THE MULTIPLE INTELLIGENCES OF AMAIUB STUDENTS: BASIS FOR PEDAGOGICAL INNOVATIONS

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ABSTRACT

This descriptive – survey study determined the multiple intelligences of students of AMA International University - Bahrain, Kingdom of Bahrain during the school year 2015-2016, the findings of which were the bases for pedagogical innovations.

Included in the study were the 151 students from the colleges in AMAIU - Bahrain. It utilized an adapted instrument of Multiple Intelligences Inventory by Walter McKenzie. The Statistical Package for Social Science (SPSS) program was used to counter-process the data gathered for some statistical analysis. This descriptive statistics employed include:

Mean, T-test, and Analysis of Variance (One-Way ANOVA) to determine the significant difference on the multiple intelligences of students when grouped as to sex and program enrolled.

The results showed that the three most dominant multiple intelligences of students in AMAIU-Bahrain are: Existential, Bodily-Kinesthetic and Visual-Spatial. When group as to sex, male and female students also showed being dominantly existential learners. The programs Bachelor of Science in International Business (BSBI), Bachelor of Science in International Studies, and Bachelor of Science in Computer Studies are dominantly Existential. While the students in Bachelor of Science in Engineering; Mechatronic Engineering (BSME) are mostly Bodily-Kinesthetic, while Informatics Engineering (BSIE) are Interpersonal.

As on the analysis of variance on the multiple intelligences of students when grouped as to sex and program enrolled, both variances displayed significant differences.

Keywords: Multiple Intelligences, Sex, Program Enrolled, Existential, Bodily-Kinesthetic and Visual-Spatial

INTRODUCTION

There is an increasing number of researchers who believe that intelligence is not anymore limited to IQ (Intelligence Quotient), and that intelligence can be seen and observed in a multitude of intelligences such as the seven intelligences pushed by Howard Gardner [1].

There are seven frames of mind as basis for intelligence and not limited to one, unitary general intelligent factor [2]. The number increased to nine as more researchers bring about such findings. While specialists in human behavior further investigate lifespan development

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and intelligences, few were done to look into the multiple intelligences and their adjustments much less on local studies with regards to this field.

With this, the researcher realizes that there is a need to conduct this study, having been into classroom teaching for the last sixteen years, that there are students who are intellectually superior yet their behavior & academic specialization needs improvement. And as a new lecturer in AMAIUB, the researcher finds it important to consider individual learner's potentials and weaknesses in order to facilitate better transfer of knowledge. And one way to realize this is to conduct this study.

STATEMENT OF THE PROBLEM

This study determined the multiple intelligences of students of AMA International University - Bahrain, Kingdom of Bahrain during the school year 2015-2016.

Specifically, the study answered the following questions:

1. What are the three dominant intelligences of students as an entire group and when grouped as to sex and program enrolled?

2. Is there a significant difference on the multiple intelligences of students when grouped as to sex and program enrolled?

3. What pedagogical innovations can be proposed based from the findings of the study?

CONCEPTUAL FRAMEWORK

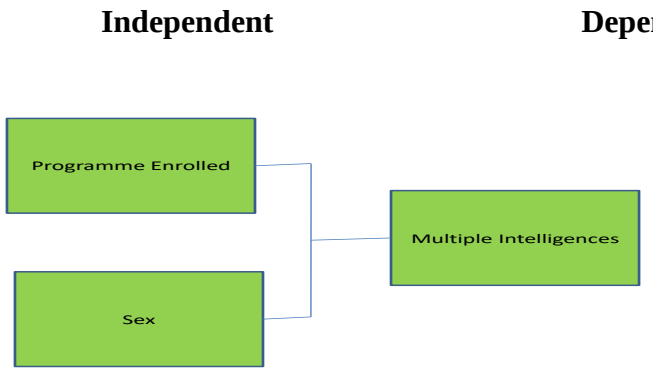

Figure I. Conceptual Framework of the Study

Figure 1 shows the conceptual framework of the study. It shows the two independent variables; programme enrolled and sex and the dependent variable which is the multiple intelligences.

