DIFFERENCES IN STUDENTS' ABILITY TO RECEIVE AND PROCESS INFORMATION ON EDUCATIONAL STATISTICS COURSES

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Abstract
The ability to receive and process information is included in cognitive abilities. This ability is a basic ability that everyone should have well because almost every day human life is surrounded by information. However, not all individuals can immediately understand the information provided to them, including students. For this reason, this study aims to find out how students' abilities in receiving and processing information in educational statistics courses. In addition, it is also to find out what causes differences in students' abilities in receiving and processing information in educational statistics courses. The method used is a qualitative method with a grounded theory approach. Data collection was carried out by observing, filling out questionnaires, and documentation. The research was conducted in Class PAI 5E FAI UIKA Bogor. The results showed that student's ability to receive and process information in educational statistics courses was quite good. This can be seen from the results of student learning which shows that the average is at A-B grades. The causes of differences in student abilities in receiving and processing information on educational statistics courses are caused by 3 things, namely interest and motivation to learn, focus on learning, and supporting facilities in learning these courses.

Keywords: Cognitive ability; learning outcomes; educational statistics

Abstract

Kata kunci: Kemampuan kognitif, hasil belajar, statistika pendidikan
INTRODUCTION

Receiving and processing information is a basic ability that everyone should have well. Because almost every day and even every moment of human life is surrounded by information, both in the form of small things (trivial) and big things (important). This is because information can be obtained from anywhere, either directly or indirectly, or orally or in writing. Information usually contains important things that must be understood by the recipient of the information. However, sometimes not all recipients of information can immediately understand the information given to them because everyone has different abilities in receiving and processing information (Rahayu et al., 2020). The ability to receive and process information is included in cognitive abilities. The term cognitive comes from the word cognition which has the same meaning as knowing, namely knowing. In a broader sense, cognition is the acquisition, organization and use of knowledge. In subsequent developments, the term cognitive became popular as a human psychological domain related to mental behavior which includes understanding, consideration, information processing, and problem solving (Syah, 2018). Cognitive ability is a person's ability to receive and process information from the experiences they experience to then present them in their daily lives (Sutranita, 2022).

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Each individual has different characteristics. These differences are generally caused by heredity and environmental factors. Congenital factors are internal/biological factors that are caused by genetics that are passed down from parents. While environmental factors are differences caused from outside the individual such as socioeconomic status, culture, and birth order. Individual differences that exist between one another is unavoidable. Each individual has their own characteristics and characteristics. Likewise in the world of education. Between one student and another cannot be equated because they are different personalities. They are affected by different internal and external factors as well. So that when looking at the
personality of students it should cover various aspects including physical, religious, intellectual, social, and ethical (Turhusna & Solatun, 2020).

Psychologically, students are included in early adulthood. Early adulthood is a time when a person has reached the age range of 18-40 years (Hurlock, 1991). According to Apriani, new students are a transition from mid-adolescence to late adolescence or can also be interpreted as someone who is currently studying at a tertiary institution and towards personal maturity (Prastiwi & Vera, 2022). There are several signs of a person's maturity, namely being able to accept himself, respecting others, accepting responsibility, believing in himself, being patient, being able to make decisions, having integrity, enjoying working, having strong principles, and having fortitude, tenacity, and endurance (Daryanto & Tarno, 2017). Based on this, students should be able to process and understand information well. Because one of the hallmarks of adulthood is their mature thinking. However, why is it that when receiving information there are still some of them who cannot immediately understand it and even experience difficulties?

According to Jean Piaget, a psychologist who is famous for his cognitive theory, it states that the more mature a person's age, the more it affects the way that person thinks in processing the information he receives. This is because the more mature a person is, the more learning experiences he has experienced so that he can more easily process, associate, and reason with the information he gets (Fatimah Ibda, 2015). This is also included in one of the student's tasks, namely having knowledge and previous learning experiences so that it makes it easier for them to accept something new (Pesha, 2021). In addition, humans have also been gifted by Allah SWT with reason so they can think and analyze everything that is around them (al-Sheikh, 2004). Allah SWT berfirman:

"Verily, in the creation of the heavens and the earth, and in the alternation of the night and the day, there are signs (of Allah's greatness) for people of understanding. (That is) those who remember Allah while standing, sitting, or lying down, and they think about the creation of the heavens and the earth (saying), "O our Lord, You have not created all this in vain; Blessed be You, protect us from the torment of hell." (QS. Ali-Imran/3: 190-191)".

