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# Multiple intelligences and university students' language performances

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### ABSTRACT

People concerned with educational matters do not consider theories as ends in themselves but as means to achieve ends (Ellis, 1990). This paper is the outcome of a study conducted according to Gardner (1983, 1993, 2005)'s Multiple Intelligences (MI) theory. The objective, however, is to coordinate classroom activities with language students' intelligences in order to assist students cope with the limitations associated with the learning context and for them to have better achievements. To do this, a validated modified version of Silver and Strong (1998)'s MI Indicator has been employed and 119 university students have been subjected to MI analysis. The results gained as the outcome of factor analysis, descriptive statistics, T-test and correlation furnished a pool of information to draw on in order to employ effective learning activities.

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### Introduction

According to Ellis (1990, 1995), there are two views to language study: a linguistic view and an educational view. The advocates of the first view are preoccupied with linguistic issues and get involved in the study of Second Language (L2) acquisition when they find it conducive to the development of a theory of language. The proponents of the second view, however, are concerned with educational matters. They focus on L2 acquisition since they want to know how learners develop the ability to use a language in order to provide them with effective learning opportunities. In the domain of this second view, any theory is good as long as it can be employed to enhance learning and fulfill learning objectives.

The idea is that people concerned with educational matters do not evaluate theories in absolute term. They assess theories in accordance with their own objectives as well as the practical usefulness of the theories. Among the theories which have contributed to education in general and second language education in particular, Howard Gardner (1985, 1993 and 2005)'s Multiple Intelligence (MI) enjoys a high status. That is why this study focuses a prominent Iranian educational institute (Payame Nour University PNU) to assess the MI of students majoring in English there.

### Multiple Intelligences

#### Historical Background

Looking back in retrospect we come to see that the first learning theory that found its way into language education in early 20th century was Behaviorist psychology. In this theory, learning was considered a mechanical process of rote learning, habit formation, stimulus-response, and analogy. According to this theory, mind does not exist, the processing capabilities of the mind have no bearing on human learning, and language learning is the outcome of stimulus-response and conditioning. Mainly because Behaviorist psychology failed to account for the creativity of learners, it was challenged and finally rejected by the advocates of cognitive psychology.

Cognitive psychology considers learning a mental process of creativity, analysis, and rule formation. Here, human is

considered an independent entity that experiences the outside world but is not conditioned to have fixed reaction toward the stimuli. Rather, he experiences the world actively, analyses the incidents, and deduces the rules to make use of them in the years to come. This theory branched into several similar theories among which a prominent case is Jean Piaget's developmental psychology according to which cognitive development takes place in a series of stages, the acquisition of each stage is an essential requirement for the acquisition of the next stage, and cognitive development is prerequisite for linguistic development. Furthermore, in this theory, as presented by Mirhassani (2003), intelligence is seen as a process of adaptation and organization.

Adaptation involves two processes, namely assimilation that is defined as the incorporation of environment in to the present patterns of behavior, and accommodation a process that calls for changes in intellectual structure (schemata) to adjust to the demands of the environment. Organization, however, is defined as a structural concept to describe the integration of schemata. Jean Piaget's developmental psychology, according to Gardner (2005) paved the way for the development of his Multiple Intelligences theory which was a move away from the traditional approach to intelligence.

Intelligence was traditionally defined and measured in terms of only linguistic and logical-mathematical abilities and the Intelligence Quotient (IQ) notion was based on several generations of the testing of these two domains. Furthermore, traditional intelligence tests were based on the idea that intelligence was a single, inborn, unchanged capacity while Gardner considers intelligence as the combination of nine different forms of intelligences. He also argues that everybody enjoys all types of intelligences although they might differ in strength and combinations of intelligences; and that the strength of each can get enhanced through training and practice. Gardner (1983, 1993 and 2005)'s multiple intelligences are presented below.

### Multiple Intelligence

Gardner (2005)'s framework includes nine types of intelligences among which eight have been discussed in his previous work (Gardner 1985, 1993). These eight intelligences according to which Silver and Strong (1998)'s MI Indicator employed in this study has been devised are as follows.

1) Verb- Linguistic: This type of intelligence is high in those people who have a great interest for language and seek every opportunity to draw on and explore that interest. People who show an ease of application with words and feel at home with all language components

2) Logical- mathematical: Logical- mathematical intelligence is strong in those who draw on the observation of physical objects to identify logical connections in abstract phenomena. Such individuals can handily state hypotheses and infer the relevant consequences. Furthermore, they are usually able to use deduction to arrange ideas into patterns.

