



The Influence of Reflective Journals on Critical Thinking Ability of Students

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Abstract: This study aimed to analyze the effect of reflective journals on students' critical thinking skills. The research subjects were 30 students majoring in Teacher Education at the Elementary School, Faculty of Education, Private University of Tangerang – data collection using a questionnaire and student reflection writing. The data obtained is processed qualitatively. This study analyses the skill aspect of critical thinking using skills indicators of critical thinking according to Facione, namely interpretation, analysis, evaluation, conclusion, explanation, and self-regulation. The study results show that knowing note-taking methods can help students make journals from the courses they teach. This helps students think critically about each course and learn the nature of the course and note-taking methods appropriate to the course. Meanwhile, based on the research findings, it is known that Cornell Notes, Mapping Method, Charting Method, Sentence Method, and Visual Note Taking are methods appropriate to the courses taught by students. Thus it can be concluded that reflective journals influence students' critical thinking skills.

INTRODUCTION

Reflective learning can allow students to participate actively in learning activities by including their own experiences as learning resources.

This helps in the formation of the

concept of knowledge and stimulates students to think creatively and solve problems in life based on the concept of knowledge and experience that is felt.



According to Harrington, (1996) reflective behaviour consists of three main criteria, namely: 1) open-mindedness or openness, as a reflection of what is felt and obtained, 2) responsibility, a moral attitude and professional commitment regarding the influence of learning on the learner, the learning process, and the people around him, and 3) whole heartedness or sincerity in action and doing assignments.

Through the process of reflective thinking, students learn to put themselves in a position, know themselves, and know other people and the environment in which they live. This process also makes them accustomed to practising emotional maturity so they can easily manage attitudes and behaviour, including good tendencies such as great enthusiasm, being full of new things, and creativity.

Reflective learners have a critical attitude because this attitude is one of the main things in the outcome of reflective learning. The main behaviour is competence in doing: 1) giving an impression/ Interpretation, 2) investigation/ description/ analysis (analysis), 3) evaluation (evaluation), 4)

summary/ conclusion (inference), 5) explaining (explanation), and 6) self-regulation.

Reflection is understood in a particular definition, which is an effort to pay close attention to a certain subject matter, experienced things, ideas, offers, or reasonable changes to understand the importance of a deep understanding of its meaning and consequences. At this stage, students are positioned to be able to use critical thinking competencies. Critical thinking is the competence to use reasoning abilities in constructing various kinds of material in various conditions, not only remembering but also carrying out the process of sorting out problems and adjusting and associating various strategies to find solutions (Rais & Aryani, 2019).

Questions that can bring curiosity from critical thinking begin with the questions "Why?", "what happened?" and "what if?" not with the prefix "what?" or "where?". Asking questions like these to students in the classroom will help them to get self-design, the real self, through various results of theoretical studies. These questions and answers will: 1) create awareness; 2) develop a positive learning will; 3) form

good association procedures; 4) know various problems and how to overcome them; and 5) form the ability to hold attitudes through competence in IQ, EQ, and SQ.

In developing students' reflection abilities, the reflection method can be used. In the process, students reflect on what they have learned. The reflection method is one method in the world of education. This method is part of HOTS (High Order Thinking Skills), namely the competence to think critically, use logic, reflect on what is done, metacognitive, and use creative thinking, which is a high-order thinking skill. A good relationship between the teacher and students is needed in the reflection section.

This can be a place for students to convey their points of view and accept and appreciate how other people think about each student (Prasetyo et al., 2014). By doing reflection, can help to provide real change and bring development.

Reflection has an important role in shaping students through appreciation of what they have gone through. Reflection is part of the learning process, in addition to practice, experience,

assessment and reminders. Meaningful learning occurs when students can do self-monitoring and reflection. Simply put, a reflection is a form of individual reaction towards a condition, event or experience. Reflection helps teachers and students to retrieve, remember, give meaning, think about, contextualize, and give value to things that have been passed to make decisions and sort out what has been experienced, how to experience it, and what will or will not be done in the future.

