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THE INFLUENCE OF EPISTEMIC BELIEFS ON MASTER'S STUDENTS' CRITICAL THINKING IN ACADEMIC READING

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Abstract: The understanding of how an individual perceives knowledge and knowing is called epistemic beliefs. Moreover, Epistemic beliefs are also closely related to critical thinking. This study investigates the effects of epistemic beliefs on critical thinking, specifically in reading. There are two research questions formulated in this study which are: (1) What are the master's students' epistemic beliefs level in reading? and (2) How do epistemic beliefs affect their critical thinking in reading? The participants of the study consisted of 12 graduate students from a private university in Yogyakarta. Descriptive quantitative and descriptive analysis were employed. The data were collected using a close-ended questionnaire and open-ended questions. The Justification for Knowing Questionnaire (JFK-Q) from Ferguson et al. (2013) was adapted for this study. Open-ended questions functioned as the follow-up of the questionnaire. The result showed that the graduate students' epistemic beliefs were classified as sophisticated. The possessed beliefs helped to activate, hone, and improve the student's critical thinking in reading.

Keywords: *epistemic beliefs, critical reading, master's students*

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INTRODUCTION

Learning requires a lot of knowledge input. Understanding new concepts and completing prior knowledge are crucial things that happen in the learning process. Zua, (2017) states that "Reading is a very important activity in the life of any literate person who wants to keep abreast of events and ideas outside his or her immediate environment." (p. 128). It is depicted that a way to enrich knowledge is by reading. Reading enables students to be exposed to the authors' thoughts. Thus, new theories, notions, and concepts could be acquired. Rintaningrum (2009, 2019) also emphasizes that it is crucial for students to master reading skills due to the role of reading as a base for students to learn subjects from various sciences. Therefore, learning through reading is a critical part of the educational field.

The sophisticated knowledge that graduate students need to understand requires them to be able to comprehend reading texts well as one of the important literacy skills

(Harmoko, 2021). That is also the reason why reading should not only be done to gain surface understanding. Students should employ critical thinking skills to enhance their comprehension and acquire a deeper understanding. Critical thinking gives students the ability to be active learners and to be able to internalize their understanding based on their characteristics (CIRIK et al., 2015). Reading is not only about recognizing the words in the texts, but when it comes to critical reading it is also about becoming an active reader. As stated by Din (2020), "Critical reading means reacting critically to what is being read." (p. 2) Din further explained that critical reading encompasses the discovery of a connection between the content and the values, attitudes, and standards that an individual brings. However, according to a study that was conducted by (Sultan et al., 2017) the critical reading awareness of graduate students is classified as low. Despite the importance of understanding the deeper meaning of a text, students are prone to find only the meaning of a text textually instead of ideologically. Promoting critical reading in the master's classes is a way to help them go deeper to comprehend the reading.

Afflerbach et al., (2013) note the things incorporated in reading development. Those are metacognition, engagement and motivation, self-efficacy, and epistemic beliefs. However, the focus of this study is critical reading. Afflerbach et al. explain that the strategies used in critical reading are bound with epistemic beliefs. It is "the individual's theory of knowledge and knowing." (p. 444.) It is also stated by Hofer and Pintrich (2012) that epistemic beliefs, from the psychology and education point of view, are concerned with the way one makes use of the knowledge and knowing conception to construct an understanding of the world. The concept of knowledge and knowing encompasses how knowledge is defined, constructed, and evaluated. It also includes where knowledge resides and the way knowing happens. Some previous studies conducted by Hofer and Pintrich (2012), Afflerbach et al. (2013), and Ferguson et al., (2013) focus on the knowledge related to the source of the reading. The belief in the truthfulness and accuracy of the reading, the belief about the author's expertise in explaining the ideas, the importance of understanding the content, and how readers understand the content are the points of reading connected to epistemic beliefs. It depicts that the students' epistemic beliefs promote a deeper understanding of the reading. As shown by Lee & Chan (2015) "the students with less sophisticated epistemic beliefs tended to adopt a surface approach." (p. 609)

