Promoting HOTS and critical thinking to English students of higher education through authentic assessment

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ABSTRACT

The development of social life relationship in this 21st century becomes more challenging than the previous era. All the human being needs to be designed sophisticatedly with some skills to maintain the global welfare, such as critical thinking skill which is the ability to test, analyze and explain the validity of the information according to a particular task or situation. Critical thinking that is accompanied by creativity build a high terminology called higher order thinking skills (hereafter, HOTS) that produces the activity of analyzing, evaluating and creating something new. Critical Thinking and HOTS are expected to be implemented in Indonesia's educational policies due to critical thinking skill in Indonesia is still low. Therefore, this study aims to know the role of authentic assessment on higher education English students' critical thinking skill and HOTS. This study used qualitative descriptive approach by giving participants a bunch of discussion in a form of interview where the participants were four college students from a private university in Bogor. The result of this study showed that authentic assessment promotes English students' critical thinking and HOTS through the activity where they were able to explore and reflect their comprehension to their situation and make a product related to their learning.

Introduction

Living in the 21st century is more complicated and brings challenges than the previous era, where all the human being needs to be designed sophisticatedly along with the fast and easy social life relationship. As the study by Tajularipin et al. (2017) one of the signs of 21st century is the increasing of the world community that open to all societies. The advances in communication make it possible to build a relationship development with anyone, anytime and anywhere. Moreover, all needs and facts of life in 21st century require the ability of critical thinking in maintaining all the changes and developments in this century, as the

study by Bağ and Gürsoy (2021) critical thinking is one of basic skills of 21st century for the intellectual development of individuals to sustain global welfare.

Besides, critical thinking becomes one of the several skills that are expected to be implicated during the learning process. As stated by Retnawati et al. (2018), students are required to be able to adapt the learning that involves innovations and skills in communication, collaboration, critical thinking and creativity along with the 21st century needs. Critical thinking creates active and interactive learning, students will tend to learn better by actively communicating with each other in certain academic content if students are encouraged to apply critical thinking when comparing views and ideas, students will have the opportunity to increase their self-awareness of abilities they will thus pave the way for self-development as a learner (Vdovina & Gaibisso, 2013).

Moreover, critical thinking that is accompanied by creativity builds a high terminology called HOTS. HOTS stands for higher order thinking skills. Higher order thinking skills contain several sequences of thinking criteria, including being able to understand, apply, analyze, evaluate and create (Lo & Feng, 2020). HOTS has three points. First, critical thinking refers to the ability in analyzing the information objectively, thinking rationally and making a judgment. Second, creative thinking refers to be able in creating new objects, developing innovative ideas, analyzing and evaluating the existing ones. Third, problem solving refers to the ability to identify the problem, collect and analyze the relevant information, find and select a relevant solution (Lu et al., 2021). High-level thinking has the concept of deep thinking. This thinking is formed from sequence of cognitive patterns through the stages of analysis and evaluation that produce higher-order thinking in students.

Application of students' HOTS and critical thinking can be implemented through the application of student assessments. According to Lo & Feng (2020), assessment is the process of getting information about student learning abilities referring to the evaluation of overall student performance in generating assumptions about learning which includes student quality and achievement. In simple, assessment is a method in assessing the materials that are correspond with students' needs and their learning goals. According to Umam and Indah (2020), assessment plays important role in language learning which the result from the process of teaching and learning are obtained. The success of an assessment depends on the effective selection of appropriate procedures as well as the correct application due to student's need and goals. According to Gulikers et al. (2006), the assessment mode that focuses on the required competencies tends to lean towards the authentic side, authentic assessment is expected to stimulate students to develop skills or competencies that are relevant for their future world of work.

The previous research was conducted by Mohamed and Lebar (2017) using the literature review as the methodology of the study which was adapted from the systematic guide to literature review by Okoli and Schabram. The study gains the concept of authentic assessment through higher order thinking skills. The results of the literature review shows that authentic assessments have potential to measure high order thinking skills among students. The previous research only focus on the literature review rather than the real situation. The researchers of this study aim to target this study to the students of higher education that have been experienced to the authentic assessment forms that is given by the lecturers, it aims to analyze the real situation of what is exactly the role of authentic

assessment for them as students in English classroom through their HOTS and critical thinking skills.

Method

Research design

This research is the qualitative approach and uses case study as the design of the study, according to (Choy, 2014) the main strength of the qualitative approach is for cultural valuations that investigate the values that underlie beliefs and assumptions about their behavior, meanwhile "case study research involves the study of an issue explored through one or more cases within a bounded system; setting and the context" (Creswell & Poth, 2007). Therefore, this study aims to investigate the students' perspectives about authentic assessment that is implemented by their lecturer and how well does it promote them to think critically, creative and have the problem-solving skill in their classroom.

Setting and participants

This research setting is conducted on the perspectives of undergraduate students and was carried out by 4 college students of English major in a private university in Bogor, West Java, Indonesia. Data were collected in 12 until 15 July 2021. The participants were at the same class in 5th semester of their college degree that already learned about the authentic assessment theory.

