

*

(438)

.(2014-2013)

" "

()

:

. 2014/9/15 :

.2015

. 2014/1/11 :

*

©

...

**Habits of Mind of Mathematics Students at the Jordanian Universities
and its Relationship with Students Gender, Academic level and
Achievement Level, and their Attitudes Towards Mathematics**

Sumailah Ahmad Sabbagh

Abstract

This study aimed to identify the habits of mind of Mathematics students at Jordanian Universities. In addition, the study attempted to examine whether student's habits of mind differ significantly according to their gender, academic level, achievement level, and to find out whether there was a correlation between students' habits of the mind and attitudes toward mathematics. A cluster random sample composed of 438 students enrolled in mathematics for the first semester of the academic year 2013-2014 was used. The results of 3away ANOVA indicated significant difference according to their achievement levels, as long as interaction between or among independent variables: gender academic and achievement levels. Also the results indicated that there is no significant correlation between students' habits of mind and attitudes toward mathematics.

Keywords: Habits of Mind, Academic level, Gender, Achievement levels, Attitudes towards mathematic

.2015

(Lowery, 1998: 26-30)

(Bills&Bills,2004)

(Johnson,,2004)

(2011) Ma and Kishor, 1997; Bolaji, 2005 ;

.(NCTM, 2008; Beal, Qu & Lee, 2008)

...

(Marzano,1998 2007)

.(Oxford, 2005)

"

"

.(Costa and Kallick, 2005; Costa,2001; Tishman ,2000)

.(Campbell, 2006)

(Costa, 2001)

Wanket.2005 (Wiggins & McTighe, 1998
(Chuska, 1995)

(Huitt, 1997; Marazona, 1998)

: (Halpern, 1998:11- 12) .(Costa, 2001)

(5) (4) (3) (2) (1):
(6)

(Tishman, Jay, & Perkins, 1993: 148)

(3) (2) (1):
(7) (6) (5) (4)

: (Hyerle, 2000)

:

:

(Costa & Kallick,2003)

:

:

:

...

	:
	.
.	:
.	.

(Costa & Kallick,2003;2005)

	:	
	:	
.	:	.1
	:	.2
.	:	.3
.	:	.4

:() .5

: .6

: .7

: .8

: .9

: .10

: .11

: .12

: .13

: .14

...

: .15

.

: .16

.

.

. (Seker,2010; Bolaji, 2005; Ma & Kishor,1997 2007)

. (Effandi & Normah, 2009)

(National Council of Mathematics Teacher, NCTM,2008).

:

:

(2010)

(68)

(Wiersem & Licklider, 2009)

(8)

(Niemivirta, 2008)

.(485)

:

...

(2008)
(1000)

(Culler, 2007)
(25)

(2006)
(834)

(16)

:

:
(2012)
(60)

(2012)

(2012)
(62)

(2010)
(122)

(Williams, 2009)
(206)

(Rogers, 2008)
(38)

(2008)

: (71)

...



(Fredrick, 2008)

()

(60)

(Court & Givon, 2008)

(12)

(Squire & Jan,2007)

(28)

(2007)

):

(186) (

(2007)

(2007)

(60)

(2006)

(38)

(2005)

(160)

()

(Khoon, 2005)

(163)

...



2006 2012)

.(Niemivirta, 2008

(Williams, 2009; Rogers, 2008; Fredrick, 2008; Culler, 2007;

2007 2007 2008 Squire & Jan, 2007 ; Khoon, 2005;

.(2010 ; 2007

.(2011)

(Bolaji, 2005 2007 Seker, 2010)

.(NCTM, 2008; Beal,Qu & Lee, 2008)

:

.(3 :2005 55 :2005)

.(Costa & Kallick, 2003; 2005).

(PISA,

(OECD)

(TIMSS, 2003; 2007)

2006; 2009)

)

. (NCTM, 2008 2005

12 :2007

:

:

...

	-1
(0.05 = α)	-2
(0.05 = α)	-3
)	
((
(0.05 = α)	-4
()	
(0.05 = α)	-5
)	
(
(0.05 = α)	-6
	:

.(NCTM, 2008)

(2005)

.(2002)

.

:

:

•

.

•

.(2014-2013)

:

:

:

.

...



:

.

:

.(4-1)

:

:

(4 3,3)

(3 2-2 3)

.(2 3)

:

.

(438)

(2014-2013)

(1)

(1)

%42	186		
%29	126		
%29	126		
%100	438		
%30 , 3	133		
%69 , 7	305		
%100	438		
%30 , 8	135		
%55	241		
%14 , 2	62		
%100	438		

:

:

(Costa & Kallick,2003;2005) .1
2006)

(Rogers,2008;Fredrick,2008;Culler,2007;Squire & Jan,2007 2005

. .2
(Bolaji,2005 2007 Seker,2010 2011)

. .3

.4

...



4 (64)

.(1)) . (48)

:

.

1= 2= 3= 4= 5=

.(240-48)

(40)

.5

.(2)) (30)

2= 3= 4= 5= :

1=

.(150-30)

:

" "

(%88)

"

"

.