Learning activities can make students active through experience, communication, interaction, and reflection (Prasetyo et al., 2014). Through reflecting activities, students have time to see the final evidence of their individual learning that is experiencing changes, needs to be changed or given understanding so that others understand, and obtain character values that can be used and applied to realize learning transformation. Reflective learners understand that they can achieve conceptual knowledge independently and learn from everything they have gone through. With reflection, character development, namely the way of thinking, heart and

things that are done, is increasingly visible in students. Therefore, the aim of this research is to analyze the effect of reflective journals on students' critical thinking skills.

Critical thinking ability is one of the most important concepts involved in education. This ability is so significant that the teachers at the university where the research was conducted attempted to integrate critical thinking skills into their teaching.

So far, research has identified at least 21 skills that students must have in this modern era. One of the basic skills that are important to master is critical thinking (Galinsky, 2010). There are various definitions and interpretations of critical thinking.

In Bloom's Taxonomy, the term used to define critical thinking is "intellectual abilities and skills" (Krathwohl, D. R. & B. S., & Masia, 1964) This ability is very important, and critical thinking skills will enable students to see problems from a broader, more impartial, insightful, and empathetic perspective and help students to communicate and work together better.

Therefore, the teachers at the research sites are trying to integrate the courses with activities that enable students to practice their critical thinking skills. One way to do this is by giving students the task of writing reflective writing after studying a unit. This relates to the view (Santrock, 2008), which reveals that critical thinking is closely related to reflective thinking, productive thinking, and evaluation of evidence.

However, the relationship between reflective writing and critical thinking skills in Indonesian education needs to be studied more deeply. Several studies related to reflective writing have been conducted. Nugraha (2017) analyzed the increase in critical thinking ability, described the increase in critical thinking ability in terms of science process skills, and described the increase in critical thinking ability in terms of learning motivation. This research was conducted using mixed methods and a sequential explanatory strategy.

Rohana (2015) related the mathematical reasoning abilities of prospective teacher students to reflective learning. This research looks

at the increase in mathematical reasoning ability (KPM) that occurs when reflective learning is applied. This study used a quasi-experimental method with nonequivalent pretest and posttest control group designs.

Liao & Wang (2016) conducted more specific research, namely linking critical thinking with reflective writing. They examine the relationship between reflective writing, which is done to master medical humanities literature, with aspects of empathy and medical students' critical thinking. They formed a heterogeneous study group (experimental group) and a non-heterogeneous study group (control group). Their research tested whether the heterogeneous group, namely the group that was given intervention in reflective writing to master medical humanities literature after the intervention, obtained positive effects in terms of empathy, critical thinking, and reflective writing. Before and after the intervention was carried out, they saw that regarding the critical thinking aspect, there were significant differences in the 'systematic and analytical', 'sceptical and knowledgeable', and 'maturity and

sceptical' sections, and all parts of this aspect.

Another research was conducted by Woldt & Nenad (2021). They revealed, "12 of the 13 studies determined that reflective writing had a positive impact on student's critical thinking, judgment, and/or learning". Their research aims to see the effect of reflective writing activities on students' critical thinking skills in dental education programs. Their research results show that reflective writing positively affects students regarding reflection, learning through reflective writing, reflection skills, self-assessment, critical thinking, clinical reasoning, problem-solving, and motivation to change after evaluating their learning experiences.

Based on research that has been done, the results of this research are expected to contribute to the evaluation of reflection writing activities, given that students are often asked to make reflections. Regarding critical thinking indicators, there are different components in measuring critical skills. The following are components of critical thinking from Facione, Halpern, and Bloom. First, (Facione, 1990) states that critical thinking skills consist of

Interpretation, Analysis, Evaluation, Inference, Explanation, and Self-Regulation. Second, (Possin, 2013) explains that there are five dimensions in critical thinking: verbal reasoning, argument analysis, thinking as hypothesis testing, possibility and uncertainty, and decision-making and problems. Third, Benjamin Bloom is famous for his Bloom's Taxonomy (Krathwohl, D. R. & B. S., & Masia, 1964), which initially consisted of knowledge, understanding, application, analysis, synthesis, and evaluation. In 2001, a revision of Bloom's Taxonomy was created, and the chart below is Bloom's most recent or recent taxonomy.

