

# A Comparative Study on the Ethical Perceptions of Contractors and Designers in the Malaysian Construction Industry

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## Abstract

Corporate ethics together with CSR is becoming a new requirement for a successful business in the 21<sup>st</sup> century. This trend continues to be strengthened throughout the industry and the construction industry cannot be exceptional. Further the construction industry suffers from the notorious image that the ethical standard in construction cannot meet the expectation of the society. The unique feature of construction is that it is based on projects and the primary stakeholders of construction projects are clients, designers and contractors. Therefore, for construction ethics management, different approaches might be required from other industries. In construction projects, designers and contractors both work for clients, but their roles and responsibilities are quite different in many aspects, and often this leads to confrontational situations during the execution of the projects. This paper investigates the ethical perceptions of designers and contractors in the Malaysian construction industry. 18-major ethical issues have been used in the questionnaire survey. 8-construction companies (contractors) and 8-engineering consulting firms (designers) have been involved in the survey. The ethical issues are ranked based on 'frequency' and 'seriousness' for contractors and designers respectively. In addition the relationship between demographic factors and ethical issues, comparisons between the ethical perceptions of contractors and designers have been analyzed through SPSS. The outcome shows that there is no significant difference between contractors and designers in terms of 'seriousness'. For 'frequency' of ethical issues, there seems to be some differences between them. The result also indicates that demographic factors do not influence the ethical perception. Overall, contractors and designers in Malaysia have similar ethical perceptions despite the differences in their roles and responsibilities in construction projects. This result is in line with the previous researches in UK and South Korea. Future researches in other countries are recommended to establish a theoretical background of ethical perceptions of construction professionals.

**Keywords:** construction, ethics, contractor, designer, Malaysia

# 1. Introduction

Ethics in business is becoming a defining issue of our time, affecting corporate profits and credibility, as well as sustainability of global economy (Dalla Costa, 1998). Construction cannot be excluded from this trend. According to the Bribe Payer Index of Transparency International (TI), public works/construction is the business sector most prone to bribery, followed by arms and defence, and oil and gas (Stansbury, 2003). Further, disastrous consequences of unethical behaviours of construction professionals cannot be underestimated. In 1995, one of the two buildings of Sampoong Department Store in Seoul collapsed from its top floor (5<sup>th</sup> floor above ground) to the bottom basement (-4<sup>th</sup> floor underground). The result was disastrous – 501-deaths, 937-injured and 6-missing. The main causes of this disaster were incorrect construction and negligence in supervision during the construction process and excessive changes in the structure after completion of construction. Incorrect construction resulted in concrete cracks and poor steel reinforcement. Supervision was not properly conducted during the construction process, resulting in poor quality of the finished product. Excessive structural changes after construction were permitted by the local government of which mayor was bribed by Sampoong Department Store and Sampoong Construction. Sampoong Construction which was the branch company of Sampoong Department Store was the main contractor of the structural changes. These relationships allowed excessive structural changes which resulted in structural instability (National Emergency Management Agency in Korea, 2004). These causes are definitely related to ethical standards and practice of construction professionals.

The construction industry requires a different approach to ethics management from manufacturing or factory based industries. In manufacturing or factory based industries, mass production methods are common practice and stakeholders are related to business. However, in the construction industry, most projects tend to be one-off and the stakeholders are related to the project. The major stakeholders in construction are the participants of the project, typically clients, designers (architects/ engineers), contractors, sub-contractors, suppliers and end-users. These participants can have different levels of moral development and ethical standards. Therefore, ethical conflicts can easily arise among these participants unless a certain degree of alignment of ethical standards and values is set throughout a project. In Design-Bid-Build (DBB) projects which are traditional and still most common type of contracts, two major stakeholders in actual production of the project are designers and contractors. Here the designers are the representative of the client whereas the contractor is at the bottom of the hierarchy. Therefore their roles and responsibilities are quite different in many aspects, sometimes leading to confrontational situations. Considering the importance of these two stakeholders in construction projects, it is worth investigating the ethical perceptions of these two professionals.

The aim of this research is to investigate the ethical perceptions of contractors and designers in the Malaysia construction industry, thus comparing them to understand the differences and similarities.

