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QUESTION AS A REFLECTION OF STUDENTS' THINKING SKILL IN INDONESIAN LANGUAGE EDUCATION LECTURES WITH THE ASSISTANCE OF AI-BASED APPLICATION

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A R T I C L E I N F O

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A B S T R A C T

The problem formulations that will be studied include: (a) the form of questions based on the question words used, (b) the variety of questions based on the number of components, and (c) the level of thinking reflected in student questions. This study uses a qualitative descriptive approach. The study was conducted at the Indonesian Language Education (PBI) lecture at the State University of Malang. The subjects of the study were students who took PBI lectures and used AI-based applications in the learning process. The results of this study indicate that students use question forms using the question words what, why, how, when, why, and the clitic -kah. In addition, a variety of student questions were also found based on the number of components, namely one, two, three, and four components. Third, a variety of levels of thinking contained in student questions were found, there are four levels, namely understanding, analyzing, evaluating, and creating.

INTRODUCTION

Thinking skills, especially critical thinking, are one of the most important skills in education, especially in the era of the Industrial Revolution 4.0 and digital transformation. This ability can be reflected through the questioning process, where the questions asked reflect the level of understanding, analysis, and evaluation of stu-

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dents towards a material. Paul and Elder (2006) stated that questions are the core of the critical thinking process because each question encourages someone to explore, analyze, and compile answers based on logical arguments. In other words, the quality of questions can be an indicator of a person's level of thinking. In the context of Indonesian language education, students' questioning skills are often part of an integrated learning process. This ability not only includes the form of questions based on question words but also their variety and complexity. For example, questions such as "What is the purpose of using the style of language in this poem?" are different from "How can a particular style of language influence the reader's perception of the theme of the poem?" The first question is simple and factual, while the second question requires more in-depth analysis. In Bloom's taxonomy updated by Anderson (2009), the levels of thinking reflected in questions can be classified into low-level thinking and high-level thinking, which include analyzing, evaluating, and creating.

The development of artificial intelligence (AI)--based technology offers great potential in supporting the improvement of the quality of student questions. AI-based applications, such as chatbots or learning assistants, allow students to ask questions and receive relevant and structured responses. According to research by Zawacki-Richter et al. (2019), the integration of AI technology in education can increase student engagement and support personalization of learning. In this case, AI can act as a facilitator, which not only provides answers but also helps students formulate more complex and in-depth questions.

Earlier research related to the use of technology in learning has shown positive results. For example, research by Hindra Kurniawan et al. (2024) revealed that the use of AI-based platforms in language learning improves students' critical thinking skills by up to 45% compared to conventional methods. However, research on the influence of AI-based technology on the quality of student questions in Indonesian language education lectures is still relatively minimal.

Based on this background, this study aims to analyze students' questions as a reflection of their thinking ability with the help of an AI-based application. The formulation of the problems to be studied includes (a) the form of questions based on the question words used, (b) the variety of questions based on the number of components, and (c) the level of thinking reflected in students' questions. This study is expected to provide theoretical and practical contributions in efforts to improve the

quality of learning, especially in the context of technology-based Indonesian language education.

METHOD

This study uses a qualitative descriptive approach. This approach was chosen because it follows the objectives of the study to describe and analyze the phenomena that occur, namely the form, variety, and level of thinking reflected in student questions. In line with Moleong's opinion (1989), qualitative research aims to understand social phenomena by exploring data in depth based on a certain context.

The study was conducted at the Indonesian Language Education (PBI) lecture at the State University of Malang. The subjects of the study were students who took PBI lectures and used AI-based applications in the learning process. The data in this study were in the form of question sentences submitted by students to AI-based consultation applications, namely ChatGPT, Gemini, and Perplexity. There are two data collection techniques and instruments used in this study. First, the assignment technique of creating questions based on a selected topic. The tools used are command sentences and instructions for creating question sentences. Second, the document study technique uses document study guidelines produced by students.

Data analysis was carried out thematically using the Miles and Huberman (2020) approach which includes the stages of data reduction, data presentation, and conclusion. The classification of questions is carried out as follows. Question word form refers to the basic theory of classifying question words, such as what, who, when, where, why, and how (Keraf, 1980). Types of questions based on the number of components: reviewed through the grammatical structure of the question. Level of thinking: determined using Bloom's taxonomy revised by Anderson (2009) which includes low-level to high-level thinking categories.

