

Multiple Intelligence Profiling of Engineering Students of the Ateneo de Davao University SY 2010-2011: Basis of Improving Teaching-Learning Strategies

Edicio FALLER

Ateneo de Davao University, Davao City, Philippines
ed_faller@yahoo.com

Albert JUBILO

Ateneo de Davao University, Davao City, Philippines
ajubilo@rocketmail.com

ABSTRACT

Purpose

The purpose of this study is to determine the Multiple Intelligence (MI) profiles of the Engineering students at Ateneo de Davao University. This study will provide a set of baseline data to support and improve learning and teaching practices at the University.

Methodology

This study used validated multiple intelligence questionnaires answered by randomly selected students from first year to fifth year of the engineering programs during the first semester. The study made use of the arithmetic mean and ranking techniques to analyse and interpret the data collected.

Findings

The results showed that the respondents scored highly in logical-mathematical, musical, body-kinesthetic, interpersonal and existentialist intelligences, and scored moderately in linguistic, naturalist, intrapersonal and visual-spatial. The male engineering students possessed highest body-kinesthetic, logical-mathematical, and musical capabilities while the female engineering students had highest musical, interpersonal and logical-mathematical capabilities.

Conclusions

The top three intelligences for engineering students were (1) logical-mathematical, (2) musical and (3) body-kinesthetic. The data implies that the respondents are highly inclined towards logical thinking, musical ability and body movement control. Engineering students in this study possess capabilities or skills in mathematics, music and physical activities like sports.

Keywords

multiple intelligences, Ateneo de Davao University, teaching and learning processes, teaching and learning strategies

INTRODUCTION

Effective teaching is only possible if teachers understand the complexity of classroom teaching and learn to develop strategies that enable them to continually evaluate and improve their teaching and learning effectiveness. Most people have mental and emotional conflicts within themselves, which restrict their learning capabilities. Determining the multiple intelligence (MI) profile of the students in the College of Engineering and Architecture (CEA) will achieve more effective teaching and learning in the classroom.

This study was the initiative of the proponents with the support of the College of Engineering and Architecture. They came up with the initiative in April 27, 2010. It was proposed that randomly selected engineering and architecture students take the multiple intelligence self-assessment survey during the first semester of the school year of 2010/11. However, only the engineering students were included in the final report. The results for the architecture students were separated into another study.

The implementation of the multiple intelligence theory is a great help for educators and students in the classroom. According to Stanford (2003), multiple intelligences (MI) can provide a way to reach beyond the text and provide varied opportunities for students to learn and show evidence of learning.

Teachers can customise their teaching styles to suit the needs of each individual student if they are aware of students having more than one intelligence. Eisner (2004) stated that there is something socially right about the idea that students and adolescents should be given an opportunity to shine in classrooms in which their particular strengths can be nurtured and made public.

In order to achieve effective teaching and learning, it is prudent to determine the multiple intelligence profile of the students of the College of Engineering and Architecture (CEA). This will help the division and the faculty members to comprehend such complexities. The proponents of this project contemplated measurement of the following intelligences: (1) Linguistic, (2) Logical-mathematical, (3) Musical, (4) Visual-spatial, (5) Body-kinesthetic, (6) Interpersonal, (7) Intrapersonal, (8) Naturalist, and (9) Existentialist (Gardner, 1993). The socio-demographic profiles of the students were likewise included.

The main purpose of this project is to determine the multiple intelligence profile of the CEA students. This will serve as baseline data to support or supplement other academic undertakings of the college. The teachers will be informed of the results of the project.

Objectives of the Study

The general objective of the study is to determine the multiple intelligence profile of CEA students for the School Year 2010/11. Specifically, the study aimed to determine:

- (1) The general multiple intelligence profile of the respondent engineering students,
- (2) The multiple intelligence profile of the respondents when grouped according to their sex – male and female,
- (3) The multiple intelligence profile of respondents when grouped according to their respective programs, and
- (4) The multiple intelligence profile of respondents when grouped according to their sex and programs.

METHODOLOGY

Research Design

This study used descriptive research design utilising validated multiple intelligence questionnaires.

Respondents

The respondents were selected randomly (simple random sampling) from first year to fifth year across all engineering programs of the College of Engineering and Architecture from June 2010 to October 2010.

Research Procedure

The following is the procedure used by the proponents:

- (1) Survey of the related literature and studies
- (2) Development of the multiple intelligence questionnaire
- (3) Validation of the questionnaire
- (4) Administration of the questionnaire
- (5) Tabulation of data
- (6) Analysis and interpretation of data.