	(%91)	.
		.
		(30)
	(0.95) (.93)	.
		.
		:
		:
		.1
		.2
(8)
		.3
		.
		.4
		.
		:
		:
		:
		-1
)		()
		:
((
		:
		-3
		.

...



.

:

-4

:

()

.(0.05 = α)

.

:

:

.(2)

(2)

%84	4.20		
%76	3.80		
		- -	
%75	3.77		
%74.6	3.73		
%74	3.71		
%73	3.66		
%72	3.58		
%68	3.39		
	3.38		
%65	3.26		
%60	3.01		

(2)

.(%50)

(%60- %84)

:

(%84)

...



.(%76)

(%60)

. (%68 %65)

(2006)

(Tishman,2000)

.

.(2005 2005)

.(Costa & Kallick,2003;200)

.

(4-2)

(0.05 = α) -2

(0.05 = α) - 3
)

(0.05 = α) -4
()

(3) .(3)

(4)

(3)

22.12453	197.3445	186		
20.55035	195.6257	126		
25.56788	195.4431	126		
23.65739	198.0088	133		
22.28561	195.5593	305		
21.26639	202.1599	135		
21.82339	195.3392	241		
24.494	124.93	438		
22.71168	196.3031	438		

...

(4)

.000	2.139	660.655	119	78617.918	
.417	.877	270.930	2	541.860	
.924	.009	2.783	1	2.783	
.001	1.872	577.996	53	30633.801	*
.008	1.911	590.191	24	14164.593	*
.085	2.497	771.112	2	1542.223	*
.012	2.274	702.206	11	7724.261	* *
-	-	308.791	219	67625.239	
-	-	-	438	17103699.743	

0.05

*

(0.05 = α)

(4)

(0.05 = α)

Wiersem & Licklider,2009 2008 2012)
Niemivita,2008
Williams,2009 2010 2012)
2007 Court&Givon,2008 Fredrick,2008 2008 Rogers,2008
(Khoon,2005

(Johnson, 2004)

((Bills &Bills, 2004)

(Marzano,1998 Costa,2001)

(4)

(Gardiner, 1998)

"

...



.(Williams,2009)

(4)

2012)

(2008 Niemivita, 2008

.(Court&Givon, 2008 Fredrick, 2008)

2006 2006)

.(2006

(0.05 = α)

(4)

.(2010)

(4)

(0.05 = α)

.(2010)

(0.05 = α)

(4)

.(2010)

:

(0.05 = α)

-1

)

(

:

(4 3,3)

" "

.(2 3)

(5)

" " (5)

		" "				
.000	374	2.93	21.26639	202.1599	135	
			21.82339	195.3392	241	

...

(0.05 = α)	(5)
)	(
	(Niemivirta,2008)
	(Culler,2007)
	(2012)
(Wiersem & Licklider,)	
(2007)	(2008) 2009
	(2006)
	:
(0.05 = α)	(6)
	(6)

.2015

(6)

.009	24.494	124.93	438	

(6)

(Bolaji, 2005; Seker, 2010)

(Beal, Qu and Lee, 2008) .

.(2011 2007)

...



1 : .(191-190)
.(2007)
:
.(2006)
.
1 . (2002)
.(2008)
.
.(2011)
2011 1 38
.
.(2012)
:
5, . .(2005)
.(2007)
1 .(2005)
.
.(2010)

(2010)

() .(2012)

(5) (1)

.(2005)

.(2007)

.(2000)

.(2005)

.(2007)

.(2007)

.(2012)

...

. (2008)

(12). (2) . . .

. (2001)

.(2006)

/

.(2005)

: 1

(2000).

2000 1 28

Beal, Q and Lee.(2008). Education Matters. Student achievement in mathematics – the roles of attitudes, perceptions and family background. Retrieved June 2010 from Education Matters. Available: <http://www.statcan.gc.ca/pub/81-004x/2005001/7836-eng.htm>.

Bills, C, Bills, L, Watson, A. and Mason, J. (2004) Thinkers. Derby, ATM.

Bolaji, C. 2005: A study of factors influencing students' attitude towards mathematics in the Junior Secondary Schools; Mathematics teaching in Nigeria. Retrieved on Nov.

2005 from <http://www2.ncsu.edu/ncsu/aern/bolajim.html>

Campbell, J. (2006). Theorizing Habits of Mind as a Frame work for Learning. AARE the association for active educational researchers.

