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Determinant Factors of UiTM Graduates' Performance

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Graduates performance has become main agenda not only by higher learning institutions, but also among the employers. As a supplier to the job market, all higher learning institutions in Malaysia have continuously revised their academic programs to meet the requirement of the industry. UiTM, as one of the major contributors of graduates in the job market, has ensured that the academic programs offered are at the highest standard possible to meet the needs of the industry. However, offering high quality academic programs alone is not sufficient. It is crucial to ensure the performance of the graduates meet the employers' expectation. Thus, understanding the determinants factors that contributes to the graduates' performance are important as part of the continuous improvement in academic management. The purpose of this study is to explore the factors that contribute to UiTM graduates' performance. The determinants factors investigated in this study, includes both the students' demographic profile (gender, household income level, residing location) and the institutional factor (campus region). 13,589 samples were selected from "Data Pelajar Tamat UiTM" bachelor degree students from 2006 to 2016. Data was analysed using Descriptive Statistics, Mann Whitney and Kruskal Wallis analysis. Descriptive statistics showed that majority of the graduates were from the B40 group (78.9%) and 64.2% of the graduates earned CGPA more than 3.00. Findings showed the performance between male and female graduates differs and the graduates residing in the urban areas outperformed those from rural. Findings also revealed similar performance among graduates in the group of M40 and T20. Comparing B40 group against M40 and T20, the results showed statistically significant differences in CGPA of the graduates. These findings provide evidence on the ability of the university in transforming the bumiputeras society to a higher platform, in-line with UiTM's mission to enhance the knowledge and expertise of bumiputeras.

Key words: *Academic Performance, Demographic Profiles, Institutional Factors, Higher Learning Institutions, Non-Parametric.*

Introduction

Higher learning institutions play an important role in producing graduates that meet employers' expectations. Graduates employability becoming a significant concern not only among the universities, but also the job market. University Teknologi MARA (UiTM) is the largest university in Malaysia continuously offering quality academic programmes in order to remain relevance in the industry. However, relying on the quality of the academic programmes offered alone is not sufficient. Managing other factors such as entry requirements and the students' demographic profile are also important to ensure the universities are able to produce quality graduates that meet demand from the industry

Effectiveness of an academic institution is commonly measured using the achievement of its graduates. However, the achievement of the graduates is influenced by various factors including students socio-economic background, demographic, family background, and prior academic background. Besides students' demographic profiles, institutional factors such as entry requirements to academic programs admission and campus location are also believed the determining factors to students' performance (Deidra, 1998). This study is carried out to explore how those factors associated to UiTM students' performance.

Literature Review

One of the main UiTM's objectives is to provide maximum opportunities for bumiputeras to pursue professionally-recognised academic programmes[1]. Since its development (previously known as Institut Teknologi MARA), UiTM has provided opportunity specifically to the lower income bumiputera to obtain higher education, which in turn, helps to improve their living. UiTM's mission to enhance the knowledge and expertise of Bumiputeras in all fields of study is to support one of the national agenda for bumiputeras. To date, UiTM has produced more than 800,000 graduates from 515 academic programs in 35 campuses throughout Malaysia[2]. The success of UiTM graduates' have been evidenced through recognition from the industries. This recognition also provides evidence on the effectiveness of this academic institution in managing its academic program. For continuous improvement in the management of academic programs, this study further investigated the various factors relating to students' demographic profile that may contribute to the students' performance. This study also investigated the

[1] https://www.uitm.edu.my/index.php/en/about-uitm/university-profile/motto-vision-philosophy-objectives
[2] https://www.uitm.edu.my/index.php/en/9-about-uitm/363-uitm-facts-and-figures

institutional factors such as the entry requirements for academic programs admission as well as campus location which may contribute to students' performance.

The most common method to measure students' performance is through their academic performance, i.e., cumulative grade point average (CGPA). Higher CGPA obtained by the students the better the students' performance is perceived. Some studies have utilised CGPA as a medium to measure students' performance. For example, Nonis and Hudson (2010) used CGPA to measure students' academic performance in their study on students' study time and habit of students with the academic performance. Many studies also suggest that, demographic profiles such as, gender of the students also could become determining factors of students' performance (Ali, et al., 2009; and Lacour & Tissington, 2011)

Various studies (for example, Ali, et al., 2009; Lacour & Tissington, 2011; Rumberger & Thomas, 2000) looks at the demographic factors and student's performance. Ali et.al (2009) had tested five hypotheses on the relationship between (1) demographic factors and students' performance, (2) active learning and students' performance, (3) students' attendance and students' performance, (4) involvement in extracurricular activities and students' performance and (5) course assessment and students' performance. They consider gender, age, English result in SPM, parent's income, father's education, and mother's education level as demographic factors influencing the student's Cumulative Grade Points Average (CGPA). The results suggest a positive correlation between demographic factors and the CGPA.

Rumberger and Thomas (2000) suggest that social-class composition of schools had a strong effect on school dropout rates but not on turnover rates. This is supported by Lacour and Tissington (2011) which highlights poverty significantly affects the resources available to students which cause many students struggle to reach the same academic achievement levels of students not living in poverty. Mushtaq and Khan (2012) stated that family stress negatively affected the students' performance.

Previous studies have also found the school location (either in urban or rural area) as one of the factors that determine students' performance. Deidra (1998) examined the differences in student achievement between rural and urban schools in Western Australia. She found that the location of the school had a significant effect on student achievement, with students attending rural schools not performing as well as students from urban schools. A study by Tayyaba (2012) in Pakistan across four provinces focusing on four core subjects highlights rural and urban students had comparable levels of achievement but with mixed results depending upon variation in schools' condition, students' home background and teachers' characteristics.