The objectives of this research are to:

- (1) Review and identify current ethical issues in the construction industry.

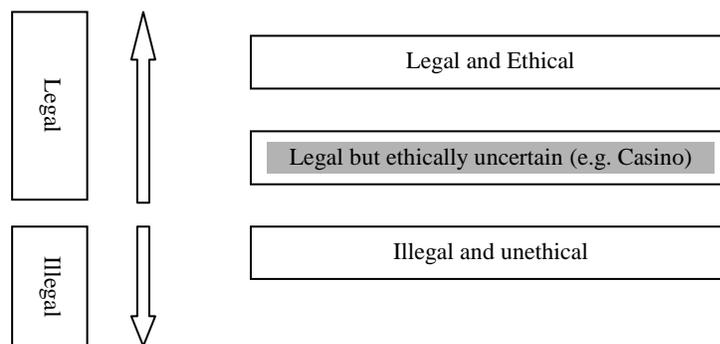
- (2) Investigate the differences in ethical perceptions between contractors and designers in the Malaysia construction industry.
- (3) Analyse the survey outcomes to comprehend the current address of ethical perceptions of the two professionals
- (4) Provide a sound background for further research in construction ethics in Asia.

Malaysia has been chosen as the target country mainly because:

- (1) Malaysia is a multicultural society whose population is composed of 60% Malay, 30% Chinese and 10% of Indian people and this combination can reflect some of possible international participations in construction projects in Asia region.
- (2) As the authors of this research are working in Malaysia, it is relatively easy to acquire accurate data for the research.

## 2. Ethical Issues in Construction

As the classic Ford Pinto case shows, serious consequences might occur if a sole ethical theory is applied to engineering fields (Martin & Schinzinger, 2009 and Harris wt al. 2005). The ethical decisions should be based on harmonized combinations of ethical theories such as end-oriented utilitarianism, mean-oriented deontological theories, virtue ethics etc (Fleddermann, 2008). Especially when ethically uncertain issues can be considered legal, this can lead to conflicts between legality and ethicality (Figure 1). These are the areas where most of ethical dilemmas occur. The ethical dilemmas should be dealt very carefully to avoid further conflicts. There are many definitions on ethics and business ethics. In this paper, construction ethics is defined as *the study of moral standard in construction environments and among the stakeholders of construction projects*. The concept of stakeholder in construction is as important as that in business because construction is based on projects in which the stakeholders are very closely related to each other.



(Adapted from Carroll and Buchholtz, 2003)

**Figure 1: Ethicalness and legality**

The ethical issues in construction have been identified through literature reviews (CIDB, 2009, Fan, 2009, Tow and Loosemore, 2009, Jackson 2005, Zarkada and Skitmore, 2000 and Ray et al., 1999) and these issues have been adopted to be used as the questions in the survey. These issues are comprehensive and detailed enough to represent the ethical issues in the construction industry (Table 1).