RESULT AND DISCUSSIONS

This research consists of three parts, namely (a) the form of questions based on the question words used, (b) the variety of questions based on the number of components, and (c) the level of thinking reflected in students' questions.

The Form of Questions Based on Question Words Used

The form of questions based on the question words used by students is

described as follows.

Question Form with the Word "What"

The following is data on student question sentences that use the question word "what".

(1) What is the reason that Kancil are considered naughty?

(2) What is the definition of "cure" in the context of medicine?

(3) Is rice a primary food requirement in Indonesia?

(4) What is meant by education?

(5) What are the alternatives to chemical fertilizers?

In data (1), the question explores the reasons why Kancil are considered naughty by using the word "what". This question attempts to identify specific reasons for the character of mouse deer, which refers to the understanding of folklore. Although using the question word "what", this question begins to enter a higher level of thinking because it encourages analysis of the behavior of Kancil in the story.

In data (2) the question explores the definition of the word "cure" in the context of medicine by using the word "what. This question seeks clarification of terminological meaning. In this case, students try to understand the concept of "cure" in a specific context. This kind of question is important in education, especially to build an initial understanding of a term or concept (Keraf, 1980).

In data (3) the question explores the position of rice as a primary food requirement in Indonesia by using the word "what. In this question, students seek confirmation of known facts or try to deepen their understanding of the topic. Although simple, this question can be a gateway for more analytical discussions, for example by connecting rice consumption data with the socio-economic context in Indonesia.

In data (4) the question explores the nature of education by using the word "what. This question is definitional, which shows the initial process of understanding the concept of education. In data (5) the question explores alternatives to chemical fertilizers by using the word "what. This question shows an exploration of practical solutions related to agricultural issues. By using the word "what", students explore more information than just looking for one specific answer.

Based on the data presented, student questions that use the question word "what" have certain characteristics in the context of the form and purpose of

communication. The question word "what" is generally used to obtain factual information or definitions about something (Keraf, 1980). According to Paul and Elder (2006), the quality of questions is a direct reflection of a person's thinking process. Questions with the question word "what" tend to be used to obtain factual information or clarification but have the potential to be developed to a higher level of thinking if directed at cause-and-effect analysis or solution exploration. In this context, AI-based applications used in learning can play a role in improving the quality of students' questions. AI allows students to expand the scope of information and get feedback that helps them develop more complex questions (Zawacki-Richter et al., 2019).

Questions based on the question word "what" asked by students reflect initial efforts to understand basic concepts, including those related to local culture. For example, questions such as "What is the reason Kancil is considered naughty?" refer to folklore that has roots in Indonesian culture. In this context, AI has a great opportunity to support information mining by considering local cultural nuances. However, language-based AI, such as ChatGPT, is often trained using global data, which may be less representative of local culture. This can affect the relevance of responses to questions that reflect local traditions, norms, or contexts.

Compared to earlier research, this research has made a significant new contribution. This study specifically analyzes the type of “what”-based questions and their potential to develop into higher-order questions, which have rarely been the focus of earlier research. This study shows how AI can be optimized to support the exploration of local cultures in education, despite the limitations of global-based datasets that underrepresent local traditions. This study shows how a simple question such as “What is the definition of healing?” can be a vehicle for exploring issues across disciplines, such as medicine, psychology, and social sciences.

Question Forms with the Word “Why”

The following presents data on student question sentences that use the question word “why”.

(1) Why does Indonesia still depend on chemical fertilizers in the agricultural sector?

(2) Why is education considered important in a person's life?

(3) Why do Indonesian people need rice?

In data (1), the question explores the reasons for Indonesia's dependence on chemical fertilizers in the agricultural sector. This question explores the reasons for Indonesia's dependence on chemical fertilizers, which directs students to analyze economic, technological, or policy factors. This type of question indicates critical thinking because students not only accept facts but also look for reasons behind the phenomenon.

In data (2), the question explores the reasons why education is considered important in a person's life. This question is reflective and explores the value or benefits of education. The focus is on the causal relationship between education and human life, thus indicating a more conceptual thinking process.

