



# Survey on Factors Influencing the Unemployment Among UTHM Fresh Graduates

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**Abstract.** Nowadays, unemployment is a serious problem among fresh graduates. Thus, a survey on factors that influence unemployment among UTHM graduates was conducted. A questionnaire was distributed via email according to a frame list based on the UTHM graduates in 2019 and 2020. A total of 435 responses was collected in this study. Factor analysis was carried out and five factors of unemployment were presented throughout the 16 variables. Word cloud analysis was revealed that employers are most concerned with working experience and technical skills are the most significant factor for graduates in the job search. Pearson's Chi-square test was used to determine the relationship between gender and race to the factors of unemployment. Then, the three lowest values of p-values were presented in the contingency table for further discussion. The three lowest p-values for the gender of 0.01968, 0.2696 and 0.001369 were presented in the contingency table. Also, the three lowest p-values for races of  $3.102 \times 10^{-5}$ ,  $5.189 \times 10^{-6}$  and  $2.576 \times 10^{-7}$  were presented in the contingency table. Hence, students and lecturers should be giving close and thoughtful attention to solving the problem of unemployment among graduates.

**Keywords:** Unemployment · Factors · Factor Analysis · Word Cloud · Cross-tabulation Analysis

## 1 Introduction

Unemployment occurs when a person can work but is unable to find work. This is one of the reasons why a country's economy suffers, and its development suffers. Long-term unemployment affects people, families, and communities indirectly. Unemployment can lead to negative outcomes such as increased crime, decreased income and consumption, and diminished human and social capital [1].

The labour force registered in December 2020 was 15.99 million, increasing 0.03 million from November 2020 (15.96 million) [2]. Meantime, unemployment increased from 764.4 thousand persons (November 2020) to 772.9 thousand persons (December 2020). As a result, Malaysia's unemployment rate has risen. Also, the COVID-19 epidemic has a negative influence on the economy, increasing unemployment. Due to the

COVID-19 outbreak, our country's economy is in a serious recession. The unemployment rate at the end of 2020 is over 4.5%, compared to the pre-crisis level of under 4.0% [3].

## 2 Methodology

This section briefly explaining about the methods used in this study. The survey instrument, sample size, reliability test and the analyses used were explained in the following parts.

### 2.1 Survey Instrument

An online survey is conducted, and the questionnaire is created by Google Form. The data was collected from a predefined group of respondents which are the UTHM graduates in 2019 and 2020 by using e-mail. There are 435 respondents involved in this research which included the graduates from nine faculties in UTHM. A convenience sampling method which is a type of non-probability sampling technique was used to collect the data.

The questionnaire consists of eight questions about respondents' demographic information and 16 questions are using the five-point Likert Scale to identify the factors that influence most unemployment among UTHM graduates.

### 2.2 Sample Size

The determination of sample size is a vital step to create precise research and satisfy the scientific standards [4]. The number of respondents was calculated using the formula of the sample size calculation is as Eq. (1).

$$n = \frac{\frac{z^2 p(1-p)}{e^2}}{1 + \left(\frac{z^2 p(1-p)}{e^2 N}\right)} \quad (1)$$

where  $n$  is the sample size,  $z$  denotes the  $z$  score,  $e$  is the margin of error,  $p$  denotes the population proportion and  $N$  denotes the population size. In this research, a finite population of 8000 UTHM graduates was obtained from the frame list, and it was used to calculate the sample size using a 95% of the confidence interval and 5% of margin error, while the population proportion is 0.5.

### 2.3 Reliability Test

Cronbach's alpha was used in this research to measure the internal consistency of dichotomous questions and Likert-scale questions. The Cronbach's alpha result obtained will be a number between 0 and 1. The higher the number of Cronbach's alpha, the higher the

reliability. The acceptance score for the reliability will be at least 0.7 [5]. The formula of Cronbach's alpha is as Eq. (2) [6].

$$\alpha = \left( \frac{k}{k-1} \right) * \left( 1 - \frac{\sum s_i^2}{s_t^2} \right) \quad (2)$$

where  $k$  is the number of questions in the survey,  $s^i$  is the standard deviation of  $i^{th}$  the question and  $s^t$  is the standard deviation of the total score.

