

# Dependability of Engineering Graduates in Private Non-for-Profit Higher Education Institution

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## Article Info

Volume 81

Page Number: 3127- 3134

Publication Issue:

November-December 2019

## Abstract:

The private education institutions in Malaysia have been booming up since 80's. The demand is increasingly and the fees of education in private institutions also big variance compare to government higher institutions. As such, private non-for-profit higher institutions were taking place to offer comparatively low fee's course to those below average income household family. Indeed, one of the high demands program is in engineering related course. However, public perception onto non-for-profit always relate to low quality or underperforming. This study provides an in depth study on investigating the perception on trustworthiness on teaching role and gender differences towards future technical professionals in private non-for-profit higher institutions. The study enables to collect 59 male and 59 female respondents for this study. Specifically, non-parametric measurement is adopted and the findings revealed that there is no difference and correlation of gender with teaching role and trustworthiness. In detail, male and female has no significant towards their selection in the private non-for-profit higher institution

## Article History

Article Received: 5 March 2019

Revised: 18 May 2019

Accepted: 24 September 2019

Publication: 14 December 2019

**Keywords:** Perception, Trustworthiness, and Engineering

## I. INTRODUCTION

Tertiary education institutions are institutions that provide higher education system with various types of academic programs (Philip, Liz, & Laura, 2009). The two most common categories are the public and the private higher education institutions (Arokiasamy, et. al., 2009). In general, public is referring to the funding system fully supported and controlled by the government however, private is referring to the self-funded higher educational system tertiary (Arokiasamy, et al, 2009). Both are established to provide further education to respective country's citizen.

Comparatively, the tuition fees in public tertiary education institution are much lower than private tertiary education institution. Indeed, the self-funded, or founded by individual or an organization with own operation will be referring to the private higher education institutions. (Chaves, 2013). Private higher education institutions are mainly customer oriented.

As Malaysia development booming rapidly since 80s, the higher education institutions also keep up the pace in order to produce skillful workforce for the country. (Selvaraj, et. al., 2014; Philip, Liz, & Laura,

2009). In particular, the developments of private tertiary education institutions have increased dramatically to fill up the gaps of lacking of seat offered by government higher education institutions. It helps to overwhelm the main issue faces in industry on the demands on skillful workforce via providing suitable education so that all the labor gaps can be filled (Sivalingam, 2012).

In 1988, the global economic challenges faced by Malaysia have caused Malaysia downturn in country's development. The impact, indirectly hits on the demand on the private higher institution as the tuition fees are comparatively few times higher compare to public higher institution. As such, government has allowed a new education system called non-for-profit higher education institutions to be established in the country. It has brought to the involvement of many local businessmen involvements to provide funding in building a totally new private tertiary education institution system known as private non-profit oriented education institution (Chang, Sirat&Razak, 2015). The established of new type of education system "Private non-for-profit tertiary institution" is operated by an organization, or by individual with the purpose not for profit earning. This type of system is highly depending on the contribution from the public donation for the operation.

Indeed, the public mindset on the perception of non-for-profit higher education institution unable to deliver better quality education compare to other institutions since the non-profit oriented institution has zero profit which means has less or no money to operate the institution at its best. The public mindset has a significant influence towards the perception of consumer (Syeda, 2012), the perception due to the customer's attitude (Jaafar, Pan & Mohamed, 2012) and trustworthiness (Martina & Ana, 2013). Thus, it influences the society's

mindset in selecting their preferred tertiary institution to further their studies for higher degree education. Nonetheless, higher degree engineering program is one of the programs that the society finds it difficult to consider studying in private non-profit oriented tertiary institution.

Engineering is at all times considered as a more challenging program to study in comparison to business study (Jin, et. al, 2014). However, gender has the different perception in selecting their main choice in engineering related field for their further career development (Pekkarinen, 2012). Shittu & Donsumu (2014) explained that male differ from female in term of their preference in choosing their favorite program to further their study. Xu, Wang, & Liu (2013) and Jin, et. al., (2014) mentioned that male and female always play an important roles in responsive to the gender preference choosing engineering related program for further study.

