

*

(15)

(8-3)

(78)

(15)

(%70)

(%78.3)

(114.57)

(%70)

(%52.43)

(%67)

.(Lederman, 1992; Abd-Elkhalick, 2000)

.(AAAS, 1989,1993; Millar, 1998. NRC, 1996)

(Celik and Bayrakceken,

2006)

2007/4/15

.2008/3/3

(2006)

.(AAAS, 1993; NRC, 1996)

(Abd-Elkhalick,

.2000)

(Craven and Penick)

(Chiappetta, Fillman and

(Celik and Bayrakceken,

.Sethna, 1993)

:(2006)

(2005)

(Epistemic Subject)

(Epistemic Object)

.(Epistemic Relation)

(Radical Constructivism)

(Social Constructivism)

(Viability)

(Truth)

.(1992•2003)

(2006)

(Brickhouse, 1990)

)

(2005

(ERfKE)

(Kuhn and Dean,

.2004)

(Laplante, 1997)

(ERfKE)

(2004

)
(2061)

()

(AAAS, 1993)

(Hewson and Hewson, 1988)

)

(1997

(Gardner, 1975

.(1981 2006

(1981)

(Nature of Science Test: NOST)

/) :
/ -
(.05)

/
%21

(Lederman and zeidler, 1987)

(18)

()

.2007-2006

(44)

:

(Nature of science Knowledge Scale:

NSKS)

(Tomlinson, 1993)

.3

(%71)

(%69)

(%12) (%62) (%72)

(Abdel- Khalick and Bou

Jaude, 1997)

(Chen, 2001)

(22)

1992

(Aikenhead)

)
(14)

.(
(Prospective)

()

(20)

.(Khun)

(Bartholomew, Osborn and Ratcliffe, 2004)

(11)

()

:

-

-

-

(Hammrich, 1997)

-

)

-

(2061

(35)

(Celik and

: Bayrakceken, 2006)

(STS)

(NOS)

(212)

(STS)

(Tusuzuky

(13)

: and Asada, 1998)

(%90)

(2006)

(17)

(%35)

.1

(%24)

()

(%41)

(American

(AAAS) Association for the Advancement of Science)

-1

-2

(AAAS, 1993, 1990)

-3

2006)

(38)

(Celik and Bayrakceken, Bartholomew, 2004 2006

(Hammrich, 1997) (2061)

)

(Tusuzuky

.and Asada, 1998; Chen, 2001)

(

1981)

(Ledarman and Zeidler; 1987

(20)

(25)

.4

(30)

(30 -)

(15)

(15)

.(0.90)

(78)

(%50)

-

(%70) (%50)

-

(8 - 3)

(%70)

-

(1)

.(0.81)

Retest)
(20)

2.473	15.60	15		
2.23	15.87	15		
2.32	15.73	30		
2.66	13.33	15		
2.61	13.67	15		
2.60	13.50	30		
8.75	114.07	15		
8.73	115.07	15		
8.60	114.57	30		

(ANOVA)

(1)

(15.73)

(%52.43)

(30)

(%53.33)

(16)

.5

(8)

(8)

() :

(%50)

(3)

(5)

(8)

:

(%26.67)

()

(22)

(%70 - %50)

:

(%73.33)

.1

(12)

(10)

.() (%70)

.2

.3

(0.73)

.(15)

()

(Celik and Bayrakceken,

.(Hammrich, 1997) (2006) 2006)

.(1)

(13) (%70)
(7) (6)
(%43.33)

.(Lederman, 1992)

.(Chen, 2001)

.(Verification)

.(2005)
(1)

/

(47) (114.57)
(128 - 96) (2006)
(141)

(8) (%60)

(18)

(10)

(1)

(%67) (13.50)
(20)

(%70)

(8-3) (5) (6) (11)
(%36.67)

() ()
 () () ()
) () (Professional knowledge)
 .(

(2)

(ANOVA)

0.759	0.096	0.53	1	0.53		
		5.55	28	155.33		
			29	155.87		
0.732	0.120	0.83	1	0.83		
		6.95	28	194.67		
			29	195.50		
0.756	0.098	7.50	1	7.50		
		76.35	28	2137.87		
			29	2145.37		

(1.00) (0.30) () :

() :

(ANOVA) .1

(2) .2

() (2) (0.096)

(0.05= α) .3

(2) (0.05= α) (ANOVA) (2)

() (1)

(2) (0.120)

(0.05= α) (0.27)

)
 ((0.098) ()
 (8-3)

(ERfKE) (Educational Reform for Knowledge Economy)

(3)

*0.674	*0.750	-	
*0.944	-	-	

.(0.05 = α) *

() :

() :

(3) :

.1

(3)

.2

= α)

(0.750)

.(0.05

.3

(0.674)

.(0.05)

(0.944)

()

.(0.05 = α)

)

.(2004

.6

.(Ledarman, 1992)

: (Scientific Literacy)

.1

:

(AAAS, 1998)

.2

(Pajares, 1992)

.3

316

2005

2004

1981

.(4) (8)

1992

2006

2003

1

1

2006

1992

292

1997

2005

108

1984

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The Level of Biology Teachers' Understanding of the Nature of Science and Controversial Scientific Issues

*Talal A. Al-Zu'bi**

ABSTRACT

This research aimed at investigating the level of biology teachers' understanding of the nature of science and controversial scientific issues, and scientific attitudes. In addition, the study aimed at investigating the relation between these levels and gender.

The research sample consisted of (15) male and (15) female teachers randomly selected out of (78) teachers having BSC degree in biology, and working at the official schools in zarka-first and second directorates of education. Means and standard deviations, and ANOVA were calculated. The results revealed that: the level of biology teachers' understanding for the nature of science is medium (52.43%). Moreover, the results revealed that the average of the sample members understanding of the controversial scientific issues reached (67%) which is below the pedagogically acceptable level (70%). However, the average their scientific attitudes were (78.3%) which is pedagogically acceptable. The results revealed also that there is no statistical difference between the averages of the two groups (males and females) on each item on the three factors of the research according to their gender.

The results also showed that there is a positive relation between the teachers understanding level of the nature of science and their level of understanding of the controversial scientific issues, and their scientific attitudes; in addition to a high positive relation between the teachers' level of understanding of the controversial scientific issues and their scientific attitudes.

The researcher recommended enhancing the teachers' level of understanding of the nature of science throughout training pre-service and in-service training, and implementing other studies on new other disciplines and other variables rather than those studied in this research.

Keywords: Nature of Science, Controversial Scientific Issues, Scientific Attitudes..

* Department of Curricula and Instruction, College of Education, Al-Hussein bin Talal University, Ma'an, Jordan.
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