

Analysis of Student Difficulties in Statistics Courses

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ABSTRACT

The educational implementation is a learning process at all levels, students are required to follow certain lectures, including mathematics courses. Learning difficulties are a barrier to learning where children are not well educated, due to disturbances, both from student factors and external factors. Learning, thus students are expected to catch up because of these obstacles. This research is classified into qualitative descriptive research that seeks to describe the analysis of student learning difficulties in statistical subjects. The subjects in this study were the fourth-semester students of 2018/2019 Mulawarman University. Research reveals things that are considered as a barrier factor for students in Statistics. In this study, the researcher collected information through documentation, tests, and interviews with students. The results of the analysis show that the difficulties of students in studying Statistics basically lie in the weakness of the concept. The results of the research conducted by the researcher were the existence of errors in process skills, errors in understanding questions, and errors in using notation. The solution to overcoming these problems is: for the eye teacher of Statistics to be able to develop learning strategies so that students can be more honed in their thinking skills and provide continuous problem training to students.

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1. INTRODUCTION

Sudjana (2016) states statistics is a science consisting of theories and methods that are branches of applied mathematics and talk about: how to collect data, how to summarize data, process and present data, how to draw conclusions from the results of analysis, how to determine decisions within boundaries certain risks based on existing strategies. Sugiyono (2016) states that principally statistics are defined as activities to collect data, summarize or present data, analyze data with certain methods, and interpret the results of the analysis.

Based on the data obtained learning outcomes in the even semester of the 2016/2017 academic year on Statistics courses only 25.39% of students get good grades. These results can be used as a measure of the extent to which students in understanding the material and what difficulties are experienced in achieving the results of learning Statistics. Some students with poor learning outcomes take back in the next semester.

Learning difficulties are a condition where students cannot learn well, marked by certain obstacles to achieving learning goals (Mursalin, 2018; Fonna, 2018; Putriani, 2018). Learning difficulties are learning disabilities and dysfunctions where students are unable to learn and the learning process does not function properly so students tend to avoid learning and result in student learning outcomes below their intellectual potential (Mulyadi, 2010; Usmani, 2018; Masitoh, 2018; Nasir, 2016). According to Jamaris (2014: 3) learning disability, also known as a learning disorder or learning difficulty is an abnormality that makes it difficult for the individual

concerned to carry out learning activities effectively.

Factors that cause learning difficulties or barriers are not easy to determine because these factors are complex. Abdurrahman (2010: 13) the main causes of learning disabilities are internal factors, namely the possibility of neurological dysfunction. According to Shah (2010: 170) the factors that cause learning difficulties consist of 2 types, namely students' internal factors: (1) cognitive, (2) affective, (3) psychomotor, and external factors of students, namely: (1) family environment, (2) community environment, (3) school environment.

In this study, the study will be conducted relating to the problems of student difficulties and their causal factors with the title "Analysis of Student Difficulties in Statistical Courses in the Mulawarman University Guidance and Counseling Study Program 2018/2019 Academic Year". This research was conducted to find out what the obstacles faced by students were in statistical subjects and to find out the factors that caused difficulties for students, so they were able to find solutions to problems faced by students.

The formulation of the problems proposed in this study is "Analysis of the factors that cause difficulties or obstacles experienced by students in Statistics courses in the Mulawarman University Guidance and Counseling Study Program 2018/2019". The purpose of the study is to find out the factors that cause difficulties or obstacles experienced by students in statistical subjects.

The benefits of this research are: 1) For students, can provide an overview of the difficulties experienced by students in Statistics courses, 2) For lecturers, can be used as a reference to improve

quality in the learning process, and 3) For researchers, it is expected to be a reference in subsequent research and can be used as consideration for researchers.

2. LITERATURE REVIEW

Learning difficulties are a translation of the term English learning disability. Learning difficulties are a multidisciplinary concept used in the fields of education, psychology, and medical science (Paloloang, 2014; Thahir, 2018; lmswatama, 2018). The following is the definition of learning difficulties according to experts: According to Abu Ahmadi and Supriyono (2003: 77), learning difficulties are a situation where students or students cannot learn as they should, this is not always caused by intelligence, but can also be caused by non-intelligence factors.

Rumini et al (Irham and Wiyani, 2013: 254) suggest that learning difficulties are a condition when students experience certain obstacles to follow the learning process and achieve learning outcomes optimally. Learning difficulties are things or disorders that result in failure or at least become a nuisance that can hinder learning progress. (Hamalik, 1983: 112).

So it can be concluded that learning difficulties are a condition where students cannot learn well, due to interference, both derived from students' internal factors and students' external factors. These factors cause students to be unable to develop according to their capacity.

According to Roestiyah (1989: 63) the factors that cause difficulties in learning a person are:

1. Endogenous factors include: biological (health, disability) and psychological (attention, interest, IQ).
2. Exogen factors, including: school (teacher's interaction with students, teaching methods, teaching methods), family (how to educate, understanding parents, family atmosphere), community (associates), whereas according to Dalyono (1997: 239) explains the factors factors that cause difficulties in learning, namely internal factors or factors within themselves and external factors.

