

**What is Discovery Learning Can Grow
Critical Thinking Skills?****Sri Sukartiningsih¹⁾, M. Jacky²⁾**

1) Postgraduate of Social Studies, Universitas Negeri Surabaya, Indonesia

2) Faculty Of Social Science And Law, Universitas Negeri Surabaya, Indonesia

Abstrak

Berpikir kritis adalah salah satu keterampilan yang harus diajarkan kepada siswa sebagai akibat dari globalisasi dan tuntutan pekerja terampil di masa Revolusi Industri 4.0. Berbagai metode, model, dan strategi pembelajaran dikembangkan untuk memenuhi tujuan-tujuan ini. Salah satunya adalah penggunaan bahan ajar Unit Kegiatan Belajar Mandiri (UKBM) dalam pembelajaran untuk mencapai tujuan pembelajaran keterampilan berpikir kritis siswa. Fokus dari penelitian ini adalah untuk mendeskripsikan tanggapan siswa terhadap penggunaan Sosiologi UKBM berdasarkan pembelajaran penemuan untuk meningkatkan keterampilan berpikir kritis siswa. Penelitian ini adalah penelitian deskriptif kuantitatif dengan teknik persentase. Data dikumpulkan melalui kuesioner, observasi dan wawancara. Sedangkan analisis dilakukan melalui empat tahap, yaitu pengumpulan data, reduksi data, penyajian data dan penarikan kesimpulan. Penelitian ini menunjukkan beberapa kesimpulan: 1) UKBM Sosiologi secara efektif digunakan dalam pembelajaran di kelas untuk menumbuhkan keterampilan berpikir kritis siswa; 2) penilaian yang paling menonjol adalah aspek minat siswa dalam desain UKBM yang menarik; 3) penilaian kurang menonjol dalam aspek pendekatan discovery learning dalam pembelajaran karena membutuhkan waktu yang lama dan keseriusan guru dan siswa. Makalah ini merekomendasikan penggunaan model pembelajaran lain di UKBM untuk menumbuhkan keterampilan berpikir kritis.

Kata kunci:**Abstract**

Critical thinking is one of the skills that must be taught to students as an effect of globalization and the demands of skilled workers in the period of the Industrial Revolution 4.0. Various learning methods, models and strategies are developed to meet these objectives. One of them is the use of the Independent Learning Activity Unit (UKBM) teaching materials in learning to achieve the learning goals of students' critical thinking skills. The focus of this study is to describe students' responses to the use of UKBM Sociology based on discovery learning to foster students' critical thinking skills. This research is a quantitative descriptive study with percentage techniques. Data is collected through questionnaires, observation and interviews. While the analysis is carried out through four stages, namely data collection, data reduction, data presentation and conclusion drawing. This study shows several conclusions: 1) UKBM Sociology is effectively used in classroom learning to foster students' critical thinking skills; 2) the most prominent assessment is the aspect of student interest in the attractive UKBM design; 3) the assessment is less prominent in the aspect of the discovery learning approach in learning because it requires a long time and the seriousness of the teacher and students. This paper recommends using another learning model at UKBM to foster critical thinking skills.

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*Corresponding author:

E-mail: memenk27@gmail.com

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INTRODUCTION

Socrates defines critical thinking as the art of judgment, meaning how to evaluate something in terms of aspects of good and bad (Sahika, 2018). Whereas Robert Ennis defines critical thinking as reflective thinking that makes sense and focuses on making decisions that must be trusted or carried out (Hitchcock, 2015). In general, the notion of critical thinking in this study is an assessment of several questions with regard to logical ways and relevant evidence.

One of the most prominent effects of globalization and capitalism is the increasing demand for skilled workers (Leander, 2017), therefore, the aim of the education program is directed at how to equip students with critical thinking skills (Tiruneh, De Cock, 2017). Thinking skills critical will be beneficial for students in facing a strong flow of information in the 21st century. Critical thinking is needed in the process of obtaining information, asking for the accuracy and reliability of information and reading data and indicators with correct evidence. This will be very important for decision making that is beneficial for people (Petru, 2018; Sahika, 2018).

Education has an important role in fostering students' critical thinking skills. They must be trained to be critical thinkers in order to become a generation that is open, sensitive, understands beliefs and beliefs, and understands the values of others so that it is not easily manipulated by a system (Petru, 2018). The teacher also plays a major role in producing students who are free, critical in democratic societies (Sahika, 2018).

A study was conducted by Walter & Walter about the school system in Germany. In their research they questioned whether critical thinking is a mediator variable to improve student performance at school (Walter, Christel; Walter, 2018). The results of the study indicate that the purpose of the school system is a determinant of the learning process. Self-regulated learning and developing student autonomy in critical thinking turned out to encourage students' activeness in the academic field.

