989) "The extent to which learners understand what they have learned from the specific experiences of a subject or subject measured by the grades obtained by the learner in the achievement test." (Al-Kalza and Mukhtar, 1989, p. 102).
- Abu Jado, 1998: "It is the outcome of what the learner learns after a certain period of time, and it can be measured by the degree to which it obtains the test of achievement." (Abu Jado, 1998, p. 469).
- Allam 2006 "The degree or level of success achieved by the student in a particular field of study." (Allam, 2006, p. 122) The researcher adopts the definition (Allam, 2006) theoretical definition of research.

The procedural definition of the researcher is "achievement in the field of knowledge achieved by the students of the first grade the average sample of the research measured in degrees obtained after their response to the test preparation prepared by the researcher who applies the end of the research experience" in mathematics.

CHAPTER TWO: THEORETICAL FRAMEWORK AND PREVIOUS STUDIES

First: the theoretical framework

Numerical Sense

1- Skills of numerical sense

Numerical sense the range of skills involved in this process and these interrelated skills are:

A. Understand the meanings of numbers and computations based on decimal system, and of course this requires understanding of natural numbers and decimal and normal fractions.
B. Understand the relative amounts of numbers, in order to accommodate the comparison between them the ability to analyze and construct numbers. This skill enables the student to deal flexibly with the numbers, in addition to the skill in computation understanding the effect of operations on results and numbers.

C. Judging the reasonableness of the extracted results without resorting to written calculation (2008: 112, Yang et al)

2- The dimensions of numerical sense

Through the researcher's knowledge of previous studies found that numerical sense includes a set of basic dimensions and these dimensions are:

Numerical sense is a mental process

A. Numerical sense refers to the student's flexibility in dealing numerically with numbers, and is seen as A. form of reading and writing by numbers and numbers, and numerical sense is a logical value in itself and a basic component in mathematics (Paul & Diaene, 1999: 51).
B. Numerical sense of learning output this dimension focuses on the end product of numerical sense, which seeks to develop students' numerical understanding and build multiple performance strategies that are flexible in solving various problems (Barkly & Gruz, 199).
C. Numerical sense is a personal trait of the student

A numerical sense is a personal character of a student. A student who possesses numerical sense necessarily has a set of characteristics:

1. Understand the size of the number and compare it with other preparations
2. The ability to connect the different methods of mental and scriptural calculation at the same time
3. Flexibility in using multiple mental account strategies (Scheider & Thompson, 2000).

The Numerical Sense Depends On His Home Learning

As the learning environment is the basis in shaping and building the numerical sense of the students by taking care of this concept and work to create an environment suitable for him to grow through attention to examples and discussion that develop this sense among students (Gey & Douglas, 1997: 27).

First: the mental and physical health of the learner

Mental and physical health status is one of the most important and influential factors in the level of achievement of students. This is done when they suffer from some diseases that may have negative effects, which exposes them to the problem of delay in school and therefore low in their school achievement, as well as that they may suffer from learning difficulties in their early stages When they enter the appropriate school, they get less (barley, 2002, p. 260).

Second: Family

Although the influence of the school has increased in terms of education and skills acquisition, the family still has a key role to play in learning. It shares the school in this educational process by strongly influencing the students' response to the school (Qatami, Qatami, 2001, p. 25). The whole family environment, which is dominated by love, reassurance and safety, all members feel calm and psychological comfort and stability, which makes their children more willing to work and achievement or to learn and collect the academic contrary to families suffering from family problems. (Saleh, 1991, p. 16). There are family conditions that affect the achievement level of students, including the social, cultural and economic situation. They may have to leave school to help their families overcome difficulties and improve their financial situation (Qatami and Adas 2002, p. 209). Nasrallah (2000) reports the results of the studies conducted by Douglas Wooten, Hales and Nebst, all of which focused on the importance of the interrelationship between the statuses of the family.

