The relationship between Multiple Intelligence and Self-efficacy among sample of Hashemite university students

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Abstract

The purpose of this study is to examine the relationship between multiple intelligence and self-efficacy. Participants of the study consisted of (576) students (male and females) selected randomly from different faculties of Hashemite University. Means, standard deviations, regression and correlation analysis were used for data in the establishing the dependence of the two variables. Results indicate that there is a significant positive correlation between self-regulatory is positively related to the bodily-kinesthetic, intrapersonal, logical, interpersonal, visual, musical, existential, and verbal-linguistic multiple intelligence. The self-confidence is positively related to the bodily-kinesthetic, intrapersonal, interpersonal, visual, musical, existential, naturalist, verbal-linguistic multiple intelligence. And the task difficulty preference is positively related to the intrapersonal, logical, interpersonal, visual, existential, verbal-linguistic multiple intelligence.

Key words: Multiple intelligence, Self-efficacy, Hashemite university students.

Theoretical Framework.

The notion of general intelligence or cognitive ability (e.g., Spearman, 1927) had long been broadly accepted by psychologists when Howard Gardner introduced Multiple Intelligences (MI) theory in his 1983 book, Frames of Mind, proposing that there are several independent ability areas. Gardner (1993) described intelligence as a bio-psychological potential that could be influenced by experience, culture, and motivational factors. He defined intelligence as the ability to solve problems and to fashion products that are culturally valued.

Gardner (1983) initially proposed that there were seven intelligences: Linguistic, Spatial, Logical/Mathematical, Interpersonal, Intrapersonal, Bodily-Kinesthetic, and Musical. He has more recently added Naturalistic intelligence and has suggested that an Existential intelligence might exist, but that a hypothesized Spiritual intelligence does not (Gardner, 1999).
Gardner (1999) stated that his choice of the word "intelligences" was a deliberate one, noting that if he had written a book referring to "faculties" or "gifts," it is unlikely that his theory would have garnered the attention that it has. Gardner has professed to be quite willing to refer to his eight

intelligences as talents or abilities, but only if verbal and quantitative abilities is referred to as talents. Gardner has argued that there is no hierarchy of ability and that Linguistic and Logical/ Mathematical abilities are of no greater real-life importance than any of the other "intelligences".

Gardner (1999) explained that he reviewed hundreds of studies before publishing Frames of Mind, and that he assessed all candidate intelligences on the basis of eight criteria: the potential of isolation by brain damage; an evolutionary history and evolutionary plausibility; an

identifiable core operation or set of operations; susceptibility to encoding in a symbol system; a distinct developmental history; the existence of savants, prodigies, and other exceptional people; support from experimental psychological tasks; and support from psychometric findings.

Gardner (1983) admitted that the criteria were somewhat flexible; some intelligence which might have met all criteria, such as face recognition, was discarded because they were not highly valued within cultures. In addition, Gardner retained candidate intelligences which seemed promising even if they did not meet every criterion.

MI theory was enthusiastically welcomed by many educators and parents (Daz-Lefebvre, 2004; Mettetal, Jordan, & Harper, 1997). Here, Gardner's message those children have unique and diverse abilities meshed well with educators' intuitive sense that children learn in very different ways. Indeed, Gardner's premise seemed far more egalitarian than did notions of g. MI theory seemed to say that a child who performed poorly in, say, math and reading had just as great a chance as anyone else at being successful in music, art, physical education, or even geography: everyone could be smart in some way. At a time when standardized testing in US schools had become highly controversial, Gardner (1983, p. 3) claimed that IQ tests had little utility in predicting success beyond school. This claim, however, is clearly contradicted by Gottfredson (2002) finding that no meta-analysis has reported exceptions to the generality of g in predicting job performance, with brighter employees always performing better on average than less intelligent employees.

