

Analysis of Difficulties of Blind Students (Low Vision) in Developing Critical Thinking Skills Through Problem Solving

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Abstract: This study aims to describe the difficulties of blind students (low vision) in developing critical thinking skills through problem solving. This type of research is qualitative descriptive research. The subject of the study was one blind student with low vision. The place of research was in the PGSD study program, FKIP, PGRI Ronggolawe University Tuban. The research instrument was an observation sheet and interview to find out the initial problems about critical thinking skills, a test sheet instrument in the form of an essay of 6 questions which will later be used as a reference in describing the difficulties of low vision students in developing critical thinking skills. The assessment indicators refer to Facione. Explanation, inference and interpretation indicators are in the good category, analysis indicators get a low category, self-regulation and evaluation indicators are in the sufficient/moderate category. Based on the results of the analysis of the difficulties faced by students in developing critical thinking skills are 1) students have difficulty in determining alternatives to the problems given, 2) students have difficulty in choosing and solving problems related to inclusive education given by lecturers, 3) students are not used to solving problems related to critical thinking, this is because the form of exam questions applied to students is still memorization and memory, 4) students are less creative in choosing or finding the right strategy according to the problems given.

Keyword: Low Vision, Critical Thinking Skills, Problem Solving

PRELIMINARY

Students with disabilities (persons with disabilities) are those who experience difficulties, obstacles or inability to perform certain activities/functions so that they require special aids, environmental modifications or certain alternative techniques so that they can learn and participate fully and effectively in community life. Among them are those who experience obstacles in visual function (blind), obstacles in hearing and speech function (deaf), obstacles in physical-motor function (physically disabled), emotional and behavioral disorders (mental disorders), autism spectrum disorders, and so on.

One type of blind student is the blind with low vision. WHO has set a working definition of Low Vision as follows: “A person with low vision is one has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 (20/60) to light perception or a visual field of less than 10 degree from the point of fixation, but who uses or is potentially able to use, vision for the planning and/or execution of a task”. From the WHO definition above about Low Vision, the following can be captured: 1) After being treated and corrected with glasses, there are still abnormalities in the function of vision; 2). Visual acuity 6/18 (20/60) to light perception; 3) The field of view is less than 10 degrees, 4). Can use or has the potential to use the remaining vision in planning and carrying out daily tasks (Hosni, 2005).

Students with special needs have the potential to experience learning problems due to their disabilities, ranging from mild learning problems to severe problems that require special attention and assistance from others. One of the problems in learning for low vision students is the difficulty in developing critical thinking skills. Critical thinking is an individual who is rational, able to think reflectively, and able to make decisions based on mature considerations (Sani, 2019). This is in line with the opinion of Rosy and Pahlevi (2015) that critical thinking is an organized process that involves mental activities including a person's ability to formulate problems, provide arguments and interact with others to solve problems. Critical thinking makes a person able to organize, adjust, change or improve his thoughts, so that he can make decisions to act faster (Maulana, 2017). The indicators of critical thinking skills are described in table 1.

Table 1. Indicators and sub-indicators of critical thinking skills

Indicator	Sub Indicator
Interpretation	Categorize
	Encoding
	Classify
Analysis	Checking out ideas
	Assessing arguments
Inference	Questioning the evidence
	Predicting Alternatives
	Make decisions/conclusions
Explanation	Declaring Results
	Justifying the procedure
	Self-inspection
	Presenting arguments
Self-Regulation	Correcting himself
	Self-assessment

(Nur, 2013)

Improving critical thinking skills is often done in science learning. The main goal of science education is to help students develop high-level thinking skills as provisions to face challenges in everyday life, through the implementation of learning activities that encourage the use of high-level thinking skills such as critical thinking skills, reasoning, reflection, and science process skills (Saido, Siraj, Nordin, & Al_Amedy, 2018). In addition to these learning, efforts to improve critical thinking skills can also be done in outdoor learning. According to Ampuero et al. (2015) explained that the application of outdoor learning has an impact on the development of the affective domain, students are entertained and willing to learn so that it guides the in-depth thinking process, as a result students are able to solve problems with more empathy, think critically and try many different solutions. Learning is more effective if supported by high learning motivation in students. Loes (2015), explains that motivation has a strong relationship with critical thinking skills. Students/students with high learning motivation and high critical thinking skills are interested in problem solving questions and like challenges.