Traditionally academic performance is relatable to gender of the students. Gender is one of the factors regularly mentioned in the literature to have considerable effects on students' academic

performances, especially in science subjects. Gender is the range of physical, biological, mental and behavioural characteristics pertaining to and differentiating between the feminine and masculine (female and male) population. Evidence from University Malaya as studied by Alfan and Othman (2005) resulted that female students achieved better CGPA than male students. Current research done by Alanzi (2018) in Kuwait also gave evidence that female students were superior rather than male students in terms of academic performance.

Research by Adigun, et al. (2015) on the relationship between student's gender and academic performance in computer science in New Bussa, Borgu local government of Niger state showed higher deviation around the mean of the male students revealed that the performances of the male students are not as uniform as the female students that is, the entire female students have similar performances as opposed to the male students. This explains the reason why the male students' better performances are not significant because the sets of male students with good performances and the sets with bad performances did so most likely due to certain variables which are treatments the students are exposed to, which necessitated the reason this study measures the gender performances in private and public schools. Finding by Adigun et al. (2015) is consistent with the findings by Jegede and Amp; Lyang (1990), Mordi (1992); Chin-Tin (1993); Fabunmi (2004); and Dania (2014), that students' performance is not determined by gender in terms of the interaction of gender and treatment on students' academic achievement.

Another study examines gender differences existing in various cognitive motivational variables (causal attributions, academic goals, academic self-concept and use of significant learning strategies) and in performance attained in school showed the existence of gender differences in variables under consideration. Female students showing lower levels of extrinsic motivation, taking more responsibility for their failures, using information processing strategies more extensively, and getting better marks in Language Arts. Gender differences were not found in academic self-concept, in-intrinsic motivation, in success-related attributions and in performance attained in Mathematics. However, Nenty (2010) found that gender of students had no significant influence on students' attribution of their performance in mathematics.

Methodology

Data Description

The purpose of this study is to explore the factors that determine UiTM students' performance. Sample is selected from graduates of the Faculty of Computer Science and Mathematics (FSKM). FSKM is one of 26 faculties in UiTM. It offers 13 bachelor degree programs. Secondary data was collected from "Data Pelajar Tamat UiTM" for all FSKM bachelor degree students from 2006 to 2016 (13,589).

The data comprises of students' performance (CGPA), gender, household income, residence location, program entry level requirement and UiTM campus location which are the variables of the study. Students' performance is measured using the cumulative grade point average (CGPA). Gender is categorised into males and females. Household income is categorised into three levels; that is B40, M40, and T20. B40 indicates income below RM3000, M40 earns income ranging from RM3000 to RM9999, T20 earns income above RM10000. Residence location is divided into urban and rural. This category is decided upon which "Mukim" the respondent resides, identified by the Department of Statistics Malaysia (DOSM). Mukim with more than 10,000 populations is considered as urban (DOSM, 2011). Program entry levels are Diploma UiTM (E1), Diploma from other higher learning institutions (E2), "Lepasan Matrikulasi KPM/ASASI/PASUM" (E3), and Others (E4). The final variable is the campus location. The campus location is where the program is offered. The programs are offered at various campuses namely: UiTM Shah Alam, UiTM Kampus Tapah, UiTM Kampus Sungai Petani, UiTM Kampus Seri Iskandar, UiTM Kampus Seremban 3, UiTM Kampus Machang, UiTM Kampus Kuala Terengganu (Cendering), UiTM Kampus Kota Bharu, UiTM Kampus Jengka, UiTM Kampus Jasin, UiTM Kampus Dungun and UiTM Kampus Arau. The campuses were grouped into four regions; Central Region (CR), Southern Region (SR), Northern Region (NR) and Eastern Region (ER).

Table 1: Variable Measuements

No.	Attributes	Description	Value
1	**Gender**	Gender of the graduates	1 (Male), 2 (Female)
2	**Household Income**	Household income classification	1 (B40), 2 (M40), 3 (T20)
3	**Residence Location**	Mukim which the graduates reside	1 (Urban) , 2 (Rural)
4	**Entry Requirement**	Program entry levels	E1 (Diploma UiTM), E2 (Diploma from other higher learning institutions), E3 (Lepasan Matrikulasi KPM/ASASI/PASUM), E4 (Others)
5	**Campus Region**	Assigned code reflecting the campus region where the program is offered	NR (Northern Region; UiTM Kampus Arau,UiTM Kampus Sungai Petani,UiTM Kampus Seri Iskandar,UiTM Kampus Tapah), CR (Central Region; UiTM Shah Alam), SR (Southern Region; UiTM Kampus Jasin, UiTM Kampus Seremban 3), ER (Eastern Region; UiTM Kampus Jengka,UiTM Kampus Machang, UiTM Kampus

			Kota Bharu,UiTM Kampus Dungun, UiTM Kampus Kuala Terengganu (Cendering)
6	**CGPA**	Range of cumulative average grade points earned up to the present semester	1 (2.00 - 2.49), 2 (2.50 - 2.99), 3 (3.00 - 3.49), 4 (3.50 - 4.00)

Data was analysed using IBM SPSS version 25. Prior to the analysis, data were screened to identify any missing values for the variables. Missing values were found for household income. Following Roziah Janor (2003), missing values can be imputed using Expectation-Maximization (EM) algorithm, mean or median. For household income, median values of the classes were used to replace the missing data point. For example, a range of 4000-4999, the mid-range is 4500. The value of 4500 was assigned for this range. Since the data scale for this variable is ordinal, the median is used instead of mean to replace the missing values. The main hypothesis for this study can be described as an equation (1).

$H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5$
$H_A: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5$

The generic hypothesis for this study as described in equation (1) can be written in five different set of hypotheses to test the mean or median performance differences among gender, residence location, household income, entry requirement, and campus location of the graduates.

