

# Thinking Process of Skeptical Students on Hoax

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## ABSTRACT

This study aims to find out the thinking process of students skeptical at hoaxes in terms of assimilation and accommodation framework. The research method used was descriptive qualitative. The data was collected through tests and interviews. The subjects of this study were students of Muhammadiyah Kotabumi University who were skeptical of the hoax. The results of this study show that the thinking process of skeptical students on hoaxes goes through several stages, namely 1) information absorption, 2) selection, and 3) decision making on the information. There were 3 characteristics of students who were skeptical of the hoax, namely the skeptical informant, the skeptical content, and the skeptical form of data. In skeptical informant was characterized by assimilation process of all information received if the source of information is included or comes from the trusted informant based on the existing scheme, but there was an accommodation process for all information received if it does not come from the trusted informant. In skeptical content was characterized by an analysis process of the logicalness of information which then occurs accommodation process to illogical or incompatible information with the existing scheme. The skeptical form of data was characterized by an accommodation process for all information presented in the qualitative form and only occurs the process of assimilation of the information presented in quantitative form.

**Keywords:** *Skeptic, Hoax, Thinking, Assimilation, Accommodation.*

## 1. INTRODUCTION

Hoax is defined as a form of deliberate deception to manipulate something that is not true as if it were the truth [1]. [2] also defines a hoax as a series of information that is deliberately misled, but familiar with the truth. Furthermore, [3] add that hoax is not only misleading information, but information that has no factual basis and is presented as if it was a series of facts is also part of the hoax. Hoax is quite dangerous for the order of social life. [4] stated that hoaxes can be packaged in media and designed to weaken existing centers of power. [5] also emphasized that hoaxes can divide society which results in uproar in various places. Once the danger of hoax, every individual should be able to increase awareness of hoax, especially students.

Students as a symbol of intellectual figures should be able to think critically so that they can easily distinguish between correct and incorrect information (Hoax). This is different from the facts revealed by several researchers, one of them is [6]. [6] concluded that most of the students (teacher candidates) were at the lowest level of critical thinking. The low level of students' critical thinking shows that students can still be influenced by hoaxes easily. This was confirmed in research [7] who state that

most scholars tend to have difficulty processing information so that it is often a mistake to conclude the information received. This fact triggers attention to explore further the cognitive aspects of students in dealing with hoax.

Hoax should be faced with the caution planted in the mind so that it is not easy to take any information received for granted. Alertness to hoax can arise in a person if he has critical thinking skills or disposition. [5] explained that one of the skills that can equip someone in preventing the effect of hoax is the skill in using critical power (critical thinking). One of the important components in critical thinking to raise awareness of hoaxes is skepticism.

The skeptic is defined as doubting knowledge received before obtaining certainty by eliminating any possible falsehoods that are considered logical [8]. Furthermore, [9] define skepticism as someone's distrust or doubt about something they find or receive. Sceptics need a rational explanation [10] thus encouraging someone to ask and aware to carry out justifiable logical evidence [11]. Sceptics can encourage someone to reflect to produce a correct conclusion and can make the right decision [12]. The skeptic has several characteristics,

namely asking or denying something. This is by the statement which states that a skeptic will deny or ask a belief that has been previously justified [9] [13].

Several studies on skepticism have been carried out, but no one has yet discussed the process. The studies that have been carried out are limited to the results, the causal factor, and the characteristics of the types of skeptics. Compared to the process, one of the studies on skepticism was carried out by [12]. Nugroho divides the skeptic into two, namely the type 1 and the type 2 skeptics. Type 1 skeptic occurs because of a warning in the mind spontaneously. Different from the type 1 skeptic, the type 2 skeptic occurs because of a mismatch between the stimulus and the existing scheme based on the results of cognitive function performance. Type 1 skeptic occurs based on an analysis of information that is incompatible with the existing scheme. In several studies, skepticism is closely related to awareness of something that is accepted.

