

THE RELATIONSHIP BETWEEN PROFESSIONAL AND UNIVERSAL ETHICS OF ENGINEERS

¹Zawiah Mat, ²Nooraini Sulaiman, ³Sazelin Arif, ⁴Safiah Sidek, ⁵Norain Ismail, ⁶Siti Arni Basir

^{1,2,3,4}Centre for Languages and Human Development, Sustainable Industrial Community Development Research Group (S-ICOMM), Universiti Teknikal Malaysia Melaka, Durian Tunggal, 76100 Melaka

⁵Faculty of Technology Management and Technopreneurship, Universiti Teknikal Malaysia Melaka

⁶Akademi Pengajian Islam, Universiti Malaya

zawiah@utem.edu.my

Article History: Received on 05th September, Revised on 20th October, Published on 15th December 2018

Abstract

Purpose: The aim of this study is to identify the relationship between professional and universal ethics of engineers.

Methodology: This study used quantitative methods to distribute the questionnaire by using random sampling to get data from 248 respondents of engineers from government and private sectors in Melaka. Respondents were required to value agreement to statement about work ethics that used a five-point Likert scale. Meanwhile, the scales used for measuring correlation were given as 0.000-0.2000 “negligible”, 0.201-0.400 “low”, 0.401-0.600, “moderate”, 0.601-0.800 “high”, and 0.801-1.000 “very high”. The Pearson correlation analysis was used to obtain these correlation results. In this research, we analysed the data collected using SPSS Ver.22 to identify the relationship between professional and universal ethics of engineers in Melaka.

Main Findings: The findings showed that all variables of professional of engineers correlated significantly with universal ethics. The significant level (p-value) was found to be less than 0.05, the study findings indicate a significant relationship between independent variables and dependent variable. Results obtained in this study confirmed that there were significant positive relationships between all variables that could influence professional and universal ethics.

Implications: This study contributes towards the improvement of Board of Engineers Malaysia (BEM’S) existing policy. Based on the study’s findings, the policy implication of this study includes: responsible bodies such as the governing institutions of engineers need to ensure that ethical practices are made as the main core in their profession by increasing knowledge and awareness about ethical practices in the engineering profession.

Originality: This study only focus on the relationship between professional and universal ethics of engineers and the results will be useful towards the improvement of Board of Engineers Malaysia (BEM’S) existing policy.

Keywords: *Relationship, Professional, Universal Ethics, Engineers*

INTRODUCTION

An engineer completing their tasks without any ethics cannot be identified as a professional engineer. Completing tasks ethically is essential to avoid the occurrence of unethical misconducts, involving corruption, abuse of power, fraud, sexual harassment, workplace discrimination, violation of civil properties and other offenses (Zawiah et al., 2016). There have been instances in the engineering world, in which buildings and bridges collapsed in different parts of the world due to the failure to properly follow the engineering ethics. Responding to these incidents, a number of engineering societies in the West have developed ethics for the engineering profession. However, these ethics were mainly drawn from their own intellectual capabilities, ignoring the principles of divine religions: every religion has its own values that govern their practitioner’s purpose in life. These religious values have strong influences on the practitioner’s culture; hence, they have impacts on people’s ethical thoughts and behaviors (Porter, 2010). Issues related to values and religion have attracted many researchers and they have explored it in various fields and settings (Zawiah et al., 2016; Javed et al., 2016; Mastura et al., 2016; Sabrina & Tanggor, 2016; Abdullahi & Suleiman, 2015; Lee et al., 2013). However, values and religious influence on professional ethics, especially among Malaysian’s engineers have been relatively underexplored in the literature and empirical research. Therefore, this study aimed to identify the relationship between professional and universal ethics of engineers in Malaysia.

LITERATURE REVIEW

Professional Ethics among Engineers

Engineering codes of ethics specify main groups of duties for a person who practises this profession. These duties should be viewed as a result of an education of the engineer, formation of his personality and virtues above all during formal university education. The virtue ethics makes clear is that good deeds are committed by a person who exhibits virtues. These are permanent abilities to make good choices and good decisions, and choosing the good and avoiding evil after an accurate recognition of a situation. Such an acquisition and development of virtues require constant and enduring ethical practice taken within a longer time (Piotr Wajszczuk, 2012). Accuracy and rigour, honesty and integrity, respect for life, law and public good and responsible leadership are the ethics should be obliged by the engineering in performing their duties (The Royal Academy of Engineering, 2011). Oliver & John (2003) have listed eight principles of the software

engineering code of ethics that are public, client and employer, product, judgment, management, profession, and, colleagues and self. The engineering profession is important due to its significant contribution towards the country's development, particularly in the aspects of societal development and well-being ([Nooraini et. al., 2016](#)).

