Student Performance in Higher Educational Institutions: A Comparative Analysis based on Student Activities and Behaviors

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Abstract - *Today university students are engaging with different activities and they have various behaviors as well. The final result of the student varies based on this highly complicated and competitive environment. Assessing one's performance, identifying one's uniqueness and gathering solutions are all challenging problems for university students as well as lecturers. The main focus of the study should be on how student performance changes as a result of their activities. This study compared student academic performance with their hobbies, extracurricular activities, different university activities and behaviors. Data were gathered from graduates of the Sabaragamuwa University of Sri Lanka and used as a sample in this study around 200 graduate students' responses through an online Google form. Descriptive analysis and multiple regression analysis were used to analyze the data. Based on the analysis results, students who regularly do past papers, regularly attend lectures, and make short notes have obtained a higher class. In comparison to the other students, those who followed extra courses before the university entrance or during the university period also had good grades. When looking at the behavior of students in their regular lifestyle, those who use social media often have a middle-level achievement in their degree. Extracurricular activities have not been significantly impacted. The majority of students who has better results collected their additional knowledge through the Internet. Students who have better results at the university entrance exam for general English could obtain a higher class in their degree. Based on the analysis result research identified that student performance can be improved by group discussions, exchanging experiences with others, various academic sessions, and seminars. Providing free Internet facilities and e-library facilities will be more helpful to improve their knowledge and giving feedback for their examinations in the early stages is also identified as an important task.*

Keywords – Student performance, Student results, Student behaviors, Student activities

INTRODUCTION

Today universities operate in a highly complicated and competitive environment. The universities face major difficulty in analyzing student performance, identifying student uniqueness, and developing student strategies. The university administration should pay greater attention to the profile of admitted students, learning about various types of subjects, various types of courses based on the data collected. Here we look at whether there are any patterns in the available data to forecast the success of university students based on their personal, educational, and other activities.

The main focus should be on the performance of the students in an educational institution. The main performance is target to educational performance, but it is important to have an overall performance of students when they are moved to the society as a graduate. We used the independent variables as different kinds of things like student extracurricular activities, their attitudes, hobbies and behaviors and dependent variable as their final result.

University students engage in a variety of activities before and after entering the university. This includes studying different extra courses, engaging in extracurricular activities, participating in various competition and their achievements, and they engage in doing a sport,

chatting with friend, traveling, like different activities. Students aspire to achieve a good class, which is their goal by balancing the various activities with their academic activities.

This research is targeted to analyze and identify the relationship between student activities and behaviors with student academic performance. The result is based on the collected responses from the recent graduate students in the university. Based on the analysis result, we can get the idea of students and we can let them know how hard they have to work to reach their academic goals. We can increase the paying special attention to current weak students in the university based on the analysis results.

There are different existing approaches that tried to analyze student performance based on the various tools and techniques. In [1], an effort is made to examine the specified feature sets by gathering scholarship data from various Pakistani institutions. To forecast whether a student will be able to complete his degree, learning analytics, discriminative, and generative classification models are used. Some studies offer [2] a case study on forecasting students' performance at the conclusion of a university degree at a beginning of the degree program, in order to assist institutions in not only focusing more on brilliant students, but also in identifying and supporting individuals with low academic accomplishment.

In the article [3], [4] outlines a method for categorizing students in order to forecast their final grade. They create, test, and compare the performance of a number of pattern classifiers using an online course dataset. Some existing studies [5] used both grade point average and assessment center evaluations were significantly influenced by overall life satisfaction. The significance of the findings for future research and educational practice are discussed. Even when standard academic performance indicators are controlled, the findings imply that total life happiness might be used to test academic accomplishment in college students.
In [6], data were collected from the University of Washington's register databases for measure the student performance. Here, data are included in only demographic information, pre college admission information and transcript records. In this study does not include their daily routing patterns. But those daily routines, student activities and behaviors highly impact to the students' performances.

According to the [7] they can forecast graduation success in a four-year university program using only per-university grades and first and second year courses grades. It gives the organization the information it needs to define quality improvement measures.