Third: The school

The school is an important part of the individual's life. It is an important factor influencing the achievement of the students directly affecting them and the extent of their achievement and the level of achievement, because the family and school are important and essential factors, especially in the education of students where the school completes what the family started in the first stages of growth or In their daily lives, and sometimes the school discovers some of the wrong behaviors that the learner may have inadvertently acquired. Here, it is her duty to correct these behaviors, and thus complement the family in the development of students' personality through a range of relationships that they contain through their

relationships or with their teacher or through the school administration relationship with teachers and students as well, and through the school's relationship with the family. (Adas, 2005, p. 16)

2- Types of academic achievement

There are two main types of educational achievement

A- Good academic achievement: It is referred to as the behavior that reflects the student's performance exceeded the achievement of the performance of the group or age group to which the student belongs, both in the age of mental or time, the student is superior to the student is that the student beyond the expected range For the age group to which he belongs (Abdel Rahman, 1990: 188).

B- Weak academic achievement: The course is divided into two basic forms, the first year and appears in all subjects, while the private is specific to a particular subject, such as mathematics (Rifai, 1979: 436).

C-

Second: Previous studies

First: Previous studies of numerical sense

1- Study (Moroccan, 2012): the relationship between numerical sense and numerical intelligence and achievement in mathematics for students in the seventh grade

The study aimed to identify the correlative relationship between numerology, numerical intelligence, and achievement in mathematics among the seventh grade students in Hebron. The research started from two basic hypotheses:

First: There is no statistically significant relationship between numerology and achievement in mathematics among seventh grade students

Second: There is no statistically significant relationship between numerical intelligence and scholastic achievement in mathematics among seventh graders

The research community consists of seventh grade students in the city of Hebron, and their total number (4193). The researcher chose a random sample of (169). The researcher adopted the measure of Mounir Karma in numerical sensory measurement. Numerical intelligence was adopted by the researcher Nabil al-Maghrabi. To measure the achievement in mathematics, the achievement test was constructed and the validity of the tools used in the research was verified. After collecting and analyzing the data, the study reached a number of results:

1. There is a statistically significant relation between the numerical sense and the academic achievement among the seventh grade students
2. There is a statistically significant relationship between numerical intelligence and academic achievement among the seventh grade students

The research concluded with a set of conclusions, recommendations and proposals.

2- Study (hitti, 2017) the relationship between numerical sense and multiple intelligences in mathematics among fourth grade students in al anbar province. The research aims to test the relationship between numerical sense and multiple intelligences. The research community may be fourth grade students in Anbar province. The researcher chose a sample of 400 students. the researcher used the first two measures of multiple intelligence (mathematical intelligence, , and the linguistic) was composed of 36 paragraphs, and also used the researcher to test the numerical sense of the component of 44 paragraphs, and the researcher has achieved the characteristics of cykometric ladin, and after the application of tools and access to data, the researcher used the appropriate statistical means, and the study found a statistically significant relationship between the variables he concluded to examine the current set of conclusions, recommendations and proposals.

Second: Studies on academic achievement

1- Study (Hamoudi, 2006) educational achievement and its relation to the concept of self among students in the fifth grade primary schools in the province of Damascus). The current research seeks to identify the correlation between scholastic achievement and self-concept among the fifth grade students in Baghdad governorate schools. The study was conducted on a sample of (180) students. The study reached the following results:

- There are statistically significant differences between the average of the sample scores on the

self-concept scale and their achievement scores at the level of (0.01)

- There are statistically significant differences between the average scores of males and females in the scholastic achievement test
- There are no statistically significant differences between the average of males and females on the scale of self-concept.

2- Study (Abdel Hadi, 2016): social support and its relationship to the achievement of education in the middle stage of education.

The research aims to identify the correlation between social support and academic achievement. In order to achieve the research objectives, the researcher adopts the descriptive analytical approach to describe and analyze the phenomenon. The research society consists of students of the second and third years of intermediate education in Sabha city, 60) students, and after the use of the statistical package of social sciences (spss) the search results in the following results:

1. Students enjoy a good level of social support by family and peers
2. Students enjoy a good level of academic achievement
1. There is a statistically significant relationship between social support and educational achievement

Comment on previous studies

The researcher benefited from these studies in the following:

1. Identify the problem of research and its importance
2. Identify some theoretical frameworks
3. Determine the sample size and society
4. Identification of some statistical means used

CHAPTER THREE: RESEARCH PROCEDURES

Research Methodology

Research Objectives for investigative current, a researcher depends on the descriptive approach because it is commensurate with the nature of the current study and the procedures followed, and that this approach is one of the most widely used and common approaches in the field of educational and psychological sciences.