Meanwhile, [National Society of Professional Engineer \(2018\)](#) stated that in the fulfilment of their professional duties, engineers must adhere to the following list of ethics:

- i. Hold paramount the safety, health, and welfare of the public.
- ii. Perform services only in areas of their competence.
- iii. Issue public statements only in an objective and truthful manner.
- iv. Act for each employer or client as faithful agents or trustees.
- v. Avoid deceptive acts.
- vi. Conduct themselves honourably, responsibly, ethically, and lawfully so as to enhance the honour, reputation, and usefulness of the profession

The ethical conduct of engineers makes them accountable for their actions towards the society and the community which entrusts its young ones to their duties and work, towards the pupils, towards the authorities who supervise their actions and most importantly towards their own self. The role of engineers is vital for progress and development of the country. All the professionally registered engineers have committed to working in an ethical and socially responsible manner according to their professional engineering institution's code of conduct ([Sarita, 2016](#)).

Universal Ethics

Professional ethics without a comprehensive formula for global ethics and international code of behaviour among nations will not get us anywhere. Therefore, people have to genuinely, lovingly, and persistently work toward a global formula for ethical behaviour within and among nations ([Roger, 2005](#)). [Anthony \(2010\)](#) stated that in response to the prevailing ethic of greed and self-interest, which has failed to deliver the world to which people aspire, a new global ethics would include a number of elements of sustainable, timeless human values and whole systems thinking should be practiced. In connection with this, [Horacio et al. \(2009\)](#) argued that universal ethics, the ethics of globalization, should be an ethics of virtues; be free, in the sense of understanding each other, be true and fair and be tolerant and sensible. The author further argued that universal ethics must be an ethic of universal values that are freedom, equality, solidarity, justice, truth and reason.

METHODOLOGY

Research design

This study used quantitative methods for the data collection. For the purpose of this study, the samples of the study were represented by engineers from government and private sectors in Melaka. The samples were selected using random sampling. A total of 400 questionnaires were distributed to the respondents. However, out of 400 questionnaires only 248 were returned. [Burns and Grove \(1993, p.777\)](#) define quantitative research as a formal, objective, systematic process to describe and test the relationship and examine the cause and effect interactions among variables. The objective of this research is to identify the relationship between professional and universal ethics of engineers in Melaka. This research addresses one hypothesis, namely: universal ethics have positive and significant relationship towards professional of an engineer.

Instruments

The questionnaire was drawn out based on the researcher's readings, previous studies, professional literature in the designing of data collection instruments were considered. The questionnaire was divided into three sections. The first section consists of questions regarding the demographics and characteristics of the respondents. The second section comprises items related to the professional engineers, while the third section covers statements linked to the universal ethics of professional engineers. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used for the questions to indicate the degree of agreement or disagreement with each of a series of statements related to the stimulus objects.

Data Collection and Analysis

Data analysis is a method of analyzing data to answer research questions. In this research, we analysed the data collected using SPSS Ver.22 to identify the relationship between professional and universal ethics of engineers in Malaysia.

The reliability of the questionnaire was validated based on the value of Cronbach Alpha. Table 1 shows the mean, standard deviation and Cronbach's Alpha of the two variables, which are universal ethics and professional of an engineer. The computed analyses showed that the mean score for universal ethics was 4.38 with the standard deviation of 0.377, while the mean score for professional of the engineer was 4.22 with the standard deviation of 0.343. Both variables have high value of Cronbach' Alpha, where the universal ethics was 0.925 and professional of engineer was 0.881, indicating that these variables have strong reliability.

Table 1: Descriptive of variables

Variables	No. of items	Mean	S.D.	Cronbach's Alpha
Universal Ethics	21	4.38	0.377	0.925
Professional of Engineer	20	4.22	0.343	0.881

FINDINGS

The aim of this study is to identify the relationship between professional and universal ethics of engineers in Malaysia. A research hypothesis has been formulated and a survey involving 248 engineers in Melaka has been conducted. This section presents the findings of the survey.