In the study [8] a model is built up based on some selected input variables collected from questionnaire method. After testing some of the hypothesis and some of affecting factors were identifies and taken to predict the grades. In [9], reserches were able to predict the results of each of students' final exams with an error of only one degree on the grade scale. Even though the task was tough, only half of the students' failures were accurately detected, despite the fact that all failed grades account for less than a fourth of all grades.

Most of the previous studies are used few independent variables to analyze student performance. But it is difficult to analyze the students' performance with few independent variables. Because extracurricular activities, daily routine, hobbies like different things are affected to the students' performance. We identified that research gap and planning to consider more independent variables for analyzing the student academic performance.

OBJECTIVES OF THE STUDY

There is no standard way to measure academic performance based on students' other activities and behaviors. But it is important to identify that relationship. If we can identify that, we can test the talents and grades of new students and we can let them know how hard they have to work to reach their target classes. It enhances not only the talents and grades of the students but also the quality and recognition of the educational institution. This study is more beneficial for identifying weak students, and the identified individuals may be personally supported by instructors to improve their study performance.

Research Questions
We have identified the following research questions based on the research problem.

RQ1: What are the main student activities that affected the student's academic performance?

RQ2: What are the main student behaviors that affected the student's academic performance?

RQ3: What is the relationship between student activities, behaviors, and academic performance?

Research Objective
Main Objective
The main objective is to analyze the university student academic performance based on their

studies, hobbies, extracurricular activities, and behaviors.

Specific Objectives
RO1: Identifying the student activities affected the student academic performance

RO2: Identifying student behaviors affected the student academic performance

RO3: Analyze the students' academic performance based on student activities and behaviors.

Figure 1 illustrates the mapping of research questions to research objectives which support achieving the main objective of the research by answering research questions.
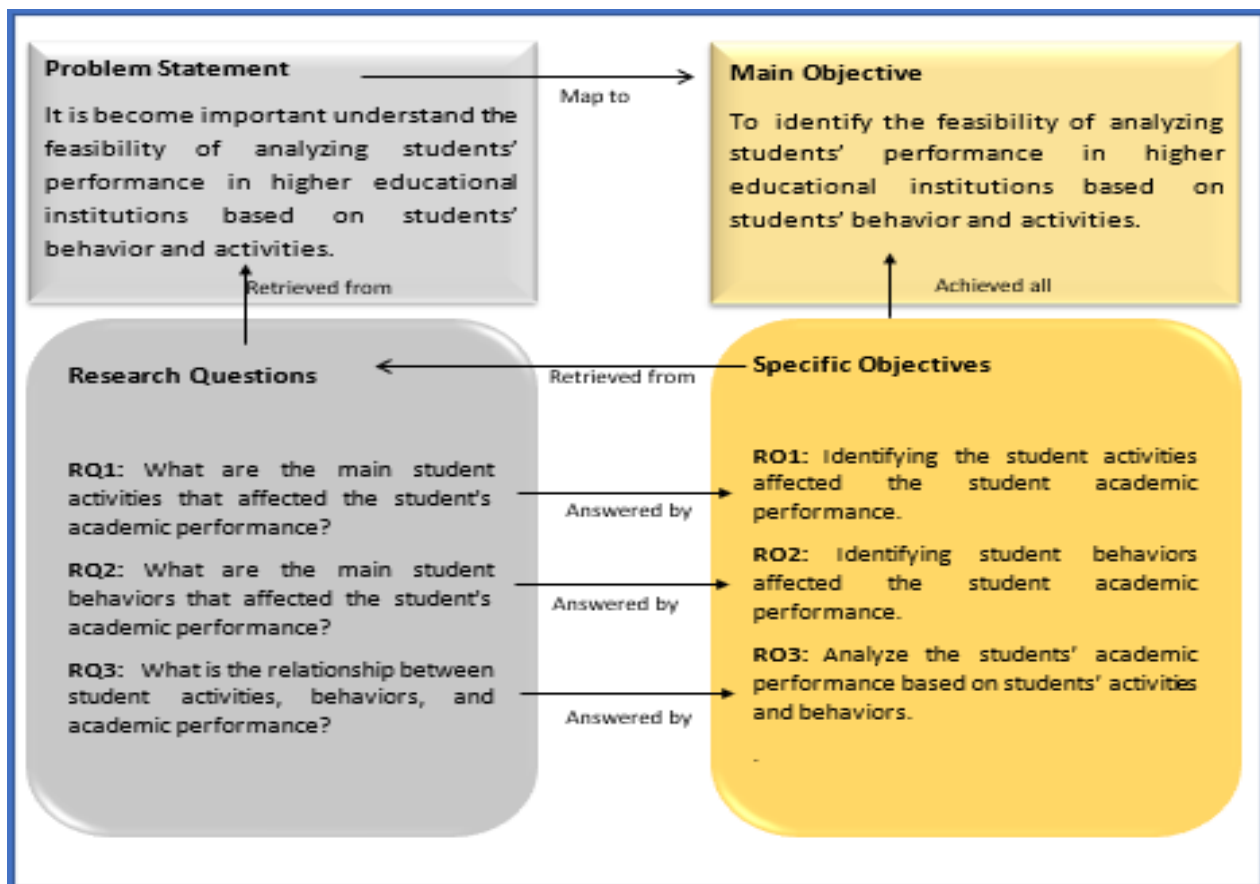