## II. OBJECTIVE OF THE STUDY

This study is measuring two main objectives in investigating the future engineers' perception and dependability of future engineers who are currently pursuing their higher education in private non-for-profit oriented tertiary institution towards the engineering program. The two hypotheses are:-

H<sub>01</sub>: Gender differences do not contribute significantly to the trustworthiness of future engineers who are pursuing higher engineering degree in private non-profit oriented tertiary institution.

H<sub>02</sub>: The perception of Future engineers on teaching role and trustworthiness has no significant correlation when selecting engineering degree program in private non-for-profit higher education institution.

### III. LITERATURE REVIEW

In Malaysia, the engineering programs are offered either by government funded universities or foreign universities. The engineering program can also be offered by public or private universities in Malaysia (MOHE, 2016). According to MOHE (2016), all the local universities offering of engineering program is compulsory to obtain MQA accreditation and also Board of Engineers, Malaysia (BEM) approval prior launching of any engineering program. In overall, the government funded university's engineering program is fully accredited by the Malaysia's professional institution - Engineering Accreditation Council (BEM, 2016). However, for foreign engineering program whereby the courses offers in which the local tertiary education institutions collaborate with foreign tertiary education institutions and offer the bachelor and/or postgraduate courses at the local tertiary learning or foreign universities that with Malaysian branch campus, the foreign engineering program is moderated by both the Malaysia tertiary education professional board and foreign higher education institution's professional board (MOHE, 2016).

However, due to the global crisis impact in 80s, Malaysia private higher education system has expanded into for-profit and non-for-profit higher education system (MOHE, 2016). The private non-for-profit higher education system in Malaysia has become the reformation of these two systems (local and/or international program) to offer bachelor and postgraduate programs. Private non-for-profit higher education institutions provide competitive fees compare to private for-profit higher institutions (Sivalingam, 2012). The private non-for-profit higher institutions profit earning is to cover operational cost and not to dispense it to the board of directors or shareholders (Sivalingam, 2012). In detail,

private non-for-profit higher institutions are commonly run by a group of volunteer trustees via finding different fundings to support the organization's operation and non-operating cost Lang & Weinstein (2013). Although these group of trustee main function are finding the resources however, all the funding received shall only be used for the interest of the non-for-profit higher education institutions (Deming, Goldin& Katz, 2012). According to Tan, Ling, & Chia (2016), private non-for-profit higher education institutions is established with the intention to assist low income household family students to have the opportunity to continue in higher education. The private non-for-profit higher education institution has to be self-finance and it is highly depending on the tuition fees collection and the donation from the public.

Indeed, society's mindset on always feel that non-for-profit does not provide good quality. Jeniffer, Kathleen & Cassie (2010) explained that the society would willingly to purchase expensive goods from the for-profit oriented organization compared to cheaper products because of the perception of the society that the non-profit oriented organization is less competent and unable to provide better quality. It is also applicable to the perception of the Society's towards on the quality education to pursue their study in higher learning institution when the students are from different background (Andanastuti, Che, Mohamad & Kaseh, 2011; Xu, 2014). Indeed, Donaldson (2013) found that the perception of parent on that the higher institutions that could provide good education to their children are still their first priority onto the teaching and learning which could affect their trustworthiness under certain conditions. As such the perception on teaching and learning would play an important factor that will influence the parents' or students' preference. Vitus & Adams (2014)

explained that there is a strong impact of trust on the students and parents' choice on their preferred institution. It establishes an environment for knowledge transfer in subject matters and learning process and provides different learning styles and cultural learning. As such, this will also govern the trustworthiness in the aspect of gender differences in the same institution. Tan, Ling, & Chia (2016) mentioned that the different perception of male and female on technical undergraduates and the gender difference is significantly determine the differences of character and behavior of an individual.