Research Community

Society includes current research students in the first grade middle school morning and both sexes in the province of Baghdad in government schools for the academic year (201 8-2019) and the following table shows the distribution of society by sex and stage

Table 1. The research community is disaggregated by gender and directorate

Stages Directorates	The second phase	
	Males	**Female**
First Rusafa	10606	8154
Second Rusafa	19176	7423
Third Rusafa	11235	8831

First Karkh	9160	5972
The Second Karkh	13951	8362
Third Karkh	7581	5338
Total	71709	44080
	115789	

Sample Research

The researcher suggest the sample size of 200 students from 12 schools of the six directorates and two schools by each directorate for males and other females, the following table illustrates this:

Table 2. Sample of the research distributed by directorate and gender

Directorate	**Sex**	**Name of school class**	**The second**
Consistently First	Males	Medium Hope	18
	Females	Medium tiles martyrs	16
Second	Males	Medium Mutanabi	21
	Females	Medium Fatima Zahra	13
Third	Males	Medium spectra	19
	Females	Medium Umm Al Qura	12
Karkh First	Males	Medium Abrar	17
	Females	Medium good	13
Karkh Second	Males	Medium session	25
	Females	Medium spectra	17

Karkh 3	Males	Medium in honor	16
	Females	Medium Khadija Al-Kubra	12
Total	12 School		200

Research Tools

First: Numerical Sense Scale

The researcher numerical scale common (Hassan, 2013), the meter consists of a three - paragraph 30 alternatives (always, often, sometimes)

Second: The Achievement Test

The researcher has built a test material for the open Mathematics for the first grade average, as adopted on the specification table in the test building, which will be from 20 paragraph in a way multiple choice, the following steps have been adopted in common numerical scale procedures and test grades:

1. Logical analysis

The logical analysis is considered one of the important and necessary steps at the beginning of the preparation of the paragraphs, because there are no statistical indicators to confirm the accuracy of the scale and its ability to measure the results of the questionnaire, so the scale and its components and instructions are presented to a group of experts and arbitrators to give an opinion on the validity of paragraphs in all (virtual Kubaisi 200 1: 177). it is for that display the researcher scale on ten of the experts and specialists in the field of educational and psychological sciences in the specialty measurement and piety m and educational psychology, the researcher has adopted the standard percentage criterion of the acceptance of paragraph, paragraph which are With the approval of (80%) of experts Barr valid paragraph in measurement, and based on this standard has received all the paragraphs in the scale and test on the consensus of experts, except some of the paragraphs that have been modified based on the observed data required.

Clarity of instructions and understanding of phrases:

In order to verify the clarity of the instructions and paragraphs, the researcher applied the tools to a sample of (40) students from the first grade students. The researcher found that the instructions are clear as well as the paragraphs. The average time required to answer the paragraphs of the scale is 12 minutes, the collection time was average (35) minutes.

Statistical Analysis of Paragraphs:

The statistical analysis of the paragraphs is one of the most important steps in the construction and preparation of tests and measurements, because it is necessary to possess the tool characteristics of good and appropriate (Anastasi, 1988: 192).

The researcher investigated the psychometric characteristics of the paragraphs of difficulty, discrimination and honesty, and found that the vertebrae had good sekmetic characteristics.

Statistical means:

1. The arithmetic mean
2. The mean medium
3. Standard deviation
4. Pearson correlation coefficient

(IJASSH) 2019, Vol. No. 8, Jul-Dec **e-ISSN: 2455-5150, p-ISSN: 2455-7722**

CHAPTER FOUR: FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND PROPOSALS

Research Results

1- **Objective 1**: To identify the level of numerical sense among students in the first grade average

In order of the achievement of the goal extracted Alp urge averages and computational theory, and the difference between the arithmetic mean of the sample and theoretical average of society as well as a Li standard deviation , and the results were as shown in the following table:

Table 3. Mathematical and theoretical averages and standard deviation of numerical sense

Category Type	The Number	Theoretical Average	SMA	Standard Deviation
Males	120	60	55.46	12.45
Female	80		53.68	14.22
sum	200		54.57	13.335

It is noted from the previous table that the level of numerical sense among students (males and females) is very low, given that the theoretical average (60) is greater than the arithmetic average (13.335). This indicates that the numerical sense of the students is very low, The nature of the traditional curriculum used in our schools, in addition to the methods of teaching is still dependent on conservation and study and does not develop the numerical sense and understanding and the ability to issue judgments at the request and this is a drop in the sense of numerical students in the middle stage.

