

A Self-Perceived Analysis of Students Intelligence and Academic Achievement

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Abstract: Multiple Intelligences (MI) are eight different ways to demonstrate intellectual ability. It is how human learn best and apply to daily activities. The theory states that every human has at least two or more intelligences, for example, verbal-linguistic, logic-mathematic, intrapersonal, interpersonal, visual-spatial, musical, natural and existential intelligences. The objective of this paper is to identify and analyse the relationship between students' intelligence and academic achievement among polytechnic students. The theories of MI are used in this study where the instrument used was *Ujian Multiple Intelligence* (UMI) which showed a positive correlation between their intelligence and academic achievement. The correlation for interpersonal, verbal-linguistic, bodily-kinesthetic, visual-spatial and musical is at a moderate rate while naturalistic, intrapersonal and logic-mathematic is weak. It is highly recommended that educators, although with minimal knowledge of Information Technology (IT), use the online MI teaching tools in the teaching and learning aspect.

Key words: Multiple Intelligences (MI), Academic achievement, Online teaching tools, Interpersonal, Visual-spatial, Verbal-linguistic.

INTRODUCTION

The idea of Multiple Intelligences (MI) theory was developed by Gardner (2006). He is a psychologist and professor at Harvard University's Graduate School of Education. According to Gardner, every human being has at least two or more intelligences such as verbal-linguistic, logic-mathematic, intrapersonal, interpersonal, visual-spatial, musical, natural and existential-intelligences. It is believed that every human being has at least intelligence and some of them can even possess to a maximum of eight intelligences.

These intelligences are located in different areas of the brain and can either work independently or together. The most important contribution of the MI theory to education is that it allows the educators to expand their repertoire of methods, tools and strategies beyond those that are frequently used in the classrooms (Gardner, H., 1983). Based on the concept of MI, educators should review lesson plans and ensure that there are variety of teaching activities and methods so that students have the opportunity to use the dominant intelligences. MI is important in the education as students achieve a variety of learning experiences and thus help their learning.

Previous research (Suzanna, G., 2011; Laidra, K., 2007; Waterhouse, L., 2006) related to MI theory indicates that students who use MI can contribute to significant differences in their learning output. Several studies showed students were taught about the strength of using MI have many benefits while other studies stated that there is a cause and effect between intelligence and academic achievement. MI in the classroom makes lessons more interesting, thus students can pay more attention to what is taught and learned (Suzanna, G., 2011). As a result, students are more engaged, able to comprehend better and thus improve their achievement (Laidra, K., 2007). When students are aware of their strengths in intelligence and consider themselves as being "smart", their self-confidence will be increased (Waterhouse, L., 2006). Additionally, educators should first evaluate their own intelligence before carrying out MI teaching, and use their dominant intelligence in planning materials and lesson plans. They should also keep track of student performances with observations and written records. This can help them to assess each student's intelligence and provide support accordingly. Teaching strategy of MI can be embedded into teaching activities in the classroom so that students can achieve higher learning effectiveness (Bellflower, J.B., 2008).

Past experiments showed the teaching effectiveness and efficiency are still limited. Extended research is needed to apply MI theory into teaching practice effectively. Educators should be encouraged to plan different

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types of intelligences in their teaching because all intelligences contribute to student achievements (Ghazi, S.R., 2011; Moran, S., 2006; Rettig, M., 2005). Few researches has been written on how these MI theory can be applied in institutions of higher education and posed challenges for instructors to apply these intelligences in their teaching (Moran, S., 2006). Besides, there are mixed reviews of the theory and application in a classroom setting. Waterhouse (2006) concluded that MI should not be implemented into a classroom while other researchers support the MI theory in a classroom (Moran, S., 2006; Parviz, A. and S. Farhady, 2012; Hajimirzayee, F. and M.K.S. Abadi, 2012; Mostafari, B.B.M., 2012). Similarly, previous studies (Embi, M.A., 2011; Jamia'an, M., 2010; Rosmah, M.I., 2001; Che, M.Y. and M.N. Mariani, 2001) stated that there are a lot of problems and challenges related to online teaching and learning that offered by institutions. One of the main reasons is lecturers are not using e-learning: lack of training, lack of time, prefer traditional teaching methods, lack of technical support, lack of facilities, additional burden to existing teaching load and other reasons (Embi, M.A., 2011). Time constraint at workplaces also adds to the environment constraint as mentioned at (Jamia'an, M., 2010). A study was conducted at *Politeknik Mukah Sarawak* where the author states that situation obstacle was the main factor in learning material provision. This opinion is supported by Rosmah *et al.* (2001) where modification process and design course contents are adapted to carry out an effective teaching method and this consumes a lot of time, effort and commitments from lecturers. Recent research in education also indicates that there is lack of creative and innovative teaching strategies among the educators (Che, M.Y. and M.N. Mariani, 2001).