3) Spatial: Spatial intelligence is sometimes referred to as the second intelligence, verbal- linguistic being considered as the first. That is because individuals with strong spatial intelligence draw on their verbal- linguistic intelligence to recreate visual experiences, and that is why for spatial learners, words usually evoke a picture in the mind

4) Musical: Musical intelligence involves the potential to create, perform and appreciate music. Individuals with this type of intelligence enjoy a well-developed sense of pitch, rhythm and movement. Furthermore, they have the capacity to draw on these elements to develop concepts and draw ideas. This type of intelligence is ordinarily acknowledged as a talent, but it should not be forgotten, according to Gardner (2005), that the abilities associated with other types of intelligences are also talents.

5) Bodily-kinesthetic: Bodily- kinesthetic intelligence is associated with those who enjoy strong preferences for physical activities, people that handle objects skillfully and use their whole body or part of it with versatility. Gardner (2005) puts such people as athletes, dancers, actors, craftsmen as well as surgeons into this category.

6) Interpersonal: Interpersonal intelligence is associated with understanding others. People with this type of intelligence are willing to draw on their own inner resources mainly when they find it conducive to the smooth functioning of society and to the welfare of others. It is important, therefore, for the interpersonally intelligent individuals to have a comprehensive grasp of how to understand other people, how to interact with them and how to motivate them to do particular activities.

7) Intrapersonal: Intrapersonal intelligence, on the contrary, involves the capacity to understand oneself. Individuals with strong intrapersonal intelligence have easy access to their own feelings, views and values, and they can receive a lot of assistance from those factors to guide their own behavior. Interest in others, for such people comes second to understanding personal ideas or wishes as well as fulfilling individual objectives.

8) Naturalistic: Naturalist intelligence, which was introduced in Gardner's later work, deals with the capacity to make fine distinctions between objects or phenomena in nature. People with strong naturalist intelligence are able to notice subtle differences between plants, animals or other naturalist phenomena such as clouds or mountains. According to Gardner (2005), "... it is likely that our entire consumer culture is based on our naturalist capacity to differentiate one car make from another, one sneaker from another and the like." (p.9).

### This Study

This study was conducted to answer three research questions as follows.

1. What kinds of intelligences do PNU students possess? What are the strengths their intelligences?

2. Do PNU female and male students differ significantly in terms of their intelligences?

3. Are there any relationships between PNU students' MI and their achievement scores on speaking, grammar and reading scores?

It was important to find answers for these questions since the information gained accordingly could help language teachers working in PNU context employ and/or introduce more effective learning activities, and this in turn could help students improve their achievement scores, which seems quite difficult due mainly to the following limitations associated with this learning context.

First, the number of sessions held for any subjects during the term is limited. More specifically, for 2- credit subjects 6 sessions and for 4- credit courses 12 sessions are generally held during the term. Secondly, all the books as well as classroom texts required for PNU courses are specified by the university's Central Education Office, and language teachers do not have a say in this regard. Third, the contents the books as well as the texts are usually far beyond the language abilities of the students in terms of knowledge and linguistic complexity. Finally, all the achievement tests are developed by the university's Central Examination Board.

To fulfill this objective, 119 Iranian PNU students majoring in English were administered a translated version of Silver and Strong (1998)'s MI indicator (as presented by Silver et al, 2000), and they were convinced and instructed to determine the rating that best described their behavior. The students had all passed speaking 1&2, grammar 1&2 and reading 1&2 in PNU (Eslam Abad Gharb Center).

To reduce any possible cultural bias associated with the MI indicator as well as any misinterpretation associated with the translation, the instrument was validated before use. To do this, copies of the original indicator along with the translation were given to five university English instructors familiar with PNU context in order for them to suggest possible modifications to the translation based on their understanding of the original instrument as well as the present context of use. The suggested changes were then incorporated into the modified instrument.