In data (3), the question explores the reasons why Indonesian people need rice. This question explores the needs of Indonesian people for rice, which are rooted in culture, consumption patterns, or economic dependence. This question can open up cross-disciplinary discussions, such as economics, social, and culture. Based on the data presented, students' questions using the question word "why" reflect an attempt to understand the reasons or causes of a phenomenon. Questions with this question word usually lead to a higher level of thinking than questions with the word "what", because they require analysis and reasoning to answer them (Keraf, 1980).

According to Paul and Elder (2006), the question "why" plays an important role in the development of critical thinking skills, because it encourages individuals to evaluate cause and effect and consider various points of view. In addition, the question "why" also helps hone logical and analytical reasoning skills, which are essential components in advanced learning.

In AI-based application-assisted learning, students' ability to ask "why" questions can be optimized. AI applications can provide additional data or perspectives that support students in exploring the reasons behind a phenomenon (Zawacki-Richter et al., 2019).

These results are consistent with the findings of Yulianti et al. (2021), who found that students' critical thinking skills increased significantly when they were involved in problem-based learning involving causal questions.

Compared to previous relevant research, this study offers a new contribution. Unlike previous studies that tend to discuss questions in general, this study focuses on the type of "why" questions as an indicator of critical and reflective thinking skills.

By showing how AI supports multidisciplinary exploration, this study connects learning technology with critical literacy in higher education.

Question Forms with the Word "How"

The following presents data on student question sentences that use the question word "how".

(1) How to reduce the negative impact of chemical fertilizer use?

(2) How is access to education in Indonesia?

(3) How does Indonesia increase agricultural productivity?

(4) What if sometimes what heals us is not chemical medicine, but positive thoughts and suggestions from ourselves?

(5) How does this story shape views on morality, considering that Kancil often manages to outsmart others without significant long-term consequences?

In data (1), the question explores how to reduce the negative impact of chemical fertilizer use by using the word "how". This question leads to an exploration of solutions to environmental problems. Students demonstrate critical thinking efforts by evaluating impacts and seeking more sustainable alternatives. This question reflects a focus on problem-solving, which is an important element in project-based learning (Hmelo-Silver, 2004).

In data (2), the question explores access to education in Indonesia by using the word "how". This question is analytical, exploring aspects of availability, equity, and barriers to access to education. This reflects the level of thinking that is oriented towards evaluating factors that influence education in Indonesia, following the analytical approach in social studies (Keraf, 1980).

In data (3), the question explores how Indonesia can increase agricultural productivity by using the word "how". Students explore practical strategies to increase agricultural productivity, which involves analyzing supporting factors such as policies, technology, and human resources. This question can be developed towards solution-oriented thinking that combines multidisciplinary perspectives.

In data (4), the question explores the possible main factors that play a role in healing by using the word "how". This question is reflective and philosophical, exploring the psychological and emotional aspects of healing.

In data (5), the question explores the stigma of society towards Kancil because

of their behavior by using the word "how". This question evaluates the impact of the story on the formation of moral values. This reflects the ability to analyze the implications of narratives in cultural and psychological contexts, which follows the concept of critical literacy analysis (Freire, 2000).

Based on the data, students' questions with the question word "how" indicate an effort to explore solutions, mechanisms, or implications of a phenomenon. These questions not only ask for factual information but also encourage students to consider possibilities, strategies, and consequences. In the context of learning, questions like these are important to build students' ability to understand the complexity of problems and formulate relevant solutions. In addition, research by Zawacki-Richter et al. (2019) shows that AI-based technology can improve students' ability to ask more complex questions. AI provides feedback that enriches discussions and supports in-depth exploration of a topic. This is in line with the findings of Yulianti et al. (2021), which show that students with access to technology tend to ask analytical and solution-oriented questions more often.

This study has similarities with the critical literacy study proposed by Freire (2000), which emphasizes the importance of connecting learning to the socio-cultural context. Questions such as "How does society stigmatize Kancil because of his behavior?" reflect an analysis of moral implications in cultural narratives. This research position combines a critical literacy approach with the use of AI technology to explore the cultural dimensions in students' questions, which are rarely discussed in previous studies.

This study also identifies that AI can help students develop multidisciplinary-based questions. For example, questions such as "How is access to education in Indonesia?" or "How can Indonesia increase agricultural productivity?" show the involvement of AI in providing data and perspectives from various disciplines, such as social, economic, and policy.