Demographic Profile

The demographic profile of the respondents based on the number and percentage of respondents by gender, age, education, position, field of expertise and experience is summarized. In terms of gender, there were 154 respondents (62.1%) represent male and 94 respondents (37.9%) represent female. In term of age, most of the respondents aged around 23-29 years old (40.3%), 30-36 years old (37.9%), 37-43 years old (12.5%) and more than 44 years old (9.3%). For the education level, 225 of the respondents with Degree (90.7%), 18 respondents with Master (7.3%) and 5 respondents with others (2.0%). For the field of expertise, Civil engineers were the highest frequency, 83 respondents (33.5%) and only 3 respondents (1.3%) from Oil and Gas engineers. Subsequently, 38.3% respondents had 1-4 years of experience, 30.6% respondents had 5-8 years of experience while 31.0% were those who spent 8 years and above in engineering profession.

Table 2: Demographic Profile of the Respondents

Demographics	Category	Frequency	Percentage
Gender	Male	154	62.1
	Female	94	37.9
Age	23 – 29 years old	100	40.3
	30 – 36 years old	94	37.9
	37 – 43 years old	31	12.5
	≥44 years old	23	9.3
Education	Degree	225	90.7
	Master	18	7.3
	PhD	0	0
	Others	5	2.0
Position	Engineer	168	67.7
	Senior Engineer	32	12.9
	Exec. Engineer	23	9.3
	Others	25	10.1
Field of Expertise	Mechanical	61	24.6
	Electrical	24	9.7
	Electronic	16	6.5
	Civil	83	33.5
	Oil & Gas	3	1.2
	Others	61	24.6
Experience	1 – 4 years	95	38.3
	5 – 8 years	76	30.6
	>8 years	77	31.0

Professional of Engineer

20 items was also developed to measure the professional aspect of an engineer. The descriptive statistical analysis of this variable is shown in Table 3. As indicated in Table 3; the highest mean scores is item number 8, "I always remember my obligations to the Creator." (4.67), while item number 3, "I make sure that my Continuing Professional Development

(CPD) is always 50 hours or more per year” has the lowest mean scores (3.68) with medium level of acceptance. The other items yielded high score with the mean score ranged from 3.97 to 4.60. The overall mean scores for professional of engineer are 4.20. It shows that engineers are highly professional in their profession as an engineer.

Table 3: Mean scores for Professional of Engineer

No.	Items	Mean	S.D	Level
1	I am competent in the basic knowledge of engineering.	4.09	.633	High
2	I am able to use the basic knowledge in my engineering profession.	4.10	.634	High
3	I make sure that my Continuing Professional Development (CPD) is always 50 hours or more per year.	3.68	.872	High
4	I emphasize ethic in completing any task given to me.	4.36	.580	High
5	I demonstrate professional attitude in every task.	4.34	.560	High
6	I am able to meet customers' needs.	4.15	.584	High
7	I always understand my responsibility to the community.	4.35	.584	High
8	I always remember my obligations to the Creator.	4.67	.506	High
9	I am capable of providing good technical report.	4.15	.581	High
10	I am not face communication problem with the customers.	4.03	.814	High
11	I am proficient in using Malay language in my daily work.	4.60	.530	High
12	I use English language in my work.	3.97	.797	High
13	I understand the work culture of various ethnics.	4.20	.583	High
14	I am capable to adapt in various working environment.	4.21	.582	High
15	I use knowledge to perform task.	4.28	.508	High
16	I use experience to perform task.	4.30	.534	High
17	I am capable to make rational decision.	4.15	.588	High
18	I am capable to make effective decision.	4.10	.552	High
19	I am able to find information using latest methods and techniques.	4.16	.558	High
20	I always prioritise innovative in my work outcome.	4.11	.565	High
	Overall mean scores for Professional of Engineer	4.20	.398	High
	n = 248			

Universal Ethics

20 items were developed to measure the aspect of universal ethics. The descriptive statistical analysis of the items for universal ethics is shown in Table 4. The highest mean score is item number 3, “I never received bribes during my service.” (4.69), followed by item number 20, “One should not belittle the ability of others during work.” (4.60). Item number 8, “I work without feeling tired and bored” has the lowest mean scores (3.90) even though it is in the high level of acceptance. The overall mean score for universal ethics is 4.30. This indicates that engineers applying universal ethics are relatively high as all the 20 items show high level of mean score.