2- Second Objective: To identify the level of academic achievement of students in the first grade average to achieve this objective, the researcher extracted the mathematical mean of the sample and the theoretical mean of the society and the standard deviation. The results were as follows:

Table 4. The arithmetic and theoretical average of the achievement test

Category type	the number	Theoretical average	SMA	standard deviation
Males	120	10	7.65	2.32
Female	80		6.67	2.34
sum	200		5.49	3.49

(IJASSH) 2019, Vol. No. 8, Jul-Dec **e-ISSN: 2455-5150, p-ISSN: 2455-7722**

Notes from the previous table that the academic achievement level of the students (male and female), where the arithmetic mean of the year (5.49) below the theoretical average (10) This is due course to the lack of interest in the development of mathematics to meet the ambitious students, as well as a Li not the attention to the thinking about my math.

3- Objective 3: To identify the relationship between numerical sense and academic achievement

To investigate this objective, the researcher used the Pearson correlation coefficient between the numerical sense responses and the scholastic achievement. The researcher found that the coefficient of correlation between the variables as in the following table:

The number	Coefficient of correlation	Level of significance
200	0 , 83	0.05

The correlation coefficient value indicates that it is a high value, indicating that there is a relationship between the low numerical sense and the academic attainment of the first grade students. This means that low academic achievement is due to low numerical sense.

CONCLUSIONS

1. Students suffer from a decrease in the level of numerical sense in mathematics among first grade students
2. The level of academic achievement is low in mathematics among first grade students
3. The relationship between numerical sense and achievement is positively positive

RECOMMENDATIONS

1. Review the curriculum and strengthen it with skills and experience.
2. Teaching methods should be based on scientific and practical methods.
3. Introducing important changes in the field of mathematics such as software and information technology.

PROPOSALS

Based on the above, the researcher proposes the following results:

1. Numerical sense and its relation to higher thinking among undergraduate students
2. Numerical sense and its relation to multiple intelligence among middle school students
3. Educational achievement and its relation to emotional intelligence among middle school students
4. Academic achievement and its relation to self-esteem among undergraduate students

REFERENCES

1. Jadallah Abu al-Makarem Jadallah (1998): Educational Achievement in Mathematics: It's Components of Cognitive and Informational Knowledge, First Edition, Alexandria: The Egyptian Forum for Creativity and Development.
2. Saeed, Radman Mohammed Saeed et al. (2008): "Numerical Sense among Sixth Grade Students from the Basic Education Course in Sana'a, Sana'a", Sana'a University Journal of Educational and Psychological Sciences, Vol. 5, No. 1, January-June, pp.
3. Said, Reza Massad (2005): "Numerical Sense", Journal of the Faculty of

Education, University of Menoufia, No. 12, January 8, pp. 24-56.

4. Abu Jado, Saleh Mohammed Ali, 19 9 8, Educational Psychology, 1, Dar Al Masirah for Publishing and Distribution, Amman, Jordan.
5. Ismail, Muhammad Emad Eddin et al., 1989, Child from Childhood to Adolescence (The Adolescence), Part II, I 1, Dar Al Qalam, Kuwait.
6. Abdul Rahim, Talaat Hassan, 1986, the Psychological Basis of Human Growth, 3, Dar Al Qalam, Kuwait.

- Good, Carter, 1973, Dictionary of Education, 3Rd. Ed, newyork, Macgraw, Hill.
- Goodman, D & Goodman, P (1991): Teaching Reasoning skills in School and homes; A Game book of Methods Spring field, Illinois C Thomas Pub.
- Hartshorne, 196, Perspective on the nature of Geography, London,p21.