The lecturer's role in teaching and learning are crucial to ensure that the motivation of students in learning will be increased. Many studies have been conducted and proven the theory of MI is very important in various aspects of education, particularly to polytechnic students who do not have good academic achievement. This theory can increase students' understanding and indirectly increase the motivation of the lecturers to teach. All students at polytechnic actually have different potential and styles of learning but which type of intelligence has a more relationship with their academic achievement? Therefore, the objective of this paper is to identify the relationship between students' intelligence and academic achievement among polytechnic students.

MATERIALS AND METHODS

Several interview sessions have been conducted with Polytechnic lecturers. The purpose of the interview was to gather information about the current problem in teaching and learning using e-learning Curriculum Information Document Online System (CIDOS) at Malaysia Polytechnic. The lecturers were randomly selected in order to collect information for this research. This interview session provides a depth of information which offer more comparable information from different individuals. The session aims to receive more detailed information on all aspects related to the research problem.

In addition to gain more information, a survey questionnaire has been carried out. This instrument was administered to respondents after the interview session. The survey questionnaire uses a Likert Scale (1-5) to determine the usage and current problem of e-learning CIDOS at Polytechnic. In addition, the survey also aims to identify the lecturer's needs in preparing teaching materials and critical subjects. The questionnaires were distributed were given to respondents and participation was voluntary. The questionnaires were personally administered to respondents from Politeknik Ungku Omar, Politeknik Seberang Perai, Politeknik Merlimau and Politeknik Shah Alam. For the internet based survey, the questionnaires were distributed electronically.

There are many ways to determine student's intelligence strengths. Several inventories, questionnaires, and tests have been created for this purpose. The *Ujian Multiple Intelligence (UMI)* is used to determine which intelligences are the strongest for Polytechnic student. The form was taken from Bushro (2008). This form was translated into *Malay* language so that students can understand the survey questions. Students were asked to take the UMI test using online application. Once the item of the survey instrument was scored, the point for each of the intelligences was totalled using the Excel and recorded for each student.

The participants involved 70 diploma students (43 female and 27 male). The UMI consists of 80 items measuring different types of intelligence. The validity of the questionnaire was approved by Bushro (2008). All participants were given the UMI via online.

RESULTS AND DISCUSSION

The collected data was entered into SPSS-19 and analyzed using appropriate statistical tests. Versatility of MI was measured using the mean and SD respectively. Table 1 shows the types of intelligences acquired by Polytechnic students. The analysis revealed that interpersonal (mean: 4.07) was the highest intelligence among the students who participated in this study. The other dominant intelligence types were logical mathematical (mean: 3.77), visual- spatial (mean: 3.76), naturalist (mean: 3.68), intrapersonal (mean: 3.67), bodily-kinesthetic (mean: 3.64), verbal-linguistic (mean: 3.60) and the lowest is musical (mean: 3.43).

Table 1: Types of Intelligences acquired by students.

Intelligence Type	Mean	(n=70) Std. Deviation
Interpersonal (INTER)	4.07	0.68
Verbal-Linguistic (VL)	3.60	0.58
Bodily-Kinesthetic (BK)	3.64	0.70
Visual-Spatial (VS)	3.76	0.70
Musical (M)	3.43	0.83
Naturalist (N)	3.68	0.87
Intrapersonal (INTRA)	3.67	0.63
Logic-Mathematic (LM)	3.77	0.69

MI and academic achievement scores were correlated using Pearson's product moment Correlation. The relationship between multiple intelligences and cumulative grade point average (CGPA) was a positive correlation. Table 2 presents the coefficient of correlation between the tendency of student intelligence and academic achievement at Polytechnic. The value of $r = 0.678$ and p value = 0.00 at $\alpha = 0.01$ level show that there is a significant positive correlation between self-perceived interpersonal intelligence and academic achievement of the students (Table 3). Overall, there is a significant positive correlation between perceived verbal-linguistic, bodily-kinesthetic, visual-spatial and musical intelligence and academic achievement of the students and it shows moderate correlation.