H_{01} The mean CGPA is the same across categories of different gender
H_{A1} The mean CGPA is not the same across categories of different gender

H_{02} The mean CGPA is the same across categories of residence location
H_{A2} The mean CGPA is not the same across categories of residence location

H_{03} The mean CGPA is the same across categories of Household Income
H_{A3} The mean CGPA is not the same across categories of household income

H_{04} The mean CGPA is the same across categories of entry requirement
H_{A4} The mean CGPA is not the same across categories of entry requirement

H_{05} The mean CGPA is the same across categories of campus location
H_{A5} The mean CGPA is not the same across categories of campus location

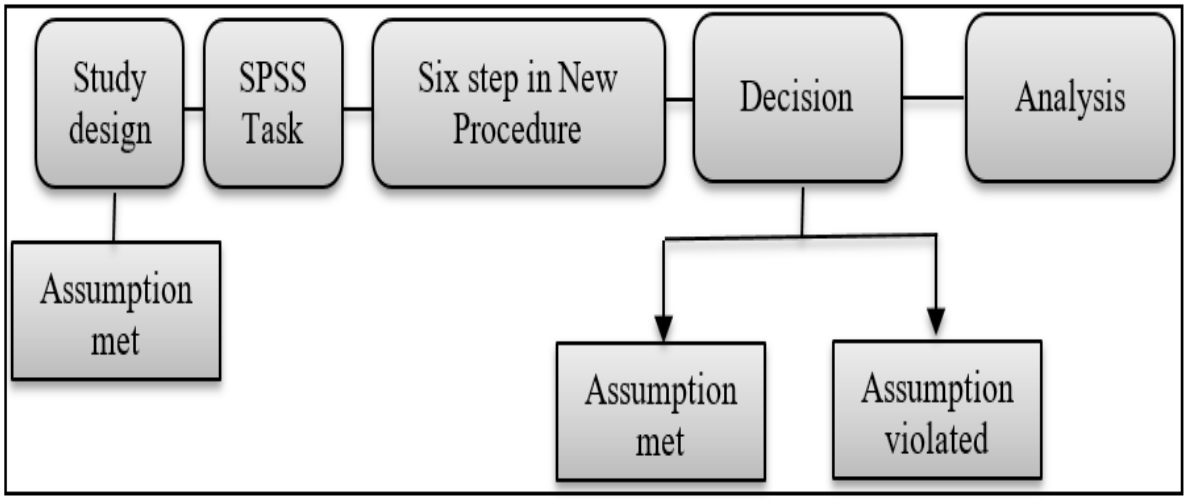
Statistical Test Analysis

Test of normality was conducted with Kolmogorov-Smirnov test as our data is 13,589. Dependent variable is not approximately normally distributed for each category of the independent variable, in such case use non-parametric methods because no assumptions about distribution. To answer the first two sets of hypotheses, the Mann-Whitney U test was used, while the remaining three sets employed the Kruskal-Wallis H test.

Mann Whitney U Test

The four assumptions of the Mann-Whitney U test include three that are related to this study design and one that is determined by the nature of the data. These are discussed in turn: Assumptions about study design: Three of the four assumptions of the Mann-Whitney U test relate to this study design are: (a) have a continuous or ordinal dependent variable; and (b) independent variable is categorical with two groups; and (c) independence of observations. Assumptions about the data: The fourth assumption involves using SPSS Statistics to help determine whether the two distributions have the same shape. Figure 1 shows the overall of Mann Whitney U Test Process.

Figure 1. Mann Whitney U Test Process

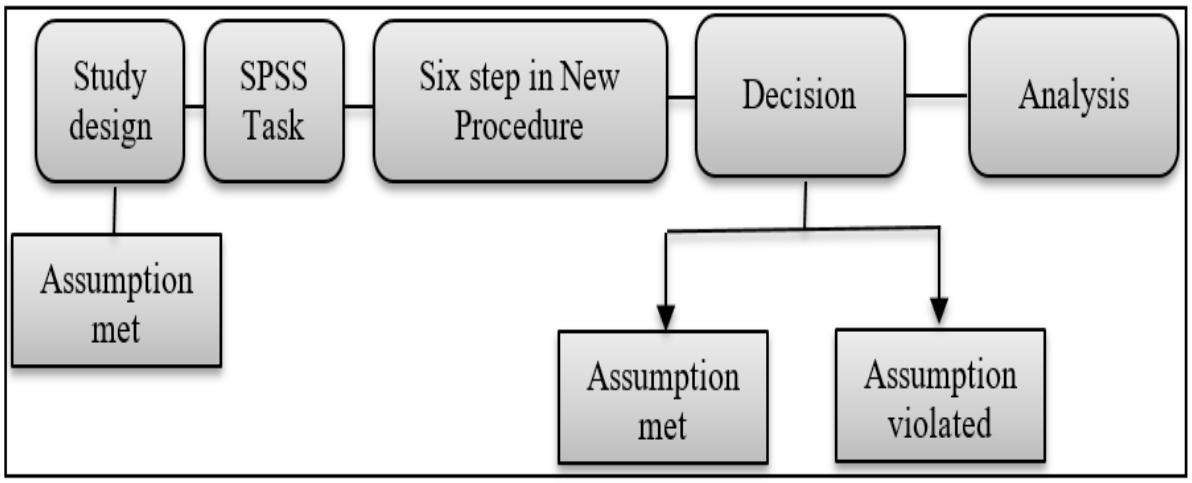


There are two different procedures in SPSS Statistics that can be used to run a Mann-Whitney U test: a legacy procedure and a 'new' procedure. However, this study employs the new procedure. The new procedure involves fewer steps in SPSS Statistics than the legacy procedure which involve testing for the assumption of the Mann-Whitney U test in one go. Therefore, after we have run the Mann-Whitney U test using the new procedure, we have lesser procedure to run in SPSS Statistics. Next, we add in the mean rank values that are found in the population pyramid chart (default chart produced by SPSS Statistics' new nonparametric test procedure) because our data violated at the fourth assumption, such that the distributions of the two groups of independent variables were not similarly shaped. Data was determined whether the mean rank for one group of the independent variable is higher or lower than another group in terms of the dependent variable.

