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.(0.81)

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(0.05= $\alpha$ )

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(National Council of Teachers of

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(Asli, 2001, p. 18)

(Friedlander and Tabach,

2001)

(Golden and Shteingold, 2001)

(Andrew and Catherine, 1996)

(Coulombe and Berenson, 2001)

(Lesh, Post and Behr,

1987, p. 34)

(1994 )

" (200 2002)

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(Gloeckner et al., 1995)

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Nasser, 2000)

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(1994)

( ) :

(Adiguzel and Akpinar, 2003)

(Hail, 2000)

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( 2003)

" (192

29

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.(NCTM, 2000)

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(2001)

(NCTM,

(Abouchedid and

.2000)

969

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( ) (stepwise)  
( ) paired-sample t-test  
independent -sample t-test

(1999)

(Waters, 2003)

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" (Kwako, 2004)  
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.1  
(0.05 =  $\alpha$  (50) (2003)

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.2  
(0.05 =  $\alpha$

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(NCTM, 2000)

(Trends in  
International Mathematics and Science Study (TIMSS),  
.( 2003 ) 2003)  
(Adiguzel and Akpinar, 2003)

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(Lesh, Post and Behr, 1987)

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Sciences)

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(MANCOVA)

(ANCOVA)

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				/	
30	10.852	3.352	10.93		
30	8.048	2.810	7.97		( )
30	11.930	4.488	12.00		
30	9.336	5.330	9.27		( )



(2)

				(λ)	
0.005	55	2	5.929	0.823	

(3)

(ANCOVA)

	( )				
0.315	1.028	9.827	1	9.827	( )
*0.001	11.0853	113.329	1	113.329	
		9.562	57	545.006	
			59	686.850	

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(1)

.(2.804)

(3)

(3)

(0.05= α)

.(2.594)

(1)

(10.852)

3.352

(8.048)

.(2)

2.81

(2)

(3)

(0.05 = α)

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(3)

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(4)  
(ANCOVA)

	( )				
0.093	2.923	68.671	1	68.671	( )
*0.043	4.277	100.486	1	100.486	
		23.495	57	1339.196	
			59	1519.933	

(ANCOVA)

(Kwako, 2004; Hail, 2000)

(4)  
(4)  
(0.05= $\alpha$ )

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(9.336)  
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(Kwako,

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(ANCOVA)

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(Kwako, 2004; Waters,

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(Adiguzel and Akpinar, 2003)

(Hail, 2000)

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(Waters, 2003)

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(117) (TIMSS 2003) 2003  
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## **The Effect of Using Multiple Mathematical Representations on the Attainment of Mathematical Concepts Among Basic Eighth Grade Students and their Ability to Solve Verbal Problems**

*Riyad Ibrahim Al-Balasi and Areej Isam Barham\**

### **ABSTRACT**

This study aims at investigating the effect of using multiple mathematical representations on the attainment of mathematical concepts and the ability to solve verbal problems by the eighth grade students in the Functions and Relations unit. The study sample consisted of 60 students from Al-Hamra Secondary School for boys in the education district of Northern Badia at the Governorate of Al- Mafraq. The participants were randomly divided into two groups: the experimental group was taught by using the multiple mathematical representations method and the control group was taught by the traditional method. To achieve the goals of the study, two tests were built. The first was to measure the acquisition extent of mathematical concepts by students. It consisted of (19) "multiple choice" items. The second test was to measure students' ability in solving verbal problems. The test consisted of (4) "essay" items. The validity of the tests was established by a group of specialized judges in mathematics, measurement and evaluation. The two tests were performed on an exploratory sample outside the study sample to achieve reliability and analysis of the two tests. Acquisition of concepts was established using Pearson correlation method. Results revealed that there were statistically significant difference ( $\alpha = 0.05$ ) between study sample subjects on the attainment of mathematical concepts and the ability to solve verbal problems, attributed to the method of instruction, in favor of the experimental group.

**Keywords:** Multiple Mathematical Representations, Mathematical Concepts, Solving Verbal Problems.

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