Statistical Treatment

The study made use of the arithmetic means and ranking techniques to analyse and interpret the data collected. Table 1 describes the mean scores.

Table 1: Verbal descriptions of the mean scores

Mean Score	Verbal Description
4.20 – 5.00	Very High
3.40 – 4.19	High
2.60 – 3.39	Moderate
1.80 – 2.59	Low
1.00 – 1.79	Very Low

RESULTS AND DISCUSSION

Profile of the Respondents

Table 2 shows the profile of the respondents in terms of number and percentage in terms of sex and programs. There were a total of 413 randomly selected respondents to the study out of 750 engineering students. Male respondents totalled 325 (78.69%) while the female respondents totalled 88 respondents (21.31%). As to the respective programs, civil engineering had 30 respondents; chemical engineering had 35; computer engineering had 89; electronics and communication engineering had 160; electrical engineering had 41; industrial engineering had 29 and mechanical engineering had 29.

Table 2: Profile of respondents in terms of sex and program

Program	Male	Female	Total
Civil Engineering (CE)	21	9	30
Chemical Engineering (ChE)	20	15	35
Computer Engineering (CoE)	73	16	89
Electronics & Communications Engineering (ECE)	125	35	160
Electrical Engineering (EE)	37	4	41
Industrial Engineering (IE)	21	8	29
Mechanical Engineering (ME)	28	1	29
Total:	325 (78.69%)	88 (21.31%)	413 (100%)

General Multiple Intelligence Profile of the Respondents

Figure 1 shows the general multiple intelligences of the respondent engineering students. It shows that the respondents had a mean score of 3.54 (High) in existentialist intelligence, 2.97 (Moderate) in naturalist intelligence, 3.37 (Moderate) in intrapersonal, 3.49 (High) in interpersonal, 3.59 (High) in musical,

3.58 (High) in body-kinesthetic, 3.60 (High) in logical-mathematical, 3.10 (Moderate) in linguistic and 3.27 (Moderate) in visual-spatial intelligence. Interpreting these results suggests that the students have a high ability in logical-mathematical, musical, body-kinesthetic, interpersonal and existentialist intelligences. The students have moderate ability in visual-spatial, linguistic, intrapersonal and naturalist intelligences. It is evident that the engineering students possess capabilities or skills in mathematics, music, and physical activities like sports. It can be inferred in the result that they have the least capacity to care for nature.

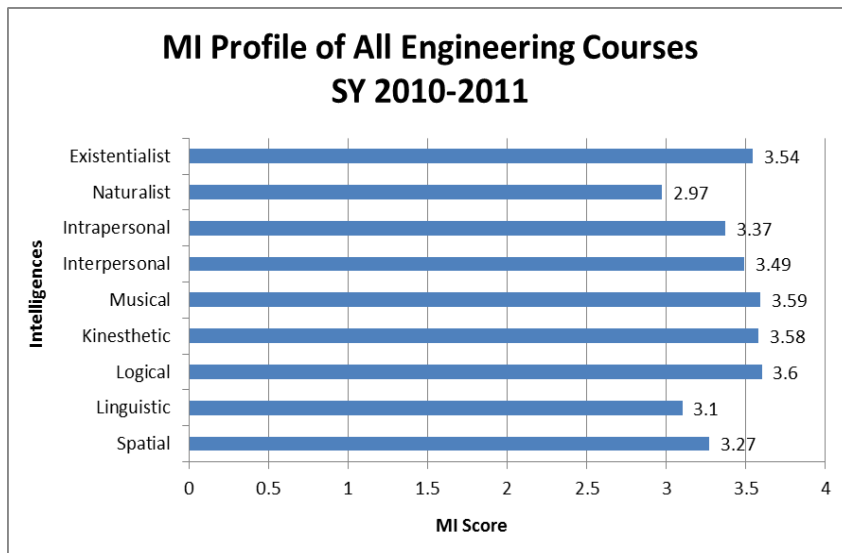


Figure 1: General MI profile of all engineering courses

Multiple Intelligence Profile of the Respondents according to Sex

Figure 2 shows the multiple intelligence profile of all respondent male engineering students. It shows that the respondents had mean scores of 3.53 (High) in existentialist intelligence, 2.94 (Moderate) in naturalist intelligence, 3.32 (Moderate) in intrapersonal, 3.49 (High) in interpersonal, 3.60 (High) in body-kinesthetic, 3.24 (Moderate) in visual-spatial, 3.55 (High) in musical, 3.58 (High) in logical-mathematical and 3.02 (Moderate) in linguistic intelligence.

