

PERSON-ENVIRONMENT FIT OF THE HEARING-IMPAIRED STUDENTS IN MALAYSIAN POLYTECHNICS: A PRELIMINARY ANALYSIS

*Che'Rozaniza Azizan (gs32800@mutiara.upm.edu.my)
Universiti Putra Malaysia*

*Samsilah Roslan
Universiti Putra Malaysia*

*Maria Chong Abdullah
Universiti Putra Malaysia*

*Soaib Asimiran
Universiti Putra Malaysia*

Abstract

Research in the Person-Environment fit (P-E fit) framework suggested that congruence between students' personality types and their academic major selection is crucial for students' satisfaction and their academic achievements but little research has been done on the hearing-impaired population. In order to enhance our understanding of P-E fit among the hearing-impaired students, this preliminary analysis examined the types of personality types based on Holland's Typology Theory (1973, 1985). A sample of hearing-impaired students undergoing their Special Skills Certificate in 4 Polytechnics all across Malaysia were selected (N=26). Samples consisted of second and fourth semester students of June 2014 intake. Personality types were measured using an adapted Malay version of Holland's Self Directed Search-Form E (SDS-E). Sign-language interpreter and individual assistance were also provided to accommodate their special needs. In addition, picture-based assistance on certain items was also provided to accommodate their limited reading ability. Findings on students' personality types and their academic major selection based on Holland Typology were discussed. The findings also imply that with certain modification and accommodation, SDS-E is valid and reliable to be used in order to understand the personality types of the hearing impaired students in Malaysian Polytechnics. Furthermore, this preliminary analysis provides insights into the largely unstudied question of how hearing-impaired personality typology and their academic major selection relate to students' academic achievements in Malaysian Polytechnics. For a start, it is recommended that an established academic major selection system is required to provide good match between the students' personality types and the academic major offered; thus leading to effective learning process and increase students' outcomes.

Keywords: Person-Environment Fit – Hearing-impaired – Personality

Introduction

Education is a fundamental right of all human beings and by right none should be excluded from gaining access to tertiary education regardless of social and disability status. Person with Disabilities (PWDs) especially those with hearing impairments should be given equal access to tertiary education as their hearing peers. Being a minority group, their rights are fully protected by law. Persons with Disabilities Act (2008) highlighted that PWDs in Malaysia should be given equal access to education starting from pre-school to tertiary education.

“Persons with disabilities shall not be excluded from the general education system on the basis of disabilities, and children with disabilities shall not be excluded from pre-school, primary, secondary and higher education, on equal basis with persons or children without disabilities, including vocational training and lifelong learning” (Person with Disabilities Act, 2008).

In response to the above mentioned act, the former Ministry of Higher Education (MOHE) via Department of Polytechnic Education (DPE) have taken necessary actions to widen accessibility and equity of PWDs by providing technical and vocational training at selected Polytechnics (National Higher Education Action Plan Phase II, 2011). As an initiative to the mentioned purposes, Polytechnic provide full-time programs in five academic majors including Graphic Design, Apparel and Fashion Design, Hotel and Catering, Mechanical Maintenance and Civil Construction (DPE, 2011). Students are given opportunities to enroll in any of the programs regardless of their pre-entry qualifications (DPE, 2012). They are required to complete the courses in four academic semesters including one full semester of industrial training. There are five polytechnics in all across Malaysia that offer this Special Skills Certificate. These include *Politeknik Sultan Abdul Aziz Shah* (PSA), *Politeknik Ungku Omar* (PUO), *Politeknik Ibrahim Sultan* (PIS), *Politeknik Tuanku Syed Sirajuddin* (PTSS) and *Politeknik Kota Kinabalu* (PKK).

The establishment of Special Skills Certificate is consistent with the PWDs Act (2008), National Higher Education Strategic Plan (NHESP) and objectives of the Polytechnic Transformation Plan (PTP), which is to increase access and equity among the PWDs in tertiary education (DPE, 2011). Furthermore, NHESP and PTP also aimed to increase competitiveness in the generation of versatile, dynamic and successful human capital. As Malaysian citizens, it is not denying that despite of their disabilities, the hearing-impaired students also play an important role towards the development of human capitals. This would in turn allow Polytechnic to serve as one of the country main provider of innovative human capitals for the local and international workforce.

