A STUDY ON THE TRANSFERABLE SKILLS OF THE ENGINEERING STUDENTS AT UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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ABSTRACT

The purpose of this study was to identify the students' levels of awareness of the importance of transferable skills and the mastery of the aspects of adaptive, critical thinking, and problem-solving. In addition, this study also aimed to identify differences in students' levels of awareness of the importance of transferable skills and the difference levels of awareness between male and female students. Research method used in this study was quantitative survey by using questionnaire. Data were analysed by finding the mean and an independent t-test. The results showed that students' levels of awareness of the importance of transferable skills and the mastery levels of these skills were at a high and there were significant differences between female and male students' levels of awareness of the importance of transferable skills. However, the analysis showed no difference in the levels of dominance. Overall, greater awareness will help students to master the skills perfectly. It can also be used as a guide for students to identify elements and features that are required by employers nowadays.

Keywords: adaptive skills, critical thinking skills, problem solving skills, transferable skills

INTRODUCTION

Transferable skills are defined as the skills possessed by individuals who have a diversity of knowledge, values, and basic life skills needed to acquire and maintain existing jobs (Abbas, Kadir & Azmie, 2013). They are also defined as a set of skills and abilities that are used in various types of work to solve specific problems in the professional world (De Juan-Vigaray et al., 2012). In other words, the skills are transferable generic competences as they are used in a wide variety of activities and competencies that include practical skills to solve a particular problem in the workplace (Rey, 1996). Therefore, these skills are not fixed to one field alone, they can be used in many different fields and sectors.

Transferable skills are very important in student-dominated societies. The skills will be viewed by employers and professional board accreditations (Duffy & Bowe, 2010). Employers need workers who are innovative, can work in groups in different environments, have critical thinking, and are able to continuously accept new knowledge. In addition, transferable skills such as creativity, critical thinking, communication, and adaptive skills are required not only to meet the needs of the current job market, but they are necessities for sustainability and continuity in the work market over time. Due to current global economic conditions, competitive graduates need to be flexible so that they are adaptable in any environment and have the ability to change when there is a need for it (Kapranos, 2014).

Society in the 21st century is facing a critical challenge to meet the demands of promoting economic growth. Development and rapid technological revolution have led employers to be more careful in hiring. An increasing demand for highly skilled labour and knowledge generates an increase in competition among graduates, especially in the engineering field (Muhaimin, Jamaluddin & Baharuddin 2008). Reports from the Department of Statistics Malaysia (2015) show that the labour force participation rate in February 2015 increased by 0.2% compared to 67.2% in the previous month. However, this increase did not affect the reduction of the national unemployment rate, rather the unemployment

rate increased by 0.1% compared to 3.1% in the previous month, making it 3.2% in February 2015.High competition among graduates to get a job has caused employers to determine that graduates need to master both transferable skills and technical skills (Stewart & Knowles, 2000; Bennett, Dunne, & Carre, 2000). A study conducted by The National Union of Students (2012) states that most students realise the importance of this, but they do not have the ability to explain and transfer these skills into practical ones. In addition, a study by the Productivity and Investment Climate Survey shows that skilled workers do not have transferable skills such as English speaking skills, fine technology skills, and technical skills as well as professional skills. Similarly, a study by the Australian Industry Group (AIG) for a firm in Australia shows that nearly half of today's workers do not have the skills to adapt to change. In addition, Mulyatiningsih (2011) states that there is a gap between the ability of students and employees of the industry, some of which are in the competence dimension: managerial, administration, leadership, business, and work attitude. Dimensions of these competencies are required in the workplace. Student's understanding of the mastery of competencies workplace can determine their success upon entering the workplace

Warman et al. (2010) found that students did not have a high level of critical thinking, which was one of the prevailing causes of unemployment in Malaysia. In addition, the results of an interview with a lecturer at one of the institutions of Malaysia by Razali et al. (2010) found that most students were not able to use their own initiative to resolve problems, did not try to think beyond expectations and rely solely on lecturers' lessons and feedback. In other hand, Utami (2013) stated that solving the problem needed to be stressed in achieving learning objectives. Knowledge must be built and raised by students. In addition, one of the results of research conducted by Sukaswanto (2013) related to student learning difficulties were not able to formulate problems and solutions.