In statistics, there are several types of data. Data can be in the form of numbers or not numbers. Data in the form of numbers are called quantitative data and data that are not numbers are called qualitative data. Based on their values there are two types of quantitative data, discrete data obtained from the calculation and continuous data. obtained from the results of measurements. According to the source data is divided into two types, namely internal data is data sourced from within an agency or agency that owns external data and data, namely data obtained from outside. Sudjana (2004) defines statistics as the knowledge that deals with ways of gathering facts, processing and making reasonable decisions based on facts and analysis carried out. While statistics are used to express a collection of facts, generally in the form of numbers arranged in tables or diagrams that describe or describe a problem.

Sudjana (2004) further states that statistics is a science consisting of theories and methods which are branches of applied mathematics and talk about: how to collect data, how to summarize data, process and present data, how to draw conclusions from results analysis, how to determine decisions within certain risk limits based on existing strategies. Singgih Santoso (2002) states, in principle statistics, are interpreted as activities to collect data, summarize/present data, analyze data with certain methods, and

interpret the results of the analysis.

Based on several opinions above, it can be concluded that Statistics is a branch of applied mathematics consisting of theories and methods on how to collect, measure, classify, calculate, explain, synthesize, analyze, and interpret data obtained systematically.

3. RESEARCH METHODS

In accordance with the purpose of the research to be carried out, this study is classified as a qualitative descriptive study that seeks to describe the analysis of student learning barriers. The research was conducted at the Kelua Mountain Campus. The subjects in this study were the fourth-semester students of the Department of Guidance and Counseling of Faculty Teacher Training and Education of Mulawarman University who took Statistics courses who experienced difficulties/obstacles. Data regarding learning difficulties/obstacles are obtained through diagnosed questions given to students. Data collection techniques in this study are Methodology Documentation, tests, and interviews.

The data analysis technique used is descriptive narrative using the Miles and Huberman models. Miles and Huberman (Sugiyono, 2011), who suggested that the activities in qualitative data analysis are carried out interactively and take place continuously until complete so that the data is saturated. The size of data saturation is indicated by no new data or information obtained. Qualitative data analysis in this study, namely: Data reduction, data display, and conclusion drawing or verification.

4. RESULTS AND DISCUSSION

The study was conducted at the Mulawarman University, in the students of the Department of Guidance and Counseling who took a statistics course consisting of 7 persons of IV semester students. The student is in one class. In the study, researchers gather information through, documentation, tests, and interviews with students. Sukardi (2010: 48-49) states that the test is an evaluation to find out the causes of failure of students who have a special emphasis on learning difficulties of students, which is not solved by formula improvements that are usually offered in the form of formative evaluations.

Based on the results of tests given to students in regression analysis material obtained:

1. When testing the pre-conditions in the regression equation. Student errors include: a) lack of skill in carrying out normality tests, b) calculation errors or inaccurate counting.
2. At the time of the regression equation. Student errors in determining the α and β constants, between because: a) forget the formula, b) calculation errors or inaccurate counting.
3. When interpreting from regression coefficients and coefficient of determination. Student error in interpreting them is because they do not understand the negative sign in the context of the regression equation.
4. When testing hypotheses, student errors in determining t-count values and conclusions are due to: a) calculation errors, b) erroneous tendencies in defining H_0 and H_a .
5. When reading t_{table} . student error in determining t-table value because of: a) error, b) forget the procedure for determining t_{table} .

Based on the results of the analysis obtained through interviews with students including:

1. When testing the normality of data, students experience difficulties and do not understand, and students do not master the techniques of counting.
2. Writing down the regression equation has a calculation procedure error, due to forgetting and being weak inaccuracy about the concept.
3. Determining the t_{count} value has a problem with the workmanship, due to forgetting and or not mastering the technique of counting.
4. Having difficulty in understanding language, interpreting words and symbols used in mathematics.

5. CONCLUSIONS

Analysis of student obstacles or difficulties that can be concluded in this study are as follows:

1. At the normality test stage due to the concept limitation on students.
2. In the material of the regression equation and when students test the size of the dependent variable can be explained by independent variables because of the concept of wrong or teaching that is not in accordance with the readiness of students.
3. When testing the significance and material, interpret the sign matching with the theory of parameter estimates. because students experience a lack of understanding, difficulties in workmanship, and counting techniques.

Based on these conclusions, the suggestions that can be given are as follows:

1. Students should apply a learning process that is meaningful in accepting the material or concepts given and must be active in every learning activity and not just centered on the concepts given by the lecturer.
2. Its is expected that lecturers provide learning assignments based on conditions so that students obtain support and benefits in their capacity to solve problems independently.
3. Variable problem exercises for students are continuous, especially those related to regression analysis material.