The investigation of epistemic beliefs has been conducted by researchers Conley et al. (2004); Greene et al. (2010). They investigated the changes in students' epistemological beliefs, and the relation between epistemic beliefs and self-regulation; identified and examined college students' epistemic beliefs, and conducted a study about epistemic belief, epistemic emotions, and complex learning. Related to reading, Ferguson et al., (2013) investigated the connection between epistemic beliefs and multiple documents reading comprehension. In the Indonesian context, Rahmiati et al. (2019) conducted studies about epistemic beliefs and writing, and Emaliana (2017) investigated the relationship between epistemic beliefs and English language proficiency. Aditomo (2018) conducted a correlational study between epistemic beliefs

and students' academic performance. However, studies about the effect of epistemic beliefs on academic reading in Indonesia are still very few. Therefore, this study is conducted as an addition to epistemic beliefs studies in the Indonesian context.

This current study aims to investigate the influence of epistemic beliefs on graduate students' critical thinking in reading. The students' beliefs of knowledge and knowing related to reading would be examined, and the way epistemic beliefs affect their critical thinking in reading would be investigated. Therefore, two research questions would be answered in the study:

- 1) What are the master's students' epistemic beliefs level in reading?
- 2) How do epistemic beliefs affect their critical thinking in reading?

LITERATURE REVIEW

The topic of the current study, which is related to critical reading and epistemic beliefs, has been investigated in previous studies. The previous studies contribute as the foundation in answering the formulated questions in this study. Some studies have been mentioned in the introduction part. Further reviews would be elaborated including critical reading, epistemic beliefs, and the relation between epistemic beliefs and critical reading.

Critical Reading

One of the reading types that require great comprehension skills is critical reading (Zua, 2017). It is said that thinking and reasoning should be employed by readers to understand the writers' perspectives and discover new perspectives. While Zua studied the concept related to the aspects that make reading critical, Gorzycki et al. (2019) investigated master's students' beliefs and practices toward academic reading. Students showed their positivity against reading and emphasized critical thinking skills are needed in reading. Thus, clearer critical thinking instructions and the promotion of critical thinking in reading are necessary for the reading class. In the Iranian context, Aghajani and Gholamrezapour (2019) point out that improving critical thinking skills enhances students' critical reading levels. However, there is no significant relationship between critical reading skills and students' language reading anxiety. Baki (2020) found that critical reading skills are in line with the creative reading evaluation process. Research related to critical reading skills emphasizes its critical role in students reading comprehension and achievement.

Epistemic Beliefs

Epistemic belief is associated with cognitive constructs, academic performance, and study approaches (Lee & Chan, 2015). The result depicts the significant correlation between epistemic beliefs and approaches to learning. They also point out that students who have less-sophisticated epistemic beliefs are most likely to employ a surface approach. Greene et al. (2010) note that the activation and deactivation of various epistemic beliefs are affected by self-regulation. Conley et al. (2004) found that students who believe in the uncertainty of knowledge possess more sophisticated establishments. They believe that knowledge is continuously changing. Conley et al. utilize the two focus points of epistemic beliefs proposed by Hofer and Pintrich (1997) to identify the

students' epistemic beliefs. Those are the nature of knowledge and the nature of knowing. The nature of knowledge has to do with how certain and how complex knowledge is, whilst the nature of knowing is about the justification and source of the knowledge. In the Indonesian context, Aditomo (2018) discovered that epistemic beliefs and academic performance have various levels of correlation depending on the nature of the discipline. He also suggested that in improving learning and achievement, the trait of knowledge and knowing play a critical role. Rahmiati et al. (2019) conducted a study about epistemic beliefs and writing. The result showed that epistemic beliefs and writing strategies contribute to students' writing achievement. Emaliana (2017) inferred that students with sophisticated epistemic beliefs would have better English proficiency. From the variety of discussions, it could be seen that studies of epistemic beliefs cover a vast range of topics in education.

Epistemic Beliefs and Critical Reading

Narrowing the range, one of the discussions in the educational field related to epistemic beliefs is critical reading. Afflerbach et al. (2013) explain that epistemic beliefs are associated with the increasing opportunity to utilize critical reading strategies. It includes the text's accuracy, judgment, and the writers' bias and reliability. Teachers could trigger students' critical thinking by asking them to evaluate, judge the content, and question the author's reliability. Ferguson et al. (2013) investigated the changes in epistemic beliefs concerning the student's critical reading of contradictory texts. It is concluded that students who read multiple-dimensional texts develop more trust toward multiple sources and greater beliefs in the knowledge of nature that is unfixed and complicated. Understanding knowledge and knowing are parts of critical thinking that also took part in critical reading.