In addition to the transferable skills, demographic factors such as gender, ethnicity, and educational fields also play an important role in business graduates' employability. Data recorded on the analysis of the Department of Statistics, Malaysia (2014) have shown that more female graduates were unemployed compared to the male graduates with the respective unemployment rates of 3.2% and 2.7%. This raises questions because the academic achievements of female students over the years have been far greater than those of male students. In fact, the total enrolment numbers of female students in institutions of higher learning were higher than those of male students (MOE, 2013).

Therefore, a study should be conducted to assess the students' levels of awareness of the importance of transferable skills and their mastery levels so that they are able to compete both locally and globally after graduation. A lack of information from previous studies about the level of awareness and mastery of these skills amongst students will also be the goal of this study. Transferable skills include adaptive skills, critical thinking, and problem-solving. By identifying these proficiency levels, we might be able to contribute to the increase of students' awareness of the importance of mastering these skills to be used throughout life. The purposes of this study are: (1) to identify students' level of awareness of transferable skills; (2) to identify students' level of awareness of the mastery of transferable skills; (3) to identify differences between female and male students' awareness of the importance of transferable skill; and (4) to identify differences between female and male students' awareness of the importance of the mastery of transferable skills.

METHOD

This study used a quantitative approach involving a survey method with a questionnaire

as an instrument. This design was chosen because it was very appropriate in reviewing and identifying respondents' perceptions of the problems to be studied.

The population involved in the study consisted of the engineering students at University Tun Hussein Onn Malaysia, Johor, namely from the Faculty of Civil and Environmental Engineering, the Faculty of Electrical and Electronic Engineering and the Faculty of Mechanical and Manufacturing Engineering. The study population consisted of about 1.300 people. The selection of candidates from three different faculties was aimed at getting more relevant results and higher reliability. This is because the learning cultures of the three faculties are different. It will indirectly affect the personality and skills of the students. The samples taken from the populations met all the demands and requirements of the study therefore they fulfilled the goals of the study.

The samples taken from the total population of 297 students covered were taken by using a probability sampling of simple random sampling based on the class. The survey instrument used was a questionnaire containing 80 items. The questions were closed, meaning that respondents had to answer them by choosing from the provided answers. Topics were based on predefined research questions and were divided into three parts; demographic, the awareness of the importance of transferable skills and the level of proficiency in these skills. The measurement scale used was based on the Likert scale.

A pilot study was conducted on 30 students from three of the university's Engineering faculties. The researchers chose these students because these groups had characteristics similar to the actual survey respondents. The analysis showed that the reliability of the Cronbach's Alpha (α) was high at 0.928. Thus, each item in the questionnaire could be used in the study. The data obtained were initially sorted by category before analysis by SPSS version 20.0. In this study,

questionnaires were analysed using two analytical methods; descriptive statistical analysis to obtain the percentage and mean and inferential statistical analysis using independent t-tests as tools. This was aimed at testing the difference between the two. The independent t-test was chosen for the third and fourth questions to identify the different levels of awareness between males and females of the importance of transferable skills and their mastery levels.

RESULTS AND DISCUSSION

A total of 297 students from three faculties responded to the distributed questionnaires. Of these, the number of female students questioned was 154, which was higher than the number of male students. The number and percentage breakdown of respondents by gender involved in this study are shown in Table 1.

Table 1. Respondents' Gender

Gender	No.	%
Male	143	48.1
Female	154	51.9

Overall, students' awareness of transferable skills was high. All of the mean scores obtained were balanced and not too different within the range of 4.0741 - 4.0964. The average value of the highest mean score can be seen in the element of adaptive skills, followed by critical thinking skills and problem-solving skills. The average reading score for all three of these elements is summarized in Table 2.

Table 2. Students' Awareness of Transferable Skills

Transferable Skill Elements	Mean Score Average	Level Interpretation
Adaptive Skills	4.0964	High
Critical Thinking Skills	4.0888	High
Problem-Solving Skills	4.0741	High
Total	4.0864	High

Referring to the analysis carried out, students' awareness of transferable skills was at a high level. The mean score obtained for each

sub-element was in the range of 3.9590 - 4.1313 where it was balanced and not too different. The mean score for the three elements of adaptive skills, critical thinking skills and problem-solving skills also appeared balanced in the range 3.9727 - 4.0903. The average value of the highest mean score can be seen in the element of adaptive skills, followed by critical thinking skills and problem-solving skills. The average reading score for all three elements and sub-elements are summarised in Table 3.