Similar to Germany, in the Philippines, education is directed and encouraged to develop critical pedagogics, not taxonomies anymore. Taxonomy has a reductive nature that is lacking in improving students' critical thinking skills, while critical pedagogics will bring students to the dialogue table by teaching them how to improve and accept questions without hostility and critical character (Leander, 2017).

The irony is that many subjects and critical thought teaching in the Philippines still produce students who are not critical. The main obstacle as a cause is the didactic teaching system. Critical thinking can be taught to students when they are given the freedom to ask questions, explore possibilities and engage in meaningful discussions. This can be done through reflective teaching (Leander, 2017).

From Tan, research in Singapore, it was mentioned that teaching critical thinking to students had two challenges (Tan, 2017). First, critical thinking must be a necessity for policy makers as a teaching umbrella to overcome all forms of constraints. Secondly the teacher's efficacy is needed to involve students in learning and to overcome the socio-cultural challenges faced. Therefore, literature is needed for teachers and students.

Critical thinking is a form of high-level thinking that involves all thought processes such as how to obtain information, understand information, analyze, correlate, interpret, evaluate, make judgments, and make judgments about good and bad or right and wrong (Sahika, 2018). This is synergistic with discovery learning learning models, in the syntax students are invited to think from easy to difficult. Syntax discovery learning starts from the stage of stimulation, problem statements, collecting data, data processing, verification and generalization.

Discovery learning as one of the learning models, in this research will be integrated into a student learning guide called the Independent Learning Activity Unit (UKBM). In the discovery learning model, students will be given various activities to build their own knowledge optimally, such as observation, experience and reasoning (Ellizar, 2018).

UKBM is a small learning unit, organized into learning activities units (Ministry of Education and Culture, 2017). Learning to use UKBM requires students to manage the burden of learning independently. In accordance with the ability and speed of each. UKBM is used in classes that carry out Semester Credit System (SKS) programs.

Discovery learning as one of the learning methods that syntax will be integrated in UKBM to improve students' critical thinking skills. Through discovery learning, students are not given answers, but material to find their own answers. This happens in situations for problem solving where learners learn from their own experiences and prior knowledge. This learning also invites students to interact with their environment, explore and manipulate objects, grapple with questions and controversies or conduct experiments. This study uses Jarome Bruner's discovery learning theory approach to determine student responses to UKBM Sociology based on discovery learning which is used to foster critical thinking skills.

METHOD

This research is a quantitative descriptive study with percentage techniques. This study will describe students' responses to the Independent Learning Activity Unit (UKBM) based on discovery learning to foster critical thinking skills (Sugiyono, 2005) in his book: "descriptive method is a method used to describe or analyze a research result but not used to make broader conclusions". The subjects in this study were class X IPS at MAN 2 Probolinggo. Data collection techniques used are through questionnaire methods, observation and interviews. While the data analysis technique is done through four stages are data collection, data reduction, display data and conclusion verification.

RESULTS AND DISCUSSION

Student Response

The purpose of this study is to show how students respond to learning packages called the Independent Learning Activity Unit (UKBM) in Sociology lessons. Some aspects that will be assessed are aspects of interest, material, language and discovery learning approaches. In the aspect of attraction, students will respond and give input on how this UKBM can help them learn sociology and what makes them interested. The following are the results of the recapitulation of student responses to UKBM aspects of interest.

Table 1. Results of Recapitulation of Student Responses to UKBM Aspects of Interest

No.	Aspect	Score
1.	The appearance of UKBM Sociology is interesting	5
2.	UKBM Sociology makes students more enthusiastic in learning	5
3.	By using UKBM Sociology, learning is not boring	4
4.	UKBM Sociology supports students to master Sociology lessons	5
5.	The word motivation in UKBM Sociology influences student attitudes and learning	4
6.	With the illustration can provide motivation to study the material	5
Total		27
Percentage		90%
Category		Very Good

Source: questionnaire data processed

Based on the response questionnaire distributed in table 1, students who learned to use the Sociology UKBM developed assessed very well (90%) and were interested in learning with this UKBM. According to them, UKBM Sociology has an attractive appearance that fosters enthusiasm in learning Sociology. Besides that, studying with UKBM Sociology is not boring and very supportive to master the lesson. Learning Sociology which was originally assessed as just a memorization lesson, through UKBM students were invited to learn in various ways, namely literacy, observation, discussion, presentation and even doing simple research.

Motivations presented through pictures and illustrations can encourage students to learn to discover Sociology concepts independently, to form good social and emotional characters such as responsibility and independence. However, not all students were inspired by their motivation to learn more about sociology. Students who are accustomed to teacher guidance have little difficulty adapting.