## 2.4 Descriptive Analysis

Descriptive statistics is one of the simplest methods of data analysis. Conducting descriptive analysis will be the first step in research and one should consider it before making the dominant analysis of the research [7]. Various descriptive methods can be used for the continuous parameter, categorical parameter and correlations [8].

## 2.5 Word Cloud

Word cloud is a simple analysis to show the words that appeared most frequently in the text documents [9]. This method can be used to summarise the most common answer or word used from a given body of text. In addition, word cloud presents the data in a visualization method that can be read clearly and easily by anyone.

**Table 1.** Variables of unemployment factors

No.	Variables	Description
1	$X_1$	Find a job related to your major study
2	$X_2$	Enough academic knowledge
3	$X_3$	Enough technical skills
4	$X_4$	Importance of English efficiency
5	$X_5$	Overqualified skills influence to find a job
6	$X_6$	Race influences to get a job
7	$X_7$	Prefer working as teamwork, collaboration, and cooperation
8	$X_8$	An introvert can handle the job
9	$X_9$	Have good enough communication skills
10	$X_{10}$	Have a positive attitude to handle the jobs
11	$X_{11}$	Salary paid influence to get a job
12	$X_{12}$	Presence of foreigners
13	$X_{13}$	Education/training received in past
14	$X_{14}$	Gender discrimination
15	$X_{15}$	A good grade is easier to find a job
16	$X_{16}$	In excess of graduates

### 2.6 Factor Analysis

Exploratory factor analysis was used to identify the association between each factor and the observed variables and to investigate the basic theoretical responses in a particular content area [10]. The maximum correlation is Eq. (3).

$$\alpha = \left( \frac{k}{(k-1)} \right) * \left( 1 - \frac{\sum s_i^2}{s_t^2} \right) X_j = a_{j1}F_1 + a_{j2}F_2 + \dots + a_{jm}F_m + e_j \quad (3)$$

where  $p$  denotes the number of variables ( $X_1, X_2, \dots, X_p$ ),  $m$  denotes the number of latent factors ( $F_1, F_2, \dots, F_m$ ),  $a_{jm}$  denotes the factor loadings on  $j^{th}$  variable on  $m$  factor,  $j = 1, 2, \dots, p$  and  $e_j$  denotes the unique factor. Table 1 displayed 16 variables of unemployment factors that were asked in the questionnaire.

### 2.7 Cross-Tabulation Analysis

Cross-tabulation also known as a contingency table, two-way table, or bivariate table, is an analysis used for categorical data. This analysis is extended from simple frequency distribution that demonstrated the frequency of the category of one variable, then extended become a two-way table that consists of two variables [11].

#### Pearson’s Chi-Square Test

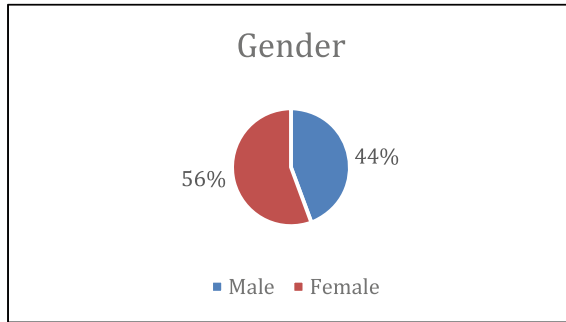
Pearson’s Chi-square test is also known as the Chi-square test of independence or Chi-square. Pearson’s Chi-square test is a widely used hypothesis test in statistical analysis between two nominal variables [12]. The steps of Pearson’s Chi-square test are first defining the null hypothesis and alternative hypothesis, which the null hypothesis is always in the situation that assumes to be true. If there is enough evidence against the null hypothesis, it can be concluded that there is no relationship between the two variables. The formula to calculate the Pearson’s Chi-square test is as Eq. 4.