Table 3. Students Awareness of the Mastery Levels of Transferable Skills

Transferable Skill Elements	Mean Score Average	Level Interpretation
Overall Mastery Level		
Adaptive Skills	4.0903	High
Critical Thinking Skills	4.0215	High
Problem-Solving Skills	3.9727	High
Total	4.0282	High
Adaptive Skill Level		
Group Work Skills	4.0842	High
Attitude	4.0556	High
Self-Management Skills	4.1313	High
Total	4.0903	High
Critical Thinking Skill Level		
Mature	4.0410	High
Confidence	4.0320	High
Willing to Know	3.9916	High
Total	4.0215	High
Problem-Solving Skill Level		
Research	3.9590	High
Problem Analysis	3.9860	High
Making Decisions	3.9731	High
Total	3.9727	High

Based on the analysis carried out, the significant values were 0.003, which was less than the significant level of 0.05. It can be concluded that there is a significant difference between the awareness of female and male students. The analysis results are presented in Table 5.

Table 5. Difference between Female and Male Students in the Level of Awareness of the Importance of Transferable Skills

Gender	N	Mean score	t-value	Interpretation
Male	143	4.0258		t < 0.05; H_0 rejected; The difference in mean scores between male and female
Female	154	4.1458	0.003	

Significant values were obtained after analysing the overall difference of 0.327 and its more than significant level of 0.05. It could be concluded that no significant differences were seen in the mean scores of the awareness of transferable skills between males and females. The analysis results are presented in Table 6.

Table 6. Test-T Not Lean Against Student Perception Differences Transferable Skills Mastery Level between Males and Females.

Gender	N	Mean score	t-value	Interpretation
Male	143	4.0520		t > 0.05; H_0 accepted; there was no difference in mean scores between males and females
Female	154	4.0048	0.327	

This discussion was intended to unravel more about the objectives that have been stated. The analysis results showed that the students' levels of awareness of the importance of transferable skills were high. This shows that the students realised that this was a very important skill to master in order to improve their performance. Studies conducted by Underhill (1992) also state that self-awareness is a very important element for every individual to improve the quality of their work. In addition, they also have to realise that mastering this skill will make them very popular with employers upon graduation. These studies coincide with a study conducted by

Salleh (2014) which states that employers are more interested in candidates who have transferable skills.

A high awareness of the importance of these skills will help students to master the skills perfectly. It can also be used as a guide for students to identify elements and features that are required by employers nowadays. Ryan and Paul (1980) states that most students realise the importance of this, but they do not have the ability to explain and transfer these skills into practical form. Mere awareness is not enough if the students can not apply the skills in a practical form. Students need to improve their profound knowledge related skills so that they can be transferred into practical skills in the workplace.

Referring to the results of the analysis carried out, students' awareness of the mastery of transferable skills is at high. It has been proven that students have applied good skills and have practiced them throughout their studies. It also provides a positive indication that UTHM will produce engineering graduates who not only master technical skills but also the transferable skills that are necessary in today's working world. The results of this analysis also gave high hope and opportunity for them to market themselves in the working world. This finding is consistent with studies conducted by Jumelan (2014) which had the same high level of analysis. Researchers believe that this may be due to aspects of transferable skills that have been studied and the fact that the number of respondents involved is almost the same in both studies.

A high command of transferable skills can improve the competitiveness of students in employability upon graduation. This is because it is very difficult for engineering graduates to get a job in the current labour market situation due to globalisation and competition among graduates. Although the results of the study revealed that the level of awareness amongst students is high, they still need to strive to be flexible and adaptable to new situations. In addition, they also have to train themselves to

think beyond expectations on a daily basis in order to elevate their thinking to be on par with critical thinkers. Problem-solving skills also need to be mastered to perfection as it has become the priority and main requirement for employers nowadays.

The analysis results showed that there were significant differences between the mean scores of the female and male students' awareness of the importance of transferable skills. The mean score showed that the level of awareness amongst female students was higher than that of male students. This shows that females are more aware and know the importance of these skills in the workplace. It also proves that they realise that the mastery of these skills can reflect their work ethic and individual achievement. These results are in line with findings by Aminuddin et al. (2006) which indicate a significant difference between the levels of awareness among male and female students.

These differences also coincide with a study by Syed Najmuddin (2007) in which females were found to be more sensitive to environmental changes than males. This suggests that females have higher sensitivity, which affects their level of consciousness to make the cognitive, emotional and behavioural changes that will allow them to be more sought after by employers. However, studies by Sahin and Francis (2002) found that males will still be viewed more positively than female students. Regardless, in this study, female students were more aware of the importance of transferable skills than males, thus attaining higher mastery levels. This is also likely to increase competition among young women to get their desired jobs.

