STATISTICAL ANALYSIS ON THE DETERMINANTS OF STUDENTS’ ACADEMIC ACHIEVEMENT: A STUDY IN UITM JOHOR

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ABSTRACT

Students are main assets of universities. For this reason, a quality of excellent achievement of student becomes one of a crucial aspect in order to be a world-class university. Thus, students have to place the greatest effort on their academic to obtain a good grade to be a great leader and manpower for the country. However, many students have been stranded due to the failure in the final examination due to some factors. Thus, this study will be conducted to identify the most influencing factors that lead to the failure and inferior of achievement. A questionnaire of 21 items distributed to all undergraduates’ students at UiTM Johor branch as respective respondents. Several factors affecting students’ academic achievement discussed in this research consist of family characteristics, self-efficacy, and university features. In addition, the Cumulative Grade Point Average (CGPA) of each respondent will be collected at the end of the semester. The data will be analyzed using exploratory factor analysis and Pearson correlation of Statistical Package for Social Sciences (SPSS). At the end of this research, highest and lowest factors influencing the students’ achievement in their academic will be identified.

Keywords: Family Characteristics, Self-Efficacy, University Features, Interest, Academic Achievement.

1. INTRODUCTION

Quality improvement of human resources closely related to the quality of education as it associated with the high learning achievement. According to Chapman et al. (2005) as stated in Pangeni (2014) mentioned that although educators and researchers have yet to agree upon a consensus on the nature of educational quality and its determinants, it is typically measured by higher achievement in examinations. The academic achievement of students is a matter of real concern in most universities in a world. As a result, it can be assessed by looking at students’ Cumulative Grade Point Average (CGPA) results at the end of the semester. There are many variables that affecting students’ academic achievement, and it have been investigated using different kinds of questionnaires Demir, Kilic and Depren (2009). It also mentioned by Pangeni (2014) in his study that family characteristics, student characteristics, parental involvement and school characteristics may influence students’ mathematics achievement in Nepal. By examining previous studies which have been published international review, it was found that there were many studies on educational achievement using multilevel regression analysis, structural equation model and principal component analysis as stated by Demir, Kilic and Depren (2009). However, this study used multiple regression analysis and ANOVA to prove the hypothesis test and relationship between the variable.
2. PROBLEM STATEMENT

Academic achievement is one of the factors that are contributing to standards of higher education institutions. The quality of students’ achievement and the number of students graduate remains at top priority for administrator and educators in Universiti Teknologi MARA (UiTM). However, the high failure rates in every semester lead to the reducing the throughput of the University. There are many factors could act as barrier and catalyst to students achieving a high CGPA that reflects their overall academic performance. One of the factors that have been identified is family characteristics. It also stated by Pangeni (2014) which family plays a crucial role in shaping children’s educational experiences and academic achievement in every society. Besides, self-efficacy somehow will enable students to work harder, to persist, persevere, and seek help so they can complete a task as stated by Otunuku and Brown (2007). Indirectly it will boost up the spirit of the student to achieve the best results. By identifying the real factor will be so helpful for administrator and educators to guide them properly based on their potentiality.

3. RESEARCH OBJECTIVES

1. To identify the effects of family characteristics towards students’ academic achievement.
2. To determine the effects of self-efficacy towards students’ academic achievement.
3. To examine the effects of university features towards students’ academic achievement.

4. SIGNIFICANCE AND UNIQUENESS

The purpose of this study is to identify a number of factors that represent the relationship between sets of interrelated variables using principal component factor analysis and to examine the contribution of each factor to the explanation of the variance in the students’ academic achievement. Although there are many factors contribute to the academic achievement of students directly or indirectly, in this study, family characteristics, self-efficacy and university features are the main factors that contribute most to the UiTM Johor students’. This will enable administrator or educator to enhance their efforts in guiding the students in encounter the problem. The findings may also contribute to the reducing the throughput of the failure rates for every student in the University. It is hoped that this study would encourage further related research to identify the factors that can contribute students to achieve high CGPA that indirectly reflects their overall academic performance.

