AN INTEGRATED ASSESSMENT OF CRITICAL THINKING SKILLS & DISPOSITIONS TO PREVENT HOAX IN ACADEMIC CONTEXT

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ABSTRACT

The increase in intolerant and anti-social behaviour along with with the lack of mental and psychological readiness for various forms of information and stimulus present to students has the potential to cause misperceptions and the appearance of behaviour that conflicts with morality and truth. It is thought to occur because of the non-optimal abilities and characteristics of an individual's critical thinking in response to all forms of change that occur. This study was conducted to develop critical thinking measuring instrument created in two versions, namely critical thinking skills and critical thinking disposition. The instrument was made based on a literature review and conceptual formulation through a qualitative rater test to produce a clear set of indicators about critical thinking. The next step is to modify the measuring instrument based on previous qualitative tests. With testing in the trial phase of a sample of 60 students selected by a purposive sampling technique, producing a comprehensive critical thinking measurement tool. The results of the analysis show that the instruments made have good reliability with each item having a high different power value.

KEYWORDS

Critical Thinking Disposition, Critical Thinking Skills, Hoax, Integrated Assessment.

1. INTRODUCTION

Personal social issues that may occur related to current technological dynamics, one of which is the dissemination of hoax information (incorrect) that develops on social media (Arif, 2016). These facts trigger various extremist behaviours, such as hate speech on social media, the intensity of bullying between groups, to radicalism, both related to personal, group, or religious motivation. (Arif, 2016; Brigida and Pratt, 2017). Some cases of extremism and radicalism occur on campus today such as behavior carried out by a student on one of the campuses in Riau that is suspected by
the campus as being affiliated with the radicalism community or a student case in Bandung which is indicated to be one of the donors for hard-line communities (Asrori, 2017; Mulyono and Mulyoto, 2017). The tendency to carry out radicalism is behaviour that is contrary to the values of nationalism and religious values.

Some studies explain that the main problem with radicalism is immature knowledge possessed by individuals about the issue of truth, an immature mentality in responding to situations that occur around them, even psychologically they do not have the ability to think critically high in filtering information and internalize it in the form of appropriate behaviour (Arif, 2016; Asrori, 2017; Mulyono and Mulyoto, 2017). More specifically, critical thinking is one of the main foundations that must be owned by an individual when getting a stimulus in the form of information or situations that require him to play an active role and decide on a behavior that will be shown in connection with the response (Lilienfeld, Ammirati and David, 2012). Also, by thinking critically, an individual will be accustomed to processing every information they obtain based on logical reasoning, the issue of truth that exists, and ideal decisions that may be related to good or bad behaviour (Lilienfeld, Ammirati and David, 2012; Chan, 2019).

As one of the important aspects of behaviour, critical thinking becomes one of the important forms of action to make a person more independent, firm in his stand and guided by the values and norms of truth (Pitt et al., 2015). Many previous studies support the hypothesis that critical thinking can prevent a person from acting anarchist and radical (Ku et al., 2019; Smith et al., 2019). However, the majority of these studies more look at critical thinking as an existing factor, whereas what is more important is how to improve the ability of critical thinking effectively.

Critical thinking is a structured intellectual process that actively and involves the ability to conceptualize, apply, analyze, arrange, and evaluate information obtained from the process of observation, experience, reflection, reasoning, and communication as a guideline that is believed and at least carried out (National Council for Excellence in Critical Thinking, 2013 in Boa, Wattanatorn, & Tagong, 2018). Critical thinking includes a final decision-making process that is full of consideration; that is the result of the process of analysis, interpretation, evaluation, inference, explanation, and reflection (Fung, 2017).

According to Kaya, Şenyuva, & Bodur (2018), critical thinking is an important aspect to do to create a good and directed education. Sasson, Yehuda, dan Malkinson (2018) explains that critical thinking is an important part for humans to understand the complexity of phenomena. Critical thinking emphasises students to melt with problems, have stronger, more systematic forward-thinking, focus on the task at hand, full consideration of the task, problem-solving, creative thinking, and decision making. Two important keys are planning and reflecting. Critical thinking is very important to be trained in daily life, especially when individuals get some information related to uncertain rumours, and about opposing political issues.