Table 4: Mean scores for Universal Ethics

No.	Items	Mean	S.D	Level
1	I use my time wisely when completing any task.	4.19	.512	High
2	I use public property in accordance with the prescribed rules.	4.26	.562	High
3	I never received bribes during my service.	4.69	.523	High
4	I am not showing off during performing my duties.	4.38	.605	High
5	I did not choose a specific task.	4.22	.705	High
6	I perform tasks regardless of time because my goal is to complete a perfect and good task.	4.15	.732	High
7	I am always responsible for all actions and decisions under my supervision.	4.35	.510	High
8	I work without feeling tired and bored.	3.90	.829	High
9	I am ready to carry out the task entrusted to me.	4.33	.578	High
10	I did not give up in performing the task and always expect for success.	4.30	.556	High
11	I am ready to face challenges in the current changes.	4.30	.509	High
12	I always work diligently and enthusiastically.	4.19	.533	High
13	I am ready to sacrifice time and energy in performing duties in the interests of the nation, religion and country.	4.17	.604	High
14	I am always grateful to perform a given task.	4.33	.542	High
15	I always dressed in clean, neat and tidy to keep the image of engineers.	4.31	.627	High
16	I always follow the rules outlined by the Board of Engineers Malaysia.	4.23	.714	High
17	I often carry out the tasks entrusted collectively.	4.25	.525	High
18	I realize that the ideas gathered in a group are more robust.	4.46	.507	High
19	I like to discuss with colleagues about something related to work.	4.42	.533	High

20	One should not belittle the ability of others during work.	4.60	.506	High
21	I am always fair in carrying out duties.	4.38	.534	High
	Overall mean scores for Universal Ethics	4.30	.366	High
	n = 248			

Correlation between Professional and Universal Ethics

The correlation between universal ethics and professional of an engineer was investigated based on the hypothesis that the universal ethics has a positive and significant relationship towards the engineering professionalism. For this purpose, the findings were drawn from Pearson's Correlation Coefficients using SPSS. Table 5 shows the correlation output for the relationship between professional and universal ethics of the engineers. By employing Pearson correlation coefficients, the results show that universal ethics has a positive and significant relationship towards the engineering professionalism ($r=0.590$, $p<0.01$). A p-value of less than 0.01 indicated that there was a sufficient statistical evidence to accept Hypothesis H1 that . Thus, H1 is accepted.

Table 5: Correlation among Variables			
	Variables	Universal Ethics	Professional of Engineer
Pearson Correlation	Universal Ethics	1	
	Professional of Engineer	0.590**	1
**. Correlation is significant at the 0.01 level (2-tailed).			

CONCLUSION

In conclusion, the findings showed that all variables of professional of engineers correlated significantly with universal ethics. A major data limitation of this study was data from other ethnic groups of engineers was not included in this study. Therefore, all the respondents in this study were Malay Muslim engineers. For a more reliable research, the limitation should be expanded beyond than the Malay Muslim Engineers only. Future research should also focus on developing a model of Professional Engineers. The findings of this study contribute towards the improvement of [Board of Engineers Malaysia \(BEM'S\)](#) existing policy.

LIMITATION AND STUDY FORWARD

This study will be limited to Muslim engineers from the government and private sector in Melaka. Future study should focus on developing a model of Professional Engineers.

ACKNOWLEDGEMENT

Highest gratitude to the Ministry of Higher Education (MOHE) Malaysia and the UniversitiTeknikal Malaysia Melaka (UTeM) for funding the research under research grant FRGS/1/2015/SS105/UTeM/02/1.

REFERENCES

1. Abdullahi, A.I. and Suleiman, M.S. (2015). Impact of religion on entrepreneurial intention of university students in Kano state, Nigeria. Proceedings of ICIC2015 – International Conference on Empowering Civilization in the 21st Century, 6-7 June, University Sultan ZainalAbidin, Malaysia
2. Anthony H. (2010). A new global ethic. Journal of Management Development, 29(5), 506-517.
3. Bertens. K (2003), Etikadan Moral untukPengajianTinggi. Kuala Lumpur: PenerbitUniversiti Malaya.
4. Board of Engineers, M. Registration of Engineers Act 1967 (2015).
5. Burns, N., & Grove, S.K. (1993). The practice of nursing research. Conduct, critique, and utilization. Philadelphia: Saunders.
6. Effendi, T. (2004). Membangun Tata Pemerintahan yang Baik, dalamLayananPublik. EdisiKetigaTahun I.
7. HorácioF., Ana K. &Fafael M. (2009). The ethics of a globalized world: A universal ethic?, Working Papers. School of Economics and Management, Technical University of Lisbon.
8. Herbert Spencer, (1978). The Principles of Ethics, Bil. II. Amerika Syarikat: Liberty Classic Inc.
9. Javed, B., Bashir, S., Rawwas, M. Y. A., &Arjoon, S. (2016). Islamic Work Ethic, innovative work behaviour, and adaptive performance: the mediating mechanism and an interacting effect. Current Issues in Tourism, 3500(April). <http://doi.org/10.1080/13683500.2016.1171830>
10. KetutSudarma(2014). Professional Behaviour Based on The Development of Employees. JurnalDinamikaManajemen, Vol 5 (1).
11. Lee, H., Ciarrochi, J., & Heaven, P. C. L. (2013). The longitudinal relationships between adolescent religious values and personality. Journal of Research in Personality, 47(5), 483–487. <http://doi.org/10.1016/j.jrp.2013.04.010>
12. LitaPermataSari (2012). PengaruhMuatanEtikaDalamPendidikanAkuntansiTerhadapPersepsiEtikaMahasiswa. Journal AkuntansiMultiparadigma.
13. Louis P. Pojman, (1999). Ethics. Amerika Syarikat: Wadsworth Publishing Company.