The importance of IQ (Intelligence Quotient) has been much recognized in the 20th century especially in the educational endeavor. Gratitude is given to Goleman, Daniel in his work to emphasize the vital role of emotion in the interplay of knowledge [3].

This idea of Goleman was hinted by Gardner, Howard (1999), in defense of his principle of Multiple Intelligences. Hence, this study is anchored on the theory of Gardner, Howard's

Multiple Intelligences. Gardner on his theory of Multiple Intelligences shows that man can learn things from his surroundings through his body, music, and words as well [4]. The universal notion is that we all have these intelligences. It is innate in man's nature.

The basic implication from the theory, Gardner says, that teachers should value the differences among students to better enhance classroom instructional materials.

Moreover, the expected output of this study is to produce pedagogical innovations based from the results of analysis and synthesis of the respondent's data.

Pedagogy is the art of teaching. It is the method and practice, especially as an academic subject or theoretical concept [5].

Education has changed ever since especially in the age of globalization. Eventually, there is a change in pedagogy so as to cater the needs of the computerized world.

Developing innovations presupposes knowledge and the aptitude to apply it. The traditional view believed by educational schools is that students receive information and skills as a student and begin to apply what they have learnt after finding employment. This is the system of thinking pedagogical innovation wishes to challenge: according to this new approach, while studying, knowledge should already be applied for creating innovations. Skills and potentials should be simultaneously applied and accumulated [6].

LITERATURE REVIEW

Gardner identified seven distinct intelligences which existed from recent cognitive research and "documents the extent to which students possess different kinds of minds and therefore learn, remember, perform, and understand in different ways" [7]. According to this theory, "we are all able to know the world through language, logical-mathematical analysis, spatial representation, musical thinking, the use of the body to solve problems or to make things, an understanding of other individuals, and an understanding of ourselves. Where individuals differ is in the strength of these intelligences - the so-called profile of intelligences -and in the ways in which such intelligences are invoked and combined to carry out different tasks, solve diverse problems, and progress in various domains."

Gardner says that these differences "challenge an educational system that assumes that everyone can learn the same materials in the same way and that a uniform, universal measure suffices to test student learning. Indeed, as currently constituted, our educational system is heavily biased toward linguistic modes of instruction and assessment and, to a somewhat lesser degree, toward logical-quantitative modes as well." Gardner argues that "a contrasting set of assumptions is more likely to be educationally effective. Students learn in ways that are identifiably distinctive. The broad spectrum of students - and perhaps the society as a whole - would be better served if disciplines could be presented in a numbers of ways and learning could be assessed through a variety of means." The learning styles are as follows:

Visual-Spatial is the style that people think in terms of physical space like architects and sailors do.

Bodily-kinesthetic is the sense of bodily awareness like dancers and medical surgical doctors.

Musical are obviously showing the love of sound and rhythm. Multimedia to these kind of learners are best suitable to facilitate knowledge.

Interpersonal are outgoing learners. They learn more through interacting with others.

Intrapersonal are the learners who are focused on their own interests and feelings. They are independent and can learn easily through independent study. They are independent learners.

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Linguistic are learners who used words effectively. Most of them are writers.

Logical-Mathematical are learners who are good in calculating and reasoning.

Gardner in his later years of study adds two (2) criteria of Multiple Intelligence: namely Natural and Existential. Hence making nine multiple intelligences all in all.

Natural are learners who have ability to categorize and recognize animals, plants, and other objects in nature. They are scientists and naturalists.

Existential are learners who are capable and sensitive to deal with questions about human existence, such as the meaning of life and when does life begin and end. They are philosophers and theologians.

Choosing the media that is appropriate to learning style is best effective in the educational setting as showed in this review of literature.

All these learning skills are considered "intelligent" according to Gardner. There are eight criteria to prove his point [8].

1. Intelligence can be destroyed due to brain damage.

2. Intelligence is isolated in special exceptional people such as geniuses and autistics alike.

3. There is a set of identifiable operations

4. There is a developmental histories including "end-state" performances

5. There is evolutionary histories and plausibility in intelligence. There is an evolution in intelligence from the animals to man handed down to human experience.