Figure 1: Mapping of research questions to research objectives

METHODOLOGY

Scope of the Study

The study's scope has been specified as students of the Faculty of Social Sciences and Languages of Sabaragamuwa University of Sri Lanka. Responses were gathered by recent graduate students from 2008 to 2014 academic years.

Data Collection

The survey included graduate students of the Faculty of Social Sciences and Languages of Sabaragamuwa University of Sri Lanka and the results are based on 200 responses from graduated students. In the pandemic situation, it was not suitable to face to face discussion with students and gather data. Therefore, an online questionnaire has been created. The survey addressed areas such as how students engage in academic activities, hobbies, extracurricular activities, followed courses, behaviors and final results. And a total of 21 questions have been scheduled to cover these areas.

Data Analysis

Using simple random sampling, we chose the data set and it was unbiased. To evaluate the data relevant to this study, descriptive analysis, chi-squire test, and regression analysis are applied by using Statistical Package for the Social Sciences (SPSS) software. Further findings and recommendations were based on the data analysis results.

Conceptual Research Model and Hypothesis

In this research, the deductive research techniques are used to examine the validity of assumption. The goal of this study is to apply such theories to the test (conform or reject). For this study, when considering the conceptual framework, we build up the following hypothesis in order to get research analysis.

H1: There is a relationship between students' performance and university entrance exam results including general English results.
H2: There is a relationship between students' performance and hobbies, extracurricular activities
H3: There is a relationship between students' performance and study schedule in the semester
H4: There is a relationship between students' performance and study schedule in the exam period
H5: There is a relationship between students' performance and daily routine activities

In Figure 2 illustrate the three criteria that were addressed in the survey via the various questions. In this survey identified personal information, educational information and other activity information related to the study.

RESULT AND DISCUSSION

First class is considered as the best result (class) in the university. Then *Second-Class Upper Division*, *Second-Class Lower Division* and *pass* is considered as highest to lowest classes respectively.

Figure 3 shows the Respondents' gender and Table 1 shows that, most of the male students who have obtained *Pass* and majority of the female undergraduates have obtained *Second-Class Upper Division*.