Although Gardner (1999) has acknowledged the existence of g, he has continued to question its explanatory power. In addition, he has maintained that each of his intelligence domains has unique processing

resources, and that there are no horizontal capacities, such as memory or creativity, that cut across all hypothesized intelligences. Instead, he views creativity as an operation performed within a domain, rather than as a general, cross-cutting ability. Gardner has suggested that executive functioning likely emerges from Intrapersonal intelligence rather than constituting an intelligence of its own or a horizontal capacity. Gardner (1999, p. 106) stated that he had no objection to others invoking an executive function, but that for the purposes of modeling mental abilities, "it is useful to see whether one can explain human behavior in the absence of such hierarchical considerations, or whether the hierarchy can emerge naturally, as part of everyday functioning, rather than by invoking a separate executive intelligence". MI theory proposes that the eight intelligence domains are theoretically independent, but Gardner (1993) has acknowledged that two or more could overlap. He cautioned, however, that correlations among subtests of standardized intelligence tests occur because the tasks all rely on rapid responses to items that are heavily based on logical/mathematical and linguistic abilities. However, Messick (1992) noted that variability in reading ability should not influence intelligence test performance as long as all participants are able to easily understand the task instructions. Gardner has expressed concern about the "verbal lens"– that is, the use of a common verbal format to assess all aspects of intelligence–but Mesick claimed that the reasoning component of the Logical/Mathematical domain is a far more ubiquitous element across tests of cognitive ability. Mesick noted that the reasoning that a person employs to solve a novel task in an intelligence domain

other than Logical/Mathematical appears more similar to a horizontal, cross-cutting ability than to method variance. In a similar vein, Lohman (2001) argued that inductive reasoning, with its component of central working memory.

The content of Gardner's intelligence domains suggests some similarities to the group factors of hierarchical models of intelligence (e.g., Vernon, 1961), and Carroll (1993) has pointed out that Gardner's intelligences bear a striking similarity to the second-stratum factors of Carroll's hierarchy. For example, Carroll noted that Gardner's Linguistic intelligence corresponded to the factor of crystallized intelligence, Musical intelligence to auditory perception ability, Logical/Mathematical Intelligence to fluid intelligence, and spatial intelligence to visual perception. Interpersonal or social abilities, in Carroll's framework, were represented to some extent in first-stratum factors of knowledge of behavioral content (with separate factors emerging for convergent and divergent tasks assessing those abilities). Carroll stated that only Gardner's Bodily-Kinesthetic and Intrapersonal intelligences appeared to have no counterpart in second-stratum factors. However, psychomotor ability is not typically recognized as an aspect of cognitive ability and, thus, Bodily-Kinesthetic ability would not be represented in hierarchical models. Carroll noted that adequate measures of intrapersonal ability have never been included in factor analytic studies of cognitive structure. Gardner had not introduced his eighth domain, Naturalistic intelligence, at the time of Carroll's writing, but the categorization of objects would seem to be related to logical reasoning.

Irani et al (2012) found there are significant relationship between multiple intelligences and general self efficacy. It also reveals that every dimension of multiple intelligences has meaningful relationship with general self efficacy also.

Beichner (2011) found that the students who were in classrooms where the teacher used two of their three dominant MI reported significantly higher self-efficacy than was reported by either of the other two groups. The implications for social change include an understanding of the relationship between multiple intelligences and self-efficacy as it provides evidence of how instructional practices related to students' self-efficacy affects their ability to achieve in a high-stakes testing environment.

Yazdanimoghaddam and Khoshroodi (2010 found that the linguistic and musical intelligence are the two main predictors of teacher efficacy.

Statement of the problem:

The connections that are to be made between Gardner (1999) acknowledgement of intellectual diversity and Bandura (1986) suggestions for empowering self-directed student learning may potentially influence educators in how they promote diversity in their own classrooms. If students are respected for their abilities, for the purpose of this argument their multiple intelligences, then their sense of self-efficacy is likely to increase. Therefore, the problem with the current study is to examine the relationship between multiple intelligence and self-efficacy among the students of the Hashemite University.

Study purpose and Questions:

The purpose of this study was to examine the relationship between multiple intelligence and self-efficacy among the students of the Hashemite University in Jordan.

The specific study questions that guided this study were:

RQ1. What are the multiple intelligence abilities of the undergraduate students at Hashemite University?.

RQ2. Is there a significant difference on the use multiple intelligence among the respondents when grouped according to sex, academic performances?.

RQ3. Is there a significant relationship between the students multiple intelligence and their self-efficacy?.