6. Experimental psychological tasks supported these intelligences.

7. Psychometric findings supported Multiple Intelligences. It is in line with other branches of psychology and behavioral sciences.

8. Human symbolic systems are encoded in intelligences. Armstrong understands these symbolic systems as internal and external factors. Where internal factors refers to "computational devises" or "organs of the mind" that infer to manipulate visible symbols. "External symbols, on the other hand, are the existing external symbols such as language, maps, arithmetic and logical expressions.

Gardner's MI theory is useful in education even if there are questions and issues around it. Kornhader, Mindy from Project SUMIT (Schools Using Multiple Intelligences Theory) has concluded that there is a significant gain in SAT's scores, discipline, and parental participation in the results after examining school's performance. Schools have believed that significant gains are attributed from implementing the use of MI theory in the curriculum [9].

Rile, Luis (2015), on his study, "Multiple Intelligences of Students with Learning Disabilities: Its Implication for Business Curriculum Development in United Arab Emirate", observed that one major struggle that learning facilitators had, how to effectively carry out learning process with meaningful results and keeping in sight the existence of students from different nationalities. The research findings revealed that students needed updated instructional materials and the universities should modify the business curriculum for students with multiple intelligences [10].

RESEARCH METHODOLOGY

This study used the descriptive – survey method. It utilized an adapted instrument of Multiple Intelligences Inventory by Walter McKenzie [11]. This study was conducted during the Second Trimester of the Academic Year 2015 – 2016. Questionnaires were distributed to AMAIUB students enrolled in Hist400 & Soci400 classes only. The Statistical Package for Social Science (SPSS) program was used to counter-process the data gathered for some statistical analysis.

RESULTS AND DISCUSSION

The dominant intelligences of students as an entire group and when grouped as to sex and program enrolled

Multiple Intelligences	f	%	Rank
Existential	55	21.40	1
Bodily-Kinesthetic	36	14.01	2
Visual-Spatial	34	13.23	3
Interpersonal	32	12.45	4.5
Intrapersonal	32	12.45	4.5
Verbal	25	9.73	6
Logical	18	7.00	7
Naturalist	13	5.06	8
Musical	12	4.67	9
Total	**257**	**100**	

Table 1 shows the rank of Multiple Intelligences of Students in AMAIU-Bahrain. It shows that the most dominant Multiple Intelligences is Existential. Existentialists are learners who are capable and sensitive to deal with questions about human existence, such as the meaning of life and when does life begin and end. They are philosophers and theologians.

The second most dominant MI of the entire group is Bodily-Kinesthetic. Bodily-kinesthetic is the sense of bodily awareness like dancers and medical surgical doctors.

The third dominant MI of the students is Visual-Spatial. Visual-Spatial is the style that people think in terms of physical space like architects and sailors do.

Providing learners with numerous ways to access content improves learning [12]. Eventually, students with varied ways to exhibit knowledge and abilities increases commitment and skills, and offers teachers with more precise understanding of learners' knowledge and skills [13]. Instruction must be informed by detailed knowledge about students' precise needs, strengths, and areas for growth [14].

Table 2. The Three Dominant Multiple Intelligences of Male and Female Students

	Multiple Intelligences	Rank
Male	Existential	1
	Bodily-Kinesthetic	2
	Interpersonal	3
Female	Existential	1
	Visual-Spatial	2
	Intrapersonal	3

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Table 2 shows that male and female students are dominantly existential learners. However, while males are bodily-kinesthetic, females are more visual-spatial learners. Interestingly enough, males project interpersonal skills while females are intrapersonal.

This finding of the study showed that knowing the strengths and potentials of the male and female students regarding their multiple intelligences will help both teachers and students in order to progress, develop skills, and select fitting syllabus designs and learning methods.

