Journal of Practice Learning and Educational Development
https://digitalpress.gaes-edu.com/index.php/jpled
E-ISSN: 2809-1205
Vol 5, No. 1 (2025) 39-46
DOI: 10.58737/jpled.v5i1.404

Submitted: 15-01-2025
Revised: 06-02-2025
Accepted: 17-02-2025

Descriptive Analysis of Student Learning Outcomes in Statistics Course

Intan Rozana[1]
Universitas Bina Sarana Informatika[1]
*E-mail: intan.irz@bsi.ac.id

Abstract

Students' final grades are still not satisfactory after the semester ends. Current data shows that the average final grade is below 70. Several factors are interrelated to shape students' learning outcomes. The following factors contribute to the total: 20% for instructor observation, 25% for assignments, 25% for midterm exams, and 30% for final exams. In order to use the results of the Statistics course as a benchmark for future comparison courses, a descriptive study of the learning outcomes of the course is needed. The course can focus more on students' strengths and areas for improvement if the instructor pays close attention to the stated course objectives. This study was conducted in the Information Systems Study Program of Bina Sarana Informatika University under the Faculty of Engineering and Informatics. The study will be conducted from September 2023 to February 2024. Participants in this study were all students enrolled in the Statistics course for the 2023–2024 academic year, namely third semester students. Students often get an A grade with a score range of 80-100 on the final exam based on lecturer observations, assignments, midterm grades, and final semester exams. Statistics scores can be used as a consideration for learning related courses. So that lecturers can anticipate low scores obtained by students.

Keywords: Learning outcomes, Statistics, Descriptive analysis

Introduction

The ability of universities to produce graduates is crucial for a country to remain competitive in the face of globalization. Graduates must be strong, talented, intelligent, and creative individuals (Amalia, 2024). Students as intellectuals of the nation have a responsibility to uphold the Tri Dharma of Higher Education (Lian, 2019). Based on Law Number 12 of 2012 Article 1 Paragraph 9, Higher Education has the responsibility to coordinate teaching and learning activities, lecturer research, and community service known as the Tri Dharma of Higher Education. Students, like the entire academic community, have the same responsibility in upholding the Tri Dharma of Higher Education. In carrying out the Tri Dharma, especially Education, students have an active role. Education is one of the main pillars of the Tri Dharma. To produce superior graduates, education plays a very important role.

A better human civilization is the ultimate goal of education, which aims to help students' physical and mental souls from their innate nature. Currently, society places high value on university education (HE) because it can shape one's professional trajectory in the workplace (Sujana, 2019). One of the criteria for graduating with a Bachelor's degree is the completion of 145 credits. The credit requirements can be met by completing a number of courses. Statistics is a compulsory course.

According to (Ririen and Hartika, 2021), statistics is a course that is considered difficult by some students. Descriptive statistics, data presentation, sigma notation for the distribution of central

frequencies of ungrouped and grouped data, measures of dispersion, index numbers, regression, simple correlation, and periodic data analysis are courses discussed in the Statistics course.

Throughout this course, you will learn the basics of statistical analysis with an emphasis on data processing in Excel or SPSS, as well as how to apply what you have learned through practical examples. Students must be able to plan, collect, evaluate, interpret, and present data to do this. As a result, many students struggle to grasp the concepts covered in this class. Students struggle to apply and understand the complex formulas used in statistical data analysis to real-world situations because they lack the skills necessary to address these types of problems.

The assessment findings show that students' final course grades are less than ideal, with a significant number of students receiving below average grades. Teachers have made efforts to improve their own educational standards in light of these disappointing results. We have provided you with homework, exercises and individual feedback. However, students' final grades are still not satisfactory at the end of the semester. The results show that, on average, students scored below 70. The learning outcomes that students obtain are the result of a combination of factors. Among them, 20% is used for lecturer observations, 25% for assignments, 25% for mid-term exams and 30% for final exams.

