NEUROSCIENCE-BASED LEARNING STRATEGIES FOR LEARNING MOTIVATION IN COURSES LEARNING EVALUATION

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Abstract

This study aims to obtain an overview of learning motivation through the results of student responses after carrying out a neuroscience-based learning process. This can be identified through the student's assumption that the evaluation course is difficult. This is proven through the results of learning assessments which are still low and student testimonies regarding evaluation learning which are considered difficult to understand. This research method is descriptive with a quantitative approach. The object sample of this research was 22 students who were taken by simple random sampling technique. The instrument used is a questionnaire sheet which is tested for validity and reliability using construct tests through expert *judgment* . The results of the study show that neuroscience-based learning can influence student learning motivation. The motivation in question can be identified through student responses to the lecturer's treatment during the learning process. Treatment through words of motivation, appreciation, stimulus for critical thinking through problem-based learning, and creating an atmosphere of collaboration through group learning.

Keywords : Neuroscience, Learning Motivation, Learning Evaluation

Abstrak

Penelitian ini bertujuan untuk memperoleh gambaran motivasi belajar melalui hasil respon siswa setelah melaksanakan proses pembelajaran berbasis neurosains. Hal ini dapat diketahui melalui anggapan siswa bahwa mata kuliah evaluasi itu sulit. Hal ini dibuktikan melalui hasil penilaian pembelajaran yang masih rendah dan kesaksian siswa mengenai evaluasi pembelajaran yang dianggap sulit dipahami. Metode penelitian ini bersifat deskriptif dengan pendekatan kuantitatif. Sampel objek penelitian ini adalah 22 siswa yang diambil dengan teknik simple random sampling. Instrumen yang digunakan adalah lembar angket yang diuji validitas dan reliabilitasnya dengan menggunakan uji konstruk melalui expert judgment. Hasil penelitian menunjukkan bahwa pembelajaran berbasis neuroscience dapat mempengaruhi motivasi belajar siswa. Motivasi yang dimaksud dapat diketahui melalui respon mahasiswa terhadap perlakuan dosen selama proses pembelajaran. Treatment melalui kata-kata motivasi, apresiasi, stimulus berpikir kritis melalui pembelajaran berbasis masalah, dan menciptakan suasana kerjasama melalui pembelajaran kelompok.

***Kata Kunci** : Ilmu Saraf, Motivasi Belajar, Evaluasi Belajar*

INTRODUCTION

Evaluation courses are always considered difficult by students. This is proven through the results of learning assessments which are still low and student testimonies regarding evaluation learning which are considered difficult to understand. One of the causes of these problems is the lack of motivation to learn. Motivation influences the learning process, as expressed by Suprijono (2014: 162) and is in line with Siregar and Nara's quotes (2014: 51-51). 36% of motivation contributes to the learning process, while McClelland shows that achievement motivation contributes up to 64% to learning achievement (Zebua, 2021) . In addition, Sardiman (2016: 84) states that motivation influences optimal learning outcomes. In line with Hamzah and Muhlisrarini (2014: 149) that if motivation increases, it will increase learning outcomes either directly or indirectly.

Students' intrinsic motivation can be instilled when teachers teach in ways that meet students' basic psychological needs for autonomy, competence, and relatedness (i.e. needs-based instruction) (Mendoza, et al , 2022). In this regard, Maslow's theory of motivation and human needs is the theoretical basis used in this study.

Motivation to Learn

Motivation is an internal process that activates, guides and maintains behavior from time to time (Murphy, et al in Slavin, 2011: 99). Motivation not only plays an important role in encouraging students to be involved in learning activities but also seeks how much students obtain information and what they can learn from these learning activities (Slavin, 2022: 100). According to Maslow's theory, there are two types of human needs, namely deficiency needs (physiology, safety, love, and self-esteem) and growth needs (Slavin, 2011: 102). The need for growth is the need to know and understand something, appreciate beauty, or grow and develop with the respect of others. This need can never be satisfied.

