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An Investigation on Multiple Intelligence of Students from the Faculty of Business Management (FPP) and Faculty of Computer and Mathematical Sciences (FSKM), Universiti Teknologi MARA (UiTM)

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Abstract

The purpose of this study is to identify the multiple intelligence of students at Universiti Teknologi MARA (UiTM), Perak and Melaka Campuses. Two faculties are involved in this study which are Business Management (FPP) and Computer & Mathematical Sciences (FSKM). 81 FPP students and 43 FSKM students were respondents of this study which employed the multiple intelligences test identified by Howard Gardner. The survey consisted of nine intelligence areas which are linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, naturalistic and existential. The surveys were conducted online throughout the semester. Descriptive analysis via frequency was performed using horizontal bar-chart to describe the data collected. Statistical Package for Social Sciences (SPSS) was used in the data analysis process to test the differences on multiple intelligences between the two faculties. Overall, FPP scores were higher than FSKM in all multiple intelligences. This research is supported by previous research done by Salehi and Germai (2012). Traditionally, Social Science students would typically be perceived to have more Linguistics Intelligence while Science Technology students would be

perceived to have more Mathematical Intelligence. The findings can be used by educators to translate it into approaches in learning strategies and to incorporate it into the curriculum.

Keywords: multiple intelligence, Howard Gardner model, student's preferences, student's personal potential, learning strategies.

1. Introduction

Howard Gardner proposed the Multiple Intelligence (MI) theory in 1983 with his published book, *Frames of Mind*. To date, his theory became a reference for the education, teaching and training communities to understand and teach many aspects of human intelligence, learning style, personality and behavior both in education and industry.

Based on this theory, Gardner indicates that human intelligence capacities consist of nine intelligence areas which are linguistic, musical, logical-mathematical, spatial, bodily- kinesthetic, interpersonal, intrapersonal, naturalistic and existential (Gardner, 1983). He suggests that different intelligence areas may be independent of each other; a person can be low in one domain area but high in another. All of us possess the intelligence areas but in varying degrees of strength and skills. Thus, he defines intelligence as "an ability or set of abilities that allow a person to solve a problem or fashion a product that is valued in one or more cultures".

In education, this means that individuals who have different intelligence types may also have different learning styles. Therefore, individuals can learn when the instructional activities are catered according to their intelligent types (Armstrong, 2008 as cited in Sadeghi 2013) as cited in Armstrong, 2008). According to the multiple intelligences theory, not only do all individuals possess numerous mental representations and intellectual languages, but individuals also differ from one another in the forms of these representations, their relative strengths, and the ways in which these representaions can be changed.

This research examines the type of multiple intelligence among students at Universiti Teknologi MARA (UiTM), Perak and Melaka Campuses. Two faculties were involved which are Business Management (FPP) and Computer & Mathematical Sciences (FSKM).

2. Research Methodology

2.1 Data Collection

Data were collected by using a structured questionnaire. The instrument was chosen as it is one of the fastest ways to collect information. The questionnaire consists of a formalized set of questions. The respondents of the study were 81 students from FPP and 43 students from FSKM. The surveys were conducted online throughout the semester. Descriptive analysis via frequency count was performed using horizontal bar- chart to describe the data collected. Then cross-tab analyses using the Statistical Package for Social Sciences (SPSS) were run to test the differences on multiple intelligences between the two faculties.

2.2 Sampling Method

According to Sekaran (2009), sampling is a process of choosing an adequate number of elements from the population. Hence, sampling design and sample size are the two most important elements to establish the representativeness of the sample generalizability. The study used probability sampling which is a simple random sampling when distributing questionnaires to the respondents since this method can highly represent the population (Black, 1999).