Critical thinking theory starts with Delphi Panelists (Facione, 1990; Facione et al., 1995) by identifying key elements that might occur in the reasoning process in the campus context. Ideal critical thinkers usually often carry out a gradual process, the information is clearly received, the reasons are trusted, open-minded, flexible, fair in evaluating, honesty in behaving, certain in making decisions, compiling information neatly, diligently in seeing relevant information, selective in thinking, focuses on verifying questions, and is diligent in seeing results that actually match accuracy.

a. Interpretation, namely mastering and expressing the meaning or significance of various experiences, situations, data, events, judgments, beliefs, rules, procedures or criteria. Consists of categorization, coding, and explanation of meaning.

b. Analysis, namely identifying deeper and actual about inferential relationships from statements, questions, concepts, descriptions, or other forms of representation of a belief, experience, reasoning. Consists of testing ideas, detecting arguments and analysing arguments into components.

c. Evaluation, i.e. obtains credibility from statements or other representations which may be in the form of descriptions of people’s perceptions, experiences, situations, beliefs, and to see the logical power of interrelated statements. Consists of testing claims and testing arguments.
d. Inference, namely identifying and looking for elements needed to draw logical conclusions, to form a hypothesis, taking into account other information, strengthen the data. Re-verify sources, provide alternatives and conclude.

e. Explanation, which is to maintain one's reasoning, to recognise that reasoning in evidential, conceptual, methodological, and contextual considerations is a person's result, then presents it into a framework of arguments. Consists of defending results, justifying procedures, and presenting arguments.

f. Self-regulation, known as self-awareness in controlling one's cognitive activity, the elements used, and expressing results. Apply the ability to analyse and evaluate judgments given by someone with a view that leads to the process of asking, confirmation, validation, correction. It consists of self-examination and self-correction.

Research on critical thinking is not new. As one of the important aspects possessed by students in the educational context, many research focuses have tried to discuss the topic. Critical thinking is a psychological construct that plays an important role in achieving learning goals (Amrullah et al., 2018). Students who have better critical thinking skills in their schools are predicted to be able to show learning performance as well as the critical thinking they have (Fong et al., 2017).

Critical thinking is two processes in which there are activities to plan and determine decisions. Both processes are part of critical thinking that cannot be separated (D’Alessio, Avolio and Charles, 2019). Critical thinking can increase a person's capacity to show a more open attitude towards what is happening around him so that this will arouse deep curiosity, especially if it is related to the desire to explore science (Fung, 2017). Based on research by Pitt et al., (2015), Critical thinking is very useful in preparing students to meet their needs in the learning process which will indirectly have an impact on their achievement in school.

In the context of measurement, the development of measuring tools for critical thinking is only made based on problems and cases that are thematic in nature, which aims to see how much the individual's ability to solve a problem based on a particular context (Bezanilla et al., 2019; Ku et al., 2019; Smith et al., 2019). Research conducted by several researchers in the field of education tries to explore theories and reduce them into a set of cognitive questions that are predicted to be able to measure one's critical thinking skills. But in a social context as used to see and prevent the practice of radicalism in the academic environment tends to be rarely done (Verawati et al., 2010; Shin, Park and Kim, 2015; Marfu’i and Krisnanda, 2019). This study provides practical alternatives that provide appropriate measuring tools to measure the characteristics and abilities of critical thinking of people based on social contexts and more specifically regarding issues of violence, peace and radicalism.

2. METHOD

In the implementation of the research method used in this study refers to the steps described by when making an instrument of psychological measurement. By referring to the concept of modification explained above, the basic assumptions built in this research method are expected to be able to get a strong theoretical concept so that when it is revealed in the form of questions or statements can describe the condition of an individual's critical thinking.

**Design.** This study uses a quantitative approach that focuses on measuring instrument modifications. Modifications are made by conducting an in-depth study of the critical thinking theory used and lowering it in a set of questions (Fahmi and Ramdani, 2014; Ramdani, 2018a; Ramdani, Widyastuti and Ferdian, 2018). The purpose of this modification is to get a measuring instrument that fits the context of the test and is based on the depth of the previous theory, which is used as the main reference source.

**Sample.** The subjects in the pilot study phase numbered 60 people with backgrounds in psychology faculty students in semester V. Of the 60 people, 12 of them are men (20%), while the remaining 80% are women. There is no consideration of the sampling technique used in this study.
Determination of the sample is based on the needs of researchers because this study is only at the trial stage of research measuring instruments.