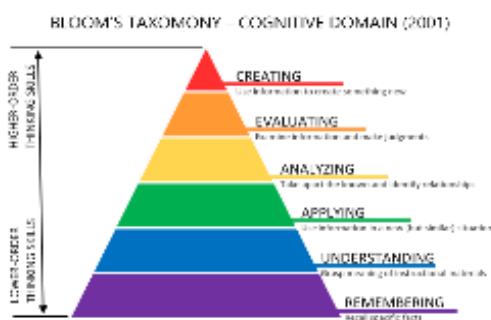


Figure 1 Revised Bloom's Taxonomy

(Gurol, A., 2011) reflective thinking is the confusion encountered in solving problems so that individuals are related; in the context of this research, learners analyze, evaluate, and motivate themselves to overcome these problems.

Reflective thinking encourages individuals to think about a strategy and evaluate it to take the right steps in solving problems (Gencel & Saracaloğlu, 2018). Reflective thinking is part of the critical thinking process, specifically analyzing and making judgments about what has happened. Therefore, this research focuses on analyzing reflective journals' effect on the critical thinking skills of students majoring in elementary school education at private universities in Tangerang.

METHOD

In this study, researchers reviewed critical thinking skills based on the sub-skills proposed by Facione. Facione indicators are considered more relevant to the context of the assignments given to students. Questions are structured using verbs from Bloom's cognitive taxonomy at levels 5 and 6 (Facione, 1990). This research is preliminary, and data collection is done qualitatively. A questionnaire is used to measure reflective journals' effect on students' critical thinking skills. Questionnaire data collection uses Microsoft Forms, which contains detailed data regarding the effect of reflective writing on

students' critical thinking skills. The subjects of this study were 30 students from the 2019 Batch of the Faculty of Education majoring in Elementary School Teacher Education (PGSD) at Tangerang Private University.

The instruments used in this study were examined and validated by experts. Data collection from research instruments was carried out by coding techniques by the research team to obtain the theme results from the data obtained.

The first stage is the preparation of data transcripts, both from primary and secondary data sources. After the data source is transcribed, the data is further processed. This processing stage is called data coding, which is coding all data according to qualitative procedures.

RESULT & DISCUSSION

Result

Based on the data obtained, the results and discussion of this study are as follows. According to Facione, PA (1990) critical thinking has six sub-skills: interpretation, analysis, evaluation, conclusion, explanation, and self-regulation.

Interpretation

In the first stage, courses that match the type of note-taking method are as follows:

Table 1 The Method of Taking Notes According to the Course

No.	Method	Subject
1	Cornell Notes	TCWDA, Pneumatology, Soteriology, Civic Education, Intermediate English, Pancasila Education, Semantics, Morphology, Systematic Theology, Bahasa Indonesia, Social Science 2.
2	Mapping Method	Syntax, Writing, Science, Physical Education, Theory, Internship, Phonology, Semantics, Prose Studies, Writing, Morphology, Pedagogy, Playing Theory, TCWDA, Teaching & Learning, Theology, CAD, Social Science, Theological Systematics, Indonesian Language, Theory of Reading & Writing.
3	Charting Method	Social Science, Civic Education, Phonology, Semantics, Prose Studies, Writing, Morphology, Mathematics, Physics, Science and Technology, English, Arts & Crafts, TCWDA, Pedagogy 3.
4	Sentence Method	Systematics of Theology, Writing, Civic Education, Phonology, Semantics, Prose Studies, Morphology, Reading, Science, Syntax, Indonesian Language, TCWDA.

5	Visual Note Taking	Writing, Civic Education, Phonology, Semantics, Prose Studies, Morphology, Soteriology, Pneumatology, Arts & Crafts, Science and Technology, Social Science 2, Physical Education Theory.
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- Can be integrated into various existing courses, especially for people who learn visually and creatively.
- Help and make it easier for us to understand the material simply.
- Very suitable for those who like to draw.
- Pictures and colours help understand the lesson well.
- A good way of taking notes but unsuitable for all courses because each subject has different characteristics.
- Has a variety of teaching materials to help students with a variety of learning styles.
- Taking notes helps concentration and focus, makes it easier to remember, and trains in selecting and organizing information.
- Seeing and taking notes can help us remember the important things we have learned.

Analysis and Evaluation

The second and third stages explain whether visual note-taking is a good way to take notes or is suitable for students.