Vigilance is one of the cognitive entities that has become the public's attention in addition to other entities such as attention. [14] state that alertness is a process in brain tissue that modulates perception to achieve effective function. Vigilance is the result of the attention process which can detect all forms of stimulation and relevant task performance in human cognition. In general, alertness can be divided into two, namely phasic alertness and tonic alertness. [15] have studied in-depth about phasic alertness and stated that phasic alertness is a state of warning against a stimulus that is temporary and tends to be spontaneous, whereas tonic alertness has a level of continuous readiness over a longer period [16]. Phasic alertness tends to occur because human nature is capable of self-protection to fortify oneself from physical harm, while tonic alertness can be established through environmental engineering. This suggests that phasic alertness is a product of type 1 skeptic and tonic alertness is a product of type 2 skeptic.

The skeptic is very important because the skeptic encourages to obtain the truth, engage in critical and creative activities, and make it possible to change the truth from past knowledge into other truths [17]. Skeptic allows one to change views of old knowledge or reject new knowledge. This indicates that there is a process of restructuring the scheme in a skeptical person.

The scheme restructuring process occurs as a result of a mismatch between the information just received and the old scheme that is already owned [18]. The results of the scheme restructuring process will have an impact on a person's decision to accept new information or change the old scheme according to the information that has just been received. This shows that the accommodation assimilation framework can be used as a basis for photographing the thinking process of a skeptic.

The assimilation and accommodation framework is a theory of thinking from the school of constructivism. The construction of knowledge is formed through the process of assimilating new knowledge based on the old scheme or the process of accommodating new knowledge with the old scheme through restructuring the old scheme. [19] explained that assimilation refers to the use of cognitive structures directly, whereas accommodation occurs by reconstructing cognitive structures when a person is faced with a new situation. Furthermore, [20] states that assimilation as an expansive generalization that emphasizes the cognitive structure is developed without changing the ideas held, while accommodation is stated as a reconstructive generalization or the occurrence of a restructuring process. In line with some of these opinions, [21] explain assimilation as the process of integrating a new stimulus into an already formed scheme, while accommodation is the process of integrating a new stimulus through the formation of a new scheme adjusted to the stimulus received. Several researchers have explored the thought process using the accommodation assimilation framework, but none have explicitly examined the thought processes of skeptical students about the hoax.

There is an interesting phenomenon found from the results of observation of 4th and 6th-semester students. Given 4 pieces of information about covid data consisted of 1 authentic information and 3 hoaxes. 3 hoaxes information has different characteristics (K1, K2, and K3). From 71 students, 1 student doubted on K1, 3 students doubted on K2, and 2 students doubted on K3. Students who doubted the hoax were then conducted a limited interview to find out more about the response to the hoax given.

It was found that: 1) the doubts about K1 occurs because of a mismatch between the existing scheme and new information related to information sources; 2) the doubts about K2 occurs because of a mismatch between the old scheme and new information related to the logic of information; 3) the doubts about K3 occurs because of a mismatch between the old scheme and new information regarding the form of data, and 4) all students who are skeptical of hoaxes indicate a type 2 skeptic student. This phenomenon is of particular concern for researchers to explore further how the thinking process of students is skeptical of a hoax because the existing literature has never explained the process of thinking.

Based on the literature review, the phenomena, and the results of previous researchers that have been described, it is necessary to research how the thinking process of students is skeptical of hoaxes.

## 2. MATERIAL AND METHOD

This research is qualitative research with a descriptive exploratory type. It is said that the research is descriptive because the researchers conducted the analysis only to the level of description, namely analyzing and presenting facts systematically [22]. This study aims to describe a special case, namely to describe the characteristics of the thinking process of students who are skeptical of hoaxes. It causes a qualitative approach to be needed in exploring the case to enrich description [23] [24].

### 2.1. Materials

The main data of this research was written answers and verbal words orally obtained from the use of hoax alertness test instruments and interviews. The data from the interview was used to validate the data obtained from the test results. The data validation in this study used member checking, namely by asking participants for a description of the responses that had been carried out by conducting interviews [25].