The number of students in attendance and class participation form a component of the instructor's observation. Other courses in the same field can benefit from descriptions of statistics learning outcomes. Lessons can focus more on student strengths and areas for improvement if instructors pay close attention to the stated course objectives. Teachers also have the option to impose harsher consequences on students who fail to maintain adequate attendance or submit assignments on time. Analysis of the Problem-Based Learning Model in Cultivating Interest in Learning Statistics in Students is another relevant study conducted by Rizky (2023). Rizky's research shows that the use of the PBL approach to teaching statistics helps to generate student interest in the course both inside and outside the classroom. The reason is that students are asked to participate more actively in the learning process by being given more case analysis projects to complete individually or in groups. To find the appropriate learning model for Statistics classes, it is important to describe the student's situation. According to Gagne and Briggs, learning outcomes are the skills that students acquire through their learning experiences and can be seen in their performance as learners. At the same time, according to Reigeluth, learning outcomes can be used as a metric to evaluate the benefits of various approaches in various contexts. According to Suprihatiningrum (2016), she continued by saying that learning outcomes are indicated by ability. Various forms of periodic assessment, including tests, assignments, and instructor observations, are used to measure learning outcomes in higher education. The acronym ABCDE stands for learning achievement assessment. Student learning outcomes are the sum of several factors, according to a letter from the Dean of FTI at Bina Sarana Informatika University. These factors include professor observations, assignments, midterm exams, and final exams. Each component contributes a different amount; for example, 20% for lecturer observations, 25% for assignments, 25% for midterm exams, and 30% for final exams. This lecturer observation component includes the quantity of students present and their level of engagement during class. Almost every academic program requires students to take a statistics course. The purpose of this course is to provide students with a strong foundation in statistics so that they can assess research topics independently. This class is an integral part of other course materials and is very helpful for students as they prepare to write their final papers.

Methods

The Information Systems Study Program, Faculty of Engineering and Informatics, Bina Sarana Informatika University, was the location of the research. The research took place from early 2023 to early 2024. The participants of this study were all students of the Statistics Study Program for the 2023–2024 academic year, namely semester III students. In this study, the researcher examined the status of learning outcomes in the Statistics course by conducting a survey of the entire population.

Thus, this study is a population-based study. The learning outcomes of the Statistics course for the 2023–2024 academic year are the independent variables in this analysis. These learning outcomes are revealed through various forms of evaluation, such as class participation, homework, midterm exams, and final exams. In this study, the variable scale was changed from an interval scale to an ordinal scale.

The research design used is descriptive. Sugiyono (2009) defines descriptive research as research that identifies variables (one or more) without drawing conclusions or connecting the variables. Meanwhile, descriptive research is defined by Suharsimi as research that aims to collect data on the current state of a symptom, namely the condition of the symptom as it is at the time the research is conducted. Research like this can provide an overview of the state of student learning outcomes in statistics courses, which is useful for compiling similar programs.

The data collected relates to students' learning outcomes in the Statistics course as viewed by the instructor, as measured by assignment completion, midterm and final exam scores, and overall performance during one semester, namely the third semester of the 2023–2024 academic year. Some of the methods used to obtain this information are: 1) Student attendance and activity data were collected using a documentation approach for use in lecturer observations; 2) Data on assignment grades, mid-semester grades and final exam grades are collected using test techniques.

This study uses descriptive analysis as its data analysis approach to determine the factors that influence student performance in Statistics courses in the 2023–2024 academic year. Researchers use a number of data presentation strategies, such as to examine the state of learning outcomes from several perspectives, including:

1. **Frequency distribution table**

   Lecturer observation data, assignment grades, midterm exam results, and final exam results are presented using a frequency distribution table. The following is the procedure for creating a frequency distribution table: a) Determine the range (maximum and minimum data difference) Determine the number of classes; b) Determining the length of the interval; c) Calculate the frequency corresponding to the interval class.

2. **Graph/histogram**

   From the frequency distribution table, graphs and histograms are generated.

