

**League of Arab States  
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**The effect's of a proposed computerized program for  
teaching decimal numbers and its impact on remade  
the misconceptions of the students on decimal  
numbers of the 4<sup>th</sup> to 7<sup>th</sup> grades at Palestinian schools.**

**(Summery)**

**Submitted in total fulfillment of the requirements of the degree of  
Doctor of Philosophy: Mathematics curricula and methods.**

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## Summery

### Introduction

Mathematics, which sophisticated and improved, is obviously ruling in the modern educational systems. Because it articles major setting course progress and advance its technological digital orientation, it specifies what developed already, and real goal. Also it determines the course of what will be developed and produced to meet the needs of society. Mathematics is trading quickly miry education system: all ideas, assets, goals and ways, yields, and measured civilian nations, which involve through production and spending of mathematics scalability for their products, are unlimited. Mathematics in ancient Egyptian pyramid is the best evidence of recent nation.

The decimals intervention in most areas of life of : computers, calculator, electronic balances in shops, security and water and electricity, watches and manual and benchmarks speed in cars, trains , aircraft , ships , submarines, , length , size, vital industries, daily in currency exchange rates, stock quotes in the financial markets, banking, as well as intervention in a world of sports competitions, and playing.

Therefore, who possess conceptual basic skills: fraction, number, decimal, decimal number components, pictures different number decimal, decimal number representation several styles, values and place value of decimal numbers, have the capacity of mathematical called conceptual knowledge (NAEP, 2003), and who has the capacity to implement algorithms and special procedures comparison (not equal), and equality, and processes the four operations, rounding ,estimations, and approximations , have knowledge of procedural knowledge (ibid), that who have solving issues verbal, it has the ability to resolve problems has the knowledge of problem solving (ibid), this classification supported in the Palestinian Ministry of education representatives in the status of measurement and evaluation to measure achievement in mathematics in Palestine (Ministry of education, 1998,p6), (Ministry of education, 2000,p14-31).

Inspecting Palestinian Mathematics text books from 4th to 7th grads might give the impression that to do is remember a few rules for placing the decimal point, and otherwise operations with decimal numbers as if they were whole numbers, yet many Palestinians students do not make this apparently small step with ease. For example the unified

examinations held in different years showed that there is low performance of students in Mathematics especially in decimal numbers. The same result showed by the monitoring tests of the Palestinian students in five fields of the working agency, that conducted by UNRWA headquarter of Jordan, showed the low progress of the students in decimal numbers.

The Palestinian center of measurement and evaluation conducted a national Mathematics exam in 1998 to the 6th grad, and showed that the total mean of the students in decimal number of 32.7 % , and the mean of conceptual knowledge is 31.3 % , procedural knowledge is 37.7 % , and problem solving is 7.1 % , which indicate the poor performance of the students, and they have many misconceptions on decimal numbers.

### **Research Problem**

The problem of the research is focused on searching, researching, and answering the major question: "what is the effective program proposal to teach decimal numbers, and what its impact in the student's treatment takes misconceptions of the fourth to seventh student's grades in Hebron area schools in Palestine?"

### **This question is divided into the following minor questions:**

- 1) What misconceptions on decimals the students have?
- 2) What causes of these misconceptions, and what are remedies?
- 3) What proposed program to teach them decimals?
- 4) What is the impact of the proposed program of treatment misconceptions have to students?

### **Research Hypothesis**

- 1) Pupils have misconceptions about some concepts of decimal numbers.
- 2) There is statistically difference between experimental and controlled pupils in outlining the misconceptions of decimal numbers before applying the program.
- 3) There is statistically difference between experimental and controlled pupils in outlining the misconceptions of decimal numbers after the application of the proposed program.
- 4) There is an impact of the proposed program.

## **Research Objectives**

The present research is designed to detect effective program proposal to teach decimal numbers by Computer, and measuring the impact of treatment misconceptions on decimals numbers to the pupils form 4th to 7th grades through the following:

- To know the misconceptions on decimals to pupils.
- To detect the cause of these scenarios misconceptions number of decimal to students.
- To proposing ways to fix the misconceptions by Computer program.
- To research, application, and evaluation program for teaching pupils.
- To measure the effectiveness of the proposed program in the teaching pupils.
- To measure the impact of the proposed program of treatment misconceptions number of decimal to students.