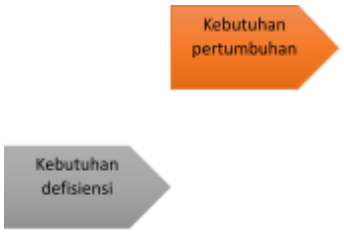

Figure 1 Maslow's Hierarchy of Needs

People tend to satisfy needs at the bottom of the hierarchy or deficiency needs before meeting growth needs. For example, the need for love and self-esteem can strengthen students' motivation to achieve higher growth goals (Slavin , 2011: 103). There are two types of motivation, namely intrinsic and extrinsic motivation. Ways to increase intrinsic motivation include the following (Cordova & Lepper in Slavin , 2011: 124):

a. Arousing interest, how to generate interest among others by giving choices about what to learn or how to learn it.
b. Maintaining curiosity, methods that can be used, for example, using teaching aids that raise curiosity as an inner urge to understand learning more.
c. Using an interesting presentation, one way that can be done is to use a game or simulation.
d. Helping students set their own goals, the way that can be done is to help students set ambitious but realistic goals and appreciate if the goals are achieved.

Neuroscience-Based Learning Strategies

Learning strategy is a learning activity that must be carried out by teachers and students so that learning objectives can be achieved effectively and efficiently (Sanjaya, 2013). Furthermore JR David (Brookhart, 2010) explained that in the world of education, strategy is defined as *a plan, method, or series of activities designed to achieve a particular educational goal* . So, a learning strategy can be interpreted as a plan that contains a series of activities designed to achieve certain educational goals.

There are two things that need to be analyzed from the definition above (Brookhart, 2010) . First of all, a learning strategy is a plan of action (a series of actions) that involves the use of methods and the use of various resources/strengths in learning. This means that the development of a new strategy does not go hand in hand with the development of a work plan. Second, strategies are designed to achieve certain goals. That is, the direction of all strategic decisions is the attainment of goals. Neuroscience is a science that studies the brain's nervous system with all its functions, such as how the thinking process occurs in the human brain (Muhtadi, 2019) .

There are six characteristics of Neuroscience that are applied and can lead to changes in paradigm development in neuron and brain theory (Fauzi, 2020) , namely:

a. *Multiple Intelligence*, a multiple intelligence that connects brain regions that control language, music, motor skills, social relationships, and spirituality.

b. *Emotional Intelligence*, emotional intelligence which includes optimism, enthusiasm, and self-motivation that is integrated with social intelligence is in the human social brain.
c. *Spiritual Intelligence*, mental intelligence, which includes the concept of emotional intelligence.
d. *Adversity Quotient*, intelligence faces challenges to respond to stimuli through aspects of cognitive psychology.
e. *Brain Based Learning*, applying learning techniques related to learning styles and how the brain works to process information and response patterns.
f. *Instrumentation*, managing the potential of thought by segmenting and grouping ways of thinking that cover all aspects of human life.

According to Jensen (Muhtadi, 2019), neuroscience -based learning can be implemented in five learning levels, namely: 1) Preparation, this phase is the phase in which a new learning framework is established and the student's brain is prepared for possible connections; 2) Acquisition, the phase of making connections that allow neurons to communicate with each other. Connections between neurons are formed when students' learning experiences are new and consistent (relative to) the material they are learning; 3) elaboration (error correction & elaboration), error correction and elaboration. The preliminary stage can be carried out through activities that map the interrelationships of research topics and encourage deeper understanding; 4) memory formation (learning to combine passwords), this phase can be called the learning phase, in which the neural connections are stronger. To strengthen the relationship, it is necessary to give special time for students to meditate without guidance from study material; and 5) functional integration (*extended use*) is an effort to strengthen and expand learning materials. Work can be done by applying different learning methods. Of the five stages, there are three main stages, namely acquisition, employment, and education.