3. **Tendency value**

   The learning outcomes of statistics courses can be grouped into three groups to see the trend value, namely:

   a. High when $X_i \geq \bar{X}_{gab} + \frac{1}{2} S_{gab}$
   b. While if $\bar{X}_{gab} - \frac{1}{2} S_{gab} < X_i < \bar{X}_{gab} + \frac{1}{2} S_{gab}$
   c. Low if $X_i \leq \bar{X}_{gab} - \frac{1}{2} S_{gab}$

Results and Discussion

Statistics serves to develop logical and scientific thinking patterns, especially in the era of globalization where all fields are inseparable from the use of numbers, data, and facts (Riduwan, 2015). In this study, the emphasis will be on descriptive statistics which contain a lot of information and interpretations that are useful for users or decision makers. Descriptive statistics is analyzing data, which means carrying out actions/treatments on data to produce certain goals, either in the form of a description of the data or in the form of conclusions regarding the conditions or events where the data was taken. In general, there are several ways to present data in descriptive statistics, including: tables, graphs/diagrams, measures of central tendency, measures of place value, measures of dispersion (Martias, 2021). The analysis used is the value of the results of lecturer observations,

assignments, midterm exams, and end of semester exams to become the final statistical value of students. The following are four aspects of value that can be seen from the collected data:

Table 1. Lecturer Observation Values

Mark	Middle Value	Frequency
17-28	22.5	1
29-40	34.5	1
41-52	46.5	1
53-64	58.5	1
65-76	70.5	2
77-88	82.5	4
89-100	94.5	35

For the Statistics course, the average instructor observation score was 96. Combining the attendance and student activity scores over the semester yields the instructor observation score. The student attendance score is calculated by summing all of their attendance records from the Statistics course. On the other hand, the student activity score is based on the level of student preparedness and participation during class. Using the data in table 1, the following diagram can be created:

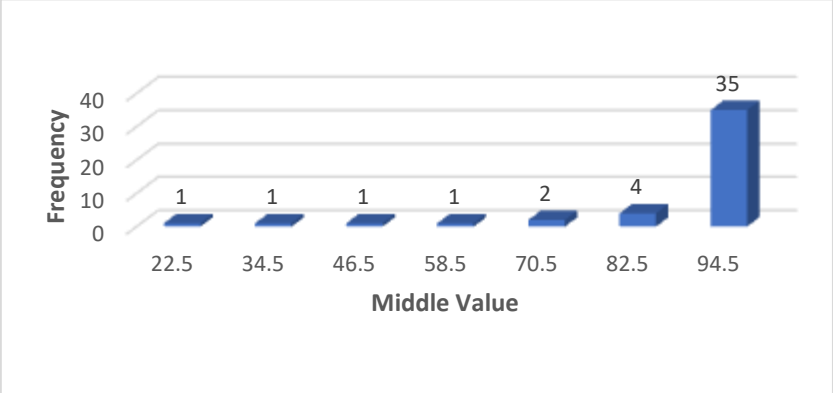

Diagram 1. Lecturer Observation Values

Figure 1 shows that of the 35 possible students, 94.5 had faculty observation scores between 89 and 100. Therefore, the majority of third-semester statistics students are typically quite engaged and never miss class. On faculty observation scores, one student each received a range of 17–28, 29–40, 41–52, and 53–64. Evidence suggests that these students are chronically absent from class, which contributes to their below-average faculty observation scores.