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Reason is also what distinguishes humans from other creatures. In fact, Allah has made humans as caliphs on earth to protect and bring the earth to goodness and prosperity (Mubarok & Sutarto, 2019). Therefore, reason should be used properly by humans. One way that can be done is by studying. Learning is an obligation that must be carried out by every Muslim. By learning humans will become noble and civilized beings (Rahman, 2016). As one of the goals of learning is for humans to develop their abilities, interests, talents and skills with the knowledge they have (Budiwan, 2018) and make humans live happily and happily in this world and in the hereafter (Hermawan, 2014). In a hadith, Rasulullah SAW:

حَدَّثَنَا مَحْمُودُ بْنُ غَيْلَانَ حَدَّثَنَا أَبُو أُسَامَةَ عَنْ الأَعْمَشِ عَنْ أَبِي صَالِحٍ عَنْ أَبِي هُرَيْرَةَ قَالَ قَالَ رَسُولُ اللَّهِ ﷺ مَنْ سَلَكَ طَرِيقًا يَلْتَمِسُ فِيهِ عَلَمًا ﻓَالْقَالُ ﺔَسْرُوُنَ اللَّهُ ﺔَسْلَمَ ﺔَلَّهُ ﺔُنَّ ﻓِيهِ مَسْطُورًا للْجَنَّةِ (رواه الترمذي)

"Has told us Mahmud bin Ghailan has told us Abu Usamah from Al-A'masy from Abu Salih from Abu Hurairah he said; Rasulullah SAW said: "Whoever walks in a way to seek knowledge, Allah will make easy for him the way to heaven." (Reported by Tirmidhi).

This hadith explains the virtues that Allah SWT gives to students of knowledge. As a student of knowledge, this hadith should be used as motivation to be more active in studying. Because based on this hadith, the seeker of knowledge will be given the easy way to His heaven. It can be seen how much Allah SWT appreciates His servants who have the desire and enthusiasm to study (Muvid, 2020). Therefore, as a faithful servant of Allah SWT, you should always have a high interest and motivation to learn.

Based on this background, researchers feel the need to conduct a study to find out the causes of differences in students' ability to receive and process information. The aims of this study were (1) to find out the ability of students to receive and process information on educational statistics courses, (2) to find out the causes of differences in students' abilities to receive and process information on educational statistics courses.

RESEARCH METHODS

The research method used is a qualitative method with a grounded theory approach. This type was chosen because the researcher wanted to find out about the causes of differences in students' abilities in receiving and processing information on educational statistics courses. The research subjects were Class 5E PAI students at FAI UIKA. There were 30 students in the...
class consisting of 11 boys and 19 girls. The research instrument used closed and open questionnaires. Data collection techniques used are observation, filling out questionnaires, and documentation. The data analysis techniques used were categorizing information, planning, formulating research outlines, and making conclusions.

RESULTS AND DISCUSSION

1. Students' Ability to Receive and Process Information on Educational Statistics Courses

   Based on the research that has been done, it can be concluded that the ability of students to receive and process information can be said to be quite good. This can be seen from the results of student learning which shows that the average is at A-B grades. As in the statement "My course grades are in the A-B range" as many as 30 students answered "Yes". The high student learning outcomes are caused by several things including the careful preparation made by them before carrying out the exam. In the statement "I always study hard before taking exams in educational statistics courses" as many as 26 students answered "Yes" and 4 students answered "No". This shows that students study hard and prepare well before the exam is held. Studying hard before the exam is of course very helpful for students in answering questions. Especially in the PAI 5E class, the exam took the form of filling out questions by processing data, which required them to understand both in theory and practice. Based on this, the lecturer can also assess students' abilities in processing data. So that the resulting value is also in accordance with the ability of students.

   In addition, the presence of students in class for each educational statistics course also supports students in obtaining high learning outcomes. As in the statement "I always attend classes in educational statistics courses" as many as 28 students answered "Yes" and 2 students answered "No". In calculating the grades derived from attendance, it is taken as much as 15% (Ibn et al., 2018). So that when students always come to class, of course the attendance value will be high. This then can cause students to get high enough scores.