The analysis results showed that there was no significant difference between the mean scores of students' awareness of skill levels. The mean scores that were analysed between male and female students showed no significant differences. However, the level of transferable skills was seen to be higher in males than in females due to the fact that the mean score was

slightly higher. Although it differs with the analysis of the level of awareness of male students who showed a lower mean score than female students, this shows that male students put their awareness into practice in real situations more often than females students. This indirectly increases their chance to apply for a job in the workplace.

This does not mean that female students are not proficient in mastering these skills. The mean score differences applicable in this study only serve as a reference to determine awareness levels and applications of transferable skills between males and females. The findings of this analysis are in line with research by Abdullah (2012) which stated that there was no significant difference in awareness of transferable skills between males and females. This shows that every student receiving scientific education from their respective institutions is the same. Therefore, the probability of the occurrence of the difference is low.

The results of this study showed that there were no significant differences between the sexes and it was generally concluded that the level of awareness of transferable skills was balanced between female and male students. What distinguishes them was how they apply these practical skills effectively. Furthermore, they will have an equal opportunity to compete with other graduates in finding employment. The employer is also not very likely to consider gender when hiring. In fact, what comes first is the quality of the individual aspects of personality, attitude, and perseverance. Employers require workers to be flexible and adaptable in the face of new challenges in the world and work organizations (Bradshaw, 1989).

CONCLUSION

Overall, it can be concluded that the objective can be answered after the first successful study reported that students' awareness of the importance of transferable

skills is high. This greater awareness will help students to master the skills perfectly. In addition, it can be concluded that students' awareness of the mastery of transferable skills can also be improved at the same time, answering the second objective. High mastery of transferable skills can improve the competitiveness of students in workforce employability. The students' level of awareness of the importance of transferable skills are significantly different in terms of the mean scores of males and females. Female students are more aware of and know the importance of these skills in order to get jobs compared with male students. However, students' awareness of the level of transferable skills did not show a significant difference in mean scores between males and females. Although the level of awareness of male students was lower than females, male students showed a higher level of transferable skills practice in real situations.

As a result of the findings and discussions of this study, some proposals can be put forward as measures to increase the level of transferable skills among engineering students. The proposals are as follows: (1) It is proposed that the management of the Engineering Faculty at the University take measures to revamp sections or classes that are set each semester to allow students to socialise and adapt to new situations and friends. This also trains students to enhance their adaptive skills. (2) The lecturers are also advised to encourage students to do activities with the community such as community service. For example, lecturers are advised to take other alternatives in making assessments of students' achievements. This assessment was based on students' abilities to connect with public facilities that are appropriate to their specialisation and subjects. This not only trains students to mingle with people outside of the university, but also trains them to solve unexpected problems. (3) The lecturers are also encouraged to tighten the weighting in each assessment. Answers should be logical and appropriate to the question. Student's answers also need to be viewed by an

unfamiliar lecturer. Lecturers also need to raise the questions to international standards and increase questions related to current issues. This aims to improve the level of students' critical thinking.

REFERENCES

Abbas, R., Kadir, F. A., & Azmie, I. G. 2013. Integrating Soft Skills Assessment through Soft Skills Workshop Program for Engineering Students at University of Pahang: an Analysis. *International Journal of Research in Social Sciences*. 2.1, 33-46

Abdullah, N. 2012. *Tahap Penguasaan Kemahiran Insaniah dalam Kalangan Pelajar Diploma Kejuruteraan di Politeknik.* Batu Pahat: Master Dissertation, Universiti Tun Hussein Onn Malaysia

Aminuddin, N. A., Abdullah, W. S., & Mohd Amin, W. A. 2006. Perbezaan Dalam Dimensi Kemahiran Generik Pelajar Baru KUSTEM. *National Student Development Conference.* Kuala Lumpur: NASDEC

Bennett, N., Dunne, E., and Carre, C. 2000. *Skills Development in Higher Education and Employment.* Buckingham: Society for Research into Higher Education and Open University Press

Bradshaw, D. 1989. Higher Education, Personal Qualities and Employment Teamwork. *Oxford Review of Education*. 15. 1, 55-70

De Juan-Vigaray, M., Gonzalez-Gascon, E., Lopez-Garcia, J., Martinez-Mora, C., Valles-Amoros, M., & Carmona-Martinez, J. 2012. The Acquisition of Transferable Skills by University Students: A Gender Approach. *EDULEARN12 Proceedings*, 191-198

Duffy, G., & Bowe, B. 2010. *A framework to develop lifelong learning and transferable skills in an engineering programme*. Accessed May 19, 2015, from http://arrow.dit.ie/engscheleart/130/

Jabatan Perangkaan Malaysia (Department of Statistics Malaysis). 2014. *Labour Force and Social Statistics*. Accessed Desember 3,2015,from https://www.statiztics.gov.my.