In the material aspect, students will assess and provide input on the presentation of material in the UKBM and how the sections presented in the UKBM can encourage students to learn independently. The following are the results of the recapitulation of student responses to UKBM on material aspects.

Table 2. Results of Student Response Recapitulation of UKBM Material Aspects

No.	Aspects	Score
1.	Submission of material in the UKBM Sociology is related to everyday life	5
2.	The material presented in UKBM is easy for me to understand	4
3.	In the UKBM Sociology there are several parts for me to find my own concept	4
4.	Presentation of material in the UKBM Sociology encouraged me to discuss with friends	4
5.	This UKBM Sociology encouraged me to write what I understood in the "Reflection" column	5
6.	This UKBM contains evaluation tests that can test understanding of Sociology material	5
Total		26
Percentage		87%
Category		Very Good

Source: questionnaire data processed

In terms of material, the Sociology UKBM developed was assessed by very good students (87%). Material, practice questions and examples presented relate to daily life so that it is easy to understand. In the parts of illustrations and images can encourage students to find Sociology concepts independently or collaborate with friends through discussion with teacher guidance. Through reflection activities, students can measure their understanding of the material they have learned. In addition, students can also test the understanding through evaluation tests presented at the end of the UKBM Sociology.

The material presented in the UKBM Sociology based on discovery learning is made in a coherent and systematic manner and is presented in a language that is easily understood by students. However, based on the assessment of students there are several students who assess it is difficult to understand the terms in sociology displayed in UKBM.

In the aspect of language, students will respond, criticism and input about the use of language in UKBM can help understand sociology learning. The following are the results of the recapitulation of student responses to UKBM on aspects of language.

Table 3. Results of Student Response Recapitulation of UKBM Language Aspects

No.	Aspect	Score
1.	The sentence and paragraph used in the UKBM are clear and easy to understand	5
2.	The language used in UKBM is simple and easy to understand	4
3.	The letters used are simple and easy to read	4
Total		13
Percentage		87%
Category		Very Good

Source: questionnaire data processed

Based on the questionnaire given to students, they assessed the UKBM Sociology in aspects of language that is very good (87%). According to students, UKBM Sociology uses simple language, choosing letters also makes it easier for students to read, sentences and paragraphs used are also clear and easy to understand. This shows that UKBM Sociology can be recommended to be used as a companion for students in studying Sociology.

In this aspect, students provide responses regarding the discovery learning approach that is integrated in the UKBM Sociology. Following are the results of the recapitulation of student responses to the UKBM aspects of the discovery learning approach..

Table 4. Results of Material Expert Validation on the Aspect of Assessment of the Discovery Learning Approach

No.	Aspects	Score
A. Discovery learning characteristics		
1.	UKBM emphasizes the development of argumentation by connecting to student experience	4
2.	UKBM is able to increase students' independence in learning	5
3.	UKBM is able to grow students' critical thinking skills	4
4.	UKBM is able to encourage students to collaborate with teachers and peers	4
B. Discovery learning syntax		
5.	There is an order to read a book, display an image, or a story question that gives students stimulation to find out more (Stimulation)	5
6.	There are questions that describe the purpose of the problem statement	5
7.	There are learning activities that require students to make observations, collect as much information as possible (data collection)	5
8.	There are learning activities that require students to analyze problems in the stage of the problem statement (data processing)	5
9.	There are student activities linking the results of analysis with experience / daily life (verification)	5
10.	There are activities for drawing conclusions	4
Total		43
Percentage		86%
Category		Very Good

Source: questionnaire data processed

Tabel 4 show the results of student assessment of UKBM Sociology on the specs of the discovery learning approach showed a very good category (86%). The assessment of the characteristics of discovery learning has been seen in the UKBM Sociology developed. First, UKBM is able to emphasize the development of student arguments by linking to student experience. Existing learning activities contain exercises to practice argumentation skills. Second, UKBM is able to increase learning independence because students are required to work independently, with or not accompanied by a teacher. Third, UKBM is able to foster critical thinking skills, as seen from the problem exercises presented to stimulate students to learn exploration, ask questions, find out and solve problems. Fourth, UKBM is able to encourage students to collaborate with teachers and peers through discussion and group work in learning activities.

Assessment of discovery learning syntax looks at how the stages of discovery learning are implemented in UKBM. According to students, UKBM Sociology used in learning has presented discovery learning syntax in the Sociology learning process, starting from the stage of stimulation, problem statements, data collection, data processing, verification and generalization. In the initial stage (stimulus), UKBM presents an order to read a book, displays images and illustrations of stimulants that stimulate students to find out more. Continued questions related to learning objectives are the stage of the problem statement. The data collection and process stage is done by students by reading literature, observing objects, interviews and group discussions. Data analysis activities, problem solving, presentations and conclusions are closing activities in the stages of discovery learning.