There is a significant positive correlation between perceived naturalist ($r = 0.391$, p value = 0.000), intrapersonal ($r = 0.370$, p value = 0.002), logic-mathematic intelligence ($r = 0.264$, p value = 0.001), and academic achievement of the students. It can also be concluded that this correlation is weak.

Table 2: Correlation between the tendency of student intelligence and academic achievement at Polytechnic.

No	Intelligence	r	P	Result
1	Interpersonal (INTER)	0.678	0.000	There is a significant positive correlation between perceived interpersonal intelligence and academic achievement of the students. It can also be concluded that this correlation is moderate.
2	Verbal-Linguistic (VL)	0.471	0.027	There is a significant positive correlation between perceived verbal-linguistic intelligence and academic achievement of the students. It can also be concluded that this correlation is moderate.
3	Bodily-Kinesthetic (BK)	0.438	0.000	There is a significant positive correlation between perceived Bodily-Kinesthetic intelligence and academic achievement of the students. It can also be concluded that this correlation is moderate.
4	Visual-Spatial (VS)	0.408	0.003	There is a significant positive correlation between perceived Visual Spatial intelligence and academic achievement of the students. It can also be concluded that this correlation is moderate.
5	Musical (M)	0.407	0.000	There is a significant positive correlation between perceived Music intelligence and academic achievement of the students. It can also be concluded that this correlation is moderate.
6	Naturalist (N)	0.391	0.000	There is a significant positive correlation between perceived Naturalist intelligence and academic achievement of the students. It can also be concluded that this correlation is weak.
7	Intrapersonal (INTRA)	0.370	0.002	There is a significant positive correlation between perceived intrapersonal intelligence and academic achievement of the students. It can also be concluded that this correlation is weak.
8	Logic-Mathematic (LM)	0.264	0.001	There is a significant positive correlation between perceived logic-mathematic intelligence and academic achievement of the students. It can also be concluded that this correlation is weak.

*Correlation is significant at α 0.01 level.

Table 3: Correlation between Interpersonal Intelligence and CGPA.

Correlations			
MEANINTER	Pearson Correlation	MEANINTER	CGPA
	Sig. (2-tailed)	1	.678**
	N	70	70
CGPA	Pearson Correlation	.678**	1
	Sig. (2-tailed)	.000	
	N	70	70

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

Figure 1 and 2 show the scatter plot between interpersonal (moderate) and logic-mathematic (weak) and CGPA which show a meaningful relationship between MI and academic achievement at polytechnic.

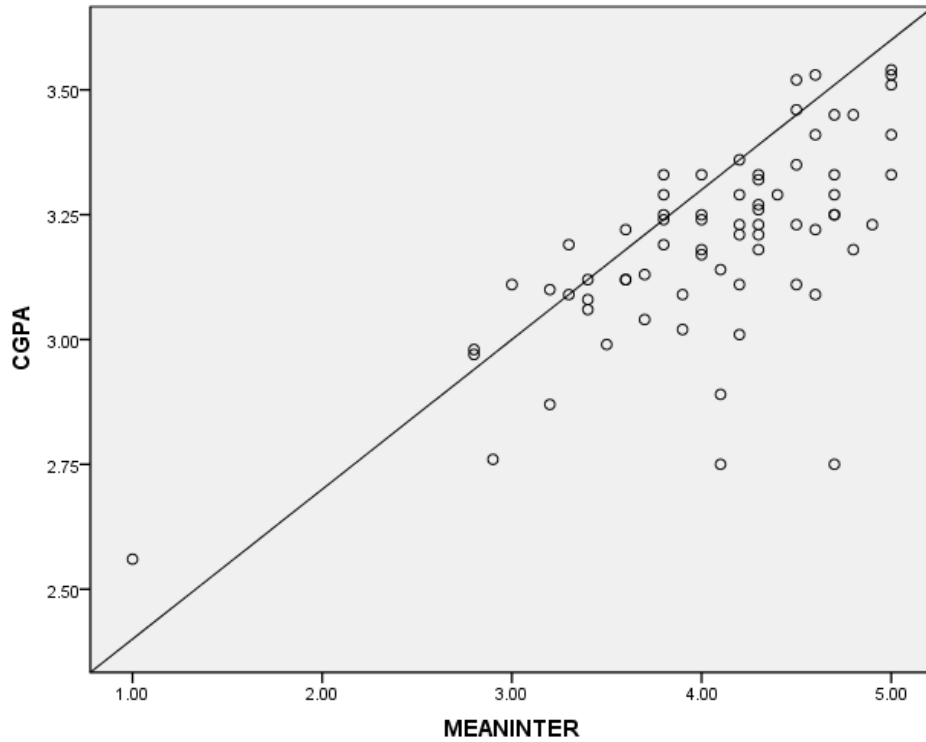


Fig. 1: Scatter plot between interpersonal intelligence and CGPA.