Given such scenario, assumptions could be made that hearing impaired students would be enjoying better academic success compared to those previous days where there were limited access and equity in tertiary education. However, DPE (2012) has stated that although there is increase awareness among the policy makers and stakeholders, but there were still unresolved issues regarding PWDs access to tertiary education. A few factors related to low enrollment rates have been identified which includes weakness in curriculum structure and contents, students inabilities to learn effectively and lack of training among the lecturers to meaningfully conduct teaching and learning for the hearing impaired (DPE, 2012). On top of that, DPE (2012) also

believed that the absence of academic major selection system is also one of the contributing factors of students' ineffectiveness.

Hence, there is an urgent calling to discover the scenario by looking into how personality types and academic majors play important roles in the hearing-impaired students' academic achievements. Thus, this preliminary analysis is conducted to further explain this scenario by (1) determining the hearing-impaired students' personality types and their academic major; and (2) determining the degree of personality-major congruence. This article shall begin with defining P-E fit framework in Holland Typology Theory (1973, 1985) context followed by hearing-impaired students' academic achievements. The proposed predictor (personality-major congruence) serves as hypothetical basis of hearing impaired students' academic achievements. This article also provides extensive reviews of P-E fit studies and how these studies can be adapted to suit the context in this current study.

Definition of Person-Environment Fit

P-E fit theories are psychological theories (Dawis, 1992) which mainly based on the interaction between individuals and their social settings (Li, Yao, Chen, & Wang, 2012). In other words, P-E fit is also referred as the degree of congruence, match or similarity between the individual characteristics and their environment (Dawis, 1992; Edwards, Caplan, & Harrison, 1998; Kristof, Brown & Guay, 2010; Schneider, Kristof, Goldstein, & Smith, 1997). As been theorized, P-E fit would positively correlate with satisfaction and productivity (Dawis & Lofquist, 1984; Holland, 1997). In other words, the greater the P-E fit, the better the satisfaction and productivity.

Environment in the P-E fit context could be represented as organization, groups, individuals or vocations (Chatman, 1989; Holland, 1997; Meglino, Ravlin, & Adkins, 1989; Schneider, 1987). In educational settings, environments is either represented by college environments (e.g., Westernman, Nowicki, & Plante, 2002; Westernman & Vanka, 2005) or academic majors (e.g., Tracey & Robbins, 2006; Wessel, Ryan, & Oswald, 2008). In this present study, environment is operationalized as academic majors rather than college environment as a whole. This is because academic major is regarded as a more immediate environment which composed of people and activities in which students' daily contact (Nafziger, Holland & Gottfredson, 1975).

According to Holland's Theory (Holland, 1997), individual's personality and environment can be categorized into six types such as Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. It is theorized that the congruence or fit between individual personality types and his environments would lead to improved career (Swaney et al., 2012; Tranberg, Slane & Ekerberg, 1998). The same principle applied to educational context. Since students may have different preferences for their academic environments (Lengnick-Hall & Sanders, 1997), it is believed that congruence between the students' personality types and their environment may later lead to improved academic satisfaction (Guan, Ma, Liu, & Ju, 2006; Li et al., 2013; Nauta, 2007) and academic achievements (Smart, Feldman, & Ethington, 2000; Tracey et al., 2012). Thus in order to understand the role of personality types and academic majors in improving hearing-impaired students' outcome, the congruence between these two constructs will be operationalized as personality-major congruence instead of interest-major congruence as were frequently termed in other P-E fit studies.

Personality-Major Congruence and Hearing-Impaired Academic Achievements

Hearing-impaired students have normal cognitive abilities as their hearing peers (Kirk et al, 2006; Moores, 2001). However, there were also studies which found that hearing-impaired students academic achievement is lag far behind what is expected of their hearing peers at similar levels and ages (Akinpelu, 1998; Antia, Jones, Reed, & Kreimeyer, 2009; Kirk et al., 2013; Lang, 2002; Qi & Mitchell, 2012). On top of that, Hyde et al. (2009) also stated that only 70% of the hearing-impaired students managed to graduate from Griffith University in Australia while another 52% and 40% respectively from *National Technical Institute for the Deaf* (NTID) and Gallaudet University in United States. Previously, Stinson & Walter (1997) also stated that only one out of four hearing impaired students or 25% able to complete their tertiary education in United States.