Significance of study:

The basic goal of this study is to determine the relationships between multiple intelligence and self-efficacy.

In addition, this study is very important for many reasons:(1) The study contributes to literature on how multiple intelligence, self-efficacy of students become important resources for enhancing students' learning, success and quality in education. (2) The study has significance for universities that support student's success and quality education.(3) The universities may make changes in the approach to preparing and training students in the area of multiple intelligence, self-efficacy.

Method

Population and sample of study:

The population of this study consisted of (15230) undergraduate students, who were enrolled in the faculties of Hashemite University in the academic year 2012/2013, who represent all levels of study at (HU). For the purpose of this study, a random sample was chosen from the population, it consisted of (576) and their ages ranged between 18-22 years.

Instruments

Participants completed measures of multiple intelligence, and self-efficacy. Each is described are following.

Multiple Intelligence Questionnaire (MIQ)

The Multiple Intelligence Inventory (MII) McKenzie (1990). The instrument consistency of the (MII) has been reported by other researcher to range 0.85 to 0.90. The instrument contains nine separate subscale sections each one representing one of the nine intelligence (bodily-kinesthetic, intrapersonal, logical, interpersonal, visual, musical, existential, naturalist, verbal-linguistic), each subscale contains ten dichotomous statements, which participants could report as "accurately describing" them (coded as 1) or as "not describing" them (coded as 0). By totaling the score each section, the participant perception of their dominate intelligence can be identified (scale 0-10).

*Self-efficacy Questionnaire***:**

The general self-efficacy questionnaire (GSE) developed by Kim and park (2000) contains 24 items descriptive of their types of self-efficacy (self-regulatory (12) items, self-confidence (7) items and task difficulty preference (5) items). The items on a 6-point scale ((6) definitely agree, (3) only to be used if a definite answer is not possible, (1) definitely disagree). A cronbach alpha of (0.61) was reported for the self-efficacy questionnaire. In terms of the self-efficacy dimension, a reliability estimate of (0.59) was reported for the self-regulatory, and a (0.55) was reported for the self-confidence, and a (0.68) was reported for the Task difficulty preference.

Procedures:

The instruments were administered to the participants in their regular classrooms by the researcher. The researcher explained to the participants the purpose and the importance of their participation in this study. In addition, the researcher assured the participants of the confidentiality of their response and that their response would be used only for research purposes.

Then, the question booklets were distributed and instructions were given to the participants on how to answer them. The participants' responses were scored by the researcher and were entered into the computer for statistical analysis. The data were analyzed using the SPSS package**.**

Results:

To facilitate understanding the results of this study, questions of this study are divided into three questions**.**

Results related to study question (1): What are the multiple intelligence abilities of the undergraduate students at Hashemite University?.

To answer this question, the student's means and stander deviations were calculated and reported in Table 1.

Table 1: mean and standard deviations of students' multiple intelligence

Multiple intelligence	Mean	SD
Bodily-kinesthetic	2.46	.60
Intrapersonal	2.42	.62
Logical	2.42	.59
Interpersonal	2.16	.60
Visual	2.50	.58
Musical	2.70	.71
Existential	2.40	.62
Naturalist	2.52	.67
Verbal-linguistic	2.54	.59
Total	2.21	.59

As table 1 show, that the scores obtained from all sub-scales of the multiple intelligence inventory indicate a positive situation. From sub-scales of the represent higher level of musical (M=2.70) , verbal-linguistic (M= 2.54), naturalist (M= 2.52), visual (M= 2.50), bodily-kinesthetic (M= 2.46), logical (M= 2.42), intrapersonal (M= 2.42) existential (M= 2.40), understanding and interpersonal (2.16).

Results related to study question (2): Is there a significant difference on the use of multiple intelligence among the respondents when grouped according to sex, academic performances?.

To answer this question, mean and stander deviations and t-test were calculated and reported in table 2.

Table 2: mean and standard deviations and t-test of student's multiple intelligence (N male=256, N female= 320).