As shown in Figure 4, the sample mostly represents 85% of the graduated students with Honors degree and 15% represent graduated with General degree. Table 2, most of the students who have obtained the General degree have obtained the *Pass* and majority of the Honors degree holders have obtained *Second-Class Upper Division*. 6.5% of Honors degrees have obtained *First* class.
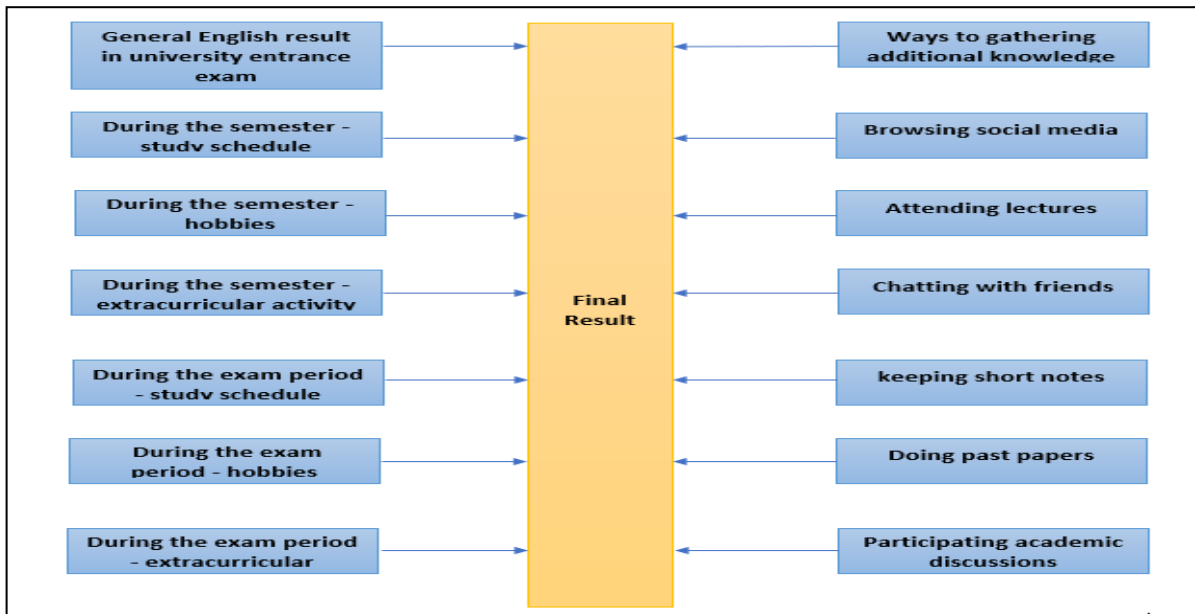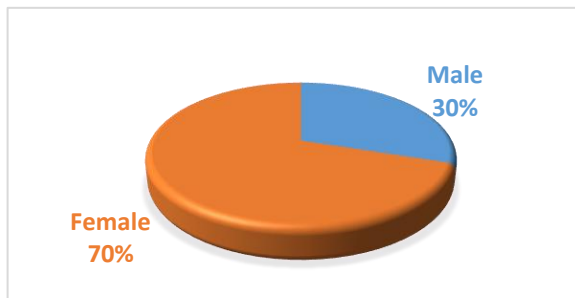
Figure 2: Conceptual research model
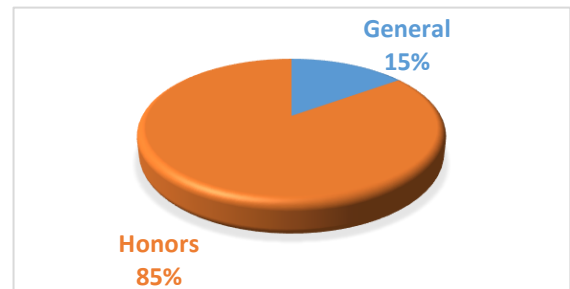

Figure 3. Respondents' gender

Figure 4. Degree type of the student

Table.1. Students' obtained class vs gender

		Result (Class)			
		First Class (3.70 and above)	Second Class - Upper Division (3.30 - 3.69)	Second Class - Lower Division (3.00 - 3.29)	Pass (0- 2.99)
Gender	Male	3.3%	10.0%	13.3%	73.3%
	Female	6.4%	47.1%	30.0%	16.4%