In order to ascertain the reliability of the measuring instruments, the internal consistency ( $\alpha$ ) reliability of the MI indicator was calculated (it turned out to be 0.91). As for as the achievement tests were concerned, however, it should be noted that all achievement tests in nation wide PNU Branches including the ones used in this study are devised by the university's Central Examination Board, and as such, are checked for consistency and validity by the Board. That was why the achievement tests employed in this study were not checked for consistency and validity. It should be added that regarding speaking the Board designs oral questions and sets guidelines for the instructors to decide half of the marks based on the oral performance of the students. Thus, half of the speaking marks of the students in this study were also decided according to individual speech presentation, topical conversation as well as classroom participation.

### Results and Discussions

To explore whether the instruments employed in this study met the fundamental psychometric requirements, reliability and

validity had to be taken into account, As far as the language tests were concerned, as stated above, all PNU achievement tests are devised by the university's Examination Board, and as such, are checked for consistency and validity by the Board.

As for the MI indicator, however, the coefficient Alpha was calculated and found to be 0.91. Furthermore, since it was the first time the indicator had been employed with PNU students and in order to ascertain the validity of the findings provided in this context, in addition to the content analysis discussed above, Principle Component Factor Analysis was performed which indicated a balanced pattern of the items loading under the general factors showing that the construct was meaningful for PNU context.

To answer the first question and to find out about the relative strengths of intelligences for our students, descriptive statistics furnished a lot of insights. The descriptive statistics of the scores the MI indicator produced the results presented in

**Table1. Descriptive Statistics of the Scores on the MI Indicator**

Intelligences	N	Minimum	Maximum	Mean	Std. Deviation
Verbal-Linguistic	114	10.00	38.00	28.36	5.397
Logical-Mathematical	112	11.00	34.00	23.05	4.719
Spatial	106	14.00	37.00	27.10	4.660
Musical	113	9.00	36.00	26.04	5.917
Bodily-Kinesthetic	115	8.00	39.00	26.82	5.699
Interpersonal	111	8.00	38.00	27.72	4.942
Intrapersonal	115	18.00	39.00	29.43	4.147
Naturalist	117	6.00	36.00	24.09	5.852
Valid N (listwise)	85				

This table provided useful information since it showed, for instance, that we had the highest mean for the intrapersonal intelligence of our students because the maximum score gained

for this intelligence turned out to be 39 and the mean was 29.43. By examining such information, we could develop good insights into the combination of strengths and weaknesses our students brought to their language classes. For example, when we noticed that our students were the strongest in terms of their intrapersonal intelligence, we draw on Richards and Rogers (2001) to decide that our students were much more prepared to take advantage of reflective learning and journal keeping. Thus, this information we got on the intelligence comfort zones of our student assisted us employ the type of learning activities that were more in conformity with the intelligences of our students. We were aware, off course, that we were following the preferences of our students as a group an issue which seems to be in opposition with the new trends in classroom evaluation that attach a lot of importance to the preferences of individual students (see Brown, 2004 for more information). However, people professionally concerned with the real life challenges of language teaching (including Brown) agree that solutions provided in other contexts cannot get imposed on the local problems of language teachers (see Widdowson 1990, 2003 for more on this issue), and all language teachers familiar with PNU context are in accord that the employment of individual-oriented procedures is not feasible in PNU context due to the limitations stated above.

In an attempt to deepen our insights into how to incorporate more effective activities into our classroom environment, we took another step which was to find answers to the second research question- whether there was a significant difference between our male and female students in terms of the types and strengths of their intelligences. To fulfill this objective we employed the T-test procedure. We began by checking the assumptions since if T-test assumptions were met, as stated by Brown (1995), it could be the most powerful means of analysis at this juncture of our study; otherwise, we were to turn to other statistical procedures.

**Table 2. T- test of the Performances of Male and Female students on the MI Indicator**

Equal Variances Assumed	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Verbal-Linguistic	2.885	.092	1.502	112	.136	1.59	3.691
Logical- Mathematical	.007	.932	1.437	110	.155	1.33	3.163
Spatial	.252	.615	2.350	104	.021	2.23	4.114
Musical	.000	.988	1.397	111	.165	1.64	3.964
Bodily-Kinesthetic	.016	.899	-383	113	.702	-.43	1.801
Interpersonal	5.175	.025	1.839	109	.069	1.81	3.762
Intrapersonal	2.535	.114	.124	113	.902	.10	1.727
Naturalist	.379	.539	-.848	115	.398	-.97	1.302