Sex	Male		female		t	significant
Multiple intelligence	Mean	SD	mean	SD		
Bodily-kinesthetic	2.49	.62	2.43	.59	.552	.581
Intrapersonal	2.46	.59	2.39	.64	.688	.493
Logical	2.40	.64	2.43	.54	-.316	.752
Interpersonal	2.21	.71	2.13	.49	.802	.424
Visual	2.54	.58	2.47	.58	.710	.479
Musical	2.76	.71	2.65	.71	.969	.334
Existential	2.49	.65	2.33	.58	1.553	.123
Naturalist	2.54	.58	2.51	.75	.262	.794
Verbal-linguistic	2.60	.67	2.50	.51	1.046	.297

As table 2 shows, no significant difference in the level all sub-scales of the multiple intelligence between male and female**.**

On the other hand, one-way analysis of variance (ANOVA) was utilized to identify whether the variances between the four academic performances of university students at the Hashemite University were equal or significantly different. Table 3 shows that there were no significant differences among the four academic performances in terms of their levels of multiple intelligence.

Table 3. The differences among the f academic performance groups on the levels of multiple intelligence.(N= 576).

Multiple intelligence	Sum of squares		df	F	p
Bodily-kinesthetic	Between groups	.125	3	.115	.951
	Within groups	51.391	572		
	Total	51.516	575		
Intrapersonal	Between groups	1.432	3	1.262	.290
	Within groups	52.942	572		
	Total	54.269	575		
Logical	Between groups	2.082	3	2.054	.109
	Within groups	47.651	572		
	Total	49.734	575		
Interpersonal	Between groups	1.706	3	1.606	.191
	Within groups	49.564	572		
	Total	51.269	575		
Visual	Between groups	1.702	3	1.699	.170
	Within groups	47.077	572		
	Total	48.779	575		
Musical	Between groups	.610	3	.397	.755
	Within groups	72.218	572		
	Total	72.828	575		
Existential	Between groups	1.544	3	1.360	.258
	Within groups	52.965	572		
	Total	54.508	575		
Naturalist	Between groups	1.178	3	.863	.462
	Within groups	63.727	572		
	Total	64.906	575		
Verbal-linguistic	Between groups	1.198	3	1.166	.325
	Within groups	47.938	572		
	Total	49.136	575		

Results related to study question (3): Is there a significant relationship between students multiple intelligence and their self-efficacy?.

 To answer this question, the correlation coefficients between multiple intelligence and self-efficacy are presented in table 4.

Table 4: correlation between multiple intelligence and self-efficacy

Multiple intelligence	Self-efficacy		
	Self-regulatory	Self-confidence	Task difficulty preference
Bodily-kinesthetic	.24*	.19**	.10
Intrapersonal	.31*	.28*	.22*
Logical	.36*	.13	.27*
Interpersonal	.22*	.24*	.25*
Visual	.27*	.21*	.21**
Musical	.21**	.24*	.16
Existential	.32*	.21**	.24*
Naturalist	.13	.30*	.12
Verbal-linguistic	.37*	.25*	.36*

*(p<0.01)
**(p<0.05)

Table 4 shows that the self-regulatory is positively related to the bodily-kinesthetic, intrapersonal, logical, interpersonal, visual, musical, existential, verbal-linguistic multiple intelligence (p=0.01, 0.05). The self-confidence is positively related to the bodily-kinesthetic, intrapersonal, interpersonal, visual, musical, existential, naturalist, verbal-linguistic multiple intelligence (p=0.01, 0.05). And the task difficulty preference is positively related to the intrapersonal, logical, interpersonal, visual, existential, verbal-linguistic multiple intelligence (p=0.01, 0.05).

Multiple Regression Analysis:

Table 5 shows the results of multiple regression analysis using self-efficacy as predicted to multiple intelligence.

Table 5: Results of regression analyses predicting scores of self-efficacy of multiple intelligence.