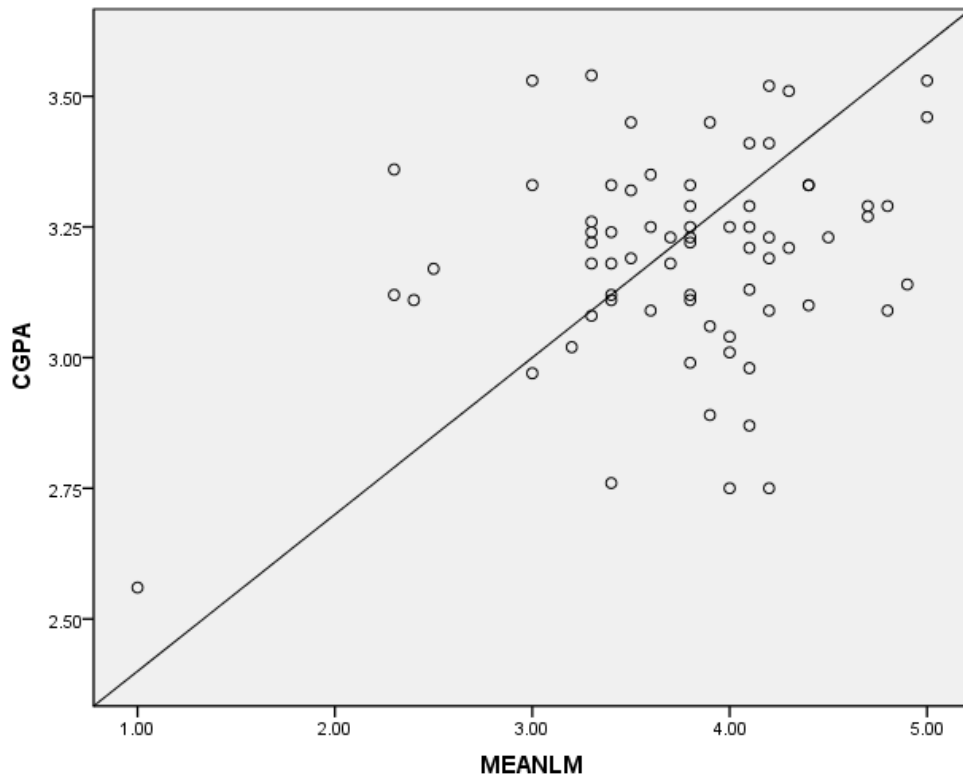


Fig. 2: Scatter plot between logic-mathematic intelligence and CGPA.

Conclusion:

In conclusion, lecturers should be creative when designing their teaching materials or activities to enable polytechnic students to use their intelligence in the classroom. With the interactive and suitable teaching materials and activities in class, student attention can be retained and also, improve lecturer's passion and

motivation to teach and prepare teaching materials. In an effort to achieve quality teaching and learning, it must be based on multiple approaches with a series of activities involving online teaching tools. Designing online MI teaching activities at higher education is the best solution to facilitate lecturers to create their own teaching materials without having any IT knowledge especially in programming. Lecturer can reduce preparation time and indirectly attract the attention of students to learn and use the materials effectively. It is recommended that an online MI teaching tool should be designed and developed.

ACKNOWLEDGMENT

Siti Nurul Mahfuzah would like to thank her primary advisor, Assoc. Prof Dr. Sazilah Salam and Dr. Norasiken Bakar for her advice, support, encouragement and guidance. She also likes to express gratitude to the diploma students from Malaysia Polytechnic, who participated in this paper, as well as to all the Polytechnic lecturers for their support and cooperation. Thanks to the Malaysia Ministry of Higher Education (MOHE) who sponsor her study and deep appreciations are also dedicated to anyone who directly or indirectly involved in this study.

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