$$\sum \chi_{i-j}^2 = \frac{(O - E)^2}{E} \quad (4)$$

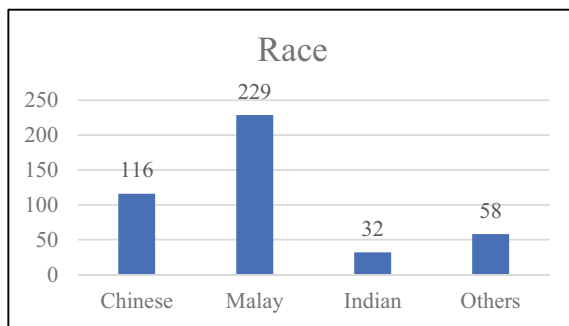
where  $\sum \chi_{i-j}^2$  is the sum of the Chi-square value calculated from the first cell of  $i$  to the last cell of  $j$ ,  $O$  is the observed value and  $E$  is the expected value.

## 3 Results and Discussions

This section presents the demographic profile of respondents and results obtained by using factor analysis, word cloud and cross-tabulation analysis.



**Fig. 1.** Frequency of respondents' gender.



**Fig. 2.** Frequency of respondents' race.

### 3.1 Respondents' Demographic Profile

The questionnaire was created using Google Form and distributed to UTHM graduates via email. There are a total of 435 respondents collected through the convenience sampling method.

Figure 1 displayed the frequency of respondents' gender. Figure 1(a) indicated that most of the respondents consisted of female graduates. There are 193 (44%) male and 242 (56%) female respondents in this study. Figure 2 showed the frequency of respondents' races. The respondents consisted of race of Malay (229), Chinese (116), Indian (32) and others (58).

### 3.2 Reliability Test

A pilot study aims to determine the questionnaire's reliability by using the software of Minitab version 18.1.0.0. 16 Likert-scale questions with 35 respondents were collected by distributing the questionnaire through e-mail. Cronbach's alpha value of 0.7593 obtained by using the software of Minitab indicated that the scale has a good level of internal consistency.

### 3.3 Word Cloud

Word cloud analysis was conducted and separated into two parts to analyse the two questions from the last section of the questionnaire, which addressed the questions of the requirements during a job search by employers and the factors of unemployment among UTHM graduates.

Figure 3 indicated the requirements of an employer looking for, most of the respondents of 89.43% respondents think that working experience is the most concerning requirement by employers for a job search. Then, the requirements are followed by technical skills, communication skills and academic knowledge. Only 38.16% of respondents think that leadership skills are important for a job search.

Figure 4 depicted the opinions of respondents about the factors that affect graduates in a job search. There were ten factors affecting job placement. 258 people chose technical abilities as the top priority. The next factor is the expected salary, which was mentioned by 51.72%. Then, the third factor is communication skills. The graduates also think that English efficiency is important for them to find a job. Academic knowledge and confidence are having a percentage of 28.28% and 25.75% respectively. Next, the factors followed by the willingness to work overtime, willingness to travel a long distance to work and the locality of the company. The factor of willingness to work for cross-major is the least crucial factor which was only chosen by 11.95% of respondents.



Fig. 3. Word cloud of the requirements from the employer.



Fig. 4. The factors that influence getting a job.

### 3.4 Factor Analysis

The  $p$ -value of the Shapiro-Wilk test will be tabulated in Table 2. All the  $p$ -value obtained from the Shapiro-Wilk test are less than 0.05, therefore the presence of normality could not be detected, and all the variables were said to be not normally distributed.

According to the result obtained from factor analysis, the 16 variables was presented into five factors. The extraction method used was principal component analysis while Varimax with Kaiser normalization was the rotation method. The components were successfully categorized into five factors: university skills, personal characteristics, education level, employability skills, and job mismatch.