### 2.2. Participants

The subjects of this study consisted of 6 students of Mathematics Education of Muhammadiyah Kotabumi University. The selection of research subjects is based on the following criteria: 1) Muhammadiyah Kotabumi University students, (2) skeptical of the hoax given, and (3) able to communicate their thoughts orally and written well.

### 2.3. Procedures

The procedures of this research firstly selected 71 mathematics education students consisting of 4th and 6th semester and they can communicate their thoughts orally and written well. The selection is based on the observation conducted by researchers during the teaching and learning process. The selected student was given 4 pieces of information about Covid data which consisted of 1 authentic piece of information and 3 hoaxes. 3 hoaxes information has different characteristics (K1, K2, and K3). 71 students were selected students who were skeptical of the hoax. Then 6 students were skeptical of the hoax (S1, S2, S3, S4, S5, and S6).

### 2.4. Data Collection Methods

Data were collected in this study through the test. The test was given with several questions about student responses to the information provided. These questions are: 1) after reading the information, what do you think? (2) if the information was publishing on your campus, would you believe the information?; 3) if you believe or not the information, what is the reason? There are four pieces of information provided, namely 1 authentic information and 3 hoaxes. 3 hoaxes have different characteristics, namely: 1) do not include clear

information sources (K1); 2) there is unlogical information (K2), and 3) presented in the form of qualitative data (K3). The test was given to determine the students' responses to the hoax. After that, students who were skeptical of the hoax were selected to conduct an in-depth interview regarding their responses to the hoax. The data obtained from the test results and interview results were used as data to be analyzed in this study.

### 2.4. Data Analysis

Valid data is used for the thinking process of students who are skeptical of hoaxes in terms of assimilation and accommodation frameworks. The analysis process goes through several stages, namely: 1) collecting data for analysis, 2) interpreting the data in general, 3) coding, 4) collecting codes into categories, and 5) interpreting the meaning of the data. This is by the disclosed data analysis procedure Creswell [25], namely: preparing and organizing data to be analyzed, exploring the initial data through the coding process.

## 3. RESULTS AND DISCUSSION

The following are the results of interviews conducted with the six students who stated that the information provided was a hoax.

#### Subject 1

*S1: When I got the news, I read the data that was affected by covid here.*

*S1: Yes, after that, I looked at the source because as far as I know, the health department is the one giving the true news about covid.*

*S1: when I looked there was no source.*

*S1: Yes, when I saw that there was no source, I doubted whether it was true or not.*

*S1: I tried to find out again who knows if there was a source, but it doesn't exist.*

*S1: Yes, when I found out there really wasn't one, I was sure that it was a hoax.*

#### Subject 2

*S1: I read it first; I saw it like the others, sir*

*S2: Yes, please read this, sir, which areas are affected by covid, then how many people are affected,*

*S2: Not only that, sir, I also saw a good picture*

*S2: After I noticed, why is there something strange about this data.*

*S2: You know, sir, this is the total cooking, even though it's like this here, right?*

*S2: Yes, it's weird, sir, it should be 4, here instead of 14, where did the ten come from?*

*S2: I was doubting whether I should not be late, so after that, I checked again but after checking it turned out to be weird*

*S2: Yes, sir, after that you are sure that it's a hoax, that's why you answer when asked.*

**Subject 3**

- S3: First, I saw the information about the place that you sent.
- S3: After that, I got all the information here, sir, how many have been affected by covid in each area.
- S3: After I read it, how come there is something strange,
- S3: This one, sir, only 4 of them got covid, but strangely enough, there were only 4 who got covid.
- S3: Yes, sir, from there, I have my doubts, the factual news cannot have such a contrast
- S3: After that, I read it again, sir, who knows if someone saw me wrong, after I read it a few times it still looks weird.
- S3: After that, I was sure that it was a hoax

**Subject 4**

- S4: I saw the one you love first
- S4: I read that which areas are affected by covid.
- S4: I read how many people got covid.
- S4: Yes sir, I read all of them, but after that, how come there is something strange.
- S4: At first I didn't know what was strange, I tried to read it again, and then I saw that it was different from the total number.
- S4: Yes sir, I'm so doubtful.
- S4: No sir, I didn't immediately think it was a hoax, I tried to read it again to be more sure of my doubts,
- S4: Well, after I continued reading, I made sure there was something odd, then I was sure that it was a hoax.