Kruskal Wallis H Test

In order to run a Kruskal-Wallis H test, the following four assumptions must be met. The first three was related to our choice of study design, whilst the fourth reflects the nature of the data. These are discussed in turn: (i) have one dependent variable that is measured at the continuous or ordinal level; (ii) have one independent variable that consists of two or more categorical, independent groups; (iii) have independence of observations, which means that there is no relationship between the observations in each group of the independent variable or between the groups themselves; and (iv) determine whether the distribution of scores for each group of your independent variable. Figure 2 shows the overall of Kruskall Wallis H Test Process.

Figure 2. Kruskal Wallis H Test Process



There are two different procedures in SPSS Statistics that can be used to run a Kruskal-Wallis H test: a legacy procedure and a 'new' procedure. This study employs the new procedure. The new procedure involves fewer steps in SPSS Statistics than the legacy procedure and testing

for the assumption of the Kruskal-Wallis H test in one go. Therefore, after we have run the Kruskal-Wallis H test using the new procedure, we have lesser procedure to run in SPSS Statistics. In this study, we found that two (household income and entry requirement) data met and one (campus region) violated at the fourth assumption. These are discussed in turn; (i) the data met at the fourth assumption, such that the distributions of the dependent variable for the three or more groups of the independent variables are similarly shaped. Data was determined whether there are any statistically significant median differences between the three or more groups of the independent variables in terms of the dependent variable. In order to get medians, we generated the medians using the Means procedure; and (ii) the data violated at the fourth assumption, such that the distributions of the dependent variable for three or more groups of independent variables were not similarly shaped. Data was determined whether the mean ranks for one group of the independent variables are higher or lower than the groups in terms of the dependent variable. In order to get the mean ranks, we need to run the legacy procedure.

Results and Discussion

The objective of the study is to explore factors determining the performance of the bachelor degree students from the computer and mathematical sciences program. In order to achieve the objective of this study, data was analysed using descriptive statistics and hypothesis testing using the Mann Whitney U test and Kruskal Wallis H test.

Descriptive Statistics

Descriptive analysis is performed for all the dependent and independent variables in this study. Table 2 shows the descriptive statistics for all variables considered in the study. Results indicate the majority of the graduates are female (9,492), which represents 69.9%. Descriptive analysis shows 78.9% graduates come from B40 group, while only 2.1% are from T20. Residence location variable, 87.7% of the graduates are from urban areas as compared to only 12.3% of those who are from rural areas. As shown in table 2, the majority of the graduates enrolled into the program with the diploma qualifications, 71.9% are E1, and 1.2% is E2, while 25.2% are those who came into the program with foundation qualification. In terms of campus region, 61.9% of the graduates are in the group of CR, followed by SR with 16.9%, ER with 11.6% and NR with 9.6%. Result for the dependent variable measured with CGPA shows that 64.2% of the graduates earned more than 3.00.

Table 2: Descriptive statistics

		Variables	N	Percentage (%)	Mode	Median	Mean	Std. Dev.
Gender								
	Male		4097	30.1				
	Female		9492	69.9				
	Total		13589	100	2	2	1.70	0.459
Household income								
	B40		10727	78.9				
	M40		2533	18.6				
	T20		329	2.4				
	Total		13589	100	1	1	1.23	0.478
Residence location								
	Urban		11920	87.7				
	Rural		1669	12.3				
	Total		13589	100	1	1	1.12	0.328
Entry Requirement								
	E1		9774	71.9				
	E2		159	1.2				
	E3		3429	25.2				
	E4		227	1.7				
	Total		13589	100	1	1	1.57	0.922
Campus Region								
	NR		1311	9.6				
	CR		8413	61.9				
	ER		1574	11.6				
	SR		2291	16.9				
	Total		13589	100	2	2	2.36	1.176
CGPA								
	2.00 - 2.49		173	1.3				
	2.50 - 2.99		4694	34.5				
	3.00 - 3.49		6589	48.5				
	3.50 - 4.00		2133	15.7				
	Total		13589	100	3	3	2.79	0.712