### 3.5 Cross-Tabulation Analysis

To conduct cross-tabulation analysis, Pearson's Chi-square test was used to examine the variables' relationships. There are 16 variables in a five-point Likert scale question. The  $p$ -value less than 0.05 indicates adequate evidence to reject the null hypothesis. Otherwise, a  $p$ -value of 0.05 or greater suggested the two nominal variables were independent. The null hypothesis states that two variables are independent and have no relationship, whereas the alternative hypothesis states that two variables are dependent and have a relation.

As shown in Table 3, the relationship between gender and the variables are shown. The result obtained shows ten variables related to gender. The three lowest  $p$ -values variables are tabulated.

$H_0$ : There is no significant relationship between gender and the variable.

$H_1$ : There is a significant relationship between gender and the variable.

Table 4 determined the relationship between race and the variables, shows ten significant factors with  $p$ -values less than 0.05. Then, the three lowest  $p$ -values are tabulated in the following part.

$H_0$ : There is no significant relationship between race and the variable.

$H_1$ : There is a significant relationship between race and the variable.

According to Table 5, the contingency table of gender and the significant factors of unemployment was presented, three Likert scale questions were tabulated to be discussed. Almost 21.6% of respondents are female agreed that gender discrimination is the factor of unemployment among UTHM graduates. However, 20.0% of respondents (male) have a different opinion from female respondents. Then, 149 female respondents agreed that graduates have good enough communication skills will help them to get a job. Male respondents occupied 32.2% of the respondents have the same opinion as to the female respondents which agreed that the factor of communication skills is important to the graduates. Most of the respondents included 36.8% of respondents (female) and 24.4% of respondents (male) agreed that introvert can handle their job.

Table 6 displays the contingency table of the factors of unemployment towards races. The races such as Chinese, Indian, Malay and others were discussed. Most Chinese respondents (12.1%), Indian (4.9%), Malay (27.4%) and other races (4.8%) agreed that race will influence getting a job. 51 Chinese respondents disagreed that overqualified skills would influence graduates in their job search. However, respondents from Indian (2.9%), Malay (22.8%), and other races (4.1%) agreed that overqualified skills may affect

**Table 2.** Rotated component matrix

Variables	Factors				
	University skills	Personal characteristics	Education level	Employability skills	Job mismatch
Enough academic knowledge	0.828				
Enough technical skills	0.822				
Education/training received in past	0.397				
Presence of foreigners		0.687			
Gender discrimination		0.673			
Race influence to get a job		0.651			
Overqualified skills influence to find a job		0.578			
A good grade is easier to find a job			0.691		
Find a job related to your major study			0.675		
Importance of English efficiency			0.430		
Have a positive attitude to handle the jobs				0.760	
Prefer working as teamwork, collaboration, and cooperation				0.676	
Have good enough communication skills				0.597	
Salary paid influence to get a job					-0.303
An introvert can handle the job					0.786
In excess of graduates					0.440



**Table 3.** Pearson's Chi-square test of gender

GENDER		
	<i>p</i> -value	Decision
Enough academic knowledge	0.05962	Do not reject $H_0$
Enough technical skills	0.03446	Reject $H_0$
Education/training received in past	0.04913	Reject $H_0$
Presence of foreigners	0.09405	Do not reject $H_0$
Gender discrimination	0.01968	Reject $H_0$
Race influence to get a job	0.9473	Do not reject $H_0$
Overqualified skills influence to find a job	0.3893	Reject $H_0$
A good grade is easier to find a job	0.3971	Reject $H_0$
Find a job related to your major study	0.1903	Reject $H_0$
Importance of English efficiency	0.0676	Reject $H_0$
Have a positive attitude to handle the jobs	0.2425	Do not reject $H_0$
Prefer working as teamwork, collaboration, and cooperation	0.02853	Reject $H_0$
Have good enough communication skills	0.02696	Reject $H_0$
Salary paid influence to get a job	0.02757	Do not reject $H_0$
An introvert can handle the job	0.001369	Reject $H_0$
In excess of graduates	0.0946	Do not reject $H_0$