**Psychometric Property.** Critical thinking tools used are based on the theory conveyed by Facione et al., (1995) & Facione (1990), which divides critical thinking into two big domains (sub-constructs). First is critical thinking skills and second is critical thinking disposition. Critical thinking skills is an innate ability in the cognitive realm, which focuses on one's ability to analyse and solve problems while critical thinking dispositions are more about the tendency of nature and characteristics to behave critically (Facione et al., 1995; Facione, 1990).

| Sub-Construct | Dimension       | Item | Time |
|---------------|-----------------|------|------|
| Skills        | Interpretation  | 10   | 30″  |
|               | Analysis        | 5    | 5″   |
|               | Evaluation      | 7    | 8″   |
|               | Inference       | 3    | 10″  |
|               | Explanation     | 3    | 15″  |
|               | Self-Regulation | 12   | 10″  |
|               | Total           | 40   | 78″  |
| Disposition   | Truth-seeking   | 62   | 15″  |
|               | Open-Mindedness |      |      |
|               | Systematic     |      |      |
|               | Inquisitiveness |      |      |
|               | Analyticity     |      |      |
|               | Cognitive       |      |      |
|               | Maturity        |      |      |
|               | Self-Confidence |      |      |
|               | Total           | 102  | 93″  |

Note. (″) symbol is minute.

**Research Procedure.** This study was conducted classically using standardised testing standards. All items are made in a problem book complete with instructions, time spent, and answer sheets. The test is carried out following the measurement standards contained in the code of ethics for measurement in psychology (Anastasi and Urbina, 2007).

**Data Analysis & Interpretation.** The raw data is tabulated and analysed using a classical approach to see the difference in power and reliability of the instrument.

3. **RESULT AND DISCUSSION**

This study begins with a cognitive analysis of the results of a literature review on the critical thinking construct. Below is a discussion of the indicators carried out by three experts. The expert assesses the suitability of each item made based on the existing theoretical construct. Some things that are assessed include, the suitability of the item with the existing construct, the editorial sentences used, as well as the administration of test implementation.
Table 2. Cognitive Analysis of Rater

| Sub-Construct | Dimension          | Judgment                                                                 |
|---------------|--------------------|--------------------------------------------------------------------------|
|               |                    | Rater 1                                                                  |
| Skills        | The appropriateness between the constructs measured with the indicators must be clear | There are still some differences in the subject's perspective in assessing an item |
|               |                    | Constructions must be distinguished which measures attitudes, emotions, and even behaviour | The measured construct is clear and indeed visible in the indicator |
|               | Rater 2            | The editors used must be considered more                                   |
|               | Timing and items must be adjusted very proportionally                    | The items are made according to the construct                              |
|               | Rater 3            | Making items prioritises the principle of language and content appropriateness | Because many use images, the visualization should be made more interesting and clear |
|               | The clarity in distinguishing the measuring domain is very influential on the measurement process | The domain of measurement because of its psychological nature must be more open |
|               | Rater 1            | The number of items that are too much will affect the workmanship Adjusted time needed | Negative sentences should be made clearer                                  |
|               | Rater 2            | There are some items that are considered too long and confusing           |
|               | Rater 3            | Items that are not yet clear are considered for compatibility              |
|               |                     | An explanation of the instructions and implementation of the items must be clear | The effectiveness of the item must be an important note                   |

The results in table 2 explain the analysis that has been given by the rater of the instruments that have been made. Based on the combination of all the rater, the assessment given is enough to represent the things that must be improved in the instrument. Most of the analysis refers to items that are considered still unclear measuring certain constructs. Also, other, more technical things are considered by the author to be fixed.

Figure 1. Example Stimulus on Critical Thinking Skills Questions
The results of the analysis in Table 3 explain the psychometric properties obtained from the results of trials on 60 subjects. For the part of critical thinking, critical thinking skill is measured separately because the scoring system and the aspects measured are different. Of the six dimensions available (table 3), only the inference aspect that gets a relatively small value of reliability (0.289), while the others are already good because it approaches the number 1 (Ramdani, 2018b; Ramdani, Widyastuti and Ferdian, 2018).

Table 4. Psychometric Property of Critical Thinking Disposition

| Reliability Coefficient | Item Discrimination |
|-------------------------|---------------------|
| 0.954                   | 0.293-0.698         |

For table 4 explains the reliability value of the critical thinking disposition instrument that shows good results because the value approaches the number 1 (0.954). As for the power, the difference varies until there is the greatest 0.698. Items to be taken are with different power values above 0.3 (Azwar, 2016).

Table 5. Item Processing During Pilot Study

| Subtest | Critical Thinking Skills | Critical Thinking Disposition |
|---------|--------------------------|-------------------------------|
| Stage   | Pre          | Post    | Pre | Post |
| Item    | 40           | 20      | 62  | 52   |

Table 5 explains how the number of items before and after the trial. There is a reduction in the number because items that get poor results in the discrimination section will be eliminated. Therefore, only good items will be continued.