Table 2 Visual Note Method for All Courses

- Not suitable for English courses because it takes practice to understand sentence formulas and vocabulary.
- Train yourself to filter information.
- Make it easy for note readers to follow the notes' flow.
- Make notes more attractive and organized.
- Present information visually, concisely, and attractively.
- Several courses involve numbers and complicated mathematical concepts that cannot be explained with charts, even though in mathematics, there are complementary pictures that help learners to form concepts of material in their heads.
- One thing that is interesting but not easy to make because it requires a better understanding, especially in Arithmetic courses.
- Besides being a reminder, neat and attractive notes are very important in encouraging enthusiasm for learning.
- This method is also expensive.
- Take more notes accompanied by interesting pictures so that the notes are more varied and creative because readers don't get bored reading them.
- More stimulate the brain to practice thinking.
- Make it easy to remember the important concepts of the course.
- Requires good drawing skills.

Inference and Explanation

In the fourth and fifth stages, the appropriate note-taking method for students is as follows:

Table 3 The Proper Recording Method for Students

Method	Reason
Visual Note Taking	<ul style="list-style-type: none"> - Not boring. - The mathematical method is suitable for taking notes - Make it easy to know and remember Arithmetic formulas, examples, and subject matter. - Arithmetic cannot be effectively explained with ordinary charts. - In Arithmetic is an interesting thing but certainly not easy to make because it requires a better understanding. - In Arithmetic, you will focus on numbers and need more time to colour or draw pictures. - Using a variety of images to make it more interesting.

Sentence Method	<ul style="list-style-type: none"> - Images and colours are very helpful in understanding learning well. - Help to organize materials and assignments. - Write down all the information. - Lecturer explains, can immediately record it and very effective. - Efficient. - More detail. - Accustomed to writing an outline of the understanding obtained. - Requires notes with long enough explanations to be reread and used to record matters related to literature. - Most effective and easy to remember when learning it again. - Systematic. - Defect in paragraphs because the information obtained is more or complete. - Tend to record all the material presented first and then review it again to make it easy to understand.
Mapping Method	<ul style="list-style-type: none"> - Analyze clearly each subject matter - It's easier and simpler to make notes and understand notes. - Adapted to student learning styles. - Make colourful notes and include important material more concisely. - Take notes more concisely, plus pictures or symbols, even though it's black and white. - Most effective and easy to remember when learning it again. - Take notes by listening, then make them in the form of important paragraphs/points/write back. - Write down the important points obtained.
Cornell Notes	<ul style="list-style-type: none"> - Very effective because it takes little time to record. - Systematic.

Self-Regulation

In this sixth stage, students apply skills in analyzing a topic in the subject taught by using the note-taking method that suits the student's learning style.

The following are some examples of the results of student analysis using note-taking methods that suit their learning styles because taking notes can improve students' memory skills, namely by entering and associating information received to give meaning tailored to their desires or is personal (Dewi & Indrawati, 2014).

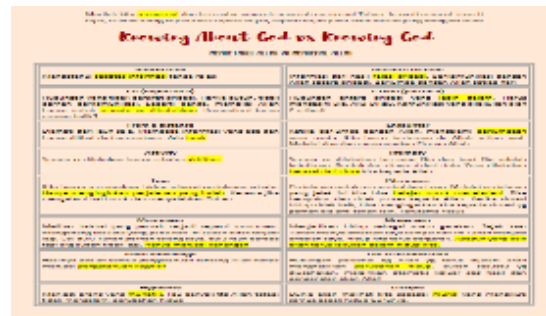


Figure 2 Charting Method

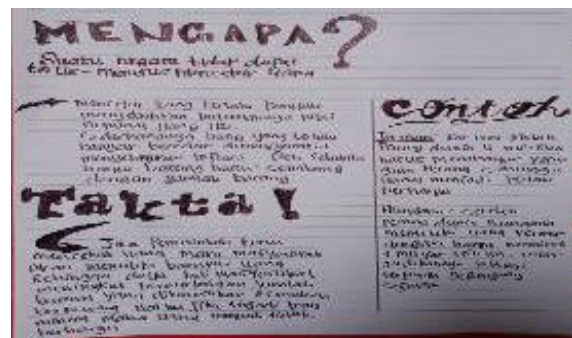


Figure 3 Cornell Notes



Figure 4 Sentence Method



Figure 5 Mapping Method



Figure 6 Visual Note Taking

Discussion

Based on Table 1, the reasons for using the note-taking method that is appropriate to the course are explained as follows:

1. Cornell Notes Method: a) take notes on what we read, b) write down keywords and write down questions, c) take notes on the keywords and important concepts

from the existing material, d) practice writing down keywords and questions, e) tabular form makes it easier to take notes, f) discuss key points and have lots of concrete questions, g) reviewing the reviews or material that has been studied, and h) make conclusions that aim to check to understand.