This study has several unique contributions that distinguish it from previous studies. This study not only discusses the level of thinking but also analyzes the use of the question word "how" from a linguistic perspective, which provides an additional dimension to the understanding of students' questions. This study shows how students combine multidisciplinary perspectives in their questions, especially with the help of AI technology. This study explains how AI technology can be used to support the exploration of moral, cultural, and social dimensions in learning, which

are rarely discussed in previous studies.

Questions with the word "Why"

The following is data on student question sentences that use the question word "why".

1) If for that reason, why doesn't Indonesia try to instill a culture of eating types of carbohydrates other than rice?

2) Why is the clever Kancil called naughty?

In data (1), the question explores the reasons why Indonesia does not try to instill a culture of eating types of carbohydrates other than rice. This question leads to an analysis of food policy and culture in Indonesia. Students not only accept the fact that rice is a staple food but also explore why food diversification has not been successfully implemented. This question reflects critical thinking that questions social, economic, or historical factors that are obstacles.

In data (2) the question explores the reasons why the clever Kancil is called naughty. This question explores the interpretation of morals and values inherent in the folklore about the mouse deer. Students try to analyze how the clever nature of the Kancil can be interpreted as naughty, which shows the ability to think reflectively about norms and culture.

Student questions that use the question word "why" show an in-depth exploration of the causes or reasons behind a phenomenon or decision. In addition, this question can also reflect students' curiosity about critical aspects of a problem, which is the core of inquiry-based learning (Hmelo-Silver, 2004).

According to Paul and Elder (2006), the question "why" encourages deeper learning by focusing on causes and consequences. This is in line with the reflective approach that helps students understand the background, assumptions, and influences behind an event or phenomenon.

In the context of technology-based learning, the question "why" can be optimized through the use of AI-based applications. This technology can provide historical data, alternative perspectives, or in-depth analysis that supports students to explore answers to their questions (Zawacki-Richter et al., 2019).

Question Form with the Word "When"

The following is data on student question sentences that use the question word "when".

When will Indonesia not need to import rice?

In the data above, the question explores information on criteria in the future when Indonesia will not need to import rice. This question shows predictive or projective thinking skills, which are important in understanding strategic policies and resource management. According to Keraf (1980), questions that explore aspects of time require analytical thinking that considers social, economic, and policy dynamics. In this case, students try to understand indicators or situations that can enable the achievement of rice self-sufficiency.

This research, which focuses on predictive exploration related to future rice self-sufficiency policies, is in line with current trends in problem-based learning (PBL) and prediction strategies in learning. The following is the position of this research compared to related studies. The combination of the PBL approach with prediction methods, such as Predict-Observe-Explain (POE), has been shown to improve students' critical and scientific thinking skills. This method allows students to formulate data-based projections while evaluating the impact of decisions in real scenarios. Studies have shown that predictive activities help improve conceptual understanding and build better evidence-based solutions (Postgraduate Student at Universitas Negeri Malang et al., 2020).

A recent study highlighted that problem-based learning models are effective in encouraging students to analyze strategic policies by integrating historical data and social dynamics. The emphasis on long-term solutions through problem-based discussions helps students develop an analytical mindset toward global and local challenges (Baldwin et al., 2004).

This study contributes by linking policy-based predictive analysis to Indonesia's specific challenges, such as dependence on rice imports. It complements the more general literature on the application of PBL to public policy issues.

Question Form with the Word "How Much"

The following is data on student question sentences that use the question word "how much".

1) What percentage of Indonesian people consume rice as their main food?

2) What is the percentage of recovery by consuming chemical drugs?

In data (1) and (2), the questions explore the number or percentage which in this case is quantitative. In data (1) the quantity of Indonesian people who consume rice as their main food; (2) the percentage of recovery by consuming chemical drugs. Both use the word "how much". Questions with the question word "how much" tend to explore quantitative information.

The two data above show students' interest in statistical data that is relevant to understanding broader phenomena. Research by Yulianti et al. (2021) states that quantitative data is often the basis for more complex analysis. This question also shows the beginning of a scientific approach, where students understand the importance of data to support their arguments or hypotheses.

In the context of language learning, the ability to form and understand quantitative questions is an important component of language acquisition. Previous research has shown that this skill also contributes to the development of student's critical thinking and analytical skills.