   Even so, some students still experience difficulties in learning educational statistics courses. In the statement "I have difficulty remembering the sequence of explanations that have been delivered by the lecturer in the educational statistics course" as many as 25 students answered "Yes", and 5 students answered "No". In addition, in the statement "I experience
difficulties when the material presented does not use concrete examples that can be found in everyday life" as many as 22 students answered "Yes", and 8 students answered "No". Based on the results of this study, it shows that students still have difficulties in thinking abstractly and systematically in educational statistics courses.

The more mature a person also does not affect his speed in receiving and processing information. This can be seen from the results of research on the statement "I have difficulty remembering educational statistics lecture material when the lecturer conveys it too quickly" as many as 22 students answered "Yes", and 8 students answered "No". Some students still find it difficult if the lecturer conveys the material too fast. It also takes several explanations so that students can better understand the purpose of the material being taught. So the lecturer also usually explains several times and more slowly if students are found who still don't understand the material being explained. The different cognitive abilities between one student and another also cause their speed in understanding information to differ.

2. Causes of Differences in Student Ability in Receiving and Processing Information on Educational Statistics Courses

Based on the research that has been done, there are several things that cause differences in students' ability to receive and process information in educational statistics courses, including:

a. Student interest and motivation in educational statistics courses.

Interest and motivation to learn are two important things that must be grown in every individual. Interest in learning is a feeling of pleasure and interest in students towards learning activities which is also a motivating factor in them to learn. Meanwhile, learning motivation is a power within students that is able to encourage them to be diligent in learning and directed in the learning process so that the goals that have been targeted can be achieved (Ricardo & Meilani, 2017). When a person's interest and motivation to learn is high, his interest and enthusiasm for learning will also be high. Vice versa, if the interest and motivation to learn is low then the interest and enthusiasm in learning is also low. Because it comes from within the individual, this interest and motivation are included in internal factors.
The level of difficulty of a material can also reduce one's interest and motivation to learn. This is because when a material has a high level of difficulty it also requires high concentration and persistence in understanding the material. So it takes a lot of effort to understand the material. Not infrequently because of the difficulty of the material can make some individuals prefer to stay away from the topic. The educational statistics course is one of the subjects that has a fairly high level of difficulty because this material explains the procedure for processing data. The existence of a formula that must be applied in data processing also makes this course quite complicated in terms of practice. For some people, statistics is a difficult subject because it requires thoroughness and a deep understanding of processing data and numbers. As stated by several respondents regarding the difficulties experienced in relation to educational statistics courses: "Difficult to understand and easy to forget the material being taught." -Respondent 1- "Hard to understand and remember formulas." -Respondent 2- "When encountering formulas or when the statistical data is operated using a laptop it makes me a bit difficult." -Respondent 3-

Based on the results of the questionnaire, there were also some difficulties experienced by students. In the statement "I have difficulty understanding the material for educational statistics courses" as many as 18 students answered "Yes", and 12 students answered "No". In addition, in the statement "I have difficulty remembering educational statistics course material" as many as 20 students answered "Yes", and 10 students answered "No". This shows that the educational statistics course is quite difficult. It can be seen from the number of students who still have difficulty understanding and remembering the course material given. In addition to experiencing difficulties in terms of theory, students also see difficulties in practice. This can be seen from some of the difficulties experienced by students when operating formulas in processing statistical data.

If you look at the results of observations that have been made, it seems that some students are often distracted when learning. This can be seen from their behavior, including those who play mobile phones, chat with friends next door, and show little response when the lecturer asks or explains. The emergence of some of these behaviors indicates low interest and motivation in students. As a result of this, it can cause difficulties in understanding what is being explained because during the explanation the lecturer is not focused and concentration
continues to be distracted. As in the research results on the statement "I have difficulty understanding the instructions conveyed by the lecturer in the educational statistics course" as many as 26 students answered "Yes", and 4 students answered "No".

High concentration during the lesson can help make it easier for students to understand the material. After concentrating can then be supported by persistence in learning. This means going back to reviewing the material and trying to put it into practice in earnest so that you can understand the instructions and explanations that were previously presented. Therefore, students should increase their perseverance and concentration during learning so that the material presented can be well understood. One way that can be done is by being active in class, such as conducting questions and answers with the lecturer, or giving an active response when the lecturer asks questions or is explaining. The existence of active interaction in class between lecturers and students will help improve student concentration. This will then reduce the possibility of students being distracted during learning activities. When students follow what is explained by the lecturer, it is likely that it will also make students interested in the material being studied.

a. Student focus during the learning process of educational statistics courses.