3. Data Analysis and Findings

3.1 Descriptive Analysis

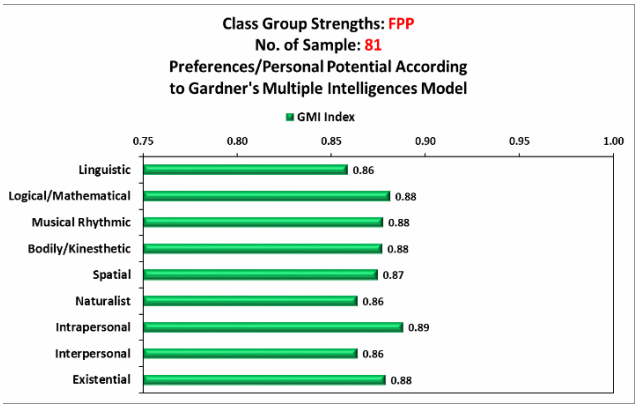

Fig.1 Preferences/personal potential of FPP

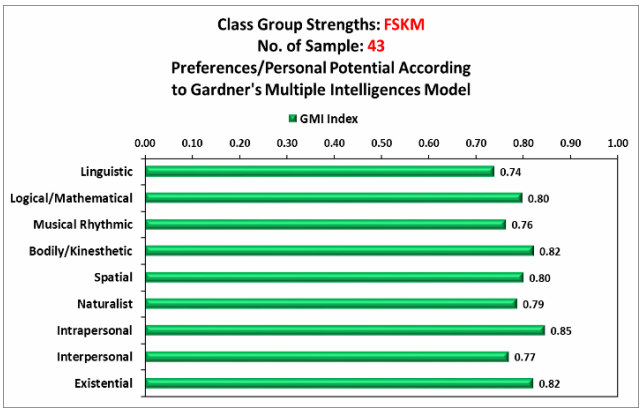

Fig.2 Preferences/personal potential of FSKM

Those who possess linguistic intelligence have a very good command of vocabulary, the function of language and grammar. Activities that involve hearing, listening, impromptu or formal speaking, tongue twisters, humor, oral or silent reading, documentation, creative writing, spelling, journal and poetry will highly benefit these types of students. Based on the linguistic intelligence findings, it is shown that overall, FSKM students' MI score (0.74) is lower than FPP (0.86). This may be the nature of the course and the subjects that are offered. For FSKM students, the courses are heavy on calculations and are theory based which do not allow these students to interact and use their linguistic capabilities to the fullest as compared to FPP students.

Logical-mathematical intelligence involves students who think in logical patterns and organize information systematically. Activities that involve abstract symbols/formulas, outlining, graphic organizers, numeric sequences, calculation, deciphering codes, problem solving will ignite the potential of such students. The findings show that FPP students' score (0.88) is higher than FSKM students (0.80); this might be due to the difficulty level of the subjects, such as basic Mathematics for FPP and a more difficult level for FSKM.

Learners who are sensitive to pitch, melody, rhythm, and tone as in a composer possess musical intelligence. Musical intelligence uses activities that involve audio tape, music recitals, singing on key, whistling, humming, environmental sounds, percussion vibrations, rhythmic patterns, music composition, and tonal patterns. Based on the findings, the MI score for FPP students (0.88) is higher than FSKM students (0.76). This might be that business students are more musically-inclined, imaginative and creative while computer students think better using logic, reasoning, analysis and numbers.

Spatial intelligence students enjoy highly visual experiences. They perceive the world accurately and try to re-create or transform aspects of that world as in a sculptor or airplane pilot. Spatial learners often want to see the connection between what they visualize and what they read. Use activities that involve art, pictures, sculpture, drawings, doodling, mind mapping, patterns/designs, color schemes, active imagination, imagery, block building. For this type of intelligence, FPP students recorded a higher score which is at (0.87) than FSKM students with (0.80) as Business students easily relate with visuals or pictures to fulfill a learning task. FSKM students prefer numbers and mathematical calculations to solve problems and learn.

Students with bodily kinesthetic intelligence on the other hand are able to use the body skillfully and handle objects adroitly, as in an athlete or dancer. Activities such as role playing, physical gestures, drama, inventing, ball passing, sports games, physical exercise, body language and dancing are highly recommended for these types of students. FPP students' bodily kinesthetic intelligence (0.88) is higher than FSKM students (0.82) whereby students with this form of intelligence prefer to engage in hands-on activities which assist them to learn better.

Interpersonal intelligence consists of students/learners who understand people and relationship and prefer to work in groups. Learners think by bouncing ideas off of each other and need to work either in groups or with a partner to generate ideas. It is suggested that activities which involve group projects, division of labor, sensing others' motives, receiving/giving feedback, collaboration skills should be used. The findings show that FPP students score higher (0.86) than FSKM students (0.77).

Intrapersonal intelligence possesses access to one's emotional life as a means to understand one self and others exhibited by individuals with accurate views of themselves. Use activities that involve emotional processing, silent reflection methods, thinking strategies, concentration skills, higher order reasoning, "centering" practices, and meta- cognitive techniques. The findings show that FPP students' score (0.89) is higher than FSKM students (0.85).

Naturalist intelligence is more connected to the outside world, enjoys nature and is good with animals. This form of intelligence deals with sensing patterns in and making connections to

elements in nature. Use activities that involve bringing the outdoors into the class, relating to the natural world, charting, mapping changes, observing wildlife, keeping journals or logs for effective learning. The findings show that the score for students from FPP (0.86) is higher than FSKM (0.79).