#### IV. METHODOLOGY

In this study, quantitative research method was used with 5 likert scale measurement. There were 136 respondents responded to the self-administered questionnaire. Out of 136 respondents, 77 respondents were male and 59 respondents were female. All the respondents are currently pursuing their bachelor degree in engineering from private non-for-profit higher institutions. However, equal numbers of respondents were chosen to minimize the gender bias in this study (Pekkarinen, 2012; Tan, Ling & Chia, 2016). From the responded questionnaire, 59 respondents of female were all adopted while 59 male respondents were selected from the 79 respondents through random sampling method. Simple random sampling is a selection from a set of known and equal chance respondents in the same study group (Sekaran & Bougie, 2013). As such, the 59 male and 59 female respondents are selected in this study. To ensure the data is reliable, reliability test is conducted after identifying the suitable respondents to be used. According to Malhotra (2010) and Arain, *et. al.* (2010), reliability analysis is an important measurement needs to be conducted prior to further analyzing the data. Once the data is found to be reliable the data can be analysis

further (Hazzi&Maldaon, 2015). In this study, Ipos MORI (2012) questionnaire is adapted to measure the perception on teaching role and facilities. Ipos MORI (2012) questionnaires are widely used to measure the perception of end user. For example, Henn & Foard (2012) adapted the same set of questionnaires to measure the new generation perception and trust in political views. Cornell, Pidgeon & Parkhill (2012) adapted Ipos MORI questionnaires to study a group of geo-engineers perception in geo-engineering related works, public feelings and stakeholder perspectives. In addition, to test students' perceived value (PV), the five questions used in this study were: PV1: The lecturers are good in explaining things, PV2: Lecturers have made the subject interesting, PV3: Lecturers are enthusiastic about what are they teaching, PV4: I have received sufficient advice and support from the lecturers and PV5: Good advice is available when I am facing hardship during my study. However, in studying the trustworthiness (TW) variable, Kim and Kim (2004) survey questionnaire would be adapted. Kim and Kim (2004) likert scale questionnaires was adopted to measure the trustworthiness on the future technical graduates. For example, Lee and Back (2008) used the questionnaires from Kim & Kim to explore attendee-based brand equity and royalty. Besides, Tong and Hawley (2009) measured Customer-based brand equity, Huang and Sarigollu (2014) measured brand awareness and market outcome with the used of the same questionnaire. Four survey questions to measure students' trustworthiness were: TW1 : If I had to do it all over again, I will still take my chosen engineering program, TW2: I intend to continue studying until I finished my chosen engineering program, TW3: This engineering program is my first choice and TW4: I am satisfied with my chosen engineering program.



In this study, the normality test showed that the data was not normal. As such, Non parametric method was opted when the data distribution showed abnormality. Based on the analysis, it is necessary to use non parametric correlation test which is Spearman Correlation (Sekaran&Bougie, 2013). The Spearman correlation investigated the dependence variables between PV and TW which was acquired by separating the co-variance of the two variables by standard deviation (Malhorta, 2010). For the differences analysis using non-parametric test, Mann-Whitney U (M-W) and Kruskal-Wallis (K-W) were adopted for the analysis (Sekaran&Bougie, 2013). These two different tests enabled the investigation of the same sampling sets to identify the possible differences between two independent samples coming from the same distribution in two or more groups (Sekaran&Bougie, 2013). After measuring for the differences, the correlation test were used Spearman's rho and Kendall's tau b to determine the correlation between PV and TW categories. The rejection of hypotheses was set at a minimum requirement of  $p < 0.05$  (Sekaran&Bougie, 2013).

## V. RESULTS AND DISCUSSION

This study adopted SPSS to analyze the data. Table 1 shows the result for the reliability test. The Cronbach's Alpha (CA) result obtained is 0.852. It shows that the reliability level of this set of questionnaire is suitable (Sekaran&Bougie, 2013) and is convincing enough to proceed for further data collection and analysis (Zikmund et al., 2010; Tavakol&Dennick, 2011;).

Table 1: Reliability assessment

Total Responded	CA
118	.852

In this study, Shapiro-Wilk (S-W) and Kolmogorov-Smirnov (K-S) tests were used for

normality test (Gravetter&Wallnau, 2014). The test used to measure the data normality factor. Table 2 concluded that the data used for this study is beyond the normality ( $p < .05$ ) (Trochim & Donnelly, 2006; Field, 2009).