Table 2. Students' obtained class vs degree type

		Result (Class)			
		First Class (3.70 and above)	Second Class - Upper Division (3.30 - 3.69)	Second Class - Lower Division (3.00 - 3.29)	Pass (0- 2.99)
Degree Type	General	0.0%	13.3%	33.3%	53.3%
	Honors	6.5%	40.0%	23.5%	30.0%

Figure 5 shows the students' main subjects (Commerce/Art) in university entrance exam and Figure 6 shows the result of the general English subject in the in university entrance exam examination. According to Figure 5, 54 % of the students have studied Arts stream and 46 % have studied Commerce stream from these respondents. According to the Figure 6, 32 % of the sample are students who have obtained "F" grade for general English. In this sample 8 % was obtained "A" grade, 14 % was obtained "B" grade, 17 % was obtained "C" grade and 29 % was obtained "S" grade.
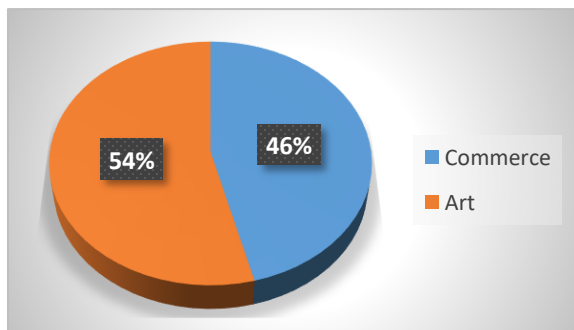
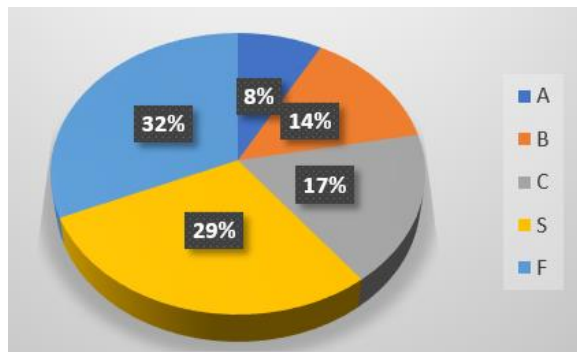

Figure 5. Main subjects in university entrance exam

Figure 6. Results of the English in entrance exam

Table 3 explains the comparison between general English results in university entrance exam with the obtained class in the university.

The majority of students who have obtained an *A* in general English are obtained the *Second-Class Upper Division* in university. 54% students who get *F* grade for general English have obtained *Pass*, and that is the highest percentage of the students who get *F*.

Figure 7 explain the summary of all the obtained classes of the responded students. Based on that, the highest number of students got second upper. It is 36 %. Also, 34 % of the sample got passes, 25 % got second lower and rest of the sample got first class.

As shown in the Table 4, the relationship between the obtained class and the student activities and behaviors has been compared. *Second-Class Upper Division* graduates are highly depending on referring books, discussion with friends, using internet and self-studying. The majority of the students who have obtained *Pass*, learned more by participating to the knowledge sharing sessions.
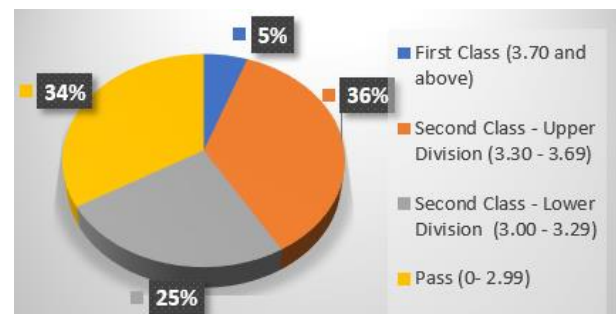

Figure 7. Obtained Class of the students

Table 3. Obtained class in the university vs university entrance exams' general English results