**Subject 5**

- S5: At first I saw it, sir, after that I saw how come it looks like this
- S5: Yes, sir, usually in the form of a table with numbers, sir.
- S5: Why is this just a narration
- S5: No, sir, I can't immediately confirm that it's a hoax.
- S5: I read earlier that there were numbers who got covid, even though it wasn't written in numbers, sir.
- S5: The more you come here, the more doubtful you are, because this is the first time the covid information doesn't use numbers
- S5: When I read your question regarding the validity of the data, I finally said that it was a hoax because usually the data is in the table and keeps the numbers for information about covid.

**Subject 6**

- S6: First of all, I read the information that you gave.
- S6: I see that the data is not as usual.
- S6: Yes, sir, usually the data is in the form of numbers when it comes to covid, this is just a narrative
- S6: I read that there are numbers that have been infected with covid, but not in numbers.
- S6: I'm not sure, sir, if it's not in the form of numbers, try to pay attention to all the covid data that appears on social media, on TV the average number is used
- S6: Yes, sir, that's the biggest reason why I doubted the information and said it was a hoax.

Based on students' responses on hoax given and the results of the interview, it was found that the thinking process of students was skeptical of hoax through three stages, namely 1) information absorption, 2) selection, and 3) making an informed decision.

**3.1. Information Absorption Stage**

At this stage, students receive the information provided, pay attention to the form of information, read all the information provided (name of the city affected by Covid, number of people affected in each area, display of information presented, and sources of information) without experiencing the suspicion that the information provided is a hoax. Then students remember things they have experienced related to the information provided (covid data in several areas that have been read, valid data is quantitative data, valid data is data with reliable sources of information, if the lecturer asks about how to respond to the information given the usual some things are strange and should be suspected of validity, valid information is logical information). McGowen & Tall [26] assert that a person's mental perceptions are influenced by problems that have been resolved before. This has an impact on the emergence of an accommodation process between the information that has just been obtained and the schemes that students have based on the experience that has been passed.

In detail, the stages of information absorption from the six subjects can be seen in Table 1 below

**Table 1.** Information Absorption Stage Of Skeptic Students On Hoax

S	Hoax Type	Activity	Process
S1	K1	<ul style="list-style-type: none"> <li>✓ Receive the information provided.</li> <li>✓ Read the name of the area affected by Covid.</li> <li>✓ Read data on the number of people affected by Covid in the area.</li> <li>✓ Looking at the source of information Given the Covid data in the area which is included in the information places.</li> <li>✓ Remember several reliable sources of information regarding hoax data.</li> <li>✓ Remember if the lecturer who provides information needs to be watched out for.</li> </ul>	Assimilation and accommodation
S2	K2	<ul style="list-style-type: none"> <li>✓ Receive the information provided.</li> <li>✓ Read the name of the area affected by Covid.</li> <li>✓ Read data on the number of people affected by Covid in the area.</li> <li>✓ See the data display.</li> <li>✓ Remember that valid information is logical</li> </ul>	Assimilation

S	Hoax Type	Activity	Process
S3	K2	<ul style="list-style-type: none"> <li>✓ Receive the information provided.</li> <li>✓ Read data on the number of people affected by Covid in the area.</li> <li>✓ Remember that valid information is logical</li> </ul>	Assimilation
S4	K2	<ul style="list-style-type: none"> <li>✓ Receive the information provided.</li> <li>✓ Read the name of the area affected by Covid.</li> <li>✓ Read data on the number of people affected by Covid in the area.</li> <li>✓ Remember that valid information is logical.</li> </ul>	Assimilation
S5	K3	<ul style="list-style-type: none"> <li>✓ Receive the information provided.</li> <li>✓ Pay attention to the form of data (quantitative or qualitative)</li> <li>✓ Read the name of the area affected by Covid.</li> <li>✓ Read data on the number of people affected by Covid in the area.</li> <li>✓ Given that valid data is quantitative data</li> </ul>	Accommodation
S6	K3	<ul style="list-style-type: none"> <li>✓ Receive the information provided.</li> <li>✓ Pay attention to the form of data (quantitative or qualitative)</li> <li>✓ Given that valid data is quantitative data</li> </ul>	Accommodation

### 3.2. Selection Stage

At this stage, students make adjustments between the new information and the scheme that has been called, namely: adjusting the source of the information to the scheme that has been called, paying attention to the logic of data by remembering that valid information is logical information, and paying attention to the form of data by remembering that the information valid is information presented in the form of quantitative data.