Hypotheses Testing

Determinants of Students' Performance

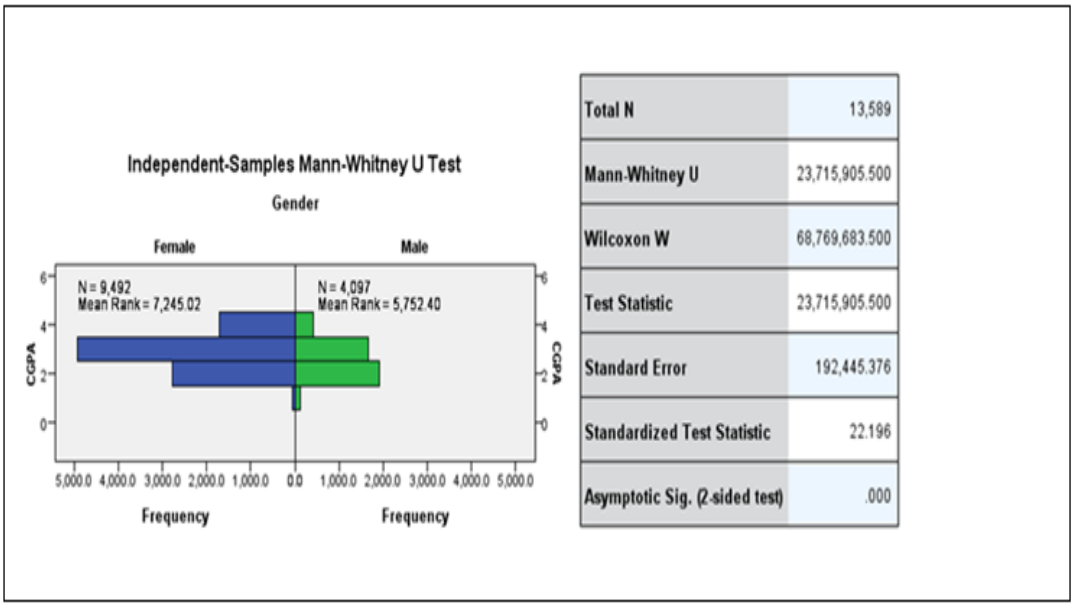
This study assumes students' demographic factors (gender, residence location, household income, entry requirements, and campus location) would have an influence on their performance measured by cumulative grade point average (CGPA). The variables are non-parametric. All independent variables have more than two categories except for gender and residence location. Therefore, in addition to the normality test, the Kruskal Wallis H test was employed to find whether there was a significant difference among categories within those variables with more than two categories on students' performance. Meanwhile, for gender and residence location, Mann Whitney test was conducted.

Results based on Mann Whitney U Test

Gender

A Mann-Whitney U test was run to determine if there were differences in CGPA score between males and females. Distributions of the CGPA scores for males and females were not similar, as assessed by visual inspection. CGPA scores for females (mean rank =7245.02) were statistically significantly higher than for males (mean rank = 5752.40), U = 15172818.5, z = -22.196, p = .000, using an exact sampling distribution for U (Dineen & Blakesley, 1973)[3].

Figure 3. Mann Whitney U Test for Gender



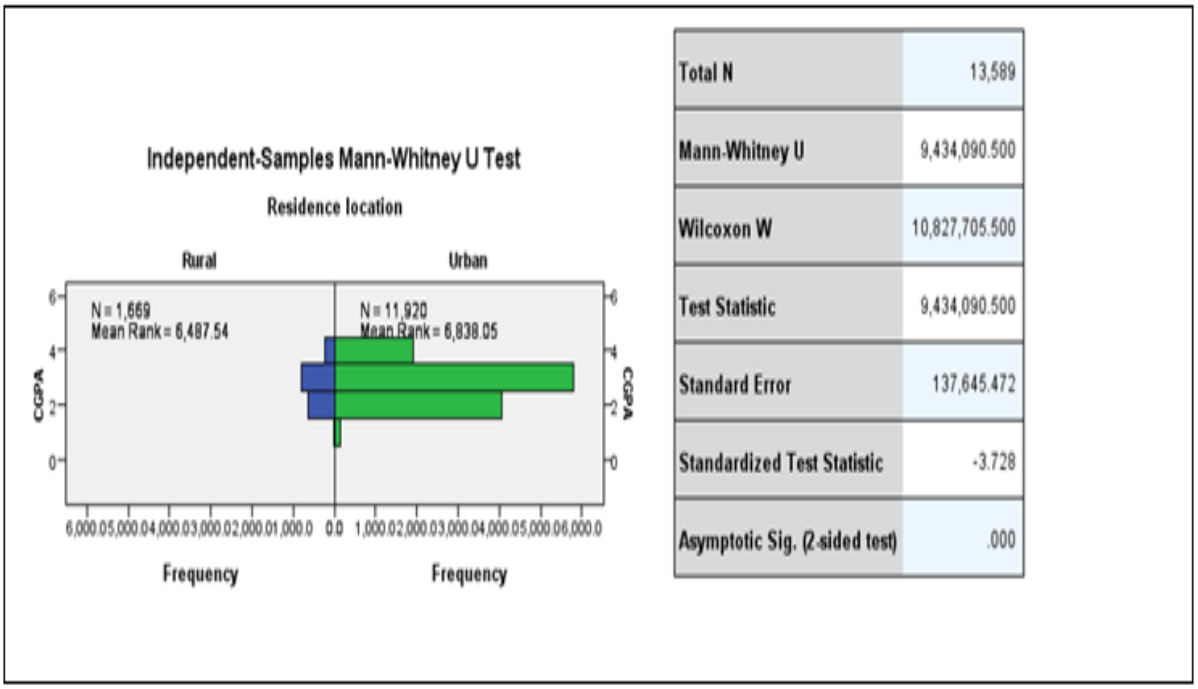
Total N	13,589
Mann-Whitney U	23,715,905.500
Wilcoxon W	68,769,683.500
Test Statistic	23,715,905.500
Standard Error	192,445.376
Standardized Test Statistic	22.196
Asymptotic Sig. (2-sided test)	.000

[3] Laerd Statistics (2015). Mann-Whitney U test using SPSS Statistics. Statistical tutorials and software guides. Retrieved from https://statistics.laerd.com/

Residence Location

A Mann-Whitney U test was run to determine if there were differences in CGPA score between urban and rural. Distributions of the CGPA scores for urban and rural were not similar, as assessed by visual inspection. CGPA scores for urban (mean rank =6838.05) were statistically significantly higher than for rural (mean rank = 6847.54), U = 9434090.5, z = -3.728, p = .000, using an exact sampling distribution for U (Dineen & Blakesley, 1973).