		Result (Class)			
		First Class (3.70 and above)	Second Class - Upper Division (3.30 - 3.69)	Second Class - Lower Division (3.00 - 3.29)	Pass (0- 2.99)
General English	A	25.0%	31.3%	25.0%	18.8%
	B	7.1%	42.9%	17.9%	32.1%
	C	8.6%	40.0%	25.7%	25.7%
	S	1.7%	50.0%	27.6%	20.7%
	F	1.6%	19.0%	25.4%	54.0%

Table 4. The relationship between the obtained class and the student activities and behaviors

		Result (Class)			
		First Class (3.70 and above)	Second Class - Upper Division (3.30 - 3.69)	Second Class - Lower Division (3.00 - 3.29)	Pass (0- 2.99)
More Information	Referring books	25.0%	31.3%	25.0%	18.8%
	Academic discussion with friends	7.1%	42.9%	17.9%	32.1%
	Gather knowledge through Internet	8.6%	40.0%	25.7%	25.7%
	Self-study	2.3%	48.8%	25.6%	23.3%
	Joining the knowledge sharing sessions	1.3%	25.6%	26.9%	46.2%

Table 5 shows how the different variables are associated with student class.

If the P value is lower than 0.05, there is an association between the independent variables.

Table 5. Chi-square test for independent variables

Variable	P value	Conclusion
Gender	0.000	The class is depended on the gender.
Degree type	0.007	The class is depended on degree type.
General English result	0.000	The class is depended on general English result of university entrance exam.
More information sources	0.007	The class is depended on more information sources.
Time spent studying in the semester	0.010	The class is depended on time of studying in the semester.
Time spent studying in the exam period	0.023	The class is depended on time of studying in the exam period.
chatting with friends	0.017	The class is depended on nature of chatting with friends.
Doing past papers	0.003	The class is depended on doing past papers.

Table 6. Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.742	.565		1.314	.190
	Studies	.780	.160	.335	4.882	.000
	Hobbies	.035	.104	.024	.335	.738
	Extracurricular	.088	.135	.049	.651	.516
	Other activities	.053	.139	.029	.379	.705
a. Dependent Variable: Class						

As shown in Table 6, the regression equation is contrasted by including the most appropriate variables to describe the dependency variable. Table 6 explain the Coefficients. Considering the above table;

Class = 0.742 +0.780stidies +0.35hobbies +0.88extracurricular activities +0.53other activities

- The unstandardized coefficient, B value of for hobbies (semester and exam period) is equal to 0.035. This means for each one unit increase in hobbies time, there is an increase in class with performance of 0.035 times units.
- The unstandardized coefficient, B value of for extracurricular activities (semester and exam period) is equal to 0.088. This means for each

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one unit increase in extracurricular activities time, there is an increase in class with performance of 0.088 times units.
- The unstandardized coefficient, B value of for studies (semester and exam period) is equal to 0.780. This means for each one unit increase in study time, there is an increase in class with performance of 0.780 times units.
- The unstandardized coefficient, B value of for other activities is equal to 0.053. this means for each one unit increase in hobbies time, there is an increase in class with performance of 0.053 times units.

Table 7 explains the Residuals Statistics. "Std. Residual" maximum and minimum values should not exceed -3.29 or +3.29. If they exceeded, there are outliers. In this sample they are not exceeded. Therefore, in the study there is no outliers.

Table 7. Residuals Statistics

Residuals Statistics[a]					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.95	3.66	2.87	.316	200
Residual	-1.998	1.842	.000	.895	200
Std. Predicted Value	-2.893	2.508	.000	1.000	200
Std. Residual	-2.209	2.037	.000	.990	200
a. Dependent Variable: class					

According to the Figure 8, linearity of the plot, dependent variable is normally distributed.
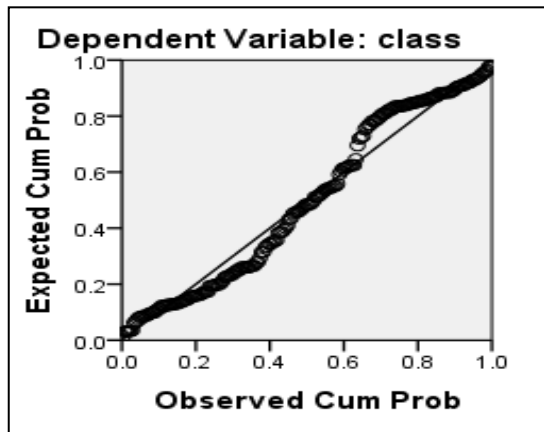