Table 3. The Three Dominant Multiple Intelligences of Students as to Program Enrolled

BSBI	Multiple Intelligences	Rank
	Existential	1
	Visual-Spatial	2
	Bodily-Kinesthetic	3
BSIS		
	Existential	1
	Bodily-Kinesthetic	2
	Intrapersonal	3
BSCS		
	Existential	1
	Intrapersonal	2
	Verbal	3
BSME		
	Bodily-Kinesthetic	1
	Interpersonal	2
	Existential	3
BSIE		
	Interpersonal	1
	Intrapersonal	2
	Existential	3

As shown in Table 3, the programs Bachelor of Science in International Business (BSBI), Bachelor of Science in International Studies, and Bachelor of Science in Computer Studies are dominantly Existential. While the students in Bachelor of Science in Engineering; Mechatronic Engineering (BSME) are mostly Bodily-Kinesthetic, while Informatics Engineering (BSIE) are Interpersonal.

Existential Multiple Intelligences is mostly dominant. It is understood that most of the respondents are sensitive to wrestle deep questions about human existence. Their skills include designing abstract theories and deep thinking like scientists and philosophers do.

The dominating MI on engineering students (BSME) is Bodily-Kinesthetic (body smart). They have the ability to handle objects skillfully and control one's body movements. The reason why they have the skills on sports, dancing, hands on experiments, & acting. These Bodily-Kinesthetic learners fit to careers such as PE teachers, actors, firefighters, & athletes.

Is there a significant difference on the multiple intelligences of students when grouped as to sex and program enrolled?

Table 4. Analysis of Variance on the Multiple Intelligences of Students When Grouped as to Sex

Multiple Intelligences	Male		Female	
	X_1	$(X_1)^2$	X_2	$(X_2)^2$
Naturalist	82.22	6760.49	57.50	3306.25
Musical	78.89	6223.46	63.33	4011.11
Logical	72.50	5256.25	56.00	3136.00
Existential	83.16	6915.24	81.18	6589.62
Interpersonal	73.91	5463.14	67.50	4556.25
Bodily-Kinesthetic	79.00	6241.00	73.33	5377.78
Verbal	85.50	7310.25	78.00	6084.00
Intrapersonal	79.52	6324.04	80.00	6400.00
Visual-Spatial	80.48	6476.42	78.57	6173.47
Sum	**715.18**	**56970.28**	**635.41**	**45634.48**
Mean	**79.46**		**70.60**	

Table 4 shows that the computed t static value of 2.49064252936307 at α= 0.05 is greater than the critical t value (2.20098515872184). Thus**, there is a significant difference on the multiple intelligences of students when grouped as to sex.** With it, the null hypothesis is rejected.

Table 5. Analysis of Variance on the Multiple Intelligences of Students When Grouped as to Program Enrolled

Multiple Intelligence	BSBI		BSIS		BSCS		BSME		BSIE	
	x1	(x1)2	x2	(x2)2	x3	(x3)2	x4	(x4)2	x5	(x5)2
Naturalist	78.33	6136.11	70.00	4900.00	85.00	7225.00	70.00	4900.00	50.00	2500.00
Musical	68.00	4624.00	65.00	4225.00	100.00	10000.00	82.50	6806.25	0.00	0.00
Logical	63..64	4049.59	50.00	2500.00	60.00	3600.00	85.00	7225.00	0.00	0.00
Existential	84.00	7056.00	84.44	7130.86	81.43	6630.61	80.00	6400.00	65.00	4225.00
Interpersonal	72.31	5228.40	72.00	5184.00	70.00	4900.00	80.00	6400.00	62.50	3906.25
Bodily-Kinesthetic	76.67	5877.78	88.33	7802.78	40.00	1600.00	78.18	6112.40	0.00	0.00
Verbal	74.55	5557.02	92.50	8556.25	85.00	7225.00	94.00	8836.00	0.00	0.00
Intrapersonal	71.67	5136.11	86.67	7511.11	78.33	6136.11	93.33	8711.11	80.00	6400.00
Visual-Spatial	74.78	5592.44	85.00	7225.00	83.33	6944.44	92.50	8556.25	90.00	8100.00
Sum=	663.94	49257.4	693.9	55035.0	683.10	54261.17	755.5	63947.01	347.5	25131.2
Mean=	73.77		77.10		75.90		83.95		38.61	