Data collection

The researchers analyzed some literature reviews to collect the data and references in the form of meaning that are accordance to the ornaments of this study. Then, the researchers used interviews as the data collection in one of the online platform "WhatsApp" in the form of voice note because of the condition of covid-19 that referred to the regulation of social distancing. According to Ary et al. (2010), a person's thoughts, beliefs, and feelings regarding a situation are elicited from them directly through an interview. Instead of testing theories, they are employed to better comprehend people's experiences and the meanings they assign to them. The participants answer the interviews based on their comprehending of the topic that is pointing on the use of authentic assessment through their critical thinking skills and HOTS.

Data analysis

The data analyses of Miles and Huberman was adopted in this study that includes three activities; data condensation, data display and conclusion drawing/verification. "The data condensation includes the process of selecting, focusing, transforming the data that appears of written-up field notes, interview, or other empirical materials by the condensation to make the data stronger, in the middle process of data condensation is writing summaries, coding, developing themes/pattern, generating categories and writing analytic memos" (Miles et al., 2014). There are several codes of this study, such as 3 codes from authentic assessment from the theory of O'Malley and Pierce (1996) namely AA1:

performance assessment, AA2: project assessment, and AA3: portfolio assessment. Other codes are CT: Critical Thinking and HOTS: High order thinking skills. The series of codes are formed into a pattern according to the results of the collected data. The data displays are decided through the rows of this study that focuses of the role of authentic assessment and finally the conclusion that lead to the decision of the study result will be drawn.

Findings and discussion

Performance assessment promotes students' critical thinking

Authentic assessment is multiple forms of assessment that requires students to use their competencies such as; knowledge, skills and attitudes to prepare and solve their real-world problem (Syafrizal, Paharnzah, & Nuraeni 2020). Specifically, according to the regulation of the Minister of Education and Culture No. 81, 2013 authentic assessment is forms of assessment that are dealing with students' behavior, knowledge and skill. The purpose of authentic assessment is to enhance the learning process to develop students' relevant competencies that would be useful in their real-world experiences (Naidu & Karunanayaka, 2021).

The researchers employed literature reviews to gain the information about the theories under research, then the researcher conducted interviews results several insights about the role of authentic assessment that is applied in the participants' classroom. They mention several forms of authentic assessment that they have experienced. The 4 participants convey that the implementation of authentic assessment in a certain course that they have completed engage them to be prepared more about the materials because they intentionally analyze the situation that they are in correlating about the given topics and materials in their learning. In the process of analyzing and evaluating, the students must have to find out the particular object, analyze and pick the logic one and also measuring the accuracy in the process of creating something new. The study by Haberlin (2018) concludes several process of critical thinking as the ability of gathering information, analyzing the information accuracy, organizing the thoughts so they can distinguish the information between logical and illogical inferences.

They all agree and stated that authentic assessment promotes them to be more creative and become more critical people along with the given task. Here are the specific criteria of the respondents' responds. Student C stated "in every semester we must have a task where we have to do the presentation in particular course."

According to Marzano, Pickering and McTighe (1993), presentation is the activity of demonstrating students' understanding and includes knowledge, habits and skill. In the activity of presentation, the students must have a discussion in preparing the materials to be delivered by dividing the tasks/do the task together, discussion includes the act of searching references of the materials from the experts, sorting the references that is suitable with the materials, reflects to the related issue by logic, finding the proves/example to strengthen the materials so they can differ between the theory and assumption about the materials, and then finally they can perform their presentation.

This action shows the critical thinking in the theory of Cottrel (2005) as follows: evaluating the evidence for alternative points of view, weighing up opposing arguments and

evidence fairly, reflecting on issues in structured way, bringing logic and insight to bear, drawing conclusion about whether arguments are valid and justifiable based on good evidence and sensible assumptions, and presenting a point of view in structures, clear, well-reasoned way that convinces others.

The findings are in line with Marzano, Pickering, and McTighe (1993), asserting that "performance assessment is included as an authentic assessment that refers to variety of tasks and situations in which students are given the opportunities to demonstrate their understanding to apply the knowledge, skills, habits of mind in a variety of contexts." Performance assessment can be implemented in a classroom as an engagement in developing students' comprehension through the practice that combines between knowledge, skills and attitudes. Performance assessment contains response tasks and items that aimed at measuring the students' individual performance on a certain skill such as their critical thinking and their perspective taking, performance assessment stimulate students' real-world decisions and interpretation-situations in their daily (Shavelson et al., 2019).

Project assessment fosters students' critical thinking and high order thinking skills

Authentic assessment help students develop their practice based on knowledge and skill that are relevant to their real-world context, as the study by Vohmann (2019) authentic assessment provides learning experience which engages students with practice-based activities, giving the opportunity to respond their real-world challenges that help students to prepare for their professional practices. Jaelani and Umam (2021) found that the use both of authentic materials and authentic assessment help students in understanding their future need profession. Furthermore, there are several types of authentic assessment that can be conducted in learning practices, those are; performance assessment, project assessment and portfolio assessment (Rukmini & Saputri, 2017) referred to O'Malley and Pierce (1996).