At this stage, doubts began to arise in students due to the cognitive conflict they experienced. This is by the opinion of Lee et al. [27] which state that cognitive conflict can make students doubt, then the psychological condition of students will show interest or anxiety. This doubt encourages students to double-check the information received before making a decision. Re-checking is carried out to reflect on what has been known from the information provided. Reflection is used to raise awareness and strengthen decision-making [28]. In detail, the selection stage of the six subjects can be seen in Table 2 below.

**Table 2.** Stage Of Skeptic Students Selection On Hoax

S	Hoax Type	Activity	Process
S1	K1	<ul style="list-style-type: none"> <li>✓ Pay attention more to whether the source of the information is a reliable source.</li> <li>✓ Experiencing cognitive conflict after learning that there is no clear source of reliable information.</li> <li>✓ Doubt the validity of the information received.</li> </ul>	Accommodation and disequilibrium occurs
S2	K2	<ul style="list-style-type: none"> <li>✓ Paying attention to the logic of information by relating all the data listed.</li> </ul>	
S3	K2	<ul style="list-style-type: none"> <li>✓ Experiencing cognitive conflict after knowing that there are two unreasonable information, namely the total number of people exposed to covid in one district is not the same as the sum of all exposed people in each sub-district in the district.</li> </ul>	
S4	K2	<ul style="list-style-type: none"> <li>✓ Doubt the validity of the information received</li> </ul>	
S5	K3	<ul style="list-style-type: none"> <li>✓ experiencing cognitive conflict because they know that the information presented</li> </ul>	
S6	K3	<ul style="list-style-type: none"> <li>✓ is not in the form of quantitative data</li> <li>✓ Doubt the validity of the information received</li> </ul>	

### 3.3. Information Decision Making Stage

At this stage, the students reflect by checking again (re-read the clarity of the source of the information or the logicalness of the information) then the results of the reflection are carried out to eliminate doubts [28] on hoax given and then decides to determine that the information

provided is valid information or hoax. Decisions made by skeptical students are based on the results of the reflections that have been done. This indicates that students are skeptical of a hoax involving reflective thinking in decision making as is done by system 2 in dual-process theory [29]. In detail, the selection stage of the six subjects can be seen in Table 3 below.

**Table 3.** Stages Of Skeptic Students Decision Making On Hoax

S	Hoax Type	Activity	Process
S1	K1	✓ Re-check by reading and pay attention to whether there is a clear source of the information received ✓ Decided to conclude that the information received was a hoax	Until the conditions of equilibration
S2	K2	✓ Re-check by reading and recalculate the number of all exposed persons in each sub-district within the district and compared with the total number exposed in one district as stated in the information. ✓ Decided to conclude that the information received was a hoax	
S3	K2		
S4	K2		
S5	K3	✓ Decided to conclude that the information received was a hoax	
S6	K3		

Based on the results of this study also shows that there are 3 characteristics of students who are skeptical of hoax, namely 1) skeptical informants occur if the information received does not come from informants who are considered reliable; 2) skeptical content occurs if there is information that is considered logical/not by the existing scheme, and 3) skeptical form of data occurs if the information received is not in the form of quantitative data.

**3.4. Skeptical informants**

Subjects who have the characteristics of a skeptical informant are S1. After receiving information (PB), S1 performs the information absorption stage (PI) through two processes, namely assimilation and accommodation. Assimilation is carried out on the data contained in the information received (D), while accommodation occurs when S1 sees that no source is considered reliable on the information (LS). This contradicts the initial scheme owned by S1 that information is said to be valid if the information comes from a trusted source (IH). Furthermore, at the selection stage (S), S1 tries to pay more attention thoroughly to the sources listed in the information obtained (SS) but still does not find it so that S1 begins to doubt the validity of the information (R).