Table 5 shows that the computed F value of **6.99450130410467** is greater than the critical F value (2.60597494919011). **Thus, there is a significant difference on the multiple intelligences of students when grouped as to program enrolled. Therefore, the null hypothesis is again rejected.**

One of the significant points that the researcher has found out based from this finding is that while the common traditional schools and culture focus most of their attention on logical-mathematical and linguistic intelligence, none of these intelligences are dominant in the student's show of knowledge. Hence, teachers should place equal attention on students who indicates gifts in the other intelligences.

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Table 6. Multiple Comparison on the Significant Difference on Multiple Intelligences of the Students When Grouped as to Program Enrolled

Between Programs Enrolled			Mean 1	Mean 2	/D/	q(0.05,40,5)*SE	Interpretation
BSIE	vs	BSBI	38.61	73.77	35.16	15.18	Significant
BSIE	vs	BSCS	38.61	75.90	37.29	15.18	Significant
BSIE	vs	BSIS	38.61	77.10	38.49	15.18	Significant
BSIE	vs	BSME	38.61	83.95	45.34	15.18	Significant
BSBI	vs	BSCS	73.77	75.90	2.13	15.18	Insignificant
BSBI	vs	BSIS	73.77	77.10	3.33	15.18	Insignificant
BSBI	*vs*	BSME	73.77	83.95	10.18	15.18	Insignificant
BSCS	*vs*	BSIS	75.90	77.10	1.21	15.18	Insignificant
BSCS	*vs*	BSME	75.90	83.95	8.05	15.18	Insignificant
BSIS	*vs*	BSME	77.10	83.95	6.84	15.18	Insignificant

The theory of multiple intelligences has strong implications for adult development and learning. Some adults are stocked themselves in courses programs & jobs that do not do optimal use of their utmost highly enhanced intelligences (for example, a highly existential individual who is trapped in a bodily-kinesthetic job when he/she would be much productive and happier in a job where he/she supposed to be in an isolated desk-job. Or to put it simply, a frustrated football player who wants to have a life in the convent.

What pedagogical innovations can be proposed based from the findings of the study?

This part is the proposed output of the study e. i. the pedagogical innovations based on Multiple Intelligences. The researcher gives emphasis only to the highly dominant three intelligences namely: Existential, Bodily-Kinesthetic, and Visual-Spatial.

This paper does not view Multiple Intelligences as learning styles but as aids to pluralizing teaching—that is, as Gardner himself states, teaching "in multiple ways" so that students become actively engaged in learning.

The pedagogical innovations suggested in this research are ways of avoiding the traditional lecture-only approach to facilitating learning, the aim being the active involvement of students in classroom sessions.

PEDAGOGICAL INNOVATIONS BASED ON MULTIPLE INTELLIGENCES THEORY

1. Pedagogical Innovations Based on Existential Intelligence

1.1 The Big-Picture Approach of Doing Course Orientation

This focuses on the first week of course sessions whereby students are given the opportunity to share their expectations of the course, and the teacher processes them in the context of the "bigger educational picture"—that is, of the program's educational objectives to which are mapped the particular course's intended learning outcomes (CILOs). Thus, students find the relevance of the course to their attainment of professional or occupational competences at program completion. The other and much bigger picture is when students understand how their education in particular courses, or finishing a program, is relevant to how they wish to live their life.

3.1.1. Hypothetical Issue Class Discussion: What Course Will I Take If There Is World War III The Next Month?
3.1.2. Museum Visits

3.2. Pedagogical Innovations Based on Bodily-Kinesthetic Intelligence

3.2.1 The Field Trip Approach to Learning

The integration of educational travel or field trips as a source of learning will stimulate students' interest, as field trip arouses general student interest due to natural curiosity about what can be learned; it is, as well, a learning resource of particular interest to students who have bodily-kinesthetic aptitudes. Taking notes based on, for example, observations of the student regarding how local craftsmen do their work has the element of directness that is not available to them from reading secondary sources of information.