Existential intelligence is the latest addition to Gardner's theory of multiple intelligences. For this type of intelligence, the findings show that FPP (0.88) scores higher than FSKM (0.82). Consecutively, existential intelligence inclines towards spiritual sensitivity to tackle questions like meaning about human existence and life.

Overall, FPP scores are higher than FSKM in all MI. This research is supported by previous research done by Salehi and Germai (2012). Traditionally, Social Science students would typically be perceived to having more Linguistics Intelligence while Science and Technology students would be perceived to have more Mathematical Intelligence (Salehi & Germai, 2012). However, in this study, FPP/ Social Sciences students seem to attain a higher mean based on the multiple intelligence indexes in all intellectual composites including the Logical /Mathematical intelligence index as compared to FSKM/Science and Technology students.

3.2 Cross-tabs analysis

Table 1 Summary of Test Differences

Types of Intelligence	Pearson Chi-Square	Df	P-value
Linguistic	242.341	238	0.41
Logical/ Mathematical	107.295	120	0.79
Musical Rhythmic	175.525	168	0.33
Bodily/ Kinesthetic	108.284	108	0.474
Spatial	149.869	156	0.623
Naturalist	123.105	120	0.405
Intrapersonal	94.317	110	0.857
Interpersonal	155.338	169	0.767
Existential	123.875	143	0.874

A cross-tabulation is done to determine if there is a significant difference between the two faculties. The analysis is based on results at 1% significance level of the Pearson Chi- Square. Table 1 shows all types of intelligence are greater than 1% of significance value (p- value). This indicates that at 99% confidence, there is no significant difference on the types of intelligence between FSKM and FPP.

4. Discussion

Table 2 The number of students based on faculty and gender

Faculty	Gender	
	MALE	FEMALE
FPP	30	51
FSKM	14	29
Total	44	80

The high MI index for FPP students indicates that their multiple intelligences are at par with their FSKM counterparts. It is also noted that the higher MI index for FSKM students could very much be contributed by the female students. Female students are said to be more focused in achieving their personal goals while male students are generally more mathematically inclined than female students (Saban, 2009). This can be seen from the small margin of index differences of both female students in FPP and FSKM groups. The small number of male FPP students and female FSKM students could also contribute to the lopsided MI index.

Profiling MI index could be used to establish the intelligence strength of a particular class and thus is able to help educators to maximize learning by considering the students' preferences. For example, the approach that could be considered for FSKM students that show high intrapersonal intelligence is to get the students to focus on what personal goals they can achieve from the learning instructions, what strength they anticipate to use to solve problems and what course of action that they would undertake to solve that problem. It is worth to note that intrapersonal intelligences subscale is closely related to spatial and logical mathematical intelligences (McNamee et. al., 2009).

Another interesting finding that needs further exploration is the existential intelligence area which is ranked high in both groups. Various literature reviews do not cover this component. It seems that this component focuses on personal spirituality which is privileged to the privacy of the human mind and is not visible (Banalan, 2013). However, the approach for existential intelligence actually could be applied in numerous ways. The spiritual conscience that God exist and Allah brought us to existence and guided us to our purpose of living that is to worship Him :-

"And I did not create the jinn and mankind except to worship Me".
- Al Quran (51:56)

This would ultimately get the students to focus on learning and acquiring knowledge besides, applying them to solve problems with a high sense of right and wrong for the betterment of mankind and its surrounding nature. It is suggested that students who possess existential intelligence tend to prefer group thinking, preaching and worshiping learning styles. Thus, the lecturer or instructor should understand and execute the best teaching method to suit with the existential styles. Some theorists suggested that existential students prefer individual freedom and instructors should create opportunities for the students to make choices that would shape

what they learn.

The MI index between FPP and FSKM female students in this study did not differ very much as compared to the index gap between FPP and FSKM male students. However, further studies need to be done and more faculties should be included. Based on the three top highest MI mean, lecturers could consider varying the approach that is associated with real life situations environment (Bodily/Kinesthetic), or connecting moral values (Existential), or achieving high professional status (Intrapersonal).

5. Conclusion

The multiple intelligence profiling from the MI test is able to give some insights about students' strengths, weaknesses and potentials which could help educators to translate it into approaches in learning strategies and to incorporate it into the curriculum. MI has its potential usage for students too, as it could help students identify their own learning preferences. In this study, the MI test revealed that conventional perceptions on FPP and FSKM intelligence traits may be incorrect after all.

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