AI-based technologies, such as adaptive language learning systems, support question-based learning by providing automated feedback to students' questions. AI enables more personalized and in-depth instruction by supporting complex data analysis, including helping students understand the linguistic context of specific question types. For example, systems such as the Cross-Cultural Intelligent Language Learning System (CILS) leverage AI to improve intercultural communication skills through individually tailored content (Xia et al., 2024). This system demonstrates that AI can improve language skills while understanding cultural contexts. Compared with current research, this focus on the relationship between question types and students' analytical skill development expands the literature on students' cognitive engagement in data-driven learning. Previous research has often focused more on AI applications to support grammar or pronunciation acquisition. By targeting quantitative and critical thinking aspects, this study adds a new dimension that is more relevant to the context of data-driven learning and scientific thinking.

Question Forms with the Clique "-kah"

The following presents data on student question sentences that use the clique "-kah".

(1) Is it true that rice production in Indonesia is inadequate?

(2) Isn't the agricultural sector big enough?

In data (1), the question explores the truth of Indonesia's rice production capacity. In data (2), the question explores the situation that shows the greatness of the agricultural sector in Indonesia.

The use of the clique "-kah" shows students' efforts to verify a statement or assumption. This question is evaluative because students try to test the validity of information or opinions based on facts. According to Paul and Elder (2006), evaluative questions help develop critical thinking, because students not only receive information passively but also try to find evidence that supports or refutes the statement.

Research by Zawacki-Richter et al. (2019) revealed that technology-assisted learning such as AI can strengthen students' ability to ask critical questions with cliques because AI systems often provide relevant fact-based feedback.

The use of the clique "-kah" in questions such as "Is Indonesia's rice production capacity sufficient?" reflects the function of language as an evaluation tool. In Indonesian, the clitic "-kah" is often used to emphasize or validate assumptions, indicating that the speaker or writer is trying to dig up the truth of the information. According to research, linguistic structures like this show the critical involvement of language users towards existing data or opinions. This study, which links the type of evaluative questions with students' critical thinking skills, adds a new dimension to previous studies that have focused more on fact-based learning and quantitative data. The emphasis on the use of the clitic "-kah" as a tool to dig up the truth of information enriches the literature on the development of language-based critical thinking skills. In addition, the integration of AI in supporting evaluative questions bridges the gap between linguistic theory and the application of technology in language learning.

The Variety of Questions Based on the Number of Components

Questions Consisting of One Component

The following presents data in the form of student question sentences that are suspected to consist of one component.

1) What are the alternatives to chemical fertilizers?

2) Why must drugs have a dosage?

3) What is meant by education?

Data (1) consists of one component, namely alternatives to chemical fertilizers. Data (2) consists of one component, namely the importance of drug dosage. Data (3) consists of one component, namely the nature of education.

The three questions above show a focus on one element or main idea. This question reflects the initial stage in learning, where students try to understand or remember basic information. According to Keraf (1980), simple questions are usually used to explore fundamental facts or concepts.

Research by Hmelo-Silver (2004) states that this type of question often appears in the early stages of inquiry-based learning, where students focus on gathering information to build a foundation of knowledge. Questions consisting of one main element, such as "What are the alternatives to chemical fertilizers?", reflect a simple but informative syntactic structure. In linguistics, this question is known as a factual question, which is designed to elicit short answers based on concrete information. This structure demonstrates the effective use of the interrogative function to focus attention on one central idea. Linguistic studies have also shown that this question form is often used by beginning language learners to develop basic communication skills.

This study makes a significant contribution by focusing on the relationship between the number of elements in a question and the stage of learning. Previously, studies such as Hmelo-Silver (2004) have highlighted the importance of simple questions in inquiry learning, but this study contextualizes it in linguistic and technology-based learning. By considering the linguistic aspect, this study broadens the understanding of how students build critical thinking skills through basic question structures.

AI-based technology can enhance students' ability to form and understand simple questions. Applications such as educational chatbots or adaptive learning platforms use algorithms to provide feedback on simple questions. These systems can also help students expand questions by adding new elements to support cognitive development. According to Zawacki-Richter et al. (2019), AI allows students to ask fact-based questions more confidently while receiving relevant answers to enrich the learning process.

Questions Consisting of Two Components

The following presents data in the form of student question sentences that are suspected of consisting of two components.

1) Did the Kancil show signs of regret after stealing the cucumber?
2) How do patients and doctors evaluate the success of treatment?
3) How does the rice import policy impact the welfare of local farmers?