14. Mastura, Quazi, A., & Blackman, D. (2016). Measuring and validating Islamic work value constructs : An empirical exploration using Malaysian samples. *Journal of Business Research*. <http://doi.org/10.1016/j.jbusres.2016.03.005>
15. Mohd Taib, Norlia K., Mahadi, A.H, Ruziah, A. (2008) *KemahiranInsaniah: 7 KompetensiUnggulMahasiswa*. Melaka: PenerbitUniversitiTeknikal Malaysia Melaka.
16. Mustakim, M.M.N., S.B. Arni and W.W.H Hasniah, 2014. Strategies and factors affecting an implementation of Islamic work ethics: A Case of JCORP. *Global J. Al Thaqafah*, 4: 97-111.
17. National Integrity Plan (2006). Kuala Lumpur: InstitutIntegriti Malaysia.
18. National Society of Professional Engineer. (2018). *Code of Ethics for Engineers*, Virginia: National Society of Professional Engineer.
19. NoorainiSulaiman, Zaharin A, Mastor KA, Basri H. (2016). Relationship Between Factors Influencing Engineer's Adherence to Ethical Practices in Engineering Profession. *Journal of Human Capital Development* 9 (1).
20. Oliver K. B. & John W. (2003). Applying the new software engineering code of ethics to usability engineering: A study of four cases. *Journal of Information, Communication and Ethics in Society*, 1(3). 119-132.
21. PiotrWajszczyk. (2012). *Management and Business Administration. Reflections on Professional Engineering Ethics - A Personalistic Perspective*. PhD theses. I Lodz University of Technology http://repozytorium.p.lodz.pl/bitstream/handle/11652/847/2012_PWajszczyk_.
22. Porter, G. (2010). Work ethic and ethical work: distortions in the American dream. *Journal of Business Ethics*, 96(535), 50.
23. Roger K. D. (2005). The curse of oil! Search for a formula for global ethics. *Managerial Auditing Journal*, 20(8). 789-803.
24. Sabrina, S., &Tanggor, S. (2016). Which One Better Predict Entrepreneurial Intention: Religious Vs Personal Values. *International Conference on Entrepreneurship*, (1), 684–693.
25. SaritaArya. (2016). *Professional Ethics in Engineering*, Conference: International Conference on Integral Development for Wholesome Life, June 2016, Pacific University, Udaipur.
26. Saunders, M., Lewis P. and Thronhill A., 2012. *Research Methods for Business Students*. 6th ed. Pearson Education Limited.
27. Sedarmayanti. (2007). *ManajemenSumberDayaManusia. ReformasiBirokrasidanManajemenPegawaiNegeriSipil*. Bandung: RefikaAditama.
28. The Royal Academy of Engineering. (2011). *Engineering ethics in practice: a guide for engineers*, London: The Royal Academy of Engineering.
29. Zawiah Mat; SitiArniBasir; ZanariahJano. (2015). A Study on Practice of Islamic Professional Ethics in Shaping an Ethical Work Culture within Malaysian Civil Service Sector. *Asian Social Science*, 11(17), 28-34. ISSN 1911-2017.
30. ZawiahMat; SitiArniBasir; ZanariahJano. (2016). Factors Affecting the Practice of Islamic Professional Ethics: A Case of a Public Sector. *International Business Management*, 10(17), 3860–3866. ISSN 1993-5250.