**Table 3. Correlation between the students' scores on the MI indicator and Achievement tests**

Intelligences	Language achievement					
	Speaking 1	Speaking 2	Grammar 1	Grammar 2	Reading 1	Reading 2
Verbal-Linguistic	.18	.31**	.18	.21*	-.01	.11
Logical- Mathematical	.19*	.10	.21*	.26**	-.07	.00
Spatial	.03	.14	.11	.15	.00	.00
Musical	-.06	.11	.13	-.03	-.05	-.05
Bodily-Kinesthetic	.00	.11	.12	.09	-.12	.00
Interpersonal	.20*	.36**	-.04	.06	-.15	.07
Intrapersonal	.21*	.25**	.19*	.09	-.03	.06
Naturalist	.04	.11	.00	.08	-.01	-.01

\*\* . Correlation is significant at the 0.01 level (2-tailed)

\* . Correlation is significant at the 0.05 level (2-tailed)

As far as the assumptions were concerned, we did not have the problem of sample dependence since we compared the scores of two independent groups (males versus females). Neither did we have any problems with the produced variances because they were equal, and even though they were not, the differences in the samples sizes were not that large to exert negative effects (Brown, 1995 puts this difference at a ratio of 3 to 1 or more). We also checked our samples to see that they were not negatively affected by skewedness because, as stated by Norusis (1990) skewedness can render the results of T-test ineffectual especially when it is in the same direction. The results of the T-test are presented in Table 2

As the statistics in table 2 shows, there was no significant difference in the type and strengths of intelligences between males and females of our study. Similar to the results of the first research question, this issue also helped us make better decisions due particularly to the problems associated with the first limitation of PNU context which was discussed above. That is, because we have got only 12 instructional hours for our 2- credit courses and 24 for our 4- credit courses, we would be far short of time to address the preferences of our male and female students separately, and now that we understood there was no significant difference between males and females in terms of the type and strengths of their intelligences, we were not required to do so.

The last step we took in order to pave the way for furnishing our students with effective learning activities was to answer the third research question and to find whether there was a significant relationship between our students multiple intelligences and their language performances on the achievement tests. To accomplish this goal, the students' scores on the MI indicator were correlated with their scores on speaking, grammar and reading tests. The results are presented in Table 3.

As the results indicate, the greatest correlations occurred between interpersonal intelligence and speaking 2 (0.36) as well as verbal- linguistic intelligence and speaking 2 (0.31). The lowest correlation occurred between interpersonal intelligence and grammar 2 (0.19) and logical mathematical intelligence and speaking 1 (0.19). Other correlations included logical-mathematical and grammar 2 (0.26), intrapersonal intelligence and speaking 2 (0.25), intrapersonal intelligence and speaking 1 (0.21), verbal linguistic intelligence and speaking 1 (0.21), verbal- linguistic intelligence and grammar 2 (0.21), logical-mathematical intelligence and speaking 1 (0.20). However, no correlation was found between the students' intelligences and their reading 1 and 2 achievement scores. This information was also important due mainly to the point that the outcome furnished here, while in partial accord with the previous dichotomies presented on the relationship between particular multiple intelligences and specific language classroom activities (see Christison, 2001 for instance), could not be decided according to them. As an example, the relationships between interpersonal intelligence and speaking as well as logical-mathematical intelligence and grammar were in line with the previous studies but not that between intrapersonal intelligence and speaking. Furthermore, we found that in PNU context there is no relationship between the language students reading scores and their multiple intelligence which, if substantiated by further research, can help us answer a number of important questions.

### Conclusion

Although the usefulness of no theory can be taken for granted even those having the stamp of authority, people

concerned with educational matters are required to draw on theories to assist students learn better (Widdowson, 2003). We drew on Gardner's MI theory to gain some information on our students' intelligences. As the result of descriptive statistics, the information we got on the comfort zones of our students with regard to their intelligences was useful because we could draw on this information and Richards and Rogers (2001) to employ the type of learning activities that were more in conformity with the intelligences of our students. Drawing on T- test we found that there was no significant difference in the type and strengths of intelligences between males and females of our study. This was also conducive to making better decisions due particularly to the problems associated with the time limitations of PNU context. The last step in our study (correlation analysis) revealed that previous research findings on the relation between MI and language learning cannot directly get incorporated into our present situations, and as a result we had to draw on our intuition to modify some of the classroom activities we had employed based on the previous studies.

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