In Malaysia, research conducted by KHADIJAH MD. AMIN ET AL. (2009) has stated that hearing-impaired students in Malaysian higher institutions failed to score good academic results especially in language studies. A preliminary survey conducted by DPE (2012) has found that hearing-impaired students in Malaysian Polytechnics have difficulties to learn effectively due to several factors related to the academic major offered by DPE. These problems are said due to the absence of academic major selection system in matching the students' personality types and the academic majors (DPE, 2012).

Based on the P-E fit literatures, academic major selection system is crucial in providing good match between the students' personality types and their academic major. Studies have indicated that personality-major congruence is one of the main criteria which may affect students' academic achievements at tertiary level (Allen & Robbins, 2010; Tracey, Allen, & Robbins, 2012; Wong, 2006). Although students may be given chance to select their own academic major based on their interest and pre-entry qualifications, however there were also cases where students were offered courses which is incongruent to their personality types (Mastura Mahfar et al.; 2008).

Incongruence between the students' personality types and the academic major may have a few disadvantages as it may encourage students to change their major. In fact, there were also students who were dissatisfied and depressed once their major change application was rejected by the faculty. Although there were few of them managed to graduate, somehow their academic achievement (CGPA) may not be well good as compared to their peers. This statement is in line with Holland (1985) who stated that personality-major congruence may allow the students to achieve overall satisfaction and thus may result in good academic achievement.

P-E fit literatures all around the world have suggested that there were plenty of research conducted to investigate the interaction between the hearing students' personality types and academic majors in tertiary education context. However, there were very limited literatures found in the hearing-impaired tertiary education context which mainly focus on this personality-major construct. Thus, this preliminary analysis corresponds to the gap mentioned above in providing basic understanding on how personality-major congruence may affect hearing-impaired academic achievements.

Methodology

This study involved a descriptive quantitative survey to measure the congruence between the hearing-impaired students' personality types and their academic majors in Malaysian Polytechnics. A total of 29 second and fourth semester (June 2014 intake) hearing-impaired students' population from all the five Polytechnics were selected as the respondents for the study. However, 3 respondents were excluded from the analysis due to incomplete responses. Thus only (N=26) were included in the analysis. During data collection, sign-language interpreter and individual assistance were also provided to accommodate the students' special needs. In addition, picture-based assistance on certain items was also provided to accommodate their limited reading ability.

The adapted version of Self-Directed Search®-Form E (Holland, 1996) is used to measure the students' personality types (R=0.921) while the students' academic major were measured using Educational Opportunities Finder™ (EOF) by Holland & Messer (2013). Analysis was done descriptively by using Environment Assessment Technique (EAT). The personality and academic major (environment) code represented the 3 most dominant types in the RIASEC scale.

Personality-major congruence was identified by computing the agreement between these two three-letter codes using Iachan's index (1984, 1990). The index ranges from 0 to 28 (Table 1). Each letter in the three-letter codes is represented by a constant weight which corresponds to the match positions (Table 2). The degree of congruence is then obtained by simply adding all the weights of these two 3-letter codes (personality code and academic major codes). Although there are many types of congruence indices, Iachan's (1984) index has been selected to measure personality-major congruence as the index has been identified as the most accurate technique for determining the similarity (agreement) between the two three-letter codes (Holland, 1985).

Table 1- Degree of Congruence Based on Total Scores (Iachan, 1984)

Total Score	Degree of Congruence
26 - 28	Very close matches
20 - 25	Reasonably close matches
14 - 19	Not close matches
13 <	Poor matches

Table 2- Illustrative Weights for Assessing Agreement between Two Three-Letter Codes (Iachan, 1984)

Summary Code of Personality			
Summary Code of Environment	First Letter	Second Letter	Third letter
First Letter	22	10	4
Second Letter	10	5	2
Third letter	4	2	1

Data Analysis

All data were analyzed descriptively. These include frequencies, percentage and mean to explain the respondents' demographic factors, personality types and the degree of personality-major congruence.

Results

Respondents' demographic factors

This section discusses about respondents demographic factors which include gender, race, age, academic major and degree of hearing loss.