It can be interpreted that the male students have high ability in existentialist, interpersonal, body-kinesthetic, musical and logical-mathematical intelligences. The male students have moderate ability in naturalist, intrapersonal, visual-spatial and linguistic intelligences. It is evident that the male engineering students possess highest capabilities or skills in physical activities like sports, mathematics and

music. It can be inferred in the result that they have the least capacity to care for nature.

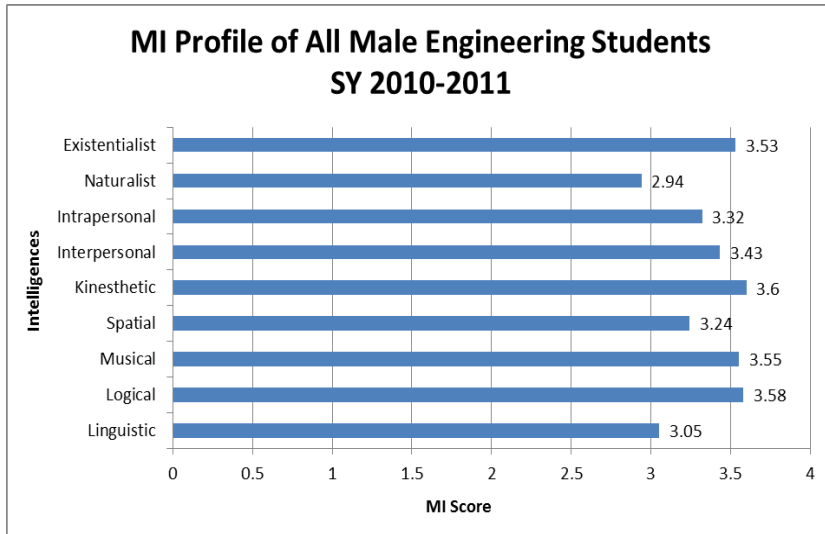


Figure 2: MI profile of all male engineering students

Figure 3 shows the multiple intelligence profile of all respondent female engineering students. It shows that the respondents had mean scores of 3.58 (High) in existentialist intelligence, 3.10 (Moderate) in naturalist intelligence, 3.57 (High) in intrapersonal, 3.71 (High) in interpersonal, 3.51 (High) in body-kinesthetic, 3.36 (Moderate) in visual-spatial, 3.75 (High) in musical, 3.68 (High) in logical-mathematical and 3.28 (Moderate) in linguistic intelligence.

It can be interpreted that the female students have high abilities in existentialist, intrapersonal, interpersonal, body-kinesthetic, musical and logical-mathematical intelligences. The female students have moderate ability in naturalist, visual-spatial and linguistic intelligences. It is evident that the female engineering students possess highest capabilities or skills in music, perceiving other people's feelings and mathematics. It can be inferred in the result that they have the least capacity to care for nature.

Multiple Intelligence Profile of the Respondents according to their Respective Programs

Figure 4 shows the MI profile of the students when grouped according to their programs. Chemical engineering students were highest in linguistic, visual-spatial, interpersonal, interpersonal, naturalist and existentialist intelligences, industrial engineering students were highest in logical-mathematical and musical

intelligences, while electronics and communications engineering students were highest in body-kinesthetic intelligence.