METHOD

The study was conducted by employing quantitative and qualitative methods. 12 Students from the English Education Master's Program (EEMP) of Sanata Dharma University were the participants in this study. The students from the master's program were chosen due to their familiarity with reading academic materials. They were required to write journals, thus reading many academic resources was needed to get a better understanding of what they were writing. Therefore, they should implement critical thinking in reading. For the instruments of the study, a close-ended questionnaire with the addition of open-ended questions was employed. A questionnaire was deployed due to its ability to provide straightforward and structured quantitative data for researchers to analyze (Cohen et al., 2018). In addition, Cohen et al. (2018) also explained that "Open-ended responses might contain the 'gems' of information that otherwise might not be caught in the questionnaire." (p. 275). Therefore, both close-ended and open-ended questions were included in the questionnaire to help the researcher understand the participants' points of view better.

The employed questionnaire was adapted from Ferguson et al. (2013) which is called the Justification for Knowing Questionnaire (JFK-Q). It included the students' authority justification, personal justification, and multiple sources justification related to

reading. The items in the questionnaire were adjusted to suit the study. A scale of ten points agreement level from completely disagree and completely agree was implemented, and to test the questionnaire's reliability, Cronbach's alpha reliability test was run. After the close-ended questionnaire, the open-ended responses were analyzed. The important points were drawn from the responses and summarized. Thus, inferences could be drawn from the data.

RESULTS AND DISCUSSION

In this part, the results of the gathered data would be presented. The discussed data encompassed the questionnaire and the result of the open-ended questions. The discussion attempted to discover the master's students' epistemic beliefs levels, and the way epistemic beliefs could affect their critical thinking in reading academic texts.

Questionnaire Analysis

In answering the first research question which is "What are the master's students' epistemic beliefs level in reading?", the researchers employed the Justification for Knowing Questionnaire (JFK-Q). The questionnaire yielded various responses from the participants. The responses were summarized in the form of a table and a chart as displayed in Table 1. and Figure 1. The aspects that were analyzed included the percentages and the mean. Using the Cronbach Alpha reliability test, the questionnaire was categorized as reliable with the α value of 0.86.

Table 1. Students' epistemic beliefs level

No.	Statement	Strongly disagree				Strongly agree	Mean
		SD	D	N	A	SA	
S1	If the author states a statement as correct, you do not immediately believe the statement's reliability.	-	2	2	6	2	3.6
		-	16.7%	16.7%	50%	16.7%	
S2	I don't simply believe that everything in the reading material is correct.	-	-	4	7	1	3.75
		-	-	33.3%	58.3%	8.3%	
S3	I believe in a reading that contains concrete reasoning and evidence.	-	-	2	6	4	4.16
		-	-	16.7%	50%	33.3%	
S4	In discussing a reading material, what is believed to be a fact could be different. It depends on one's personal views.	-	2	-	6	3	3.9
		-	16.7%	-	50%	25%	
S5	Readers could have different opinions about reading because there is no such thing as correct answers.	-	-	2	5	5	4.25
		-	-	16.7%	41.7%	41.7%	
S6	Knowledge of reading material is also influenced by the author's personal opinion. It is not simply a fact.	-	-	-	4	8	4.6
		-	-	-	33.3%	66.7%	
S7	To trust the ideas contained in a reading, I have to check various knowledge sources.	-	-	-	6	6	4.5
		-	-	-	50%	50%	

S8	To detect incorrect claims in the text, checking several information sources is important.	-	-	1	5	6	4.4
		-	-	8.3%	41.7%	50%	
S9	I cannot be completely sure about an idea in reading material. I have to check it with at least one other source.	-	1	-	10	1	3.9
		-	8.3%	-	83.3%	8.3%	
S10	To decide whether something I read is correct, I have to check whether it is in accordance with other things I have read or heard.	-	-	-	9	3	4.25
		-	-	-	75%	25%	
S11	Just one source is never enough to decide what is right.	-	-	1	6	5	4.3
		-	-	8.3%	50%	41.7%	

In deciding the epistemic beliefs level, there were two groups of levels namely simple epistemic beliefs and sophisticated epistemic beliefs. The category was indicated using the mean. The epistemic beliefs are considered simple when the mean ($\bar{x}$) is in the range of $1.00 \leq \bar{x} \leq 3.00$. On the other hand, the mean that indicated sophisticated epistemic beliefs were in the range of $3.1 \leq \bar{x} \leq 5.00$.