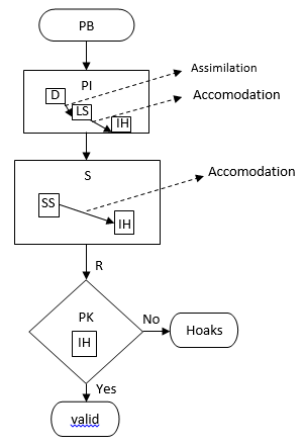
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Furthermore, at the selection stage (S), S1 tries to pay more attention thoroughly to the sources listed in the

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**Chart 1.** Thinking Process of Skeptical Informant Students

**3.6. Skeptical Content**

Subjects who have the characteristics of a skeptical informant are S2, S3, and S4. After receiving information (PB), the subject takes the information absorption stage (PI) through the assimilation process, which is receiving the information provided ( $D_1$ ), reading and absorbing information about the names of areas affected by Covid ( $D_2$ ), reading absorbing information about the data on the number of people affected by Covid in that area ( $D_3$ ), and see the data display ( $D_4$ ). At this stage, students also remember that valid information is logical information (IL). Furthermore, at the selection stage (S), the subject pays attention to the logic of the information by linking all the data listed (LI). This resulted in a cognitive conflict (CC) after learning that two pieces of information did not make sense, namely the total number of people exposed to Covid in one district was not the same as the sum of all exposed people in each sub-district in the district.

Then doubts arise about the validity of the information received (R). At the decision-making stage (PK), the subject checks again by reading and recalculating the number of all exposed people in each sub-district in the district and compared with the total number exposed in one district as stated in the information. Furthermore, the Subject decided to state that this information was a hoax.

3.7. *Skeptical Content*

Subjects who have the characteristics of a skeptical informant are S2, S3, and S4. After receiving information (PB), the subject takes the information absorption stage (PI) through the assimilation process, which is receiving the information provided ( $D_1$ ), reading and absorbing information about the names of areas affected by Covid ( $D_2$ ), reading absorbing information about the data on the number of people affected by Covid in that area ( $D_3$ ), and see the data display ( $D_4$ ). At this stage, students also remember that valid information is logical information (IL). Furthermore, at the selection stage (S), the subject pays attention to the logic of the information by linking all the data listed (LI). This resulted in a cognitive conflict (CC) after learning that two pieces of information did not make sense, namely the total number of people exposed to Covid in one district was not the same as the sum of all exposed people in each sub-district in the district.

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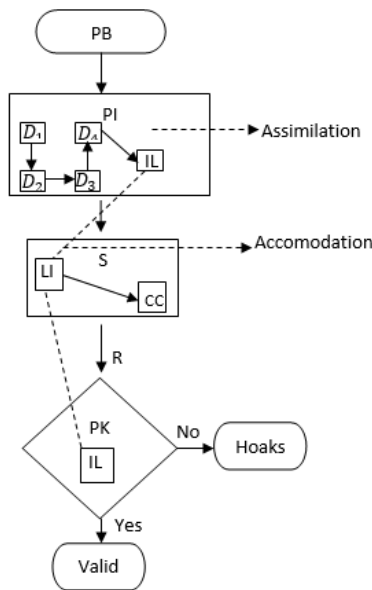


Chart 2. Students Thinking Process of Skeptical Content

3.8. *Skeptical Form of Data*

Subjects that have the characteristics of the skeptical form of data are S5 and S6. After receiving information (PB), the subject undertakes the information absorption (PI) stage through the accommodation process, namely paying attention to the form of data (quantitative or qualitative) (BD) and remembering that valid data is quantitative data (SK). Furthermore, at the selection stage (S), the subject experienced a cognitive conflict (CC) knowing that the information presented was not in the form of quantitative data. This result in the subject

doubting the validity of the information received at the decision-making stage (PK), the subject decided to state that this information was a hoax.