The grade you earn on an assignment is the second part of your evaluation. The following table shows the average grades for student assignments based on documentation data:

Table 2. Assignment Values

Mark	Middle Value	Frequency
17-28	22.5	2
29-40	34.5	0
41-52	46,5	1
53-64	58,5	2
65-76	70,5	3

Mark	Middle Value	Frequency
77-88	82,5	6
89-100	94,5	31

The statistics study program uses the assignments completed by each student during the semester to determine their final grades. Based on the data in the table, we know that 31 students fall into the highest frequency category (89-100). The statistics study program has an average assignment score of 84. As a result, 31 students have achieved above average results in their assignments. The statistics assignment document shows that the two students who completed the least work did not complete many assignments and did not submit them on time. This is related to the initiative taken by the students. There is a correlation between the poor assignment results of the two students and their lack of engagement and attendance in class. There is a favorable correlation between engagement and academic success, as stated in a journal article by Rr. Dyahayu Yustianingrum (2015). The level of student engagement is directly correlated with how much they learn. The high level of participation and regularity in class was seen in the 31 students who obtained the best grades in completing their assignments. Based on these results, it can be concluded that the second semester assignment scores for the statistics course are quite good, with 78% of students obtaining scores above 84.

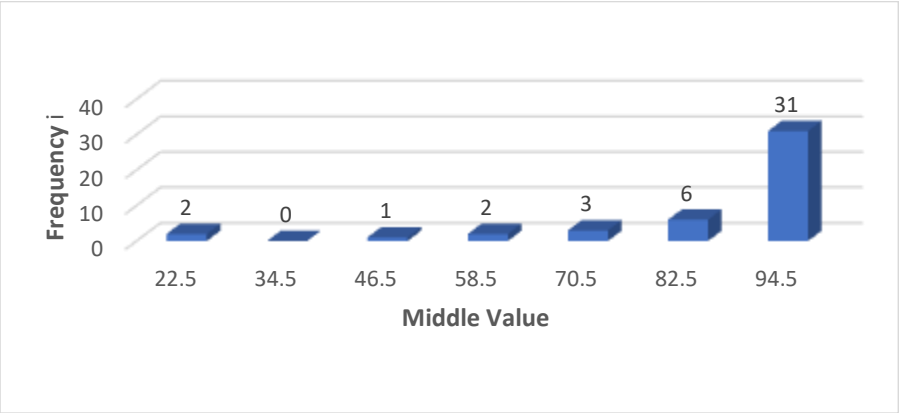

Diagram 2. Assignment Value

The results of the UTS or Mid-Semester Exam are further evidence. After the seventh lecture, the UTS will be held. In the middle of the semester, the UTS score is associated with the attendance, involvement, and seriousness of students in completing assignments. The following are the achievements of students' UTS scores:

Table 3. Mid-Semester Exam Scores

Mark	Middle Value	Frequency
17-28	22.5	2
29-40	34.5	2
41-52	46.5	6
53-64	58.5	9
65-76	70.5	11
77-88	82,5	9
89-100	94,5	6

Before receiving remediation, students' midterm scores reflected their raw performance. The mean score on the midterm exam was 67, which was not very high. With a standard deviation of

18.85, the median score was 66. Midterm exam scores above 67 were achieved by only 48.88% of second-semester students. It can be said that the midterm exam results of second-semester students in statistics courses are still below average, therefore there is still room for improvement. If instructors want to see poor results on the final exam, they need to provide more treatment to their students. Instructors should pay more attention to their students' skills and use learning approaches that can improve their students' learning outcomes. Table 3 provides the data used to create the accompanying diagram.