Data (1) consists of two components, namely the signs of the Mouse Deer's regret and the act of stealing the cucumber. Data (2) consists of two components, namely the evaluation of the success of treatment, and the roles of patients and doctors. Data (3) consists of two components, namely the import policy and the welfare of local farmers.

The questions in the data presented above involve two main elements, such as the relationship between an action and its impact or the interaction of two parties. This question reflects the ability to connect two concepts or perspectives. According to Paul and Elder (2006), questions with two components indicate a transition from factual thinking to analytical thinking, where students begin to look for causal or comparative relationships.

Questions with two components, such as "How do patients and doctors evaluate the success of treatment?" show a higher level of linguistic complexity. Syntactically, this question combines two main elements, namely the subject of evaluation (patient and doctor) and the focus of evaluation (treatment success). This structure reflects the student's ability to understand the relationship between elements in a phenomenon, both temporally, causally, and comparatively. In linguistic analysis, this can be considered an intermediate question that shows Maturity in the use of language for analysis.

AI-based applications, such as Natural Language Processing (NLP)-based question and answer systems, can support question-based learning with two main elements. This technology helps students ask more complex questions and provide answers that connect two variables or concepts. According to Zawacki-Richter et al. (2019), AI can provide contextual feedback that allows students to further explore the relationship between the two elements being discussed. In addition, AI can also analyze student question patterns to provide recommendations for relevant materials or topics to deepen understanding.

This study highlights the importance of questions with two components as indicators of the transition from factual to analytical thinking, expanding the literature that previously focused more on factual or single-element questions. For example, Yulianti et al. (2021) emphasized that group discussions often raise questions with two main elements, but this study provides linguistic and technological contexts for understanding this phenomenon. Thus, this study makes a new contribution to understanding the relationship between question structure, analytical skills, and technology-based learning.

Questions Consisting of Three Components

The following presents data in the form of student question sentences that are suspected to consist of two components.

1) How are measurements made so that the Kancil are considered naughty and disseminated in the media and stories?

2) What impacts arise due to the imbalance between import policies and efforts to increase production and protect farmers?

3) Is there a long-term solution to reduce the gap between the quality of education in urban and remote areas in Indonesia?

Data (1) consists of three components, namely the measurement of the mouse deer's behavior, the assessment of the Kancil as naughty, and dissemination in the media and stories. Data (2) consists of three components, namely import policies, efforts to increase production, and protecting farmers. Data (3) consists of three components, namely Long-term solutions, urban education quality, and remote area education quality. The questions in the data above integrate three or more elements in one question. This reflects students' ability to analyze more complex situations and see various perspectives.

This study highlights how students ask questions involving three or more elements, which indicates higher analytical and evaluative thinking. Compared to previous studies, such as Anderson (2009), which focused on cognitive taxonomy, this study contextualizes this complex question in technology-based learning, specifically AI-based applications.

Questions Consisting of Four Components

The following presents data in the form of student question sentences that are suspected to consist of two components.

1) Does the independent curriculum make it difficult for students to understand the material and find learning resources?

2) Is this decline in the quality of education due to the current generation being different from the previous one or is it because our government's way of working is less relevant to the current era?

Data (1) consists of four components, namely the independent curriculum, student conditions, understanding of the material, and finding learning resources. Data (2) consists of four components, namely the decline in the quality of education, generational differences, the way the government works, and the current era.

The questions above include four or more elements, which indicate the highest complexity in student thinking. This question not only explores the relationship between various elements but also evaluates the interaction between factors simultaneously. According to Hmelo-Silver (2004), questions like this often arise in the context of advanced problem-based learning, where students are required to evaluate many variables and produce comprehensive solutions.

Research by Zawacki-Richter et al. (2019) also found that questions with four components indicate a deep level of understanding of an issue and are often the result of intensive discussions or the use of learning support technologies. This study highlights that students who engage in problem-based learning or intensive discussions tend to produce questions with a high level of complexity, namely including four or more elements. Unlike previous studies that focused on questions with two or three elements, this study broadens insights by analyzing the simultaneous relationship between various variables.

The Level of Thinking Reflected in Students' Questions

In this section, the types of questions are classified based on the level of thinking contained in a question sentence. The classification of questions based on the level of thinking in the revised Bloom's taxonomy (Anderson, 2009) reflects the cognitive development of students, from the ability to understand basic concepts to create innovative solutions. This analysis helps in understanding the quality and depth of questions asked by students and describes their maturity in thinking in an

academic context.