The responses displayed in Table 1. showed that the mean values of each statement surpassed the minimum range of sophisticated epistemic beliefs level. Therefore, students' level of epistemic beliefs was categorized as sophisticated. The data summary from Chart 1. also showed that most of the students gave a positive response toward the statements in the questionnaire.

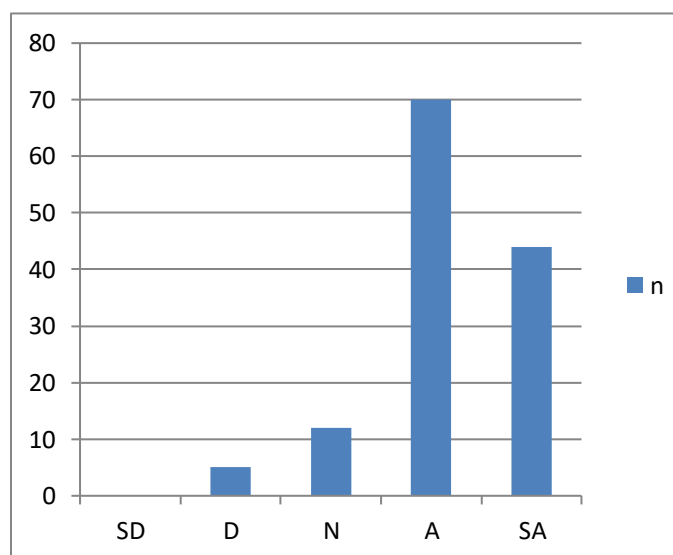


Figure 1. Students' Level of Agreement

The students' responses on statement 6 yielded the highest mean score. The students agreed that the knowledge contained in a reading could be biased according to the author's personal opinion. Being aware of the uncertainty of a knowledge source is an indication of complicated or sophisticated epistemic beliefs (Chan et al., 2011). Two

other statements (S7 and S10) also showed complete agreement from the students. As displayed in the statements' response, comparing and contrasting various academic reading sources were claimed to be done by the students. It depicted the way students seek to understand and make sure about what they were reading. It is supported by Griffin et al. (2012) who stated that students with complicated epistemic beliefs "may view a multiple-document inquiry task as an exercise in corroboration, seeking coherence, and looking for evidence to support claims."

The positive responses from statements displayed the students' awareness that multiple points of view deepen students' understanding of the information and the truthfulness of an academic reading text. It is because unlike students with simple or less sophisticated epistemic beliefs, students whose epistemic beliefs level was categorized as sophisticated do not only focus on the "right" or "wrong" answer (Griffin et al., 2012). The neutral option was provided for the students who neither agree nor disagree with the statements. More elaboration regarding the neutral option would be discussed in the next section. Related to the negative response, it could be seen from the chart that no student chose the "strongly disagree" option, and from the table, there were only three statements that were disagreed by 16.7% (S1), 16.7%(S4), and 8.3%(S5) of the students. The positive responses dominating the collected data indicated the overall level of the students' epistemic beliefs which was more constructivist. The result is in line with the finding from Gorzycki et al. (2019) that students with that level of beliefs do not perceive academic reading as simple understanding and completion of a teacher's task but are more likely to see it as a chance to shape novel knowledge.

Open-Ended Questions Analysis

The "neutral" option from the questionnaire was followed up by an open-ended question directed to the students. They were asked about the rationale underlying that decision. It turned out that the neutral response was because more aspects needed to be added for the students to be considered. One of the aspects is related to the author's statements and quotation from other academic reading resources as displayed in the following excerpt from respondent 8 (R8):

"It is because I have to see who the writer is and how many times researchers use it as the reference." (R8)

The frequency of the author's statement being cited in other resources was stated to be needed to decide the level of agreement for statement 2 in the questionnaire ("I don't simply believe that everything in the reading material is correct.").