Students' assessment / response to UKBM towards UKBM Sociology based on discovery learning will be a source of final assessment that UKBM Sociology is feasible for use in Sociology learning. The following is a summary of the overall results of the UKBM Sociology assessment based on discovery learning.

Table 5. Recapitulation of Student Responses to UKBM Sociology Based on Discovery Learning

No.	Aspect	Percentage
1.	Student Interest	90
2.	Material	87
3.	Language	87
4.	Discovery learning Approach	86
Average		88%
Category		Very Good

Source: questionnaire data processed

From the recapitulation of the results (table 5) of filling in student response questionnaires in the table above it can be shown that overall the assessment of UKBM Sociology based discovery learning for Social Sciences class X is getting a very good predicate (88%). This shows that UKBM Sociology is effectively used in social studies classes. The developed Sociology UKBM is considered to be able to help teachers achieve learning goals, namely growing critical thinking skills and increasing student learning independence.

Learning as a cognitive process

The discovery learning process which consists of six stages is integrated into parts of the UKBM systematically and coherently. The following discovery learning syntax is integrated in UKBM.

At the stage of stimulation (stimulation), students are faced with a problem so that the desire arises to investigate themselves, students are given illustrations / questions, suggest reading books, or other activities that lead to problem solving. At UKBM, this stage is placed in the learning process. Students are given illustrations of pictures or stories in order to be interested and have high curiosity to learn the material to be learned.

In the stage of statement or problem identification (problem statement) is a pair of stimulation stages. Under the illustration on the stimulus, students are given the opportunity to identify as many problems as possible that are relevant to the lesson, then selected to be formulated in the hypothesis. At UKBM this stage is displayed at the core activities, namely at the UKBM general instructions and learning activities. Students are asked to read references and work on problem exercises as a form of problem identification.

At this stage students will gather as much information as possible. Activities are carried out by reading literature, observing objects, interviewing or conducting research. Data that has been obtained in the previous stage, then identified, classified, analyzed according to the type of problem and the level of understanding of students. In processing data, students are given the opportunity to be independent, discuss with friends or ask for teacher direction.

Verification Phase, students learn to find concepts, theories, rules or understanding through examples found in their lives. Students learn to connect concepts learned with reality that can be found. And the generalization stage, students are invited to learn to find solutions to the problems presented (case studies), and learn to draw conclusions independently (generalization).

The discovery learning model gives students the freedom to learn to find their own concepts. Learning in the SKS class has the same goal in the use of UKBM. Learning to use UKBM aims to hone students' independence, students are given the freedom to complete UKBM according to their abilities and speed. Each student will have different learning progress, and UKBM will be the size. Such learning models will make it easier for teachers to identify the capacity of students as fast, normal and slow learners.

To complete the UKBM it takes learning motivation and responsibility to students, if they do not have both students will be left behind from their friends. Learning by using UKBM frees students to organize themselves. When borrowing terms in Bandura's learning theory, the learning process with UKBM requires self-regulation. Bandura defines self-regulation as an act of managing thoughts and feelings to allow action to be directed towards success in school (Murray, D. W. & Rosanbalm, 2017).

According to Bandura, student self regulation is formed due to several factors, namely internal motivation, complexity of learning, learning objectives, self-fulfillment and competition process (Arslan, 2018). Whereas, in Bruner's learning theory, there are four main aspects of learning, namely knowledge structure, learning readiness, intuition and motivation (Alkatiri, 2014; Thelma, 2017). The structure of knowledge when students understand ideas and concepts that previously seemed unrelated. Student learning readiness consists of mastering simpler skills that have been mastered before, making it easier to master higher skills. Intuition is related to intellectual techniques of analysis, while motivation is a condition that can affect students to learn.

CONCLUSION

Independent Learning Activity Unit (UKBM) as part of teaching materials used by teachers in Sociology learning. UKBM is created by integrating discovery learning syntax in the sequence of learning activities, with the aim of fostering students' critical thinking skills. From the results of the study found conclusions, first, based on student responses, it can be explained that UKBM Sociology based on discovery learning is able to grow students' critical thinking skills. Second, the most prominent aspect in students' assessment is their interest in UKBM. This shows that the appearance of the number of images contained in the UKBM can trigger students' enthusiasm and learning motivation. Third, the smallest assessment is in the discovery learning approach, meaning that in the implementation of this model requires more time and seriousness in the learning process in accordance with the syntax.

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