Understanding

The following is data in the form of student question sentences that are suspected to be at the level of understanding.

1) What research is being conducted related to the use of fertilizer in Indonesia?

2) What is meant by education?

3) What is the definition of "cure" in the context of medicine?

Data (1) shows that the question asks for a factual description of the research being conducted. Data (2) shows that the question asks for a basic definition of education, which is a fundamental concept in this field. Data (3) shows that this question asks for a basic understanding of the term "cure" in a medical context. All three questions show a request for a description consisting of one element, that is fundamental, and factual.

The description above follows Anderson's opinion (2009) that the level of understanding includes the skills to explain or summarize basic information. Questions at this level indicate that students are in the early stages of the learning process, where they are trying to construct an initial understanding. Research by Chin and Osborne (2008) states that understanding questions often arise in inquiry-based learning, where students try to clarify the concepts they are learning. Thus, these questions are important for building a strong foundation before moving on to more complex levels of thinking.

Analyzing

The following presents data in the form of student question sentences that are suspected to be at the analytical thinking level.

1) Why does Indonesia still depend on chemical fertilizers in the agricultural sector?

2) Are there any problems between students and teachers that are often encountered?

3) Can the rice import policy harm local farmers by suppressing the price of rice at the farmer level?

4) Why are there some medicines that also require a doctor's prescription?

5) Has the Kancil ever stolen anything other than cucumbers?

Data (1) shows that the question asks for an explanation of the causes of dependence on chemical fertilizers. Data (2) shows that this question requires an analysis of the dynamics of the relationship between students and teachers. Data (3) shows that this question asks for an analysis of the impact of import policies on local farmers. Data (4) shows that this question asks for an analysis of the reasons for the regulation and supervision of drug use. Data (5) shows that this question asks for an analysis of the behavior of the mouse deer.

Data (1) asks for an explanation of the cause-and-effect relationship between Indonesian agriculture and chemical fertilizers. Data (2) asks for an explanation of the dynamics of the relationship between students and teachers. Data (3) asks for a description of the cause and effect between rice imports and local farmers and the price of grain. Data (4) asks for a description of the dynamics of the relationship between drugs and doctor's prescriptions. Data (4) asks for a description of the classification of the relationship between the activity of stealing cucumbers and other activities. The five questions above show a pattern that the questions consist of two or more elements and seek their relationship.

This follows Anderson's opinion (2009) that analyzing is the ability to break down information into smaller elements and understand the relationship between these elements. This question shows the student's ability to identify cause and effect, patterns, and relationships in a problem.

Research by Dwyer et al. (2014) shows that the level of analytical thinking is important in improving critical understanding of complex issues. In this context, analytical questions help students develop critical thinking skills, which are essential in data-based decision-making. This is in line with this study which can explain how students use technology to find basic definitions or clarifications. Huang et al. (2019) stated that comprehension skills are strengthened with the help of technology-based tools, such as chatbots or AI applications, which can provide fast and accurate explanations for factual questions. This study provides a more specific local context, especially for students in Indonesia. Unlike previous studies that focused more on science or educational technology, this study covers a multidisciplinary context (education, agriculture, and health). This study strengthens recent findings that state

that AI-based technology can help students understand basic concepts more effectively.

Evaluating

The following presents data in the form of student question sentences that are suspected to be at the level of evaluating thinking.

1) Is the chemical fertilizer subsidy policy in Indonesia still relevant for the future of sustainable agriculture?

2) What about teachers who do not receive a decent salary while the teaching load given is quite heavy?

3) Does Indonesia need to import rice? Isn't Indonesia an agrarian country?

4) Is medicine alone enough to cure diseases?

5) Can the act of stealing carried out by the Kancil in the song "Si Kancil Anak Naughty" be categorized as a Kancil being a naughty child?

Data (1) shows that the question asks for an assessment of the relevance of the policy. Data (2) shows that this question asks for an evaluation of the condition of teachers and their impact on education. Data (3) shows that this question asks for an evaluation of the need to import rice in the context of Indonesia's agrarian status. Data (4) shows that this question asks for an evaluation of the role of medicine in the healing process. Data (5) shows that this question asks for an evaluation of the characterization of the Kancil based on his actions in the story.