The focus of learning is a thought or behavior to focus on learning so that the goals set can be achieved (Pujiyanto & Sulistiyowati, 2016). The focus of learning is one of the important things that needs to be grown in every individual when studying. This is because when someone is focused on learning, he will continue to focus his attention on learning. He will not be easily distracted or distracted because when he has decided to focus on learning, it means that there is a goal to be achieved from these activities, such as gaining new knowledge or knowledge, new skills, and so on.

Based on the results of the research questionnaire that has been conducted, in the statement "I have difficulty paying attention during educational statistics lectures" as many as 22 students answered "Yes", and 8 students answered "No". This shows that some students still have difficulty focusing during the learning process. Even though high focus can make someone better able to understand a material well. When a person concentrates properly during the learning process, the information received will also be maximized and can be processed properly in the brain.
This is in accordance with one of the theories of information processing according to the psychologist Atkinson & Shiffrin. In this theory it can be concluded that when a person focuses on learning, the information he gets is likely to last longer in his memory than those who are less focused during the learning process (Rafiqa, 2015). This is because when someone focuses on listening to the explanation that the lecturer conveys, the information will continue to be processed in his brain without interruption. In contrast, when a person is not focused during the learning process, it is likely that the information will be cut off in short-term memory only, not in long-term memory. For this reason, the focus of learning is needed so that the received memory can be remembered and understood by the recipient of the information.

The lack of focus experienced by students can be seen from some of their behavior during class, such as playing cellphones, chatting with friends next to them, and so on. This can be caused by several things, one of which is a decrease in attention. Each individual's learning focus is influenced by their respective brain abilities so that the strength of the focus differs from one to another. According to Dimyati and Mudjiono, students' attention increased in the first 15-20 minutes, then decreased in the second 15-20 minutes, then increased and then decreased again. In this case, the tendency for attention to decrease occurs parallel to the length of time learning is carried out. In addition, the causes of a person's lack of focus on learning include because he is not fit enough, the learning environment is not good, and he feels bored (Setyani & Ismah, 2018). That is why some students seem inconsistent in maintaining their focus when the lecturer is explaining the material.

PAI 5E class is one of the regular classes with afternoon hours held at the Islamic Religious Education Study Program, Faculty of Islamic Religion, Ibn Khaldun University, Bogor. The Islamic Religious Education study program has many enthusiasts, so it needs to be divided into several classes and different entry times, namely morning and afternoon. This class is an alternative for students who cannot attend in the morning due to their busy schedules, such as work, teaching, organizational activities, and so on. Educational statistics courses are held from 16.00 to 17.15 WIB. Based on that time, the atmosphere in the class was affected because at that time it was already afternoon so the sky was getting dark. In addition, some of the students in the class had already worked and had other activities before coming to campus so that their bodies were already tired and worn out by previous activities. Fatigue can also be a
common cause that causes students to experience boredom in learning. This is because fatigue can trigger feelings of boredom in the students concerned (Syah, 2018).

b. Inadequate supporting facilities that affect student understanding in terms of theory and practice in educational statistics courses.

Statistics courses are courses that need to understand theory and practice well as the purpose of this course is so that students can understand theories in educational statistics, have the ability to apply basic principles and theories, as well as how to process, present and analyze data that will later be able to help students in the world of education (Ibn et al., 2018). For this reason, good supporting facilities are also needed when studying this material. One of them is a laptop. Laptops are one of the important media used while studying educational statistics courses. Because the data processing is usually done with a laptop or with other similar electronic devices.