3. Pedagogical Innovations Based on Visual-Spatial Intelligence

3.1 Reading and Conference
3.2 Rendering Abstract Ideas Concrete through Illustration
3.3 Narrating A Story through Graphics
3.4 Using You Tube and Other Films Pertinent to Particular Course Content or Lessons

YouTube is one of the most popular websites on earth and a massive resource for educational content. The site has over 10 million videos marked as educational, most of them submitted by fellow educational professor [15].

Ways to use You Tube in the classroom

1. Tag on video clips that will show more fun side of the lesson
2. Create playlists as student assignments

While YouTube's the main place to turn when looking for educational videos online, you can actually find great informational videos in a number of other places
Some educational video resources:

1. Teacher tube
2. Neo K-12
3. Explore
4. TedEd
5. Zane Education
6. National Geographic

3.5 Charts, Graphs, Tables, Real Estate Models
3.6 Creative Visualization for Success

4. Pedagogical Innovations Based on Interpersonal Intelligence

4.1 Using Interview as a Learning Resource
4.2 Discussing Lessons with Friends via Skype
4.3 Collaborative Approach to Problem-Solving
4.4 Simulating Seminar-Workshop Discussion in the Classroom

5. Pedagogical Innovations Based on Intrapersonal Intelligence

5.1 Using A Volunteers Bureau in a Course
5.2 Investigative Approach to Social Issues

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6. Pedagogical Innovations Based on Verbal Intelligence

6.1. Internalized language-based reasoning
6.2. Perform complex language-based analysis
6.3. Listen to and recall spoken information

7. Pedagogical Innovations Based on Naturalist Intelligence

7.1**.** Take a walk with students and let them listen to the different sounds around them. And have them Illustrate the source of the sound and of what it looks like as well.
7.2. Discuss how natural events influenced the course of history. For example, talk about disease outbreaks in various ancient civilizations, disappearance of dinosaurs etc.
7.3. Point out mathematical influences in nature - Example, the various geometries in natural formations

8. Pedagogical Innovations Based on Logical Intelligence

8.1. Create a maze or crossword puzzle for the class
8.2. Create a secret code and write it down in a code key format. Write letters using your code key

9. Pedagogical Innovations Based on Musical Intelligence

9.1 Culture Assignments and Reporting
9.2 Holding Poetry Sessions
9.3 Culminating Program: Students' Variety Show

CONCLUSIONS

Based from the findings of the study, the following conclusions are drawn**:**

1. The Three Dominant Multiple Intelligences of the Entire Group of Students are ranked as follows: 1.) Existential 2.) Bodily-Kinesthetic 3.) Visual-Spatial.
2. The Three Dominant Multiple Intelligences of Male Students are ranked: 1.) Existential 2.) Bodily-Kinesthetic 3.) Interpersonal. While female students displayed the dominant MI as: 1.) Existential 2.) Visual-Spatial 3.) Intrapersonal.
3. The Three Dominant Multiple Intelligences of Students as to Program Enrolled are: BSBI displays 1.) Existential 2.) Visual-Spatial 3.) Bodily-Kinesthetic; BSIS demonstrates 1.) Existential 2.) Bodily-Kinesthetic 3.) Intrapersonal; BSCS exhibits 1.) Existential 2.) Intrapersonal 3.) Verbal; BSME shows 1.) Bodily-Kinesthetic 2.) Interpersonal 3.) Existential and BSIE expresses 1.) Interpersonal 2.) Intrapersonal 3.) Existential.
4. There is a significant difference on the multiple intelligences of students when grouped as to sex. With it, the null hypothesis is rejected.
5. There is a significant difference on the multiple intelligences of students when grouped as to program enrolled. Thus, the null hypothesis is again rejected.

RECOMMENDATIONS

Based from the findings of the study, the following recommendations are drawn:

1. The study recommends for the use of pedagogical innovations in the lessons as the proposed output of the study.

2. Teachers can use the MI Survey to appraise instructional strategies and alternative methods of assessment.
3. An in-depth study on MI interesting findings will merit further research.

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