- Chuska, K. (1995). *Improving classroom questions: A teacher's guide to increasing student Motivation, participation, and higher-level thinking*. Bloomington, IN: Phi Delta Kappa Educational Foundation.
- Costa, A. (Ed.). (2001). *Developing minds: A resource book for teaching thinking* (3rd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.
- Costa, A. & Kallick, B. (2003) . What Are Habits of Mind? Retrieved, (6 /4/ 2005), From : <http://www.habits-of-mind.net/whatare.htm>
- Costa, A. & Kallick, B. (2005). Describing (16) Habits of Mind. Retrieved, August 28,2005, From: <http://www.habits-of-mind.net/whatare>
- Costa, A., & Kallick, B. (2007). Assessing and reporting on habits of mind. Alexandria, VA: Association for Supervision and Curriculum Development, Volume 18 , Number 2 . Winter 2007:327.
- Court, D. & Givon, S. (2008). Group Intervention to improve mind habits for Improving Academic skills and achievement. *Teaching Exceptional Children*, 26(6), 50-65.
- Culler, A. (2007). *From dropouts to higher achievers: Habits of mind*. PhD thesis, ED. 344718, U.K.
- Effandi Zakaria and Normah Yusoff. (2009). Attitudes and Problem-solving Skills in Algebra among Malaysian College Students. *European Journal of Social Sciences*. 8, 232-245.
- Fredrick, K. (2008). The relationship between mind Training and Students Grades. *DAI*, 57 (6-B), 1226.
- Gardiner, L. (1998). Why we must change: The research evidence. *Thought and Action*, 14, 71-87.

...

-
- Halpern, D.F.(1998).Critical Thinking Across the Curriculum: A Brief Edition of Thought and Knowledge. Mahwah,NJ:Lawrence Erlbaum Associates,Inc.
- Huba, M., & Freed, J. (2000). Learner-centered assessment on college campuses: Shifting the focus from teaching to learning. Needham Heights, MA: Al-lyn & Bacon.
- Hyerle, D. (2000). A field guide to using visual tools. Alexandria, VA:Association for Supervision and Curriculum Development.
- Johnson, S. (2004).A Framework for Technology Education Curricula Which Emphasizes Intellectual Processes. Retrieved, January 10, 2004, from: <http://www.Journal of Technology Education>.
- Khoun, A. (2005). The Impact of Habits of Mind on Student' Achievement. (on- Line) 47(1) Available; File://www.iproed. com/AR/Paper/sec-Xinmin2.htm- 54k- cached.
- Lowery, L.(1998). How new science curriculums reflect brain research Educational Leadership,56 (3).26-30.
- Ma, X. and Kishor, N. (1997). Assessing the relationship between attitude towards mathematics and achievement in mathematics. A meta-Analysis. Journal of Research in Mathematics. 30, 520-540.
- Marzano, R. J. (1998).Different Kind of Classroom: Teaching with Dimensions of Learning. Alexandria, VA: Association for Supervision and Curriculum Development.
- Mathers,r.(2001).Why Study Creativity. Retrieved (13/2/2005), com:Http://www. Bafflostate .edu/center/creativity/Recources/Reading- Room/ / Directorycps.html. National Council of Teachers of Mathematics (NCTM),

- (2008).Principles and Standards for School Mathematics, Retrieved 15/8/2008 from <http://standards.nctm.org/document/index.htm>
- Niemivirta, M. (2008). Habits of mind and academic endeavors: the Finland.
- OECD Program for International Student Assessment 2006 (2006). Economic Co-operation and Development.
- OECD Program for International Student Assessment 2009 Economic Co-operation and Development.
- Oxford. (2005). Oxford word power, Oxford University press.
- Rogers, S. (2008). Infusing Habits of mind in Lessons. Journal of Learning
- Seker, H. (2010). Applicability of the approaches-related beliefs of Problems of Education in the 21st Century, Vol. 25, 138-150.
- Sizer, Ted and Meier, Debbie (2007).Habits of Mind. Retrieved February 1,2007,from:<http://www.essentialschools.org/pub/ces-docs/about/phil/habits.htm>
- Sternberg, R.(1998).Metacognition, Abilities, and Developing Expertise :What Makes an Expert Student ? Instructional Science.29 (1-2):p127-140>
- Sternberg, R.(1999). A propulsion model of types of creative contributions. General Psychology 3:83-100.
- Swartz, R. J., Costa, A. L., Beyer, B. K., Regan, R., & Kallick, B. Norwood MA: Christopher Gordon.
- Trends in International Mathematics and Science Study. TIMSS (2003).
- Trends in International Mathematics and Science Study. TIMSS (2007).
- Tishman, S.(2000) Why teach habits of mind? In A.L.Costa and B. Kallick (Eds.) Habits of mind: Discovering and exploring: 41-52).Alexandria,

...

VA:ASCD (Association for Supervision and Curriculum Development).

Tishman, S., Jay, E., and Perkins, D. N. (1993). Teaching thinking disposition: From transmission to enculturation. *Theory Into Practice*, vol.32:147-153

Wanket, M. (2005). Building the habit of writing: Journal writing is strength training for the mind. *Educational Leadership*. September, 74-77.

Weimer, M. (2002). *Learner-centered teaching*. San Francisco: Jossey-Bass.

Wiersema, J. & Licklider, B. (2009). Intentional Mental Processing: Student Thinking as a Habit of Mind. *Journal of Ethnographic & Qualitative Research*, 3 (1), 117-127.

Wiggins, G., & McTighe, J. (1998). *Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.

Williams, V. (2009). The mind Productive Thinking program. *Elementary School Journal*, 7 (1), 39- 55.

Watson, A., & Mason, J. (2005). *Mathematics as a constructive activity: Learners generating examples* Mahwah, NJ : Erlbaum