**Table 4.** Contingency table of gender and factors of unemployment.

GENDER		
	Disagree	Agree
Gender discrimination		
Female	90 (20.7%)	94 (21.6%)
Male	87 (20.0%)	47 (10.8%)
Have good enough communication skills		
Female	14 (3.2%)	149 (32.4%)
Male	13 (3.0%)	140 (32.2%)
An introvert can handle the job		
Female	14 (3.2%)	160 (360.8%)
Male	23 (6.7%)	106 (24.4%)

**Table 5.** Pearson’s Chi-square test of races

RACES		
	<i>p</i> -value	Decision
Enough academic knowledge	0.4723	Do not reject $H_0$
Enough technical skills	0.0014	Reject $H_0$
Education/training received in past	0.0029	Reject $H_0$
Presence of foreigners	0.0178	Reject $H_0$
Gender discrimination	0.0276	Reject $H_0$
Race influence to get a job	$3.102 \times 10^{-5}$	Reject $H_0$
Overqualified skills influence to find a job	$5.189 \times 10^{-6}$	Reject $H_0$
A good grade is easier to find a job	0.0577	Reject $H_0$
Find a job related to your major study	0.0360	Reject $H_0$
Importance of English efficiency	0.2978	Do not reject $H_0$
Have a positive attitude to handle the jobs	0.4223	Do not reject $H_0$
Prefer working as teamwork, collaboration, and cooperation	0.9442	Do not reject $H_0$
Have good enough communication skills	0.0603	Do not reject $H_0$
Salary paid influence to get a job	0.0138	Reject $H_0$
An introvert can handle the job	0.1131	Do not reject $H_0$
In excess of graduates	$2.576 \times 10^{-7}$	Reject $H_0$

**Table 6.** Contingency table of races and factors of unemployment.

RACES		
	Disagree	Agree
Race influences to get a job		
Chinese	53 (12.1%)	33 (7.6%)
India	5 (1.1%)	18 (4.9%)
Malay	60 (13.8%)	119 (27.4%)
Others	13 (3.0%)	21 (4.8%)
Overqualified skills influence to find a job		
Chinese	51 (11.7%)	23 (5.3%)
India	2 (0.5%)	19 (2.9%)
Malay	52 (11.9%)	99 (22.8%)
Others	18 (4.1%)	18 (4.1%)

(continued)

**Table 6.** (continued)

RACES		
	Disagree	Agree
In excess of graduates		
Chinese	11 (2.6%)	78 (17.9%)
India	2 (0.5%)	26 (6.1%)
Malay	7 (1.6%)	181 (41.6%)
Others	2 (0.5%)	32 (9.7%)

graduates' career prospects. Most responders from Chinese (17.9%), Indian (6.1%), Malay (41.6%), and other races (9.7%) agreed that excess of graduates is a factor in UTHM unemployment.

#### 4 Conclusion

This study achieved all three objectives and identified factors of unemployment among UTHM graduates. A reliability test with 35 respondents yielded a Cronbach's alpha value of 0.7593, indicating that the questionnaire is acceptable. This study included 435 UTHM graduates. The 16 variables were successfully factored into five factors of unemployment. Then, two-word cloud analyses were performed, with employers focusing on working experience and technical skills as a factor of unemployment. The 16 variables were analysed to gender and race using Pearson's Chi-square test. The contingency table displayed the three smallest p-values. Unemployment was linked to gender discrimination, poor communication skills, and introversion with the factor of gender. The characteristics of race, overqualified talents, and over graduates were the most crucial variables to the races.

Several suggestions were made to reduce graduate unemployment. To eliminate racial bias in research results, the sample size of each race should be checked. Then, future studies should include more variables to pinpoint graduate unemployment. Future studies may also include employers as responders to identify the causes of unemployment. Finally, this survey only includes UTHM graduates, not all Malaysian graduates. To obtain more complete results, future researchers should include alumni from other Malaysian universities.

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**Authors' Contributions.** The authors have successfully identified the factors of unemployment among UTHM fresh graduates through an online survey. Several recommendations and limitations were determined to recommend future researchers to conduct better-related research.

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