METHOD

This research method is descriptive with a quantitative approach. Through this research, the researcher aims to obtain an overview of learning motivation through the results of student responses after carrying out a neuroscience-based learning process. Therefore, the purpose of this research is in line with the understanding of descriptive research according to Sugiyono (2012: 13) which explains that descriptive research is

research conducted to determine the value of an independent variable, either one variable or more (independently) without making comparisons, or connecting with other variables. Another opinion that is in line is according to Sudjana and Ibrahim (Jayusman & Shavab, 2020) that descriptive research is research that describes symptoms, events, or events that are happening at this time. The quantitative approach is used because the data is in the form of numbers, starting from data collection, data interpretation, to data display (Arikunto, 2013: 12).

Based on this understanding, it can be concluded that descriptive research is carried out by seeking information related to existing symptoms, explaining the objectives to be achieved, and collecting various data for report preparation. The object sample of this research was 22 students who were taken by simple random sampling technique. The instrument used is a questionnaire sheet which is tested for validity and reliability using construct tests through expert *judgment* .

RESULTS AND DISCUSSION

The results of the research that will be presented below are the results of an interpretation of Maslow's theory regarding the hierarchy of human needs. The needs in question are deficiency needs including self-esteem needs and growth needs including the need to understand and understand self-actualization. The implementation of neuroscience in the learning process at this research stage is the preparatory stage and the next stage is carried out in further research. The preparatory stage is the stage of providing a framework for new learning and preparing students' brains with possible connections. Efforts for the preparatory stage are through *treatment* of appreciation, motivation, critical thinking stimulus, and explanations that are easily understood by students.

The results of the *treatment* can be explained through the following questionnaire data.

1. Students are familiar with learning neuroscience

   The following circle graph shows that 63.6% of students have heard the term neuroscience.

Graph 1 Introduction to Neuroscience to Students

Even though there were students who answered "no" but the number was still less than students who answered "yes".

2. Students Get Motivation from Lecturers during the Learning Process

   Respondents' answers indicate that students always get motivational words from lecturers as evidenced by the percentage of 63.6% of students who answered "yes".

Graph 2 Giving Motivational Words by Lecturers

3. Students always get appreciation from lecturers during the learning process

   Respondents' answers indicate that students always get appreciation for their abilities from lecturers as evidenced by the percentage of 86.4% of students who answered "yes".

Graph 3. Lecturer Appreciation for Students

4. Students always get a stimulus to be able to think critically

   Respondents' answers indicate that students always get a stimulus to think critically from lecturers as evidenced by the acquisition of a percentage of 100% of students who answered "yes".

Graph 4 Critical Thinking Stimulus during the Learning Process

5. Students get Easy-to-Understand Explanations

Respondents' answers indicated that the lecturer explained in language that was easy to understand as evidenced by the percentage of 77.3% of students who answered "yes".

Graph 5 The Lecturer's Explanations are Easy to Understand

6. Students receive complicated and convoluted explanations from lecturers

   This questionnaire question strengthens the respondent's answer to the previous question. The results of the answers show that the lecturer explains in easy language understandable, not complicated and convoluted, this is evidenced by the acquisition of a percentage of 72.7% of students who answered "yes".

Graph 6 The Lecturer's Explanation is Complicated and Convoluted

7. Lecturers make students pessimistic in learning

   Respondents' answers indicated that lecturers did not make students pessimistic in learning as evidenced by the percentage of 77.3% of students who answered "yes".

Graph 7 Lecturers make students pessimistic in learning

8. Lecturers make students optimistic in learning

   Respondents' answers indicated that lecturers made students optimistic in learning as evidenced by the percentage of 81.8% of students who answered "yes". This questionnaire question points reinforces question point no. 7.

Graph 8 Lecturers make Students Optimistic in Learning

9. Implementation of Group Learning

   Respondents' answers indicate that the learning process is carried out in groups. Evidenced by the acquisition of a percentage of 72.7 % of students who answered "yes".