Figure 4. Mann Whitney U Test for Residence Location



Total N	13,589
Mann-Whitney U	9,434,090.500
Wilcoxon W	10,827,705.500
Test Statistic	9,434,090.500
Standard Error	137,645.472
Standardized Test Statistic	-3.728
Asymptotic Sig. (2-sided test)	.000

Results based on Kruskal Wallis H Test

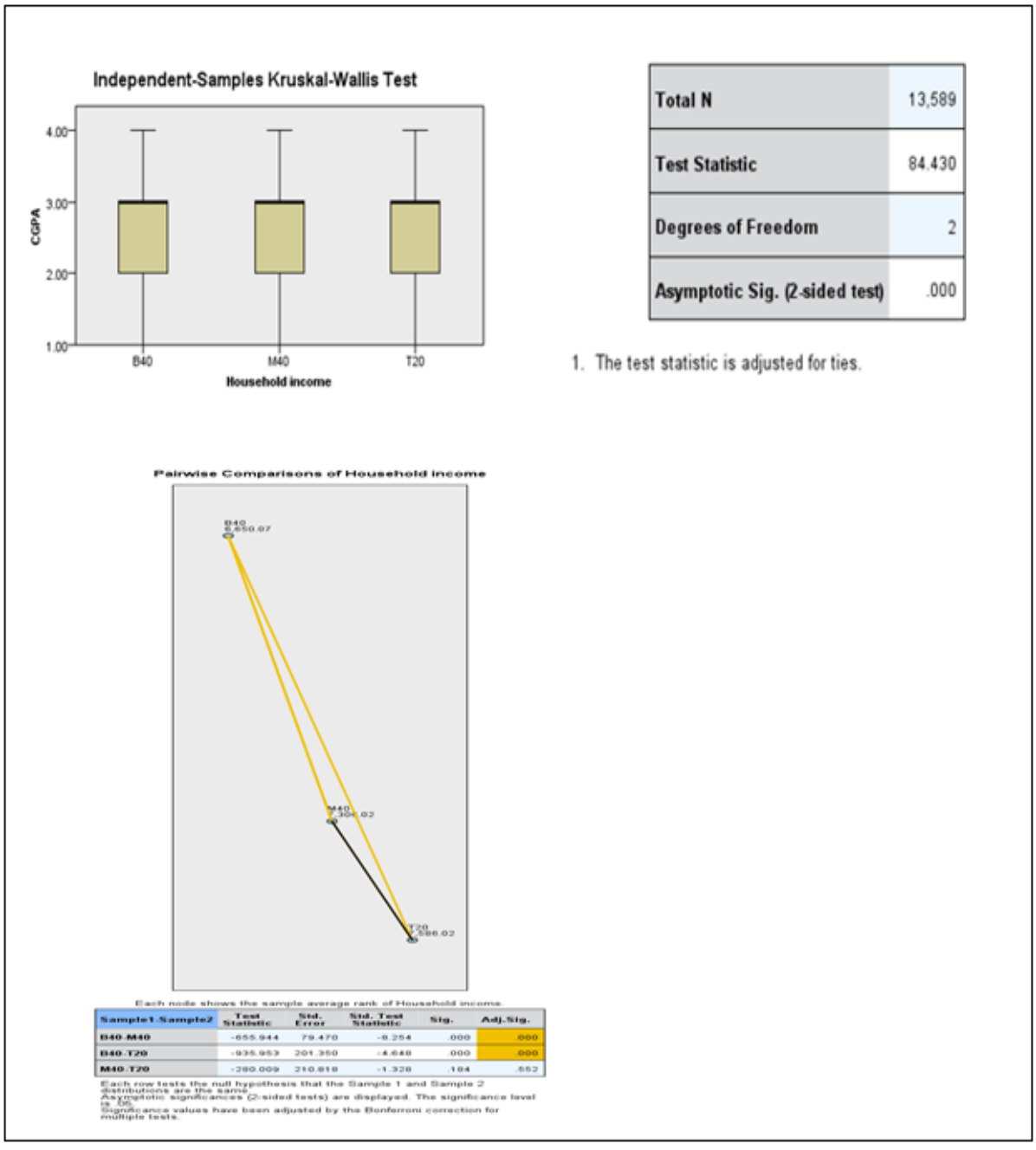
Household Income

A Kruskal-Wallis test was conducted to determine if there were differences in CGPA scores between groups that differed in their household income: the "B40" (n = 10727), "M40" (n = 2533), and "T20" (n = 329) household income group. Distributions of CGPA scores were similar for all groups, as assessed by visual inspection of a boxplot. Median CGPA scores were statistically significantly different between the different levels of household income group, $\chi2(2) = 84.430$, p = .000. Subsequently, pairwise comparisons were performed using Dunn's (1964)[4] procedure with a Bonferroni correction for multiple comparisons. Adjusted p-values

[4] Laerd Statistics (2015). Kruskal-Wallis H test using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from https://statistics.laerd.com/

are presented. This post hoc analysis revealed statistically significant differences in CGPA scores between the B40 (Mdn = 3.00) and M40 (Mdn = 3.00) (p = .000) and B40 and T20 (Mdn = 3.00) (p = .000) household income groups, but not between the M40 and T20.