2. Mapping Method: a) take notes quickly because they are in the form of important points and can follow the learning flow well, b) arouse learning motivation, c) when the lecturer explains too fast, d) take notes by making concise and concise in the form of arrows or keywords, e) take notes all subject matter briefly and clearly, f) make it easier to remember with a variety of colours and shapes, g) make important points more interestingly, and h) write down the big title as the main idea and make it like a tree branch.

3. Charting Method: a) helps in understanding small components of the material, b) takes notes using main topics and sub-chapters, c) the use of tables is very helpful, d) suitable for math courses, e) data is

more structured if entered in tabular form, and f) using tables, facts, or data.

4. Sentence Method: a) take notes in detail and systematically, b) feel comfortable and fast, c) write main sentences and explanatory sentences in it, d) suitable if in the form of long sentences, e) the material noted will be easy to remember and understand, f) use sentences as the keyword, g) record and select the things that are the key to the discussion, and h) summarize all the material from a topic and make several sentences instead of paragraphs that represent each keyword from the topic.
5. Visual Note Taking: a) drawing certain charts while listening to the material can help, b) notes are more varied and creative and accompanied by interesting pictures, c) interesting and not dull, d) shorter and helps to remember important points, e) makes it easier to remember important concepts, f) study the material and make creative notes, g) are experts in drawing, h) is very suitable for those who like to draw, i) pictures

and colours are very helpful in understanding learning well, and j) write an outline or AHA which can be the keyword of the material obtained.

At this stage, students understand and express the meaning or significance of various experiences using note-taking. The note-taking method chosen by students is adapted to situations, data, events, assessments, conventions, beliefs, procedures, rules, or criteria appropriate to the context of the field and the course being studied. At this stage, students can also categorize, decode significantly and clarify the meaning of each lesson learned through note-taking.

Gurol (2011) reflective thinking is the confusion encountered in the problem-solving process so that the individual concerned, in the context of this study, is called the learner, analyzes, evaluates, and motivates himself to overcome the problem. Reflective thinking encourages individuals to think about a strategy and evaluate it to take the right steps in solving problems (Gencel & Saracaloğlu, 2018). Reflective thinking is part of the critical thinking process,

specifically analyzing and judging what has happened. As for the reflective learner, from the explanation above, it can be concluded as a learner who is used to thinking reflectively.

Based on Table 2, students analyze the note-taking method they choose according to the course. The analysis identified the note-taking method appropriate for the type of course, thereby helping students understand the material being studied. After identification, students evaluate the appropriate note-taking method according to the course type. This stage is also inseparable from student learning styles and expectations of the expected courses.

Based on Table 3, students conclude by considering relevant information from the note-taking method and the subjects taught. The conclusions drawn become the basis for the results for students to present reasons why they choose a note-taking method that suits their learning style and the courses they teach.

Based on the results of taking student notes on the subjects they teach, the method of writing down sentences, Cornell note-taking, and mapping is

most favoured by students. Because this note-taking method helps students to record the important things they learn and makes it easier for them to repeat the material that has been learned. In these three methods, some guidelines can help them, such as keywords, points and questions that guide students to make journals/summaries of what they have learned. The visual note-taking method of recording is also interesting for students, but this method requires skills in drawing and capital in terms of colourful writing instruments. Whereas the Charting method is very suitable for material with many sub-chapters, it makes it easier for students to make journals/summaries.

CONCLUSION

The note-taking method assists students in making journals/summaries of the courses they teach. Knowledge of note-taking methods can help students make journals/summaries of their courses. This allows them to think critically about each course's needs, the course's nature, and what note-taking method is best suited. Students understand that choosing the right note-taking method can improve their thinking flow. Thus, they are

sharper and faster in thinking. Some things must be considered from each selected note-taking method by students, such as note-taking methods that must be adapted to the learning style and students' thinking skills.

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