Multiple intelligence	Self-efficacy	R	R²	F	β	T
Bodily-kinesthetic	Self-regulatory	.310	.096	4.990	.259	3.069
	Self-confidence				.209	2.415
	Task difficulty preference				-.049	-.539
Intrapersonal	Self-regulatory	.423	.179	10.191	.304	3.758
	Self-confidence				.278	3.353

	Task difficulty preference				.035	.401
Logical	Self-regulatory	.402	.162	9.085	.313	3.853
	Self-confidence				.079	.948
	Task difficulty preference				.151	1.738
Interpersonal	Self-regulatory	.352	.124	6.582	.191	2.292
	Self-confidence				.202	2.360
	Task difficulty preference				.126	1.409
Visual	Self-regulatory	.350	.123	6.573	.254	3.046
	Self-confidence				.199	2.331
	Task difficulty preference				.061	.689
Musical	Self-regulatory	.327	.107	5.645	.215	2.557
	Self-confidence				.246	2.862
	Task difficulty preference				.010	.114
Existential	Self-regulatory	.379	.157	8.719	304	3.710
	Self-confidence				187	2.222
	Task difficulty preference				.085	.968
Naturalist	Self-regulatory	.334	.111	5.856	.158	1.877
	Self-confidence				.318	3.684
	Task difficulty preference				-.042	-.471
Verbal-linguistic	Self-regulatory	.487	.238	14.540	.320	4.101
	Self-confidence				.185	2.306
	Task difficulty preference				.200	2.386

Results given in table 5 show that the self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of bodily-kinesthetic (R^2= 0.096, F= 4.990, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.310). Approximated 9.6% of the variance of the student's bodily-kinesthetic was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of intrapersonal (R^2= 0.179, F= 10.191, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.423). Approximate 17.9% of the variance of the student's intrapersonal was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of logical (R^2= 0.162, F= 9.085, p=0.05). This

results was supported by the close moderate correlation between the third variables (r= 0.402). Approximate 16.2% of the variance of the student's logical was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of interpersonal (R^2= 0.124, F= 6.582, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.352). Approximate 12.4% of the variance of the student's interpersonal was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of Visual (R^2= 0.123, F= 6.573, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.350). Approximate 12.3% of the variance of the student's visual was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of musical (R^2= 0.107, F= 5.645, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.327). Approximate 10.7% of the variance of the student's musical was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of existential (R^2= 0.157, F= 8.719, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.379). Approximate 15.7% of the variance of the student's existential was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of naturalist (R^2= 0.111, F= 5.856, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.334). Approximate 11.1% of the variance of the student's Naturalist was accounted by self-efficacy. Self-regulatory, self-confidence and task difficulty self-efficacy is a significant predictor of verbal-linguistic (R^2= 0.238, F= 14.540, p=0.05). This results was supported by the close moderate correlation between the third variables (r= 0.487). Approximate 23.8% of the variance of the student's verbal-linguistic was accounted by self-efficacy.

Discussion:

Multiple intelligence theory defines nine intelligence and suggest that each human beings has a unique array of these intelligence with some being dominant than other. The primary purpose of this study was to examine the relationship between multiple and self-efficacy of university students in the Faculties at the Hashemite University in Jordan. A sample of 576 students participated in the study by responding to the Multiple Intelligence Questionnaire and Self-efficacy Questionnaire. As indicated in the results section, that the self-regulatory is positively related to the bodily-kinesthetic, intrapersonal, logical, interpersonal, visual, musical, existential, verbal-linguistic multiple intelligence (p=0.01, 0.05). The self-confidence is positively related to the bodily-kinesthetic, intrapersonal, interpersonal, visual, musical, existential, naturalist, verbal-linguistic multiple intelligence (p=0.01, 0.05). And the task difficulty preference is positively related to the intrapersonal, logical, interpersonal, visual, existential, verbal-linguistic multiple intelligence (p=0.01, 0.05).

This result means that the self-regulatory, self-confidence and task difficulty self-efficacy is influenced of the multiple intelligence university students. The size of this correlation indicate that generally high level self-regulatory, self-confidence and task difficulty self-efficacy are related to high level of students bodily-kinesthetic, intrapersonal, logical, interpersonal, visual, musical, existential, naturalist, verbal-linguistic multiple intelligence.
The results of this study and the results of other researches like Irani et al (2012), Beichner (2011),Yazdanimoghaddam and Khoshroodi (2010).

From the theoretical standpoint, the following line of research is suggested for the future: (a) The university needs to have a better role to increase the effectiveness of students' multiple intelligence through academic and training programmers.(b) the researcher recommend conducting other studies on other variables in different university.

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