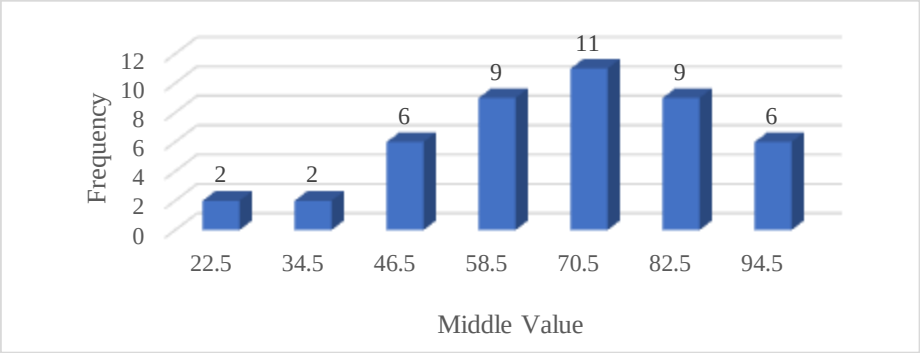

Diagram 3. Midterm Exam Scores

At least six students scored between eighty-nine and one hundred, according to Figure 3. Eleven students scored between 65 and 76 in the midterm exam, with a median score of 70.5. Twenty-two students scored higher than the average midterm exam score of 67. Low assignment scores were also seen among students with the lowest midterm exam scores. It seems that the midterm exam results were influenced by the lack of seriousness in completing the midterm exam. In fact, the lecturer's assignment was a practice for the midterm exam.

The following table displays the final assessment components used to calculate a student's final grade:

Table 4. Final Semester Exam Scores

Mark	Middle Value	Frequency
0-14	7	1
15-29	22	0
30-44	37	0
45-59	52	6
60-74	67	7
75-89	82	24
90-104	97	7

The final exam scores were obtained through completion of case study papers and presentations. The results ranged from 75 to 89 for the majority of the 24 students. Among them, one child scored the lowest in the class 7 in the middle. However, seven students managed to get the best scores in the final exam. Scores above 75 were obtained by the majority of students. The following diagrammatic representation is obtained from table 4:

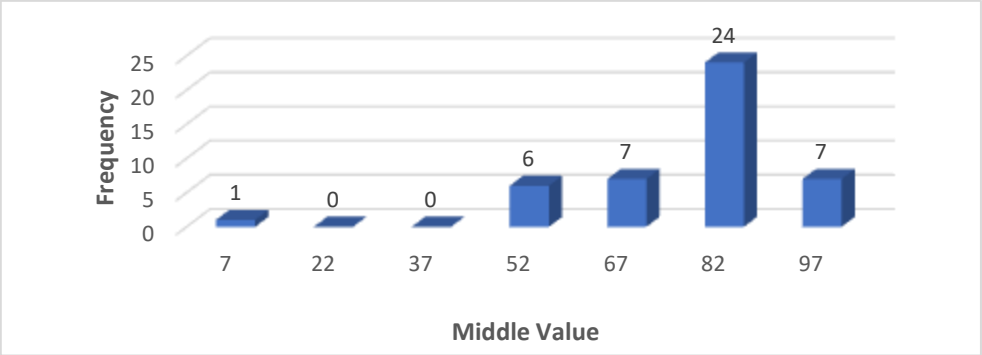

Diagram 4. Final Semester Exam Scores

Figure 4 shows the results of the second semester final exam. The majority of students scored above the average of 77. Meanwhile, 29 students scored above the average. Second semester students of the Statistics program have achieved an optimal level of performance on the final exam. With an increase in learning outcomes and final exam scores of 77, the program is still categorized as moderate, according to the average midterm score of 67. Interestingly, the students' final exam results did not match the high scores given by the instructor. The results were already at a high level in terms of student engagement and attendance. However, the final exam and its results were not affected. Low final exam scores are an indication of poor performance on assignments and exams. This provides the instructor with a holistic perspective on the problems arising from students' learning models, their aptitudes, and project questions on the midterm and final exams, as well as from assignments and homework. Lecturers should consider the weight of the questions and ensure that the level of difficulty of the questions is distributed when compiling midterm exam questions.