In PAI 5E class, the lecturer explains how to process data with the help of Microsoft Excel and SPSS (Statistical Package for the Social Science) applications. During the lecture the lecturer explains with his laptop witnessed by students from the infocus screen which is already connected to his laptop then tries to understand the method of data processing taught by the lecturer. For the Microsoft Excel application, students usually find it difficult when operating formulas to process data because entering the wrong formula will usually cause errors and cause errors in the results of data processing. As for the SPSS application, the difficulties experienced were downloading and installing the application first so that it could be used on each laptop. As in the results of the questionnaire research that has been done. "Because I don't have an SPSS account yet, so when the explanation isn't connected." –Respondent 4-

"When encountering formulas or when the statistical data is operated using a laptop that makes it a bit difficult for me" -Respondent 5-

Some of these difficulties become one of the factors that affect student understanding in educational statistics courses, especially in terms of practice. Because students cannot access the application properly, they cannot practice what has been conveyed by the lecturer. This can then lead to an imbalance of understanding between theory and practice. Based on the research results on the statement "I have difficulty remembering the new skills taught by the lecturer after the lecture ended" as many as 26 students answered "Yes", and 4 students answered "No".
Because theoretical understanding is not immediately accompanied by practical understanding, it is sometimes difficult for some students to remember new skills that have been explained by the lecturer.

In addition, students' low awareness of carrying laptops is also one of the reasons for a lack of understanding of educational statistics courses. This can be seen from the observation activities that were carried out before that it was seen that there were only 5 students who brought laptops and tried to follow what the lecturer explained. For students who don't bring laptops, they will usually make notes in their notebooks regarding the things being explained by the lecturer. When listening to the lecturer's explanation while trying to follow what is being explained, of course it will be more effective than just listening. The skills just taught can also be more clearly understood. If there are errors or discrepancies when trying to follow the lecturer's directions, students can immediately ask questions and be given a solution to the problem. Different when in class just listen. Even though in the end you will try to practice it at home, the chances of forgetting are also greater. When learning is over, it is not certain that they will remember everything that has been explained by the lecturer. If you encounter problems in the process of practicing it, students cannot directly ask the lecturer. When it's like this, it can reduce the enthusiasm to do it and end up only understanding the theory, not the practice.

Lecturers who teach are also seen rarely giving assignments to their students. This makes students have to have more high awareness in learning. Early adulthood is a time when a person is able to direct himself. About 70% of learning is in each individual, and the remaining 30% comes from the teacher. So that in practice it is usually adults who are more active in seeking and developing ideas and opinions. Then the teacher or supervisor will assist them in straightening out and providing a more detailed explanation of what they have found (Asmin, 2011). Even though the lecturer does not give assignments, it is hoped that students will continue to study independently practicing how to process data according to what has been taught by the lecturer. Moreover, the purpose of this educational statistics course is so that students can be helped later when they are already teaching or working.

However, besides the lack of awareness of students, there are some students who lack adequate facilities. Some don't have laptops, have difficulty using applications, and so on. Some
students tried to use the application through the facilities they had such as cellphones but it turned out that the application did not support being installed on these electronic devices. So that this causes learning difficulties for students who do not have adequate facilities to apply the practice of the educational statistics course material that has been taught.

"Because I just found this lesson, and I don't have access to learning applications on my cellphone." -Respondent 6-

"I'm weak with numbers. So hard to remember, especially with the formula. Coupled with the lack of facilities that I have hindered its implementation." –Respondent 7-

For those who do have adequate facilities, they should be able to learn and continue to try to practice the skills that have been taught by the lecturer. But for those who lack adequate facilities, of course, it will be difficult. However, it is hoped that these difficulties will not reduce the enthusiasm and sincerity of students in learning. It is hoped that students will continue to try to find solutions to their learning problems so that they can still understand the material properly and optimally.

CONCLUSION

Based on the results and discussion above, it can be concluded that the ability of students to receive and process information in educational statistics courses is quite good. This can be seen from the learning outcomes which show a fairly good value, which is in the A-B range. The good learning outcomes are because students study hard before carrying out exams and are supported by high attendance scores. While the causes of differences in student abilities in receiving and processing information are (1) Student interest and motivation (73.3% of students show low interest and motivation), (2) Student focus during the learning process (73.3% of students still have difficulty to focus attention during learning), (3) Inadequate supporting facilities that affect students' understanding in terms of theory and practice (as many as 16.6% who are seen directly practicing what is explained by the lecturer). These three things were obtained based on the actual situation that occurred in the field. Through observation and filling out the questionnaire that had been done previously, these three things became the main factors that caused differences in students' ability to receive and process information in educational statistics courses, especially in PAI 5E class.
The researcher would like to thank various parties who have helped and supported the realization of this research, especially the Faculty of Islamic Religion, University of Ibn Khaldun Bogor.

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