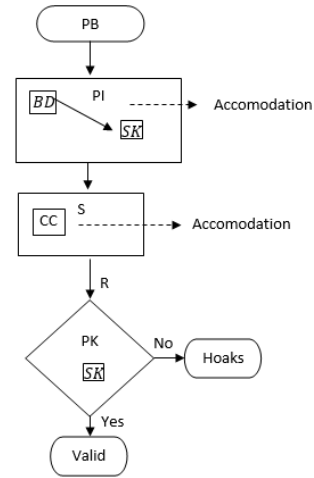


Chart 3. Students Skeptical Thinking Process Form of Data

4. CONCLUSION AND SUGGESTION

The thinking process of skeptical students on hoax goes through several stages, namely 1) information absorption, students receive the information provided and recall their schemes related to the information received; 2) selection, students make adjustments between new information and the scheme that has been called; and 3) decision making on information, students decide to accept or reject the new information that has been given.

In this study, there were 3 characteristics of skeptical students on the hoax, namely 1) skeptical informants occur if the information received does not come from informants who are considered reliable; 2) skeptical content occurs if there is information that is considered logical/not by the existing scheme, and 3) skeptical form of data occurs if the information received is not in the form of quantitative data

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REFERENCES

[1] Aliasari, "Pengaruh Pemahaman Keagamaan dan Literasi Media terhadap Penyebaran Hoax di Kalangan Mahasiswa," J. Komun. Islam dan Kehumasan, vol. 1, no. 2, pp. 126–147, 2017.  
 [2] C. Silverman, "Lies, Damn Lies, and Viral Content," Tow Cent. Digit. Journal., 2016.  
 [3] H. Allcott and M. Gentzkow, "Social Media and Fake News in the 2016 Election," J. Econ. Perspect., vol. 31, no. 2, pp. 211–236, 2017.