Using these four components of the grade, we can calculate the final grade of the students by adding the grades of the lecturer's observations, assignments, midterm exams, and final exams. Whether or not the students pass the Statistics course depends on their final grade. As you can see in the pie chart below, the final grade data for the Statistics course is:

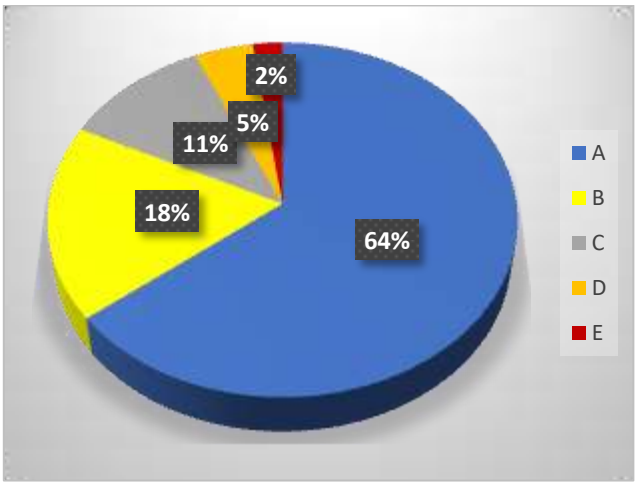

Diagram 5. Final Value

Based on the data in Figure 5, the percentage of students who received grades A, B, C, D, and E are as follows: 64%, 18%, 11%, and 2%. On a scale of 80 to 100, the majority of students received an A on their final grade. Students' achievement in the Statistics course during the third semester is summarized in their final grades. Other similar courses can use this data as a basis for their lessons.

Conclusion

Documentation data for the third semester of statistics courses in the 2023–2024 academic year shows that, considering lecturer observations, assignments, midterm exams, and final exams, students usually get A grades ranging from 80 to 100. The results of the midterm exams and final exams are the most important factors determining this final grade. Low scores (65–76) on the midterm exam and high scores (75–89) on the final exam indicate that students perform well in the course. Students prefer to process data in case studies rather than working on problems while completing projects for final exam evaluation at the end of the semester. This is because students tend to get better grades on the final exam than on the midterm exam. Related to the learning method, student skills, material coverage, and the weight of questions in assignments and exams, poor midterm exam results in Statistics courses can be used as learning material for the next stage of Statistics learning. Considerations for courses related to learning can also be based on statistical results. So that teachers can be prepared to deal with poor student performance.

Reference

Amalia, Nur. (2024). Tridharma Perguruan Tinggi untuk Membangun Akademik dan Masyarakat Berpradaban. Jurnal Karimah Tauhid, 3(4), 4655. doi: 10.30997/karimahtauhid.v3i4.12886

I, W, C, Sujana. (2019). Fungsi Dan Tujuan Pendidikan Indonesia. Jurnal Pendidik Dasar, 4(1), 29. doi: 10.25078/aw.v4i1.927.

Lian, Bukman. (2019). Tanggung Jawab Tridharma Perguruan Tinggi Menjawab Kebutuhan Masyarakat. Prosiding Seminar Nasional Pendidikan Program Pascasarjana, Universitas PGRI Palembang, 3 Mei 2019 (hal. 100-106). Diakses dari https://jurnal.univpgri-palembang.ac.id

Riduwan. (2015). Dasar-dasar statistika. Alfabeta

Ririen, D., & Hartika, D. (2021). Identifikasi Kesulitan Belajar Mahasiswa Pada Mata Kuliah Statistika Selama Masa Pandemi Covid-I9. Jurnal Ilmiah Universitas Batanghari Jambi, 21(1), 148–155. doi: 10.33087/jiubj.v21i1.1236.

Rizky, Vega Bintang, Murtono, Abdul Munip, Ammi Thoibah Nasution. (2023). Analisis Model Pembelajaran Problem Based Learning dalam Menumbuhkan Minat Belajar Statistik pada Mahasiswa. Jurnal Ilmiah Pendidikan Dasar, 8(3), 2477-2143. doi: 10.23969/jp.v8i3.11184.

Sugiyono. (2009). Metode penelitian kuantitatif, kualitatif, dan R&D. Bandung : Alfabeta.

Suprihatiningrum, Jamil. (2014). Strategi Pembelajaran. Jogjakarta: ArRuzz Media.

Undang Undang No. 12 Tahun 2012, Pasal1 Ayat 9