**Table 1: Ethical issues in the construction industry**

Issue No.	Description
1	<b>Lack of competence or misinterpretation of competence</b> (Examples: Operating outside one's area of expertise, operating without a license, misleading information, etc.)
2	<b>Lack of quality or quality control of work</b> (Examples: Not satisfying specification, compromising standard, use of low quality material, lack of working manner while performing, etc.)
3	<b>Lack of protection to public's health, safety and welfare</b> (Examples: Poor risk management and assessment, neglect worker's safety, hazardous material, etc.)
4	<b>Lack of protection to the environment</b> (Examples: Action contributing to water, air, sound, etc., pollution, natural resources depletion, etc.)
5	<b>Improper bidding practices</b> (Examples: Bid shopping- disclosing a contractor's bid to another prospective contractor to secure lower bid, Under bid - To make an unnecessarily lower bid, etc.)
6	<b>Improper Bill of quantities practices (BoQ)</b> (Examples: Engineer inflates price in BoQ with intention to collude with successful contractor, etc.)
7	<b>Improper drawings practices</b> (Examples: Engineer includes unnecessary structure or material in drawing in sharing the excess cost with abettor, etc.)
8	<b>Improper political or society involvement, conflict of interest</b> (Examples: Involvement in politic for personal and company's interest, fraud, performing construction services for others' financial, political and personal interest, etc.)
9	<b>Misrepresentation of financial status or records</b> (Examples: Misleading lending institution, bank, client, etc.)
10	<b>Misrepresentation of completed work or value of work</b> (Examples: Adjusting schedule of value, work percentage completed, etc.)
11	<b>Abuse of company resources</b> (Examples: Use of company's telephone, vehicles, facilities, etc, for self-beneficiary, etc.)
12	<b>Abuse of client resources</b> (Examples: Over billing for time and material, excessive charges, etc.)
13	<b>Favouritism, discrimination and harassment</b> (Examples: Bias treatment in favour of race, sex and religion in performing construction practice, sexual harassment, etc.)
14	<b>Mishandle sensitive information</b> (Examples: Revealing or obtaining confidential information such as bid and price, violation of privacy, etc.)
15	<b>Failure to practice whistle-blowing</b> (Examples: Failure to inform any wrongdoing occurring in workplace, no protection given to whistle-blower, etc.)
16	<b>Bribery and corruption</b> (Examples: Making or receiving illegal payment in a form of money or gifts in exchange for favour or influence, etc.)
17	<b>Alcohol and drug abuses</b> (Examples: Consumption of alcohol and drug while on duty, consumption of alcohol and drug off duty which could affect performance while on duty, possession of alcohol and drug at workplace, etc.)

### 3. The Survey Undertaken

A survey was conducted to gather data on the ethical perceptions of contractors and designer in the Malaysian construction industry. In deciding the participating companies of the survey, the adopted selection criteria and procedures were:

- 1) Browse contractor's companies in Construction Industry Development Board (CIDB) of Malaysia
- 2) Browse engineering consultant's firm in The Association of Consulting Engineers of Malaysia;
- 3) The amount and size of completed projects;
- 4) Awards/achievements received; and
- 5) Company website.

Eight contractors and eight consulting firms (designers) were selected. All selected companies were informed in advance by phone call of the intention to carry out survey in their companies. With agreements, 150 questionnaires were distributed to these contractors and consulting firms respectively (total of 300). The questionnaires were collected once they were completed, normally one week or two weeks later.

Questionnaires are divided into two parts. First part contains 18 ethical issues with responses using Likert Scale of 1 to 5. Every issue has two Likert scales, one for seriousness of the issue and the other for frequency of issue. For the Likert scale of seriousness, 1 indicates 'not serious at all', 2 indicates 'fairly serious', 3 indicates 'serious', 4 indicates 'very serious' and 5 indicates 'extremely serious'. Subsequently, for the Likert scale of frequency, 1 indicates 'never', 2 indicates 'rarely', 3 indicates 'sometimes', 4 indicates 'often' and 5 indicates 'very often'. Second part of the questionnaire contains 6 questions. The questions require the participants to fill in their demographic information such as gender, age, working experience, education level, the existence of company codes of ethics and the effectiveness of the codes of ethics.

### 4. Results and Analysis of the Survey

Table 2 shows the response rates from contractors and designers. The response rates are quite good as the questionnaires were directly handed out to/ collected from the survey participants. The statistical analyses have been conducted using the Statistical Package for the Social Sciences, SPSS (version 12). Three major results have been analysed (5.2, 5.3 and 5.4) from the questionnaires. Due to the nature of the data – not normally distributed and not equally variant-, non-parametric tests are adopted instead of parametric tests (Field, 2009).

*Table 2: Response rates of questionnaires for contractors and designers*

	<b>Contractors</b>	<b>Designers</b>	<b>Total</b>
<b>Sent</b>	150	150	300
<b>Received</b>	69	95	164
<b>Response Rates in %</b>	<b>46%</b>	<b>63%</b>	<b>55%</b>

#### **4.1. Significance Level**

The preset significance level in this analysis is 0.05, which is the typical level to decide whether the null hypothesis should be rejected or not. (Chapter 6, Morgan et al, 2004 and Chapter 4, Kerr et al, 2002). So, if  $p \leq 0.05$ , then the null hypothesis of no difference or no relationship would be rejected as it is highly unlikely due to chance. Table 3 shows the significance level in this research.