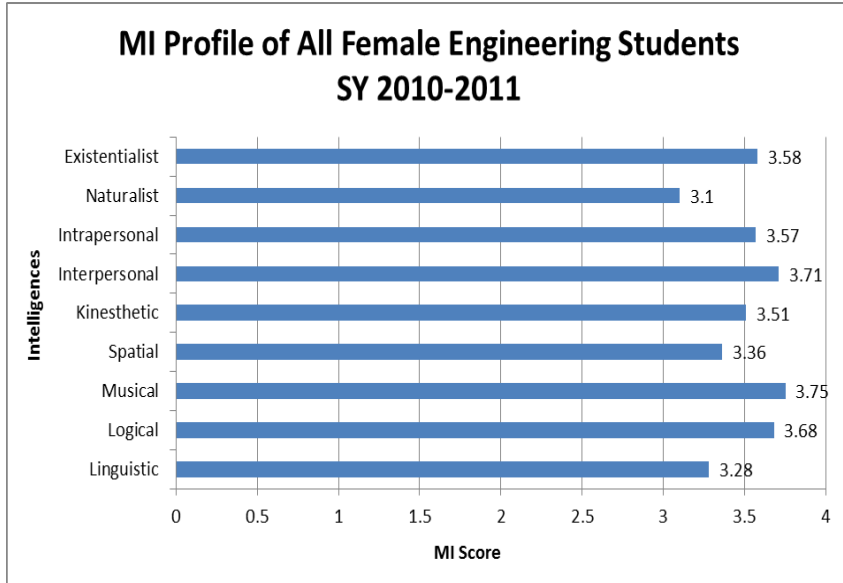


Figure 3: MI profile of all female engineering students

Computer engineering students had the lowest mean score in linguistic, logical-mathematical, naturalist and existentialist intelligences. Mechanical engineering students had the lowest mean in musical and interpersonal intelligences. Electrical engineering students had the lowest in visual-spatial and intrapersonal intelligences, while civil engineering had the lowest mean score in body-kinesthetic intelligence.

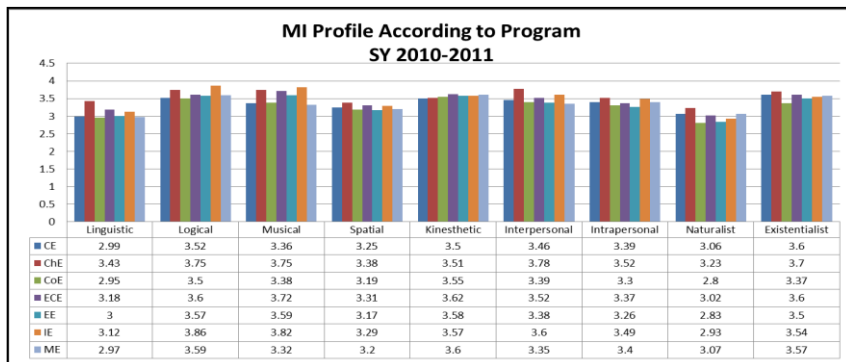


Figure 4: MI profile according to program

Multiple Intelligence Profile of Respondents according to Sex and Programs

Figure 5 shows the multiple intelligence profile of the respondent male engineering students when grouped according to program. Male chemical engineering students scored highest in linguistic, interpersonal, naturalist and existentialist intelligence. Male industrial students were highest in logical-mathematical and musical intelligences. Male civil engineering students were highest in the visual-spatial and interpersonal intelligences, while male electronics and communications engineering students scored the highest in body-kinesthetic intelligence.

Male computer engineering students had the lowest mean score in linguistic, logical-mathematical, musical, intrapersonal, naturalist and existentialist intelligences. Male mechanical engineering students were lowest in musical and interpersonal intelligences. Male electrical engineering students were lowest in visual-spatial intelligences, while male chemical engineering students were lowest in body-kinesthetic intelligence.

Figure 6 shows the multiple intelligence profile of the respondent female engineering students when grouped according to program. Female industrial engineering students were top in linguistic, logical-mathematical, kinesthetic and intrapersonal intelligences. Female chemical engineering students were top in musical, interpersonal, naturalist and existentialist intelligences, while the female mechanical student were top in visual-spatial and body-kinesthetic intelligences.

Female electrical engineering students had the lowest mean score in logical-mathematical, body-kinesthetic, interpersonal and naturalist intelligences. Female civil engineering students were lowest in musical, spatial and intrapersonal intelligences, while the female mechanical and computer engineering students had the lowest score in linguistic and existentialist intelligences, respectively.