Table 3 - Respondents Demographic Analysis

Demographic Factors		Frequency	Percentage (%)
Gender	Males	12	46.2
	Females	14	53.8
Race	Malay	14	53.8
	Chinese	7	27.0
	Indian	1	3.8
	Others	4	15.4
Age	19-20 years old	11	42.4
	21-22 years old	14	53.8
	> 23 years old (31 years old)	1	3.8
Academic Major	Graphic Design	5	19.2
	Apparel and Fashion Design	-Nil-	0
	Hotel and Catering	13	50.0
	Mechanical Maintenance	-Nil-	0
	Civil Construction	8	30.8
Degree of Hearing Loss	Minimum (15 - <30 dB)	4	15.4
	Moderate (30 - <60 dB)	6	23.1
	Severe (60 - <90 dB)	5	19.2
	Profound (\geq 90dB)	2	7.7
	Unsure	9	34.6

(N=26)

Table 1 shows that there is only a slight differ between the female (N=14; 53.8%) and the male respondents (N=12; 46.2%). Malay respondents (N=14; 53.8%) dominated the analysis, followed by Chinese (N=7; 27.0%), others (N=4; 15.5%) and lastly Indian (N=1; 3.8%). Majority of the respondents age between 21 to 22 years old (N=14, 53.8%), followed by 19 to 20 years old (N=11; 42.4%) and the eldest is 31 years old (N=1; 3.8%). Hotel and Catering counts for the highest respondents (N=13; 50%), followed by Civil Construction (N=8; 30.8%) and Graphic Design (N=5; 19.2%) but neither in Apparel and Fashion Design nor Mechanical Maintenance. Majority of the respondents were unsure (N=9; 34.6%) about their degree of hearing loss, followed by moderate (N=6; 23.1%), severe (N=5; 19.2%), minimum (N=4; 15.4%) and profound (N=2; 7.7%).

Personality Codes and Academic Major Codes

Personality codes were obtained descriptively by using the 3 dominant letters with the ranks recorded. Academic major codes were obtained from EOF.

Table 4 - Personality Codes Analysis

No	Academic Major	Mean						Personality Code	Academic Major Code
		R	I	A	S	E	C		
1.	Graphic	2.20	2.40	5.40	4.20	4.0	2.80	ASE	AES

2.	Design Hotel & Catering	4.23	2.77	3.54	4.60	2.77	3.00	SRA	RAS
3.	Civil Construction	3.88	2.75	2.50	4.50	3.50	3.38	SRC	IER

Personality Code – Three-Letter Codes (Personalities)

Academic Major Code - Three-Letter Codes Obtained from EOF

Table 4 shows respondents' personality codes which were obtained by summated means of the three most dominant codes. For Graphic Design, the highest score is Artistic personality types ($M = 5.40$), followed by Social ($M = 4.20$) and Enterprising ($M = 4.0$). Hotel and Catering and Civil Construction obtained the first two similar codes (i.e Social and Realistic), only the third codes differ, i.e Artistic ($M = 3.54$) and Conventional ($M = 3.38$) respectively. The analysis concludes that the personality and academic major codes for Graphic Design is ASE and AES respectively, Hotel and Catering is SRA and RAS respectively, while Civil Construction is SRC and IER respectively.

Degree of Personality-Major Congruence

Degree of personality-major congruence was obtained by comparing the personality and academic major codes (refer Table 4) as suggested by Holland's Theory (1985; 1997).

Table 5 - Degree of Personality-Major Congruence

No.	Academic Major	Degree of Congruence	Level of Congruence
1	Graphic Design	26	Good Matches
2	Hotel and Catering	16	Not Close Matches
3	Civil Construction	4	Poor matches

Table 5 shows degree of personality-major congruence analysis among the hearing-impaired students in three academic majors in Polytechnics. Graphic Design shows the highest degree of congruence (congruence = 26) and thus indicates a good match between the students' personality types and their academic major. In contrast, Civil Construction had the lowest degree of congruence (congruence = 4) which indicates a poor match between the students' personality types and their academic major. Hotel and Catering which consisted of PKK and PTSS students had low to moderate degree of congruence (congruence = 16) which indicates not close matches between the students' personality types and their academic major.