*Table 3: Significance level*

<b>Significance Level</b>	<b>Null Hypothesis</b>	<b>Interpretation</b>
p=1.00	Do not reject	Not statistically significant (likely due to chance)
p=0.50		
p=0.07		
p<=0.05	Reject	Statistically significant (unlikely due to chance)
p=0.01		
p<0.001		

#### **4.2. Differences of ethical perception within a demographic factor**

Table 4 summarizes the demographic factors used in the survey. The demographic information is categorized into six factors and subdivided into several groups. For example, 'age' has been divided into six sub-groups from '20 and below' to '61 and above'. All six demographic factors have been analyzed by Kruskal-Wallis (K-W) test. These analyses identified ethical differences among each sub-group within the same demographic factors –e.g. whether differences in age range can influence the ethical perceptions.

**Table 4: Ranges of demographic factors**

Gender	Age (Years)	Working Experience	Education	Code of Ethics' Existence in Organization	Effectiveness of Code of Ethics
Male	20 and below	Below 5 years	SPM/ O level	Yes	Yes
Female	20-30	6-10 years	STPM/A level	No	No
	31-40	11-15 years	College diploma		
	41-50	16-20 years	University's bachelor degree		
	51-60	Above 20 years	Master's degree		
	61 and above		PhD		

The Kruskal-Wallis (K-W) test compares the mean ranks within a demographic factor. If the test statistics shows statistical significance ( $p \leq 0.05$ ), then it can be interpreted that there is an overall difference among the range groups in the chosen demographic factor. On the other hand, if the test statistics shows no statistical significance ( $p > 0.05$ ), then the overall difference is highly unlikely. The K-W test, in this research, has provided a tool to investigate the differences in ethical perceptions among the ranges of a demographic factor. Table 5 summarizes the outcome for Kruskal-Wallis test for all the demographic factors. It can be seen that only frequency of 'Effectiveness of Code of Ethics' within the contractors' groups has significant difference when tested at 0.05 (shaded in table 5).

**Table 5: Output for Kruskal-Wallis test**

	Contractors		Designers	
	Seriousness	Frequency	Seriousness	Frequency
<b>Gender</b>	H*(1)=0.001 P=0.971	H(1)=0.045 P=0.833	H(1)=1.632 P=0.201	H(1)=0.053 P=0.819
<b>Age</b>	H(4)=1.791 P=0.774	H(4)=3.567 P=0.468	H(3)=6.951 P=0.073	H(3)=3.749 P=0.290
<b>Working Experience</b>	H(4)=1.582 P=0.812	H(4)=3.623 P=0.459	H(4)=4.292 P=0.368	H(4)=2.594 P=0.628
<b>Education</b>	H(4)=3.722 P=0.445	H(4)=4.964 P=0.291	H(3)=1.424 P=0.700	H(3)=1.092 P=0.779
<b>Code of Ethics' Existence in organization</b>	H(2)=2.054 P=0.358	H(2)=1.145 P=0.564	H(2)=3.356 P=0.187	H(2)=0.705 P=0.703
<b>Effectiveness of Code of Ethics</b>	H(2)=0.946 P=0.623	H(2)=7.426 P=0.024	H(2)=0.349 P=0.840	H(2)=0.561 P=0.756

\*H: Test statistic for Kruskal-Wallis test

### 4.3. Correlations between ethical perception and demographic factors

To reconfirm the findings from Kruskal-Wallis test and investigate whether there are statistically significant relations between mean of seriousness and frequency and the demographic factors, the Spearman correlations were computed. For example the correlations between ‘age’ and ‘ethical perception’ have been analyzed to check whether ages are related to ethical perceptions. Table 6 summarizes the outcomes of Spearman correlation between mean of seriousness and frequency and the demographic factors. Applying significance level of  $p=0.05$ , only designers’ mean of seriousness and ‘age’ factor is significantly correlated (shaded in Table 6).