5. LITERATURE REVIEW

According to Ali et.al (2009) as stated in Mushtaq & Nawaz Khan (2012) mentioned that school, colleges and universities have no worth without student as they are most essential asset for any educational institution. The students’ academic achievement plays an important role in producing the best quality graduates who will become great leader and manpower for the country thus responsible for the country’s economic and social development. Students’ achievement in Universiti Teknologi Mara was based on their Cumulative Grade Point Average (CGPA). Some of the students won’t be able to complete their study in final semester because they had failed certain subject in every semester that leads them to be dismissed. This scenario happened because of several factors such as family characteristics, self-efficacy, and university features.
Family Characteristics

According to McCoach et al. (2010), a number of malleable school, teacher, and parent characteristics factors have been associated with student achievement. It also mentioned by Farooq et al, (2011) that parental education and family socio-economic status (SES) level or family characteristics have positive correlations with the student’s quality of achievement based on the results of his study on the subjects of Mathematics and English. According to Diaz (2003) as stated in Mlambo (2011) mentioned that most of their studies focus on the three elements that associate with academic achievement are parents (family causal factors), teachers (academic causal factors) and students (personal causal factors).

Self-Efficacy

Merriman (2012) stated that self-efficacy is a person’s belief in one’s capacity to perform in a certain manner to achieve certain goals. However, according to Otunuku and Brown (2007), self-efficacy refers to an individual’s belief in how well he or she can successfully perform behaviors in given situations. In relation to that, Johnson, Crosnoe, and Elder (2001); Pajares and Schunk (2001); Williams, Williams, Kastberg, and Jocelyn (2005) as stated in Otunuku and Brown (2007) found that believing students who are good at a subject (self-efficacy) and liking a subject have both been shown to be positively related to academic outcomes. Although self-efficacy has been found to be a significant factor in predicting academic achievement by enhancing motivation to achieve still students’ self-efficacy (Chowdhury and Shahabuddin, 2007). Moreover, numerous studies by Silver, Smith, & Greene (2001); Witt-Rose (2003); Magogwe and Oliver (2007); as stated in Rashidi and Moghadam (2014) have found that self-efficacy affects both general academic achievement and science achievement as it has a well-established influence on academic achievement as stated by De Freitas (2012). This elevation in self-efficacy is related to improve academic achievement because students now believe that they can do well academically. As a result, they perform better.

University Features

A study conducted by Heyneman and Loxley (1983) as stated in Pangeni (2014) found that the overall proportion of variance in student achievement was largely associated with school characteristics and the predominant influence on student learning. In addition, according to Mersha, Bishaw and Tegegne (2013), university-related factors consists of accommodations and faculty characteristics as it will encourage disclosure and requests for accommodations or other supports. A building design combining social locale and workspaces will permit to more interactive gathering, motivating students in generating creative ideas, and discovery new way of learning. These features projected to ignite celebrating student achievements and promoting excellence (Melissa, 2014).

6. METHODOLOGY

Sample and data collection method

This methodology refers to on how the data was collected in order to accomplish this study. In completing this study, few strategies were aligned to ensure that obtained data are parallel with the findings. In addition, the manner and instruments used in selecting and constructing the techniques or, in other words, the range of approach used to gather data are explained in this chapter. It represents a science of a study on how research is done specifically and systematically to solve the research problem by logically adopting various steps (Sridhar, 2008). According to Uma Sekaran (2010), sampling begins with precisely defining the target population. Population is a group of people that the researcher wants to investigate. Target population that has been chosen normally depends on the objective of the study. Hence, this study only focused on 100 out of 1,730
undergraduate students from four (4) faculties in UiTM Johor as size of the population. They have been selected by using simple random sampling as basic sampling technique to minimize bias and offer most generalizability.

**Instrumentation**

Primary data from the questionnaire was used to identify and determine the effects of family characteristics and self-efficacy towards students’ academic achievement. Besides, it also used to examine the effects of university features towards students’ academic achievement. This questionnaire was adopted from a previous study by Pangeni (2014) and Otunuku and Brown (2007). This questionnaire are divided into two (2) sections which in section one (1) consist on demographic characteristic of respondents and section two (2) consist of four (3) items on (i) family characteristics, (ii) self-efficacy, (iii) university features. This survey was conducted at UiTM Johor by distributed 100 set of questionnaire randomly to all undergraduates’ students.

7. **FINDING & DISCUSSION**

**Finding**

Research methodology is the study of how the study is done scientifically. This chapter will explain how the study is done that gone through various steps or processes. Thus, it will help the readers to analyze whether this study has done in a correct way or not based on the research methodology.

This will include data collection, data sources, variables, research design, research framework, data analysis and treatment and hypothesis construction. This chapter will also highlight the research method and statistical technique in determining the relationship between selected variables.

**Descriptive analysis**

Frequencies are present in a term of percentage and cumulative percentage. It is shown in a form of bar charts, histograms or pie charts to identify the pattern of data. It describes as the most frequently occurring phenomenon in the data. Below are the respondent profile by percentage and frequency.