Table 2: Normality Test – (S-W & K-S Test)

Item	K-S		S-W	
	Stat	Sig	Stat	Sig
PV1	.275	.000	.823	.000
PV2	.282	.000	.828	.000
PV3	.269	.000	.837	.000
PV4	.279	.000	.834	.000
PV5	.307	.000	.795	.000
TW1	.186	.000	.899	.000
TW2	.205	.000	.867	.000
TW3	.224	.000	.890	.000
TW4	.247	.000	.880	.000

### 5.1 Statistics and Null Hypothesis Assessment

$H_{01}$ : Gender differences do not contribute significantly to the trustworthiness of future engineers who are pursuing higher engineering degree in private non-profit oriented tertiary institution.

Table 3: Gender differences Comparison

Item	PV	TW
Respondents = 118		
K-W Test	.358	.612
Asymp. Sig.		
Respondents = 118		
M-W Test	.268	.658
Asymp. Sig. (2-tailed)		

As the result is not normal, the researcher uses two tests to compare and measure the differences between gender and trustworthiness of respondents. There were Kruskal-Wallis (K-W) test and Mann-Whitney (M-W) test. These two differences measurement tools result concluded that gender differences do not contribute significantly to the trustworthiness of future engineers who are

pursuing higher engineering degree in private non-profit oriented tertiary institution ( $p < 0.05$ ).

$H_{02}$ : The perception of Future engineers on teaching role and trustworthiness has no significant correlation when selecting engineering degree program in private non-for-profit higher education institution.

Table 4: PV and TW Correlation (Corr) test

Item	Sample size (n)	Corr between PV & TW	Bootstrap 95% Confidence Interval	
			LL	UL
Statistics				
Kendall's tau b	118	.144	-.017	.307
Spearman's rho	118	.165	-.018	.347
Male				
Kendall's tau b	59	.135	-.091	.362
Spearman's rho	59	.152	-.105	.405
Female				
Kendall's tau b	59	.152	-.093	.396
Spearman's rho	59	.175	-.109	.452

In this study, total of 118 correspondents were identified to measure the median scores for PV and TW. As shown in Table 4, the correlation results from Spearman's rho statistics and Kendall's tau b indicated less correlation between perceived variable and trustworthiness. Meanwhile, to ensure the liability of the results, bootstrapping technique was used to assess the Null hypothesis. The result showed that both were spanned across zero indicated the chances of having no correlation between PV and TW. Based on the result,  $H_{02}$  statistically not ideal to be rejected at  $\alpha = 0.05$ . Specifically, the gender analyses also concluded similar less correlation in either male or female that both Spearman's rho statistics and Kendall's tau b were less interrelation with respect to 95% confidence interval contains zero. In conclusion, Table 4 showed that  $H_{01}$  not ideal to be rejected at  $\alpha = 0.05$  level as well.

## VI. CONCLUSION AND RECOMMENDATION

The 4<sup>th</sup> Industrial evolution has impacted the traditional way of performing engineering practices. The reality is that the new era of engineering practitioners not only need to be resourceful, at the same time technologically well equipped. This has led to the study to investigate the young engineering practitioners in enhancing their skills and knowledge in order to maintain competitively in the engineering industry. As the overall conclusion of this study, the gender's differences perception and the perception on teaching role and dependability on trustworthiness among the future engineers in private non-profit oriented tertiary institution statistically showed no difference and no correlation between each other. In detail, the male and female students show similarity in sensitivity on the role of teaching and trustworthiness towards the non-for-profit higher education institution upon choosing their preferred higher education institution. Furthermore, perception on role of teaching and trustworthiness also shows no significant correlation for the engineering degree graduates. To enhance the finding of this study, is it recommended to expand this study by looking into various disciplines graduates with additional influences factors on future engineer's loyalty tendencies and expectation

## ACKNOWLEDGEMENTS

Special thanks to Universiti Tunku Abdul Rahman and the CDRR Centre for the financial support given to this study.

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