*Table 6: Results of Spearman correlation between mean of seriousness and frequency and demographic factors*

	Contractors		Designers	
	Mean of Seriousness	Mean of Frequency	Mean of Seriousness	Mean of Frequency
<b>Age</b>	$r_s^*(69)=0.023$ P=0.848	$r_s(69)=-0.084$ P=0.493	$r_s(95)=-0.218^{**}$ P=0.034	$r_s(95)=-0.153$ P=0.138
<b>Working Experience</b>	$r_s(69)=-0.085$ P=0.486	$r_s(69)=-0.104$ P=0.394	$r_s(95)=-0.201$ P=0.051	$r_s(95)=-0.137$ P=0.186
<b>Education</b>	$r_s(69)=0.078$ P=0.524	$r_s(69)=0.210$ P=0.083	$r_s(95)=-0.103$ P=0.359	$r_s(95)=-0.086$ P=0.444

\*Spearman’s Correlation coefficient

\*\*Correlation is significant at the 0.05 level (2-tailed)

(Gender, existence and effectiveness of code of ethics are excluded as the ranges are independent from each other –i.e. ‘male’ vs. ‘female’ and ‘yes’ vs. ‘no’)

### 4.4. Ethical perception of contractors and designers

Table 7 and 8 show ‘mean, standard deviation, rank’ of the issues in terms of seriousness and frequency from contractors and designers. For example, the differences of ethical perception on ‘Q1: lack of competence or misinterpretation of competence’ have been analysed between contractors and designers. These analyses have been conducted on the 18 ethical issues and mean values. The most serious ethical issue from contractors is ‘bribery and corruption’ and from designers it is again ‘bribery and corruption’. The most frequent ethical issue for contractors is ‘abuse of company resources and from designers it is’ lack of protection to the environment’.

**Table 7: Seriousness, frequency and importance of ethical issues (Contractors)**

Ethical Issues	Seriousness			Frequency			Importance	
	Mean	Stdev*	Rank	Mean	Stdev	Rank	Value	Rank
Bribery and corruption	3.942	1.110	1	3.101	1.202	6	12.226	<b>1</b>
Lack of protection to the environment	3.681	1.078	6	3.319	1.022	2	12.217	<b>2</b>
Improper political or society involvement, conflict of interest	3.826	0.999	2	3.159	1.120	4	12.088	<b>3</b>
Abuse of company resources	3.522	1.066	12	3.377	1.214	1	11.892	<b>4</b>
Lack of quality or quality control of work	3.652	1.012	8	3.232	0.860	3	11.803	<b>5</b>
Failure to practice whistle-blowing	3.652	0.888	7	3.058	1.149	8	11.168	<b>6</b>
Lack of protection to public's health, safety and welfare	3.710	1.139	5	2.986	0.993	9	11.077	<b>7</b>
Improper bidding practices	3.638	0.907	10	2.928	1.048	11	10.649	<b>8</b>
Abuse of client resources	3.725	1.013	4	2.855	1.019	13	10.634	<b>9</b>
Lack of competence or misinterpretation of competence	3.420	0.976	16	3.058	0.856	7	10.459	<b>10</b>
Mishandle sensitive information	3.551	1.092	11	2.870	1.028	12	10.189	<b>11</b>
Improper bill of quantities practices (BoQ)	3.449	1.051	14	2.928	0.913	10	10.098	<b>12</b>
Misrepresentation of completed work or value of work	3.217	0.838	18	3.116	0.814	5	10.025	<b>13</b>
Misrepresentation of financial status or records	3.435	0.962	15	2.725	0.922	15	9.359	<b>14</b>
Favouritism, discrimination and harassment	3.449	1.022	13	2.710	1.126	16	9.348	<b>15</b>
Improper drawings practices	3.333	0.965	17	2.754	0.881	14	9.179	<b>16</b>
Alcohol and drug abuses	3.652	1.359	9	2.507	0.949	17	9.157	<b>17</b>
Workplace violence	3.754	1.355	3	2.377	0.956	18	8.922	<b>18</b>
<b>Average of Mean</b>	<b>3.589</b>			<b>2.948</b>			10.583	
<b>Stdev of Mean</b>	0.182			0.266			1.136	

The importance values in Table 7 and Table 8 are obtained by multiplying mean of seriousness and mean of frequency in each issue. Both contractors and designers view 'bribery and corruption' and 'lack of protection to the environment' to be the two most important ethical issues. If average mean of all the issues are taken into account, contractors and designers ethical perceptions are quite similar (difference of  $0.216=3.589-3.373$  for seriousness and  $0.234=2.948-2.714$  for frequency).