Jabatan Perangkaan Malaysia (Department of Statistics Malaysis). 2015. *Labour Force and Social Statistics*. Accessed May 12, 2015, from https://www.statistics.gov.my

Jumelan, J. 2014. *Penguasaan Kemahiran Insaniah Pelajar Dalam Penglibatan Aktiviti Kokurikulum Badan Beruniform Di UTHM.* Batu Pahat: Masters Dissertation, Universiti Tun Hussein Onn Malaysia

Kapranos, P. 2014. Teaching Transferable Skills to Doctoral Level Engineers—The Challenge and the Solutions. *Open Journal of Social Sciences.* 2. 05, 66

KPT (Kementerian Pengajian Tinggi). 2013. *Indikator Pengajian Tinggi Malaysia 2013.* Kuala Lumpur: KPT

Muhaimin, M., Jamalluddin, H., & Baharuddin, A. 2008. *Kelemahan Penguasaan Kemahiran di kalangan Pelajar: Pedagogi dan Teknologi sebagai Pendekatan Penyelesaian.* Seminar Penyelidikan Pendidikan Pasca Ijazah. Universiti Teknologi Malaysia

Mulyatiningsih, Endang. 2011. Analisis Kesenjangan Kompetensi Kewirausahaan antara Mahasiswa dan Industri. *Jurnal Pendidikan Teknologi Kejuruan*. 20.1, 141-162

Razali, N. M., Sikor, A., Hassan, R., & Madar, A. 2010. *Penguasaan Kemahiran Insaniah dalam Kalangan Pelajar*. In A. Esa, & M. Z. Mustafa, Kemahiran Insaniah: Kajian di Institut-Institut Pengajian (126-152). Batu Pahat: Penerbit UTHM

Rey, B. 1996. *Les compétences transversales en question.* Paris: ESF Éditeur

Ryan & Paul. 1980. The Costs of Job Training for A Transferable Skill. *British Journal of Industrial Relations.*18.3, 334-352

Sahin, A., & Francis, L. 2002. Assessing Attitude Toward Islam Among Muslim Adolescents: The Psychometric Properties Of The Sahin-Franccis Scale. *Muslim Education Quality.* 19.4, 133-145

Salleh, M. 2014. *Foreword. Integration of Transferable Skills in TVET Curriculum, Teaching-Learning and Assessment* (p. v). Bangkok: SEAMEO VOCTECH

Stewart, J., & Knowles, V. 2000. Graduate Recruitment and Selection: Implications for HE, Graduates and Small Busines Recruiters. *Career Development Internationa.* 5. 2, 65-80

Sukaswanto. 2013. Diagnosis Kesulitan Belajar Mahasiswa pada Mata Kuliah Statika dan Kekuatan Material. *Jurnal Pendidikan Teknologi dan Kejuruan.* 21. 4, 314-324

Syed Najmuddin, S. 2007. *Hubungan Antara Faktor Kecerdasan Emosi, Nilai Kerja Dan Prestasi Kerja Di Kalangan Guru Maktab Rendah Sains Mara.* Bangi: Tesis Doktor Falsafah, Universiti Kebangsaan Malaysia

Underhill, A. 1992. *The Role of Group In Developing Teacher Self-Awareness.* ELT Journal.46.1.71-80

Utami, Pipit. 2013. Perbedaan Jigsaw II dan Gi terhadap Pemahaman Konsep dan Pemecahan Masalah pada Kompetensi Mendiagnosis Permasalahan Pengoperasian PC dan Peripheral Ditinjau dari Motivasi Belajar. *Jurnal Pendidikan Vokasi.* 3. 2, 234-250

Warman, S., Zahari, N., Esa, A.,& Mustafa, M. 2010. Penguasaan Kemahiran Insaniah dalam Pembelajaran Berasaskan Masalah. *in A. Esa, & M. Z. Mustafa, Kemahiran Insaniah: Kajian di Institut-Institut Pengajian* (224-250). Batu Pahat: Penerbit UTHM