Discussions and Recommendations

This study have determined the hearing-impaired students personality types for three academic majors; i.e Graphic Design, Civil Construction and Hotel and Catering. Fashion and Apparel Design and Mechanical Maintenance were not included in the analysis due to lack of students' enrollment for the semester under study. From the mean analysis, Graphic Design is mainly dominated by Artistic personality, followed by Social and Enterprising personality types. This showed that the hearing-impaired students' personality types is in line with their academic major or the EOF codes

(Messer & Holland, 2013) with slight changes in the second and third letter's order (i.e ASE instead of AES).

The result implies that Graphic Design students expressed themselves as imaginative, idealistic, values aesthetics and creation of art forms, impulsive, independent, values social, ambitious, energetic, religious, aggressive, leadership skills, self-confident and sociable (Holland, 1997). These characteristics are in line with Holland (1997) third assumptions which stated that students will search for environment that allows them to exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles. As result, they will be more satisfied with their academic major, more likely to persist in the current academic major and experienced academic success (Nye, Su, Rounds, & Drasgow, 2012). This statement was in line with Allen & Robbins (2008) who found a large effect of personality-major congruence on major change intention.

Although Graphic Design showed a good match between the students' personality types and their academic major, unfortunately another two majors showed contradictory results. From the mean analysis, Civil Construction and Hotel and Catering consisted of common Social and Realistic types as their first and second codes. This means that, students from both academic majors perceived themselves as having interests in educational activities, concern with social problems, believe in equality, helpful, forgiving, religious, having mechanical, technical, and athletic abilities and love to work with people as well as machines or instruments (Holland, 1997). On top of that, Realistic abilities are needed by both academic majors as students are mainly involved in training and practical sessions either in the labs, workshops or industrial training.

With reference to EOF (Messer & Holland, 2013), Hotel and Catering environment should consist of students with Realistic, Artistic and Social personality types. Personality codes yielded by SDS-Form E suggested that respondents have all these traits in common but it is not orderly arranged; i.e SRA instead of RAS. In the other hand, Civil Construction environment is made up by Investigative personality types, followed by Enterprising and Realistic types (Messer & Holland, 2013). However, the three dominant personality codes obtained were far deviates from the EOF. In other words, the students' personality types were incongruent with their academic majors. According to Holland (1997), incongruent between the students personality types and their academic majors may lead to dissatisfaction and thus affects students' academic achievements.

The absence of academic major selection system is one of the factors leading to students' indecisiveness (Wong, 2006). Previous studies in Malaysian context have determined that students may experience difficulties in choosing their academic majors due to multiple interests in multiple field of study or they simply have no preferences for any field of study (Amir Awang, 1983; Wong, 2006). Students may choose academic major which is incongruent to their personality types due to failure in estimating their own interests and abilities.

This scenario is alarming especially when dealing with the hearing-impaired population. As stated earlier, although the hearing-impaired students have normal cognitive abilities as their hearing peers, but their academic achievements are lagged far behind than the peers of the same ages and level. Literature reviews have determined

many contributing factors which are specific for the hearing-impaired population (e.g: degree of hearing loss, the use of hearing aid, early intervention and etc.), but limited focus have been given on the P-E fit context.

Thus, the findings of this study provide significant information on the importance of academic major selection system among the hearing-impaired students in Malaysian Polytechnics. This statement is in line with DPE (2012) which stated that the absence of students' selection system is one of the factors leading to hearing-impaired students learning ineffectiveness. For a start, it is recommended that an established academic major selection system is required to provide good match between the students' personality types and the academic major offered; thus leading to effective learning process and increase students' outcomes.