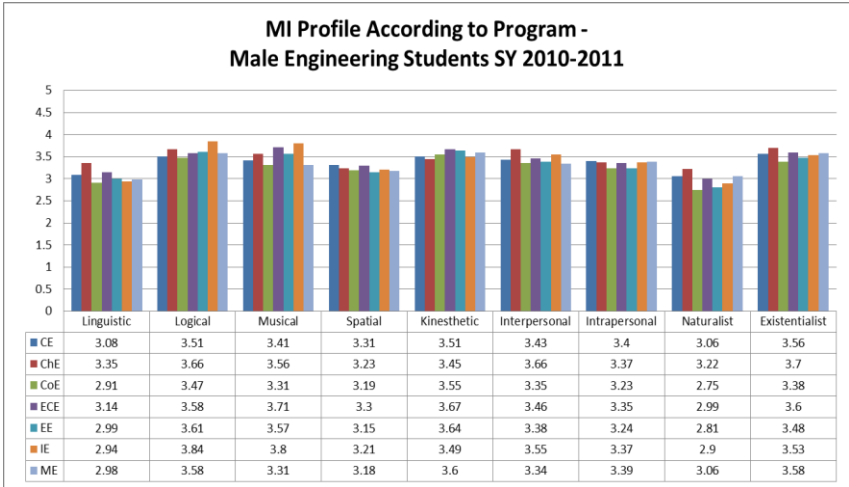


Figure 5: MI profile according to program – male engineering students

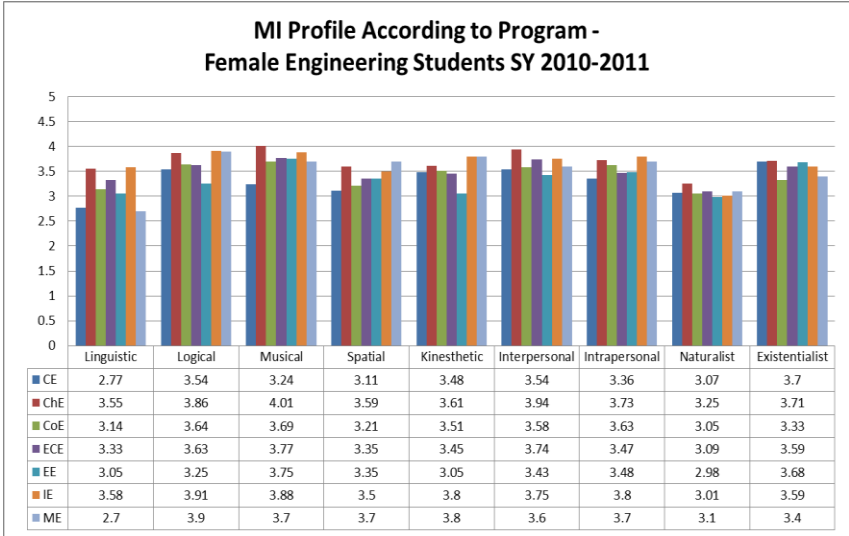


Figure 6: MI profile according to program – female engineering students

CONCLUSIONS AND RECOMMENDATIONS

1. Respondent engineering students possess high capabilities in logical-mathematical, musical, body-kinesthetic, interpersonal and existentialist intelligences.
2. The male engineering students possess high body-kinesthetic, logical-mathematical and musical capabilities, while the female engineering students have high musical, interpersonal and logical-mathematical capabilities.
3. Chemical engineering students possess high linguistic, visual-spatial, interpersonal, intrapersonal, naturalist and existentialist capabilities; industrial engineering students possess high logical-mathematical and musical capabilities, while electronics and communications engineering students possess high body-kinesthetic capabilities.
4. Male and female chemical engineering students possess the widest range of intelligences.

It is respectfully recommended that:

1. All engineering students be encouraged to enhance their logical-mathematical, musical, body-kinesthetic, interpersonal and existentialist intelligences.
2. All engineering students be encouraged to improve in their naturalist, intrapersonal, linguistic and visual-spatial intelligences.
3. The engineering faculty members be informed of the multiple intelligence profile of the students and appropriately select teaching strategies to improve the learning process.
4. The administrators be encouraged to provide proper training and workshops to engineering faculty members to effectively improve in their teaching capabilities in consideration of the multiple intelligences of the students.

ACKNOWLEDGEMENT

The proponents of this study are grateful to the following: Dr. Randell U. Espina and Engr. Jenith L. Banluta, for their technical and financial support; Dr. Victoria T. Pre, for her untiring advices and validation of the instrument; Mr. Marlon Aguelo, for his technical assistance in the computation of the data; and ES 512 students (SY 2010-2011) for their time and effort in making a successful administration of the questionnaire.

REFERENCES

Alexander, Bill (2009). *Classroom management success: Using learning styles and multiple intelligences can make classroom learning more effective*. Retrieved August 15, 2011, from <http://www.classroom-managementsuccess.org/learning-styles-and-multiple-intelligences.html>

Eisner, Elliot W. (2004). *Multiple intelligences: Its tensions and possibilities*. (Teachers College Record, 106, 31-39). Teachers College, Columbia University.

Gardner, Howard (2011). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Stanford, Pokey. (2003). *Multiple intelligence for every classroom: Intervention in school & clinic* (Teachers College Record, 39, 80-85). Hammill Institute on Disabilities Publishing.

Copyright ©2013 IETEC'13, Edicio FALLER & Albert JUBILO: The authors assign to IETEC'13 a non-exclusive license to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive license to IETEC'13 to publish this document in full on the World Wide Web (prime sites and mirrors) on CD-ROM and in printed form within the IETEC'13 conference proceedings. Any other usage is prohibited without the express permission of the authors.