**Table 8: Seriousness, frequency and importance of ethical issues (Designers)**

Ethical Issues	Seriousness			Frequency			Importance	
	Mean	Stdev*	Rank	Mean	Stdev	Rank	Value	Rank
Lack of protection to the environment	3.747	1.010	2	3.442	1.028	1	12.899	1
Bribery and corruption	3.937	1.156	1	3.189	1.416	3	12.556	2
Lack of quality or quality control of work	3.611	1.075	4	3.253	0.922	2	11.744	3
Lack of protection to public's health, safety and welfare	3.737	1.084	3	3.116	0.999	4	11.643	4
Improper bidding practices	3.442	1.182	6	3.032	1.153	6	10.435	5
Improper political or society involvement, conflict of interest	3.516	1.237	5	2.905	1.238	7	10.214	6
Lack of competence or misinterpretation of competence	3.379	1.187	8	2.832	0.781	8	9.568	7
Failure to practice whistle-blowing	3.400	1.115	7	2.726	0.994	11	9.269	8
Abuse of company resources	3.011	1.067	18	3.063	1.119	5	9.222	9
Abuse of client resources	3.126	1.094	16	2.737	1.023	10	8.556	10
Misrepresentation of completed work or value of work	3.042	1.041	17	2.779	0.936	9	8.454	11
Favouritism, discrimination and harassment	3.347	1.270	9	2.505	1.061	13	8.386	12
Improper bill of quantities practices (BoQ)	3.211	1.262	13	2.579	1.017	12	8.280	13
Mishandle sensitive information	3.232	1.340	12	2.358	0.944	14	7.620	14
Misrepresentation of financial status or records	3.147	1.229	15	2.316	0.926	15	7.289	15
Improper drawings practices	3.179	1.353	14	2.200	0.974	16	6.994	16
Alcohol and drug abuses	3.347	1.486	10	1.947	0.972	17	6.519	17
Workplace violence	3.305	1.544	11	1.874	0.970	18	6.193	18
<b>Average of Mean</b>	<b>3.373</b>			<b>2.714</b>			9.213	
<b>Stdev of Mean</b>	0.256			0.447			2.026	

The Mann-Whitney (M-W) test is used to statistically compare the differences between contractors and designers, as the M-W test is developed to compare two different conditions. The comparisons have been made in frequency and seriousness of the ethical issues. From table 9, it can be seen that only question 11 and 12 (shaded in Table 9) produce significant difference between contractors and designers in term of seriousness when tested at 0.05. However in terms of frequency, there are seven issues with significant difference between contractors and designers (shaded in Table 10).

**Table 9: Output for Mann-Whitney Test (Seriousness)**

	<b>Mann-Whitney U</b>	<b>Wilcoxon W</b>	<b>Z</b>	<b>Asymp. Sig. (2-tailed)</b>
<b>Q1</b>	3241.000	7801.000	-0.126	0.900
<b>Q2</b>	3216.500	7776.500	-0.211	0.833
<b>Q3</b>	3257.000	7817.000	-0.071	0.943
<b>Q4</b>	3199.000	5614.000	-0.273	0.785
<b>Q5</b>	2970.000	7530.000	-1.064	0.287
<b>Q6</b>	2943.000	7503.000	-1.150	0.250
<b>Q7</b>	3124.500	7684.500	-0.525	0.600
<b>Q8</b>	2848.000	7408.000	-1.484	0.138
<b>Q9</b>	2851.500	7411.500	-1.470	0.142
<b>Q10</b>	2989.000	7549.000	-1.008	0.313
<b>Q11</b>	2485.500	7045.500	-2.732	0.006
<b>Q12</b>	2305.500	6865.500	-3.354	0.001
<b>Q13</b>	3208.000	7768.000	-0.239	0.811
<b>Q14</b>	2863.500	7423.500	-1.417	0.156
<b>Q15</b>	2908.500	7468.500	-1.284	0.199
<b>Q16</b>	3256.000	5671.000	-0.075	0.940
<b>Q17</b>	2897.000	7457.000	-1.307	0.191
<b>Q18</b>	2755.000	7315.000	-1.804	0.071
<b>Mean of Seriousness</b>	2832.000	7392.000	-1.485	0.138