Figure 8. Normal P-P Plot

According to the Figure 9, it is nicely distributed on the positive side (+3.29) and the negative side (-3.29) of the zero-horizontal line. Also, there is no outliers.
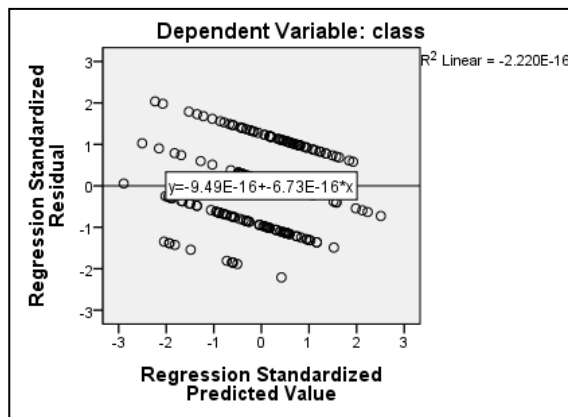

Figure 9. Scatterplot

In Figure 10, Residuals are plotted equally around the zero. Plotted values are equally plotted on both sides.
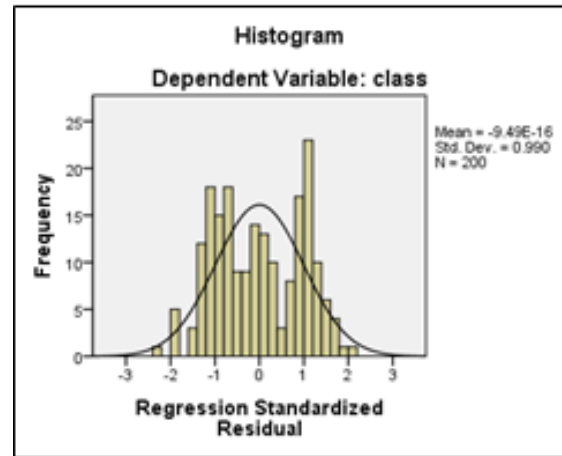

Figure 10. Histogram

CONCLUSION AND RECOMMENDATION

The university students' academic performance is depending on different criteria relevant to the student's behavior and activities. We have collected data from the graduate students and collected the students' obtained class and their activities, behaviors, and relevant other details during the university time. The hypothesis is evaluated by examining the sample data using descriptive analysis and multiple regression analysis. Objectives of the study is to analyze the students' performance based on their academic activities and other extra activities. Based on those activities, the researcher analyzes the relationship between those extra activities and behaviors with obtained class.

According to analyzed data, students who refer to more books, have academic discussions with friends, gather more knowledge through Internet, engaging in self-study have obtained a second-class upper division. And also, students who regularly do past papers, attend lectures, and make short notes have obtained a first-class.

According to the analysis results, we can suggest some ways to improve the academic performance of students. Based on the analysis results, the following improve the students' academic performance.

- Conducting various seminars and group discussions related to the subjects will improve student knowledge.

- As a university can support improving the reading opportunities by increasing the library and e-library facilities.
- Internet facilities inside the university can improve and encourage the student to use the Internet to improve their knowledge.
- Encourage students to self-study, doing past papers, attend lecturers and keep short notes.

And the results also suggested providing scores and feedback on the assignments and quizzes to students before the end of each semester. Then the student can identify their mistakes and improve themselves. Pay more attention to important subject matters in a practical situation is identified as another important thing to improve academic performance.

As future work, we are planning to improve this analysis result and make a model for predict the students' performance based on the above-mentioned criteria. Then we can easily predict student performance in the early stages and encourage that student to improve the academic performance.

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