REFERENCES

- Abdurrahman, M. (2010). *Pendidikan Bagi Anak Berkesulitan Belajar*. Jakarta: Rineka Cipta
- Abbas, N. (2014). *Pengembangan Perangkat Pembelajaran Matematika Berorientasi Model Pembelajaran Berdasarkan Masalah (Problem Based-Instruction)*. Surabaya: PPs Universitas Negeri Surabaya.
- Ahmadi, A dan Supriyono, W. (2013). *Psikologi Belajar*. Jakarta: Rineka Cipta.
- Amalia, R., Saiman, S., Sofiyani, S., & Mursalin, M. (2018, September). Designing computer-based fraction worksheets for junior high school. In *Journal of Physics: Conference Series* (Vol. 1088, No. 1, p. 012110). IOP Publishing.
- Arikunto, Suharsimi. (1993). *Manajemen Pengajaran Secara Manusiawi*. Jakarta: Rineka Cipta.
- Budiyono, (2013). *Metodologi Penelitian Pendidikan*. Surakarta: Sebelas Maret University Press.
- Budiyono, (2010). *Statistika Untuk Penelitian*. Surakarta: Sebelas Maret University Press.
- Creswell, John W. (2012). *Research Design Pendekatan Kualitatif, Kuantitatif dan Mixed*. Yogyakarta: Pustaka Pelajar.
- Fonna, M., & Mursalin, M. (2018). Pengembangan Modul Geometri Analitik Bidang Berbantuan Wingeom Software untuk Meningkatkan Kemampuan Representasi Matematis Mahasiswa Program Studi Pendidikan Matematika Universitas Malikussaleh. *UNION: Jurnal Ilmiah Pendidikan Matematika*, 6(3), 391-402.
- Franke, G. R. (2010). Product Moment Correlation. *Wiley International Encyclopedia of Marketing*.
- Hamalik, Oemar. (2001). *Proses BelajarMengajar*. Jakarta : PT Bumi Aksara
- Irham, M dan Wiyani.A.N. 2013. *Psikologi Pendidikan*. Yogyakarta: Ar-Ruzz Media
- Imswatama, A & Lukman, H.,S. (2018). The Effectiveness of Mathematics Teaching Material Based on Ethnomathematics. *International Journal of Trends in Mathematics Education Research*, 1(1), 35-38. doi:10.33122/ijtmer.v1i1.11
- Masitoh, L. F., & Fitriyani, H. (2018). Improving students' mathematics self-efficacy through problem based learning. *Malikussaleh Journal of Mathematics Learning (MJML)*, 1(1), 26-30.
- Mursalin, M., Nuraini, N. L. S., Purnomo, H., Damayanti, N. W., Kristanti, D., Rohim, A., ... & Fonna, M. (2018, September). The development of algebra teaching materials to foster students' creative thinking skills in higher education. In *Journal of Physics: Conference Series* (Vol. 1088, No. 1, p. 012101). IOP Publishing.
- Nasir, M. (2016). Efektivitas Model Pembelajaran Berbasis Masalah (Problem Based Learning) Terhadap Kemampuan Pemecahan Masalah Siswa Pada Pelajaran Matematika. *Muallimuna: Jurnal Madrasah Ibtidaiyah*, 1(2), 1-19.
- Paloloang, M. F. B. (2014). Penerapan Model Problem Based Learning (PBL) Untuk Meningkatkan Hasil Belajar Siswa Pada Materi Panjang Garis Singgung Persekutuan Dua Lingkaran Di Kelas VII SMP Negeri 19 Palu. *Jurnal Elektronik Pendidikan Matematika Tadulako*, 2(1).
- Permatasari, N. E., Koeswati, H. D., & Giarti, S. (2018). Pengembangan Model Pembelajaran Problem Based Learning Dan Pesawat Sederhana (Probalpena) Untuk Meningkatkan Hasil Belajar IPA Siswa Kelas V SDN Karanganyar 01. *Muallimuna: Jurnal Madrasah Ibtidaiyah*, 3(2), 116-127.
- Putriani, D & Rahayu, C. (2018). The Effect of Discovery Learning Model Using Sunflowers in Circles on Mathematics Learning Outcomes. *International Journal of Trends in Mathematics Education Research*, 1(1), 22-25. doi:10.33122/ijtmer.v1i1.26
- Queirós, A., Faria, D., & Almeida, F. (2017). Strengths and Limitations of Qualitative and Quantitative Research Methods. *European Journal of Education Studies*.
- Siregar, S. (2017). *Statistika Terapan Untuk Perguruan Tinggi*. Indonesia: Prenada Media.
- Sugiyono. (2016). *Statistika Untuk Penelitian*. Bandung: Penerbit Alfabeta.
- Sugiyono. (2011). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.
- Sudjana. (2016). *Metoda Statistika*. Bandung: Tarsito.
- Supardi. (2013). *Aplikasi Statistik Dalam Penelitian*. Jakarta: Change Publication.
- Thahir, M., Roza, Y., & Murni, A. (2018). Validity of learning website of kapita selekta mathematics course at UIN Suska Riau Students. *Malikussaleh Journal of Mathematics Learning (MJML)*, 1(1), 19-25.
- Usmadi & Ergusni (2018). Design of ARCSI Learning Model with Scientific Approach for Teaching Mathematics in School. *International Journal of Trends in Mathematics Education Research*, 1(1), 13-18. doi:10.33122/ijtmer.v1i1.28