Figure 1 presents an example of the responses that exist in the problem. These responses are those that pass the testing phase and will become a series of critical thinking problems.

This study is built based on a clear methodology because it considers the theoretical aspects from the beginning, namely by referring to the concept of thinking conveyed by Facione et al., (1995) & Facione (1990). Historically the concept of critical thinking of the expert has shown significant developments, both in the increase in related research or manifestations for practical purposes. The concept created by Facione has been cited by many other researchers to reach tens of thousands of quotes for his writings on critical thinking. So with this foundation, the selection of grand theory in this study has referred to reputable sources and has a very large impact.

Previous research has attempted to explore and validate criteria for critical thinking in all contexts of life. As done by the importance of critical thinking for students in getting information and processing it into valuable learning for them (Yang and Wu, 2012; Niu, Behar-Horenstein and Garvan, 2013; Smith et al., 2019). Even further, with this critical thinking ability, they will be able to face various challenges that might test their logic in their daily lives (ten Dam and Volman, 2004).

This study is a series of trials conducted to obtain appropriate instruments to measure critical thinking constructs. The results of research, in general, show that instruments that measure the critical thinking disposition produce better instruments compared to instruments of critical thinking.
skills. If seen from the reliability coefficient criteria produced by the two measuring instruments, then with a coefficient of values reaching 0.954 so it is very close to lifting 1, the instrument of critical thinking characteristics is called better in this trial (Azwar, 2016; Ramdani, Supriyatin and Susanti, 2018).

Theoretically, there are no fundamental differences from the two domains of critical thinking made. Critical thinking skill measures more the cognitive aspects and technical things of an individual, while the critical thinking disposition measures the psychological dynamics or traits/tendencies that might occur in individuals to think critically (Facione et al., 1995). The high-reliability coefficient is caused by many things, including the number of items made a lot, the number of subjects involved a lot, the format of the items presented, and the important thing is also the suitability of the contract used whether clear or not (Ramdani, 2018a). Procedurally this study was limited to a small number of trial samples, but that was not the main reason for the small reliability coefficient.

The instrument of critical thinking dispositions can produce values that tend to be significant because the existing psychometric factors support the appropriate assumptions. However, for the instrument of critical thinking skills, on the contrary, it gets relatively small results from the value of the reliability coefficient. This is possible because of several things, including items that still have a level of difficulty that is not clear, so it is not able to distinguish which individuals have high abilities and low abilities.

Technically, in testing one's cognitive abilities, a person's mental and psychological readiness factors are very influential in their success in working on a cognitive problem. Questions that are too long with disproportionate use of time will affect the readiness of the subject in answering the questions presented to them. In this case, this study received initial criticism that presents forms of long questions with very limited time. This is another consideration when the results of psychometric testing are not good.

Some previous studies that have tried to construct a critical thinking skills measurement tool also consider many things if you want to make this instrument. The use of critical thinking instruments must consider aspects of the presentation and administration of the test because theoretically this ability is very relevant and will be optimized if it is designed to be very attractive and attractive (Miri, David and Uri, 2007). Also, the presentation used with a visualization that is simpler but precisely measures the construct of critical thinking will produce instruments with good items (Cavus and Uzunboylu, 2009). Instruments with various problems will produce a good set of instruments (Ku, 2009).

The instruments made in this study are devoted to getting an appropriate understanding of the fundamental differences between critical thinking skills and critical thinking disposition. Even though the difference has been determined from the beginning on the format used and the domain that was measured, some research still questioned the significance of the difference because when viewed from the dimensions along with the explanation all lead to relatively the same indicators (Profetto-McGrath, 2003). Research conducted by shows that critical thinking skill and critical thinking disposition are two essential things, but the position of the characteristics are considered before the ability (Profetto-McGrath, 2003). But in reality, these two things are two psychological constructs that are equally important.

The results of the analysis with the classical methods of the two instruments used have not been fully able to explain the location of the weaknesses of the items made, so for future research must use more and more heterogeneous samples and must use more specific statistical analyse such as the use of item response theory, because it is predicted able to see the ability of power items more specifically tailored to the abilities and psychological characteristics in individuals.

Advantages, limitations and possible applications.

4. CONCLUSION

Critical thinking instruments developed in this research are appropriate to be used to measure students' critical thinking skill and disposition, especially those used in social context because in
them many cases are raised in accordance with issues of peace, tolerance, and moral actions in daily life.

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