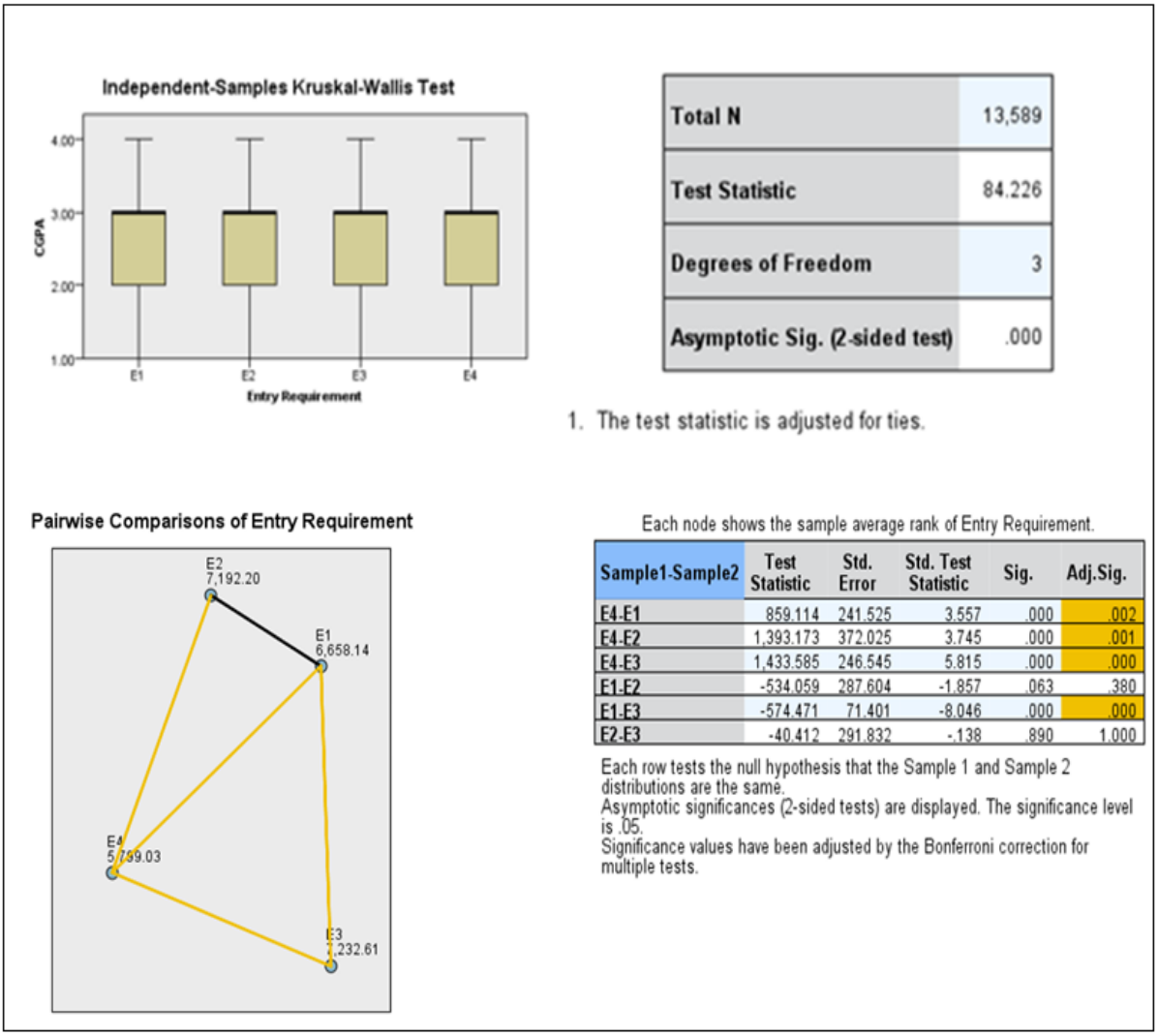
Figure 5. Kruskal Wallis H Test for Household Income



Entry Requirement

A Kruskal-Wallis test was conducted to determine if there were differences in CGPA scores between groups that differed in their entry requirement: the "E1" (n = 9774), "E2" (n = 159), "E3" (n = 3429) and "E4" (n = 227) entry requirement group. Distributions of CGPA scores were similar for all groups, as assessed by visual inspection of a boxplot. Median CGPA scores were statistically significantly different between the different levels of entry requirement group, $\chi 2(3) = 84.226$, p = .000. Subsequently, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted p-values are presented. This post hoc analysis revealed statistically significant differences in CGPA scores between the E4 (Mdn = 3.00) and E1 (Mdn = 3.00) (p = .002), E4 and E2 (Mdn = 3.00) (p = .001), E4 and E3 (Mdn = 3.00) (p = .000), E1 and E3 (p = .001) entry requirement groups, but not between the E1 and E2 or any other group combination.