**Profile of respondents**

The analysis was performing on gender, mode of study, faculty and CGPA results. The results of gender respondent who involved in this survey is female which encompass 81% or 81 respondents and the remaining 19% is male which accounted to 19 respondents. From the total numbers of respondents, 75 of them come from mode of degree which comprise of 75% of the total respondent. 25% of respondent comes from the mode of diploma with a total of 25 respondents. Nevertheless, the questionnaires have been distributed equally to all faculties in UiTM Johor, which consist of 25 respondents form Business & Management, 25 respondents from Information Management, 25 respondents from Accountancy, and 25 respondents from Computer & Mathematical Science. Whereas, the results shows that 56 respondents get CGPA result in the range of 3.00-3.49 in their study at UiTM Johor which represents 56% of the overall respondent. 20 respondents get CGPA result in the range 3.50-400 signifying 20% of the overall respondent. 18 respondents get CGPA result in the range 2.50-2.99 and 2 respondents get CGPA result in the range 2.00-2.49 representing 2% of the overall respondent. As for below 2.00 CGPA result only 1 respondent and take account of 1% of the total respondents.
Descriptive statistics & analysis

Table 5: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Features</td>
<td>100</td>
<td>2.6350</td>
<td>.45424</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>100</td>
<td>3.0967</td>
<td>.46250</td>
</tr>
<tr>
<td>Family Characteristics</td>
<td>100</td>
<td>2.1225</td>
<td>.50439</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>100</td>
<td>2.6100</td>
<td>.45826</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Standard Deviation shows the relation that set of independent variable scores has the mean of the 100 samples. Since the mean in University Features is 2.6350 and the standard deviation is .45424, we can summarize from the above statement estimate that approximately 40% of the scores contribute to information as a critical cause to enabling us to measure up the factor of affecting students’ academic achievement represents performance of students’ academic achievement as a variable with their feat on another, even when the Family Characteristics, Self-Efficacy and University Features are measured on different scales.

Reliability

Reliability test is important to ensure consistency of the measuring instrument in order to measure the intended purpose of research. The value of Cronbach’s Alpha is used to determine the consistency of the measurement. According to George and Mallery they provided a better rule of thumb regarding Cronbach’s Alpha which stated that value 0.9-1.0 is excellent, 0.8-0.89 s good, 0.7-0.79 is acceptable, 0.6 and 0.6-0.69 is questionable while 0.5-0.59 is poor and the value less than 0.5 is unacceptable.

Table 6: Reliability test result

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Cronbach’s Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.603</td>
<td>.592</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 4.3.1 shows that the total Cronbach’s alpha for dependent variables and independent variables is 0.985 and enabled for further study. According to Sekaran and Bougi (2010), the closer Cronbach’s alpha is to 1.00, the higher the internal consistency reliability. Based on the rules of thumbs for reliability analysis, it shows that the reliability for this research Average due to Cronbach’s alpha value is 0592 whereby N of items is 11 are reliable to ask to the respondents. From a standpoint, the measure will have wretched middling internal consistency because the items will correlated in the same way in all possible subsamples.
Regression Analysis

Regression analysis is a powerful and flexible procedure for analyzing associative relationship between the dependent variable and one or more independent variables. Fitness of the model built for this study is examined by this kind of standard regression analysis. The analysis shows how much of the total variance in the dependent variable is possible to explain by the independent variables.

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.493</td>
<td>.243</td>
<td>.219</td>
<td>.40493</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Family Characteristics, Self-Efficacy and University Features

b. Dependent Variable: Academic Achievement

$R^2 = 0.219$

Based on the Table above, the adjusted coefficient of determination or also known as $R$ represents the value of .493. The score indicate that 49.3% of the changes in the dependent variable (student achievement) can be explained by the independent variables (Family, Self efficacy and University). The R Square value is 0.243 (24.3%) show the relationship between the dependent and independent variables for this study. For this study it can be consider there is a relationship between dependent and independent variables.

ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>5.049</td>
<td>3</td>
<td>1.683</td>
<td>10.264</td>
<td>.000^</td>
</tr>
<tr>
<td>Residual</td>
<td>15.741</td>
<td>96</td>
<td>.164</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20.790</td>
<td>99</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: dv1

From the table 4.3.2 above, the p-value = 0.00< α =0.05. So we can conclude that the model is adequately fit. Model is significant and can proceed for this hypothesis. We believe from looking at the table above that the model is significant because there appears to be a "strong" two-way interaction between variables.
Coefficients