Other responses gave different answers which mentioned that sufficient supporting theories in the same academic reading text were the aspect of the consideration. It is as quoted from the response:

"In my opinion, if the writer can support the writers' theories, I will immediately believe the statement. However, If the writer only reports his or her opinion without providing any theories, I will use other sources to find valid information or statements." (R12)

The neutral response also depicted knowledge uncertainty and truth-seeking. Hence, sophisticated epistemic beliefs indication also showed in the response. As supported by Aditomo (2018) different from naïve or simple epistemic beliefs, sophisticated epistemic beliefs are portrayed as ones that do not perceive knowledge as “unchanging and purely objective”.

In attempting to answer the second research question which is “How do epistemic beliefs affect their critical thinking in reading?”, open-ended questions were used. As the follow-up from the questionnaire, the result of the open-ended questions was in accordance with the questionnaire result. Both instruments revealed the importance of perceiving knowledge as a complex matter that led to seeking deeper understanding and critical thinking in academic reading. As mentioned by one of the respondents, having sophisticated epistemic beliefs helped readers to sort the content of the reading critically. It could be seen in the following excerpt:

“When I find facts or information from reading material, I always consider the writer's bias. This means that even though the information presented is supported by empirical evidence. But the writer's perspective in interpreting and presenting the information should be taken into consideration. Through this, I can critically filter the information by comparing and contrasting the information with other sources. I suppose, the belief that “not everything written in the book is absolutely correct” helps me to evaluate the accuracy and truthfulness of statements, claims, and information that I find in the reading materials.” (R4)

It was also mentioned that the understanding of the knowledge uncertainty urged readers to evaluate the content of the reading text in detail. The epistemic belief level possessed by the students motivated the students to think more critically in the form of filtering and evaluating. Accordingly, Anuar and Sidhu (2017, p. 22) noted that “Academic reading involves questioning and evaluating texts in particular statements and claims put forward by authors alongside identifying the strengths or weaknesses of the arguments.” (164).

The majority of the respondents also mentioned the sophisticated knowledge contained in the reading that made them compare and contrast various reading materials to help readers to gain new background knowledge. It is quoted from respondent 11.

“In my opinion, our beliefs change when we previously have background knowledge. Even if we do not have that knowledge, we can find another reading related to the topic. Along the way, we can raise questions when we have a lot of background knowledge. That is why some people, in my opinion, can become critical thinkers when they read so many sources.” (R11)

Comparing one reading after another helps to add new knowledge and thus activates background knowledge for the next reading. It is supported by O'Reilly et al. (2019) argument that “When a reader knows more about a topic, reading texts on the topic would result in more activation of related knowledge” (p.1) Hence, Epistemic beliefs boost critical thought when readers read academic materials.

Overall, from the response to the open-ended question, there are some points that could be inferred from the collected data. The epistemic beliefs possessed by the students helped to enhance, sharpen, and improve critical thinking in reading academic texts. The responses also revealed that the focus on the reading surpassed the surface-level understanding. However, understanding the uncertainty of knowledge, comprehensive reading was more emphasized. It included comparing readings, checking the truthfulness, sorting the content, triggering curiosity, and filling the content gap.

CONCLUSION

Measuring the epistemic beliefs level of the students and investigating the way their epistemic beliefs affect their critical thinking in academic reading is the purpose of this study. Most students responded to the questionnaire positively. It depicted the sophisticated epistemic beliefs that graduate students possessed. The beliefs took roles in the students' way of understanding academic reading. It activated their critical thinking before, while, and after reading. They activated their prior knowledge, questioning the truthfulness of the materials, comparing sources, and comprehending the academic reading materials.

Due to some reasons, this study contains limitations. More in-depth results could be gained with more participants. Interview or focus group discussions could enrich the investigation and widen the possibilities of discovering new findings. Future researchers could also conduct investigations of different levels of students. Therefore, adjustments and improvements could be made.

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