The development of the era in the industrial era 5.0 requires education to make many changes. The competencies that must be mastered to face global competition in the 21st century world of work are individuals who are creative, critical thinkers, independent, work together in teams, creativity, information, communication and independent learning (Kivunja, 2015). The world of education has experienced many developments, the paradigm in the process of lectures/learning has changed, which was initially centered on teachers (teacher centered) and has now developed into learning activities centered on students (student centered). Lectures/learning activities centered on students (Student centered) aim to be able to foster the ability to develop knowledge, skills and attitudes. One of the learning models that is centered on students in lecture activities is problem-based learning or known as problem solving. Problem solving is a series of learning activities that emphasize the process of solving problems faced scientifically (Komariah, 2011). Problem-solving learning greatly influences students' critical thinking skills (Ristiasari, Priyono, & Sukaesih, 2012). Learning activities in higher education do not only develop academic (cognitive) aspects but also develop the skills possessed by students, especially students' critical thinking skills. The course on special needs children's education is a course that not only looks at the cognitive aspect but also the student's skill aspect. Critical thinking skills are very much needed for

students, especially low vision students, so that when they later enter the workforce, they are able to overcome and resolve the problems they face.

Based on the results of the pretest given to students in February 2024, initial data was obtained, namely that low vision students still have difficulty in solving problems related to critical thinking. Students do not understand the problem of critical thinking skills related to the indicators: students' ability to define the problems of inclusive education given, students' ability to choose relevant information to solve problems, students' ability to develop and choose relevant hypotheses, and the ability to decide conclusions from the problems given. Therefore, researchers try to apply problem-solving learning to foster critical thinking skills. Each stage in problem solving requires students' critical thinking skills (Haryani, 2011). In problem-solving learning activities, many difficulties were found in solving problems. Therefore, the purpose of this study is to describe the difficulties experienced by low vision students in fostering critical thinking skills in inclusive education learning by using a problem-solving learning model, namely the facts of inclusive education in providing guidance services for children with special needs in Elementary Schools.

METHOD

This type of research is in the form of qualitative descriptive research, namely a study to explore data and then describe the actual conditions. Arikunto (2010) stated that descriptive research explains a condition that actually occurs, there is no addition of independent variables and no manipulation so that it describes the actual situation. The level of critical thinking skills for low vision students can be known by using the indicators that have been determined in this study, namely according to Facione.

The subject of this study was one blind student with low vision from the Elementary School Teacher Education Study Program, FKIP Universitas PGRI Ronggolawe Tuban. The presence of the researcher was as an observer, analyzing data and research documentation. The study was conducted for 3 months. Data collection techniques used observation, interview, test and documentation techniques. The research instruments were observation sheets, interview sheets and test sheets.

The initial stage of this study was to conduct observations and interviews on the lecture activities of low vision students, followed by conducting an initial research design

and compiling research instruments. At the core stage, the researcher gave essay test questions with a total of 6 questions to low vision students to measure critical thinking skills, namely in the special needs children's education course with the main material of inclusive education. The next stage is to analyze the data and then draw conclusions from the data.

RESULTS

The application of the problem-solving learning model is a form of effort to foster critical thinking skills of low vision students in solving problems faced both individually and in groups. In its implementation, lecturers give problems or issues to students in order to stimulate students to be able to think critically. Students' critical thinking skills can develop through problem-solving learning. Based on the results in the field, the results of low vision students' critical thinking skills were obtained from essay questions that refer to indicators according to Facione (2010). Data analysis of students' critical thinking skills is known from the results of the essay test which consists of 6 questions. The results of the data obtained from the study were analyzed based on the percentage of critical thinking ability achievement criteria according to (Riduwan, 2013). The criteria for grouping critical thinking consist of very high, high, sufficient or moderate, low and very low scores. The criteria for categorizing critical thinking skills can be seen in Table 2.

Table 2. Criteria for students' critical thinking ability levels

No	Presentase	Category
1	81 - 100	Very high
2	61 - 80	High
3	41 - 60	Enough
4	21 - 40	Low
5	0 - 20	Very Low

(Riduwan, 2013)

The results of the critical thinking ability test of low vision students were analyzed per indicator consisting of 6 essay questions with indicators consisting of explanation, interpretation, analysis, self-regulation, evaluation and inference. Low vision students were analyzed for their critical thinking ability with inclusive education material, each number has a score point according to its indicator with a total score of 100. Explanation questions score 10, interpretation score 15, analysis score 25, self-regulation score 20, evaluation score 25, and inference score 5. After assessing the results of critical thinking

abilities in low vision students which were analyzed based on each indicator, the data obtained was that:

1. The explanation indicator obtained a score of 65% with a good critical thinking ability category and has basically been fulfilled by students in their ability to think critically. The explanation indicator is the ability of students to explain or make statements about the cause and effect of inclusive education service problems in elementary schools. In the explanation indicator, students are able to explain the statements or opinions conveyed so that they are arranged into a strong opinion.
2. The interpretation indicator obtained a score percentage of 63% with a good category. Interpretation in this context is related to students' ability to interpret and describe the objects of discussion observed. Measurement of the interpretation indicator in this study by presenting images of education services for children with special needs. Interpretation trains students to explain again and understand the meaning of an event, data, procedure or rule.
3. The analysis indicator obtained a score of 35% so it can be concluded that the critical thinking ability in this indicator is in the low category. The low score on the analysis indicator is because students have not been able to identify the relationship between concepts and actuals from statements or questions. Measurement of the analysis indicator is faced in solving problems about inclusive education services for children with special needs. Students still seem confused in analyzing the differences in services for children with intellectual disabilities and learning disabilities.
4. The self-regulation indicator obtained a score percentage of 53% with a sufficient or moderate category. The problems solved by students in this indicator are related to their ability to regulate their existence. Students can control themselves in facing problems by applying expertise in analyzing and evaluating the results that have been developed by themselves. The measurement of this indicator, students are faced with problems related to the factors causing abnormalities in children with special needs which are distinguished in the pregnancy, birth and post-birth phases. In addition, the forms of preventive actions that can be taken.
5. The evaluation indicator obtained a percentage result of 45% with a category of being able to think critically enough. Students are quite able to make an effort or

conclude in overcoming a problem. Students are quite able to test and estimate logical reasoning from facts, data, descriptions or representations. Students are less able to make decisions and express their reasons in steps to prevent the birth of children with special needs.

6. The inference indicator obtained a percentage score of 65% with a category of being able to think critically well. Students are generally able to identify and solve a problem so as to draw a conclusion. Drawing conclusions is done to interpret what has happened or been observed (Koasih, 2014).

DISCUSSION

The implementation of learning aims to improve student learning outcomes. In achieving optimal learning outcomes, it is necessary to be equipped with insight into logical and critical thinking to achieve learning objectives (Hallatu, Prasetyo, & Haidar, 2017). In this study, the focus of student assessment is related to critical thinking skills. Students' thinking skills in Indonesia are still low, as shown by the facts in the field that in Liberna's (2015) research in Jakarta, Rahma (2012) in Semarang. Assessment of critical thinking skills in low vision students was carried out using an essay test of 6 questions. Indicators for assessing critical thinking skills according to Facione (1996). The first indicator, namely explanation, gets good criteria. Explanation is the ability of students to express results from data, evidence, opinions, or questions. This indicator is commonly carried out by students so that the results of the score are in the good category. Problem solving in answering the explanation indicator improves insight or knowledge through. Through explanation, students can be trained in developing reasoning and critical thinking (Pujiono, 2012). The second indicator is interpretation with a good category. Students provide feedback and express their observations of an object. One important part of critical thinking that students must learn in order to have critical thinking skills is making interpretations (Orlich, Harder, Callahan, Trevisan, & Brown, 2010). Furthermore, the analysis indicator is in the low category. Students are still rarely trained in analysis indicators. Students must be able to test ideas and express reasons or statements. Students have not been able to analyze a problem and choose the right strategy to solve the problem. The fourth indicator, namely self-regulation, is included in the sufficient category and then the indicator of students who can think critically can

evaluate their thoughts and compare them with data, facts, opinions and thoughts from others (Ryan Ruggiero, 2012). From the descriptions above, in general, the difficulty of low vision students in developing critical thinking skills is caused by: 1). Most students are confused about applying the concept of knowledge they have in solving problems. 2) The learning that is carried out still does not empower critical thinking skills. 3) Students memorize more often in learning, Lack of practice and activity in critical thinking. 4) the form of exam questions applied to students is still memorization and memory.

The ability to think critically of students who are classified as lacking needs to be improved again and re-evaluated against the learning process carried out, because with the appropriate learning process, critical thinking skills can be improved. Critical thinking skills can be improved by implementing strategies that have the characteristics of involving active interaction from students and using their cognitive abilities in applying concepts and solving problems (Agboeze & Ugwoke, 2013). This is in line with the statement that critical thinking skills can also be improved by providing investigative questions, encouraging students to solve problems and make conclusions based on investigations (Iavokos, 2011).

CONCLUSION

Assessment of critical thinking skills in low vision students using indicators according to Facione. Explanation, inference and interpretation indicators are in the good category, analysis indicators are in the low category, self-regulation and evaluation indicators are in the sufficient/moderate category. Based on the results of the analysis of the difficulties faced by students in developing critical thinking skills are 1) students have difficulty in determining alternatives to the problems given, 2) students have difficulty in choosing and solving problems related to inclusive education given by lecturers, 3) students are not used to solving problems related to critical thinking, this is because the form of exam questions applied to students is still memorization and memory, 4) students are less creative in choosing or finding the right strategy according to the problems given. Suggestions for this study are that lecturers help low vision students who still have difficulty solving problems. Students must often be given problems that can foster critical thinking in students, students must be accustomed to being given high-level problems. The development of critical thinking skills is carried out by lecturers by training critical

thinking skills and facilitating in learning activities. This development is not only carried out by lecturers but the government has made efforts to improve critical thinking through the implementation of the MBKM curriculum. Another effort that can be made is to provide training to lecturers to improve critical thinking skills in the world of education.

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