Graph 9 Learning is Done in Groups

10. The Effect of Group Study on Material Understanding

    Respondents' answers indicated that group study made students better understand the learning material . Evidenced by the acquisition of a percentage of 77.3 % of students who answered "yes".

Graph 10 The Effect of Group Study on Material Understanding

The results of the study show that neuroscience-based learning can influence student learning motivation. The motivation in question can be identified through student responses to the lecturer's treatment during the learning process. Treatment through words of motivation, appreciation, stimulus for critical thinking through problem-based learning, and creating an atmosphere of collaboration through group learning. As a comparison material, research on the use of neuroscience was also carried out by Sumiati & Gumiandari (Teti Sumiati & Septi Gumiandari, 2022) , the results of the study showed that Neuroscience-based learning was proven to be effective in arousing motivation and learning achievement of *slow learner students* by providing the right stimulus, even though in this research the object is *slow learner students*.

Neuroscience-based learning strategies to increase student learning motivation through the *treatment* of motivational words, appreciation, critical thinking stimuli through problem-based learning, and creating an atmosphere of collaboration through group learning are considered suitable for IKIP Siliwangi students. This is corroborated by student responses in table 1 below.

Table 1 Student Responses Regarding Things That Can Increase Motivation and Reduce Motivation in the Learning Process

What things make your learning motivation increase?	**Write down one thing that makes you lazy to study the most!**
Motivation wants to be better by studying seriously	There is no lazy word in studying
The ideals that are dreamed of must be realized, one way is to study harder	Bad mood can affect the learning process
When you're excited	During sleepy or noon hours
Studying while listening to music and if studying in the classroom is not noisy then I will focus and learning will be easy to understand	If the class room is noisy, I become lazy to study because I'm not comfortable in class
When you understand the material that has been explained	When the mood is bad
When you get appreciation for your efforts and personal abilities.	When you get a groupmate who is less able to participate in the discussion (depends on unilateral decisions/can't give arguments). Group learning will be more effective if all members can participate in the discussion.
Teachers and learning are also fun, for example with discussions between groups	The determined group is unbalanced, the teacher is emotional

What things make your learning motivation increase?	Write down one thing that makes you lazy to study the most!
If the material being studied is not difficult	When you play cellphone
1. Great mood 2. How to teach lecturers who give 3. Realize that you have responsibilities as a student	Monotonous study room
good *support system*	when opinions are always not heard
adequate means	soaring spirit
Support, encouragement	lecturer makes it tense and not relaxed
The fun way of teaching lecturers makes learning increase	How to teach and how to explain the less cool lecturers
Become a teacher	I am lazy to study when the lecturer is delivering material, one of the students interrupts the lecturer's conversation, and makes me fail to focus
comfortable learning atmosphere, preferred subjects, making achievement targets	disliked lessons, unsupportive learning atmosphere
Learn to understand a lesson so that a lesson becomes fun	Coursework
Comfortable and interesting learning	Hard to understand material
The spirit of both parents that makes me excited to learn	Tired
Appreciation from lecturers and friends	Lack of appreciation
Seeing friends	The material submitted is not included
There are not many distractions in learning, the atmosphere of the place to study is quite comfortable	Not focus
read open and listen	the nature of the lecturer to teach is too monotonous

The colored writing in table 1 above shows student statements related to *treatment* which can affect their motivation in the learning process. Either positive or negative influence.

CONCLUSION

Neuroscience-based learning strategies to increase student learning motivation through the *treatment* of motivational words, appreciation, critical thinking stimuli through problem-based learning, and creating an atmosphere of collaboration through group learning are considered suitable for IKIP Siliwangi students. The results of the study show

that neuroscience-based learning can influence student learning motivation. The motivation in question can be identified through student responses to the lecturer's treatment during the learning process. Treatment through words of motivation, appreciation, stimulus for critical thinking through problem-based learning, and creating an atmosphere of collaboration through group learning.

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