**Table 10: Output for Mann-Whitney Test (Frequency)**

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
<b>Q1</b>	2836.000	7396.000	-1.611	0.107
<b>Q2</b>	3136.500	5551.500	-.498	0.619
<b>Q3</b>	3030.500	5445.500	-.862	0.388
<b>Q4</b>	2974.000	5389.000	-1.057	0.291
<b>Q5</b>	3072.500	5487.500	-.708	0.479
<b>Q6</b>	2668.500	7228.500	-2.134	0.033
<b>Q7</b>	2167.500	6727.500	-3.899	0.000
<b>Q8</b>	2897.500	7457.500	-1.303	0.192
<b>Q9</b>	2535.000	7095.000	-2.599	0.009
<b>Q10</b>	2635.500	7195.500	-2.294	0.022
<b>Q11</b>	2851.000	7411.000	-1.465	0.143
<b>Q12</b>	3078.500	7638.500	-.692	0.489
<b>Q13</b>	2909.000	7469.000	-1.276	0.202
<b>Q14</b>	2431.500	6991.500	-2.961	0.003
<b>Q15</b>	2786.000	7346.000	-1.731	0.083
<b>Q16</b>	3124.000	5539.000	-.523	0.601
<b>Q17</b>	2191.000	6751.000	-3.802	0.000
<b>Q18</b>	2266.000	6826.000	-3.562	0.000
<b>Mean of frequency</b>	2650.500	7210.500	-2.090	0.037

## 5. Conclusion

This research has investigated the ethical perceptions of contractors and designers in the Malaysia construction industry, analysing 18-ethical issues in terms of ‘seriousness’ and ‘frequency’ and 6-demographic factors of the survey participants. The main findings of this research together with the rankings of ethical issues (Table 7 & 8) are summarised below.

1. Kruskal-Wallis tests have shown that there is virtually no significant difference within the sub-groups of the demographic factors in terms of mean of seriousness and mean of frequency of ethical issues from both contractors and designers. –e.g. differences in age range (sub-group) do not influence ethical perceptions of contractors and designers.
2. Spearman correlation tests have shown that there is practically no significant correlation between demographic factors and mean of seriousness and mean of frequency of the ethical issues from

both contractors and designers again. – e.g. differences in age do not influence ethical perceptions of contractors and designers. This reconfirms the outcome of Kruskal-Wallis tests.

3. Mann-Whitney tests have shown that overall there are no significant difference between the perceptions of contractors and designers on the seriousness of ethical issues, though the frequency of ethical issues tends to have some differences between contractors and designers.

The SPSS analysis has shown that there is virtually no difference in the way contractors and designers perceive ethical issues in the Malaysia construction industry, especially in seriousness of ethical issues. Only two issues out of eighteen are statistically different. Moreover, the analysis shows that demographic factors such as gender, age, education, experience, existence of code of ethics and effectiveness of code of ethics do not influence the ethical perceptions among contractors and designers in Malaysia. The outcome of this research can be in line with Kang (2009)'s research in that the most influencing factor for the ethical perceptions of contractors and designers can be nationality not the demographic factors. Kang (2009) compared UK construction and Korea construction, subdividing them into contractors and designers as is in this research. In case of frequency of ethical issues, this research shows some inconsistency from Kang (2009)'s research, indicating about 40% (7-issues out of 18) of ethical issues are different between contractors and designers in Malaysia.

To understand and possibly generalize the ethical perceptions of construction professionals, further investigations will be required. Corporate ethical climate/ culture and national culture need to be dealt in depth, in order to identify the causal relationship between culture and ethics in the construction industry. This can be the second phase of the research. Also in this research, the geographical boundary is limited to Malaysia and this can be again expanded to other countries in Asia. A systematic approach on ethics training programme needs to be developed to enhance the ethicality of construction professionals. In addition practical codes of ethics and ethical decision making processes should be established to implement a comprehensive ethics management programme at the corporation and project level. The term 'ethics' has a long history but in this digital era it needs to be updated and customised to suit the needs of the individual industries and the construction industry, considering the importance in the society, should be in the front line of this evolution.

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