Data (1) uses the criteria for the future of sustainable agriculture, and data (2) uses the criteria for teacher salary eligibility based on teaching load. Data (3) uses the criteria for the need for rice imports. Data (4) uses the criteria for the adequacy of medicine as a healing instrument. Data (5) uses the criteria for traits based on the behavior carried out by Kancil. The five questions above require an assessment of something based on certain criteria.

Linguistically, the characteristics of evaluative questions are as follows. The use of evaluative question words, such as whether, how, or contradictory phrases such as Isn't it. The selection of critical diction that indicates the need for justification or comparison, such as relevant, or sufficient, can be categorized. Implicit contexts that demand analysis of criteria, for example, "the future of sustainable agriculture" in Data (1) or "the adequacy of medicine as a healing instrument" in Data (4).

This linguistic aspect is relevant in language learning because it trains critical discourse analysis skills (Fairclough, 2013). In the process of language learning, students not only learn to produce sentences but also understand the social context and evaluative criteria used to assess certain issues.

Research by Zohar and Dori (2003) shows that evaluation skills are essential in higher education because they involve reflective skills that can improve ethical and professional decision-making. This research offers an integrative approach that has not been widely done as follows. Multidisciplinary approach: combining cognitive taxonomy, linguistic analysis, and technology-based learning. Practical contribution: offering direct application opportunities using AI to train critical thinking skills in language classes. Extension to the higher education context: focusing on analyzing student questions provides insights into how language learning can be designed to support professional reflection.

Creating

The following presents data in the form of student question sentences that are suspected to be at the level of evaluating thinking.

1) How to reduce the negative impact of chemical fertilizer use?

2) How can efforts be made to improve the quality of education in Indonesia?

Data (1) shows that the question asks for the development of solutions to reduce the negative impact of chemical fertilizer use. Data (2) shows that this question asks for the development of solutions to improve the quality of education.

The student questions presented show that they are at the level of thinking "creating" in the revised taxonomy by Anderson (2009). This level includes the ability to produce innovative solutions or new ideas in a particular context. In linguistic terms, this type of question has the following characteristics. The use of productive question words, such as how to and how to try, indicates the demand to produce concrete steps or solutions. Integration of two elements of information or concepts: for example, in Data (1), information about the negative impact of chemical fertilizers and innovative solutions are the main focus; in Data (2), educational problems are combined with an improvement approach. Solution-based diction: words such as reducing impact and improving quality indicate a problem-solving orientation, not just evaluation or analysis.

Research by Barron and Darling-Hammond (2008) states that the level of creation is very important in the context of project-based learning (PBL), where students are challenged to solve real-world problems. In this case, students who can ask questions at the level of creating show their readiness to face challenges in the world of work. This study emphasizes the analysis of the ability to create as reflected in students' questions. This approach extends previous research with the following focuses. Emphasis on the level of creating: Anderson's (2009) research is more associated with evaluation, while this study contributes to the analysis of idea generation as the highest ability in cognitive taxonomy. Project-based learning (PBL) context: in line with Barron and Darling-Hammond's (2008) research, this study emphasizes the importance of developing creative skills to solve real-world problems. Innovation in technology-based language learning: the integration of linguistic aspects with AI technology is a new development that has not been widely explored, providing a unique contribution to technology-based learning and critical linguistics.

CONCLUSIONS

The conclusions of this study are as follows. First, the form of questions is based on question words. Students tend to use a variety of question words, such as "what", "why", "how", and "why". Each question word reflects a different level of thinking, from simply asking for factual information to analyzing cause and effect or exploring solutions. The integration of AI-based technology has been shown to help students formulate more complex and diverse questions. Second, the variety of questions is based on the number of components. Students' questions have different levels of complexity, from consisting of one component to four or more components. The more components used, the more complex the thinking reflected. AI plays an important role in supporting students in formulating multidimensional questions, which often involve deeper relationships between elements. Third, the level of thinking reflected in students' questions. Students' levels of thinking cover various levels in the revised Bloom's taxonomy, from understanding to creating. Most questions are at the level of understanding and analyzing, with a significant contribution from AI technology in encouraging students to evaluate and create innovative solutions. This conclusion confirms that the integration of AI-based applications in learning can improve the quality of students' questions, both in terms of form, variety, and depth of thinking, thereby supporting the development of critical and analytical thinking skills needed

in the digital era.

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