- [4] R. Arif, "Internet As a Hope or a Hoax for Emerging Democracies : Revisiting the Concept of Citizenship in The Digital Age," *Soc. Behav. Sci.*, vol. 236, 2016, doi: 10.1016/j.sbspro.2016.12.002.
- [5] V. Juliswara, "Mengembangkan Model Literasi Media yang Berkebhinnekaan dalam Menganalisis Informasi Berita Palsu (Hoax) di Media Sosial," *J. Pemikir. Sociol.*, vol. 4, no. 2, pp. 142–164, 2017.
- [6] A. R. As'ari, A. Mahmudi, and E. Nurlaelah, "Our Prospective Mathematics Teachers Are Not Critical Thinkers Yet," *J. Math. Educ. Math. Educ.*, vol. 8 (2), pp. 145–156, 2017, doi: 10.22342/jme.8.2.3961.145-156.
- [7] K. Park and H. Rim, "Social Media Hoaxes, Political Ideology, and The Role of Issue Confidence," *Telemat. Informatics*, no. November, 2018, doi: 10.1016/j.tele.2018.11.001.
- [8] J. Pryor, "The Skeptic and the Dogmatist," *Nous*, vol. 34, no. 4, pp. 517–549, 2000, doi: 10.1111/0029-4624.00277.
- [9] J. Keim Campbell, M. O'Rourke, and H. S. Silverstein, *Knowledge and Skepticism*. United States of America: MIT Press, 2010.
- [10] A. M. Superson, *The Moral Skeptic*, vol. 53, no. 9. New York: Oxford University Press, 2009.
- [11] L. Ishwara, *Catatan-catatan jurnalisisme Dasar*, vol. 20, no. 5. Jakarta: PT Kompas Media Nusantara, 2011, 2007.
- [12] P. B. Nugroho, T. Nusantara, A. Rahman As, Sisworo, E. Hidayanto, and Susiswo, "Critical Thinking Disposition: Students Skeptic in Dealing with Ill-Logical Mathematics Problem," *Int. J. Instr.*, vol. 11, no. 3, pp. 635–648, 2018, doi: 10.12973/iji.2018.11343a.
- [13] H. Sankey, "Scepticism, Relativism and The Argument from The Criterion," *Stud. Hist. Philos. Sci. Part A*, vol. 43, no. 1, pp. 182–190, 2012, doi: 10.1016/j.shpsa.2011.12.026.
- [14] H. Erel, A. Zivony, and D. A. Levy, "Cognitive Processes in Aging Effects on Attentional Alerting," *Neurobiol. Aging*, 2020, doi: 10.1016/j.neurobiolaging.2020.03.022.
- [15] M. . Posner and S. . Peterson, "The Attention Systems of The Human Brain," *Ann Rev Neurosci*, vol. 13, 1990, doi: <https://doi.org/10.1146/annurev.ne.13.030190.000325>.
- [16] W. Sturm and K. Willmes, "On The Functional Neuroanatomy of Intrinsic and Phasic Alertness," *Neuroimage*, vol. 14, 2001.
- [17] E. Goodheart, *The Skeptic Disposition: Deconstruction, Theology, and Other Matters*. Princeton University Press, 1984.
- [18] M. Ikram, *Karakterisasi Penalaran Reversibel Mahasiswa dalam Menyelesaikan Masalah Sketsa Grafik yang Melibatkan Turunan*. (Disertasi). Universitas Negeri Malang, 2020.
- [19] E. Dubinsky, "Reflective Abstraction in Advanced Mathematical Thinking," *Adv. Math. Think.*, pp. 95–126, 2002, doi: 10.1007/0-306-47203-1\_7.
- [20] D. O. Tall, "Developing a Theory of Mathematical Growth," *ZDM - Int. J. Math. Educ.*, vol. 39, no. 1–2, pp. 145–154, 2007, doi: 10.1007/s11858-006-0010-3.
- [21] T. H. Cadez and V. M. Kolar, *Comparison of Types of Generalizations and Problem-Solving Schemas Used to Solve a Mathematical Problem*, vol. 89, no. 2. 2015.
- [22] S. Azwar, *Metode Penelitian*. Yogyakarta: Pustaka Pelajar, 2010.
- [23] J. R. Fraenkel, N. E. Wallen, and H. H. Hyun, *How to Design and Evaluate Research in Education (Vol. 7)*. New York: McGraw-Hill, 2012.
- [24] M. B. Miles, A. M. Huberman, and J. Saldana, *Qualitative Data Analysis: A Method Sourcebook*. California: Sage Publications, 2014.
- [25] J. Creswell, "Riset Pendidikan: Perencanaan, pelaksanaan, dan Evaluasi, Riset Kualitatif dan Kuantitatif. Alih Bahasa." *Pustaka Pelajar*, Yogyakarta, 2015.
- [26] M. A. McGowen and D. O. Tall, "Flexible Thinking and Met-Befores: Impact on Learning Mathematics," *J. Math. Behav.*, vol. 32, no. 3, pp. 527–537, 2013, doi: 10.1016/j.jmathb.2013.06.004.
- [27] G. Lee, J. Kwon, S. Park, J. Kim, H. Kwon, and H. Park, "Development of an Instrument for Measuring Cognitive Conflict in Secondary-Level Science Classes," *J. Res. Sci. Teach.*, vol. 40, no. 6, pp. 585–603, 2003, doi: 10.1002/tea.10099.
- [28] A. Helberg, M. Poznahovska, S. Ishizaki, D. Kaufer, N. Werner, and D. Wetzel, "Teaching Textual Awareness with DocuScope: Using Corpus-Driven Tools and Reflection to Support Students' Written Decision-Making," *Assess. Writ.*, vol. 38, no. May, pp. 40–45, 2018, doi: 10.1016/j.asw.2018.06.003.
- [29] J. Spadaccini and J. E. Esteves, "Intuition, Analysis, and Reflection: An Experimental Study into The Decision-Making Processes and Thinking Dispositions of Osteopathy Students," *Int. J. Osteopath. Med.*, vol. 17, no. 4, pp. 263–271, 2014, doi: 10.1016/j.ijosm.2014.04.004.