## **Research Importance**

The importance of this research comes from the following :

- It helps pupils understand decimals and its operations.
- It helps pupils to progress very well in decimal numbers.
- It helps pupils in treatment of misconceptions on decimals and operations.
- It provides researchers effective training in treating misconceptions on decimals to pupils.
- Statement based on practical educational designers mathematics curricula in general, and particularly in planning and education program, perceptions misconceptions significant numbers of decimal and processes; such as teachers and supervisors during supervisory duties.
- Unhindered interested in improving the collection in decimals unit.
- To assist teachers in professional growth and development.
- \* Adopting the idea of treatment misconceptions on the subject of decimals seriously: more reforms in the forthcoming Palestinian educational curricula.
- Raising scientific and the attention of the relevant educational process through the development of proposals and solutions inclusiveness in decision-making.
- Attention teachers to students of the perceptions of decimals in terms of their knowledge and treatment and enrich its units non - traditional activities contribute to performance pupils.
- Unhindered researchers for the implementation of prospective studies about perceptions pupil's misrepresentation decimals and operations in education.

## **Research Limits**

- Objective: the impact of the proposed program.
- Border spatial: schools Hebron Palestine.
- Border temporal: the implementation and research in the academic year 2007 / 2008.

## **Research tools**

Researcher prepared the following tools:

- Four diagnostic tests in decimals for each of the row: the fourth , fifth , sixth and seventh, to diagnose misconceptions to pupils in decimals numbers.
- Four diagnostic-achievement tests in decimals for each of the analysis results diagnostic tests, apply to students before and after the research experience.
- Identifying open referendum from teachers and experts survey, and held views on the following:
  - a) The causes of pupil's perceptions misconceptions in decimals.
  - b) Remedies proposed scenarios misconceptions to the pupils in decimals.

\*A computerized program contains software at students learn in the experimental group unit decimals manner - impact of the misconceptions correction perceptions, students and their academic qualifications, view uses of teacher teaching the pupils, software support enrichment.

## **Research procedural steps**

\* To answer question number (1) : ( what misconceptions on decimals to pupils? )

Researcher will follow these steps:

1. Analysis of content decimals and target in the platform for mathematics ranks fourth ,fifth, sixth and seventh.
2. Test set diagnostic logging for each row alone , goals and within steps building test (ratified, objective, control )
3. Apply the diagnostic test for students .
4. Analysis of the results .
5. Select misconceptions and monitoring to build test diagnostic-achievement.

\* To answer question number II (what is the cause of these situations ? )

The researcher will do as follows:

6. Research literature earlier cause of the pupils in misconceptions.
7. See the results literature through local and global conferences.
8. A referendum teachers and experts on these misconceptions.

\* To answer question number III (what remedies? )

Researcher will follow steps:

9. Research literature earlier treatment pupils in misconceptions.

10. See the results of literature through local and global conferences.

11. A referendum teachers and experts.

\* To answer the question number (4) (proposed program to teach decimals?)

Researcher will follow the following steps:

12. Specify program objectives curriculum.

13. Select program content curriculum.

14. Methods for teaching program through the preparation of teaching guide.

15. Select methods evaluation program.

16. Arbitration program.

17. Program implementation.

18. To see the results of the hypothesis testing, and which provides "there is no difference between statistically both the experiment and control in outlining the misconceptions after the application of the proposed program."

will be extracted averages arithmetic and deviations normative, degrees of mid-dose research on post test of decimals, there was a significant difference between average degrees students groups, the experimental and control, was used, T-test.

\* To answer question number (5)(what impact the proposed program in treatment misconceptions have?)

Researcher will follow:

Measuring the impact of the program in two different ways:

19. Method 1: extracted duplicates misconceptions each pupil group experimental and control in the diagnostic test in each test, calculated percentages misconceptions each student test. Calculated averages those ratios in the tests.

20. Method 2: was calculated averages decline in percentages of misconceptions of the students experimental and Control groups in the test, as well as values differences between Mean declines in the diagnostic test the students group to the student's analogues experimental group, with the following steps adopted by the researcher to achieve this:  
- calculations of the percentages of misconceptions of each pupil mid-dose experience search in the answer to the diagnostic test, calculated percentage of misconceptions by dividing the number of misconceptions which pupil in every single number item all test.

- Calculation of average percentages of misconceptions of each group of the two sets of search experimental control in the diagnostic test

- Calculations of the decline in misconceptions in percentages for each pupil separately in the test, through calculate the difference between misconceptions belonged and easier.

\* To answer question 6: (what the effectiveness of the proposed program in treatment misconceptions?)

21. To determine the effectiveness of the proposed program and computerization correction perceptions misconceptions in decimals to the student's class 4 - 7, account Omega Test box to force the impact of the proposed program as a stand-alone on the dependent variable, were calculated by Omega.

### **Research results**

First: there is statistically difference between both experimental and control in outlining the decimal numbers achievements and progress after the application of the proposed computerized program, for all class from 4<sup>th</sup> to 7<sup>th</sup> grades.

Secondly:

- There is the impact of the proposed program computer - based in corrigendum perceptions misconceptions numbers to decimal numbers to the students 4 – 7.
- There is the effectiveness of the proposed program computer - based in corrigendum perceptions misconceptions numbers to decimal student's class 4 – 7.