References

- Akinpelu, O. F. (1998), "A study of the academic achievement and self- concept of male and female hearing-impaired students in Nigeria," *The Nigerian Journal of Guidance and Counselling*, 6(1&2), 1–10.
- Allen, J., & Robbins, S. (2010), "Effects of interest–major congruence, motivation, and academic performance on timely degree attainment," *Journal of Counseling Psychology*, Vol. 57, pp 23–35.
- Amir Awang. (1983), "Bimbingan dan kounseling untuk kesejahteraan masyarakat," *Jurnal Perkama*, Bil. 1, ms 1-12.
- Amla Mohd. Salleh. (2007), "*Ujian Minat Kerjaya: Versi Bahasa Melayu*," UKM, Bangi.
- Antia, S. D., Jones, P. B., Reed, S., & Kreimeyer, K. H. (2009), "Academic status and progress of deaf and hard-of-hearing students in general education classrooms," *Journal of Deaf Studies and Deaf Education*, Vol. 14, No. 3, pp 293–311.
- Dawis, R. V. (1992), "Person–environment fit and job satisfaction," in C. J. Cranny, P. C. Smith, & E. F. Stone (Eds.), *Job satisfaction: How people feel about their jobs and how it affects their performance*, Lexington Books, New York, NY.
- Dawis, R. V., & Lofquist, L. H. (1984). *A Psychological Theory of Work Adjustment*, University of Minnesota Press, Minneapolis, MN.
- Department of Polytechnic Education (2012). *Dasar pengajian pelajar kurang upaya di Politeknik dan Kolej Komuniti bagi peluasan akses dan peningkatan ekuiti*. Kajian Polisi yang tidak diterbitkan. Policy Development Division, Department of Polytechnic Education, Putrajaya.
- Department of Polytechnic Education. (2011), *Quick Facts: September 2011*, Department of Polytechnic Education, Ministry of Higher Education, Putrajaya.
- Edwards, J. R., Caplan, R. D., & Harrison, R. V. (1998), "Person-environment fit theory: Conceptual foundations, empirical evidence, and directions for future research," in C. L. Cooper (Ed.), *Theories of organizational stress*, Oxford University, Oxford, UK, pp. 28–67..
- Guan, G., Shiye, M., Liu, J., & Yum, G. (2006), "Relationship between satisfaction with major, academic performance, and congruence". Retrieved March, 20, 2013.
- Holland, J. (1997). *Making Vocational Choices: A Theory Of Vocational Personalities And Work Environments* (3rd ed.), Psychological Assessment Resources, Florida.
- Holland, J. L. (1973), *Making Vocational Choices: A Theory Of Careers*, Prentice-Hall, Englewood Cliffs, NJ.
- Holland, J. L. (1985), *Making Vocational Choices: A Theory Of Vocational Personalities And Work Environments* (2nd ed.). Prentice-Hall, Englewood Cliffs, NJ.
- Holland, J.L (1996), *Self-Directed Search®-Form E* (4th Ed.), Psychological Assessment Resource, Inc., Lutz, Florida.
- Hyde, M., Punch, R., Power, D., Hartley, J., Neale, J., & Brennan, L. (2009), "The experiences of deaf and hard of hearing students at a Queensland University: 1985-2005," *Higher Education Research and Development*, Vol. 28, No. 1, pp 85-98.
- Iachan, R. (1984), "A measure of agreement for use with the Holland classification system," *Journal of Vocational Behaviour*, Vol. 24, pp 133-141.
- Iachan, R. (1990), "Some extensions of the Iachan congruence index," *Journal of Vocational Behaviour*, Vol 36, pp 176-180.
- Khadijah Md. Khalid, Shakila Jacob, Rohana Jani & Mariam Alhabshi. (2009), "Pelajar kurang upaya: bantuan, persediaan dan cabaran masa hadapan," *Prosiding Seminar Hasil Penyelidikan Kementerian Pengajian Tinggi*, INPUMA-KPT dan Bahagian Biasiswa KPT, Kuala Lumpur.
- Kirk, S. A., Gallagher, J. J., Anastasiow, N. J., and Coleman, M.R. (2006), *Educating Exceptional Children* (11th ed), Houghton Mifflin, Boston.
- Kristof-Brown, A. L., & Guay, R. P. (2010), "Person-Environment Fit," in S. Zedeck (Ed.), *APA Handbook Of Industrial And Organizational Psychology*, APA, Washington, DC, pp. 3–50.
- Lang, H. G. (2002). Higher Education for Deaf Students : *Research Priorities in the New Millennium*, 4(7), 267–280.
- Lengnick-Hall, C., & Sanders, M. (1997), "Designing effective learning systems for management education: Student roles, requisite variety, and practicing what we teach," *Academy of Management Journal*, Vol. 40, pp 1334–1368.
- Li, Y., Yao, X., Chen, K., & Wang, Y. (2012), "Different Fit Perceptions in an Academic Environment: Attitudinal and Behavioral Outcomes," *Journal of Career Assessment*, Vol. 21, No. 2, pp 163–174.
- Logue, C. T., Lounsbury, J. W., Gupta, A., & Leong, F. T. L. (2007), "Vocational interest themes and personality traits in relation to college major satisfaction of business students," *Journal of Career Development*, Vol. 33, pp 269–295.