Table 8: Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.162</td>
<td>.365</td>
<td>3.182</td>
<td>.002</td>
</tr>
<tr>
<td>University Features</td>
<td>.308</td>
<td>.090</td>
<td>.305</td>
<td>3.401</td>
</tr>
<tr>
<td>1</td>
<td>Self-Efficacy</td>
<td>-.013</td>
<td>.092</td>
<td>-.013</td>
</tr>
<tr>
<td>Family Characteristics</td>
<td>.319</td>
<td>.085</td>
<td>.351</td>
<td>3.762</td>
</tr>
</tbody>
</table>

Based on the table 4.3.3, the beta value for family characteristics is .308 which is significant at the .001 level. The beta value for self-efficacy is -.013 which is not significant at 0.891 levels. However, as for the beta value for university features is .319 which is significant at the level .001

Hypothesis Test

Table 9: Hypothesis Test

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>p-value</th>
<th>Significant</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. There is no significant relationship between family characteristics towards students’ academic achievement</td>
<td>.001</td>
<td>Significant</td>
<td>Reject H0</td>
</tr>
<tr>
<td>II. There is significant relationship between family characteristics towards students’ academic achievement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. There is no significant relationship between self-efficacy towards students’ academic achievement</td>
<td>.891</td>
<td>Not significant</td>
<td>Reject H1</td>
</tr>
<tr>
<td>II. There is significant relationship between self-efficacy towards students’ academic achievement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. There is no significant relationship between university features towards students’ academic achievement</td>
<td>.000</td>
<td>Significant</td>
<td>Reject H0</td>
</tr>
<tr>
<td>II. There is significant relationship between university features towards students’ academic achievement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the table above, only self-efficacy was found to be not significant towards students’ academic achievement. While the other two variables such as family characteristics and university features show a positive significant with the students’ behavior. It is because of a significance level of 0.01 (i.e., less than a 5% chance), the result obtained could happen explaining that family characteristics and university features are the major factors that effect on students’ academic performance.

8. DISCUSSION

The purpose of the present study was to identify the effects of family characteristics towards students’ academic achievement. This study also determined the effects of self-efficacy and university features towards students’ academic achievement. To answer the first research question, an attempt was made to establish a relationship between family characteristics with students’ academic achievement. As the results show, there is a significant correlation between family characteristic with academic achievement as stated in the findings of Pangeni (2014) in Japan. Family characteristics reported playing an important factor as the number of a family member can affect students’ academic achievement. It also affected by their parent’s level of education as stated by Mersha, Bishaw and Tegegne (2013). Besides, student becomes more motivated to achieve the best results when they are studying with their siblings. In the other hand, the number of books available at their home encourages them to study and indirectly will affected their academic achievement. They also indicate that one of the factors for female students’ low academic performance and high attrition is because of their family background and characteristics.

Through the finding on this study, self-efficacy has no significant with academic achievement. Most of the respondent disagree that self-efficacy is one of the most factors affecting students’ academic achievement. For this reason, attention should be paid to the response to the second research question. Merriman (2012) study mentioned that students need teachers who understand their unique attributes and help them to success in their studies. Consequently, the students’ academic achievement is not driven by their self-efficacy.

The aim of the third research question was to examine the effects of university features towards academic achievement. The outcome between university features with academic achievement showed a significant correlation. It is because complete facilities, services and materials in UiTM Library enable students to study in a comfortable zone. Besides, locations of each class that is comfortable and strategic with the comprehensive IT equipment’s provided in UiTM Johor encourage students to attend the class. It is parallel with Stein (2014) in his study that mentioned faculty characteristics and behaviors promote academic achievement as well as faculty behavior and characteristics encourage disclosure and requests for accommodations or other supports. In addition, technologies applications such as internet connection and WiFi are fully also implemented affect the students’ academic achievement.

9. CONCLUSION

This study may inform pedagogical practice in several ways. Although this study conducted in small sampling, it is significance for the administrator and educators especially in determining the factors that may affecting undergraduates students’ in their academic achievement in UiTM Johor. Based on this study, it has been proven that family characteristics may affect the students’ academic achievement. As mentioned by Pangeni (2014) that family characteristics were responsible for a large proportion of the variance in students’ academic achievement. In short-term, few strategies can only be adopted to minimize the effects of family characteristics but in long-term much can be done for future research. The results of this study also showed that other than family characteristic,
university features are closely related to the factor that affecting students’ academic achievement. Heyneman and Loxley (1983) study that the overall proportion of variance in student achievement largely associated with school characteristics as compared to student background characteristics. Here, school characteristics can be assumed as university features. Lastly only, self-efficacy was not identified as a significant factor as shown in the result above. In conclusion, although the findings showed significant factors affecting students’ academic achievement are family characteristics and university features continuation of further research is recommended to seek and better clarify other variables that similar to this study.

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