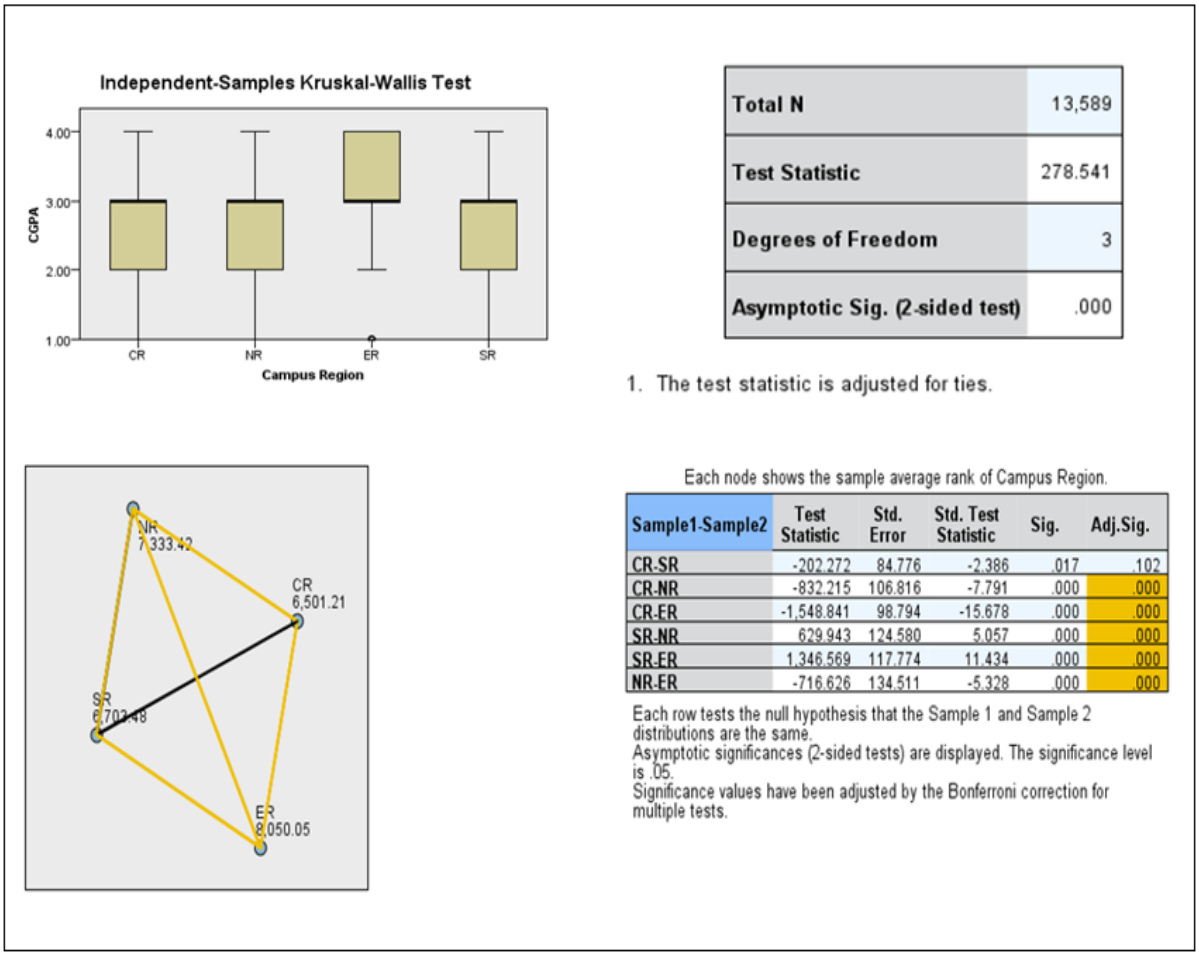
Figure 6. Kruskal Wallis H Test for Entry Requirement



Campus Region

A Kruskal-Wallis test was conducted to determine if there were differences in CGPA scores between groups that differed in their campus region: the "CR" (n = 8413), "NR" (n = 1311), "ER" (n = 1574) and "SR" (n = 2291) campus region groups. Distributions of CGPA scores were not similar for all groups, as assessed by visual inspection of a boxplot. CGPA scores were statistically significantly different between the different levels of campus region, $\chi 2(3) = 278.541$, p = .000. Subsequently, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted p-values are presented. This post hoc analysis revealed statistically significant differences in CGPA scores between the CR (mean rank = 6501.21) and NR (mean rank = 7333.42) (p = .000), CR and ER (mean rank = 8050.05 (p = .000), SR (mean rank = 6703.48) and NR (p = .000), SR and ER (p = .000), NR and ER (p = .000), but not between the CR and SR group.

Figure 7. Kruskal Wallis H Test for Campus Region



Discussion and Suggestions

The purpose of this study is to explore the factors that contribute to UiTM graduates' performance. The determinants factors investigated in this study, includes both the students' demographic profile (gender, household income level, residing location) and the institutional factor (campus region). The result for hypotheses testing is summarized in the Table 3 below.

Table 3: Summary of Hypotheses Testing

Hypotheses	**Results**
H_{01} The mean CGPA is the same across categories of different gender H_{A1} The mean CGPA is not the same across categories of different gender	Significant (Reject H_0)
H_{02} The mean CGPA is the same across categories of residence location H_{A2} The mean CGPA is not the same across categories of residence location	Significant (Reject H_0)
H_{03} The mean CGPA is the same across categories of Household Income H_{A3} The mean CGPA is not the same across categories of household income	Significant (Reject H_0)
H_{04} The mean CGPA is the same across categories of entry requirement H_{A4} The mean CGPA is not the same across categories of entry requirement	Significant (Reject H_0)
H_{05} The mean CGPA is the same across categories of campus location H_{A5} The mean CGPA is not the same across categories of campus location	Significant (Reject H_0)

The finding supports UiTM philosophy of "every individual has the ability to attain excellence through the transfer of knowledge" where 78.9% of the graduates are from B40 group. In addition, 64.2% of the graduates earned CGPA more than 3.00. Out of 10727 B40 graduates; 86.4% reside in the urban area, 62.9% earned more than 3.00. This finding provides evidence on the ability of the university in transforming the society to a higher platform. However, further research on graduate employability would confirm the findings. Analysis suggests the performance between male and female graduates differs. The graduates residing in the urban areas outperformed those from rural. Findings reveal similar performance among graduates in the group of M40 and T20. Comparing B40 group against M40 and T20, the results show statistically significant differences in CGPA of the graduates.

One of the study's null hypotheses is the mean CGPA is the same across categories of entry requirement. Result of Kruskal Walis test rejected the null hypothesis. Further analysis using pairwise revealed statistically significant differences in CGPA scores between the E4 and other groups. While E1 and E2 or any other group combinations do not differ. This may highlight graduates enrolling into programmes with diploma and foundation is of similar quality. Looking at structural character of the university, that is the campus region; the result suggests CR and SR does not differ, while other combinations are statistically different.

This finding could be utilised when management wants to design a new flexible curriculum which should consider these variabilities in demographic factors of the student profile. Now that higher education is moving towards personalised learning, at least these variations can contribute to module development that suits students that belongs to a specific group. This study is also contributing to the further analysis of predicting where the potential student would be once they enrol and a specific intervention program could be well designed to help them improve their outcome.

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