- Mastura Mahfar, Ishak Mad Shah, & Hamdan Abdul Kadir. (2008), "Kekongruenan personaliti-persekitaran kursus dan hubungannya dengan pencapaian akademik di kalangan pelajar," *Jurnal Kemanusiaan*, Vol. 12, pp 23-32.
- Messer, M. A., & Holland, J. L. (2013). *The Educational Opportunities Finder™*. PAR Inc., Lutz, FL.
- Moore, D. F. (2001), *Educating The Deaf: Psychology, Principles and Practices*, Houghton-Mifflin, Boston.
- Nafziger, D. H., Holland, J. L., & Gottfredson, G. D. (1975), "Student-college congruency as a predictor of satisfaction," *Journal of Counseling Psychology*, Vol. 22, No. 2, pp 132-139.
- Nauta, M. M. (2007), "Assessing college students' satisfaction with their academic majors," *Journal of Career Assessment*, Vol. 15, No. 4, pp 446-462.
- Nye, C. D., Su, R., Rounds, J., & Drasgow, F. (2012), "Vocational interests and performance: a quantitative summary of over 60 years of research," *Perspectives on Psychological Science*, Vol. 7, No. 4, pp 384-403.
- Person With Disabilities Act. (2008), Percetakan Nasional, Kuala Lumpur. Retrieved February, 28, 2015. <http://www.jkm.gov.my/images/stories/pdf/oku2008scan.pdf>
- Qi, S., & Mitchell, R. E. (2012), "Large-scale academic achievement testing of deaf and hard-of-hearing students: past, present, and future," *Journal of Deaf Studies and Deaf Education*, Vol. 17, No.1, pp 1-18.
- Schneider, B., Kristof, B.A., Goldstein, H.W., & Smith, D.B.(1997), "What is this thing called fit?" in N. Anderson & P. Herriot (Eds.), *International Handbook Of Selection And Assessment*, Wiley, New York, NY.
- Stinson, M., & Walter, G. (1997). "Improving retention for deaf and hard of hearing students: what the research tells us," *Journal of American Deafness and Rehabilitation Association*, Vol. 30, pp 14-23.
- Swaney, K. B., Allen, J., Casillas, A., Hanson, M. A., & Robbins, S. B. (2012), "Interests, work values, and occupations: predicting work outcomes with the workkeys fit assessment," *Journal of Career Assessment*, Vol. 20, No. 4, pp 359-374.
- Tracey, T. J. G. (2008), "Adherence to RIASEC structure as a key career decision construct," *Journal of Counseling Psychology*, Vol. 55, pp 146-157.
- Tracey, T. J. G., & Robbins, S. B. (2006), "The interest-major congruence and college success relation: a longitudinal study," *Journal of Vocational Behavior*, Vol. 69, pp 64-89.
- Tracey, T. J. G., Allen, J., & Robbins, S. B. (2012). "Moderation of the relation between person-environment congruence and academic success: environmental constraint, personal flexibility and method," *Journal of Vocational Behavior*, Vol. 80, No.1, pp 38-49.
- Wessel, J. L., Ryan, A. M., & Oswald, F. L. (2008), "The relationship between objective and perceived fit with academic major, adaptability, and major-related outcomes," *Journal of Vocational Behavior*, Vol. 72, No. 3, pp 363-376.
- Westernman, J. W., & Vanka, S. (2005). "A cross-cultural empirical analysis of person organization fit measures as predictors of student performance in business education: comparing students in the United States and India," *Academy of Management Learning & Education*, Vol. 4, pp 409-420.
- Westernman, J. W., Nowicki, M. D., & Plante, D. (2002), "Fit in the classroom: predictors of student performance and satisfaction management education" *Journal of Management Education*, Vol. 26, pp 5-18.
- Wong, K. F. (2006). *A career guidance software for selection of college majors in Universiti Putra Malaysia*, Unpublished Doctoral Thesis, UPM, Serdang.