Student B stated "we were given many tasks in a form of authentic assessment; one of them is a project of making the English module that is suitable for the students we are targeted on." From the response, student B have given task in making an English module, this kind of assessment is included as the project assessment that needs a long period of time and needed more people to help as a project group.

Before creating an English module, a group of students will have a discussion according to the appropriate materials for the module, the activity of discussion includes of identifying the other people's position, arguments and conclusion, evaluating the evidence for alternative points of view, they will combine their knowledge and understanding that build them to be critical students as the theory of critical thinking by (Cottrell, 2005). This assessment encourages them to analyze the process before making an English module that includes analyze the background of the students' English learning, what kind of module they have to design, what grades they will be targeted in making the module so they can make an appropriate English module.

The project task drives students to reflect on issues in structured way, bringing logic and insight to bear as the study of Cottrell (2005) that is also categorized as one of critical thinking classification. Moreover, this activity also drives them to be critical in analyzing and measuring the knowledge in English module based on the appropriate measurement of specific grade as the preparation in their real world context as the next teacher, this activity

task also includes HOTS that refers to the ability in analyzing the information objectively, thinking rationally and making a judgment, drives them to be creative (the ability that refers to be able in creating new objects), developing innovative ideas, analyzing and evaluating the existing ones, even promotes them to have a problem solving skill that refers to the ability in identifying the problem, collecting and analyzing the relevant information, finding and selecting a relevant solution (Lu et al., 2021). In this case, we can see that they as a college-students were trained to analyze and evaluate even create something that corresponds with their major, this shows as the efforts that adjust their real-world in English education context.

While student A stated "one of my lecturers give a task to write a scientific paper about the study case of English learning and teaching context then we have to submit it". In this context, the assessment that is given is included as project assessment that brings the effort continually along with the process of scientific paper writing which unconsciously drives respondents to read and gain many information to know many insights and issue/problematic in learning context especially in English education. They are also encouraged to find the solution/methods to settle the matters in educational field as the students of the faculty of teacher training and education. This authentic assessment also includes HOTS in several processes, such as; formation, comprehension, decision making and has a complex cognitive strategy; critical thinking, creative thinking and problem solving.

Apart from skill in solving a problem, it provides the activity of formulating, identifying, making arguments of the related information that would attract students to think critically and creatively towards the output of the credible source (Yeung, 2015). In the process of making a scientific paper, students will be trained to view wide information through the process in writing it that embraces the activity of finding the problems and try to discover solutions on it.

Concerning project assessment, project is an assessment require students to do several tasks that will result a specific product or data (Rukmini & Saputri, 2017). According to Junaedi (2019), project assessment is an assessment that assesses students in the form of investigation includes some activities of planning, data collecting, organizing, analyses and presenting within period of time.

High order thinking skills or HOTS refers to several abilities of thinking skills (Retnawati et al., 2018). HOTS is the process of thinking that has several stages based on the Bloom's taxonomy scale which includes three components (analyzing, evaluating and creating) with the top three components of knowledge dimensions (conceptual, procedural and metacognitive). According to Lu et al. (2021), HOTS as three items, such as critical thinking; refers to the ability in analyzing the information objectively, thinking rationally and making a judgment, creative thinking; refers to be able in creating new objects, developing innovative ideas, analyzing and evaluating the existing ones, and problem solving refers to the ability to identify the problem, collect and analyze the relevant information, find and select a relevant solution.

HOTS becomes a significant reason to build students skill of problem solving. According to Yeung (2015), HOTS has several thinking processes such as concept formation, comprehension, decision making and has a complex cognitive strategies; critical thinking,

creative thinking and problem solving. Apart from skill in solving a problem, it provides the activity of formulating, identifying, making arguments of the related information that would attract students to think critically and creatively towards the output of the credible source. According to Zohar (2004), HOTS has a pattern that includes some specific activities, such as formulate a research question, control and draw the inferences, identify and make arguments based on the reliable source of information. HOTS is an important element in educational field, because it has benefits to improve students' learning performances that contain day to day activities.

Portfolio assessment boosts students' critical thinking

Critical thinking is a complex process of deliberation which involves a wide range of skills and attitudes that includes 1) identifying the other people's position, arguments and conclusion, 2) evaluating the evidence for alternative points of view, 3) weighing up opposing arguments and evidence fairly, 4) being able to read between the lines, seeing behind surfaces and identifying false or unfair assumption, 5) recognizing techniques used to make certain positions more appealing that others, such as; false, logic and persuasive devices, 6) reflecting on issues in structured way, bringing logic and insight to bear, 7) drawing conclusion about whether arguments are valid and justifiable based on good evidence and sensible assumptions, and 8) presenting a point of view in structures, clear, well-reasoned way that convinces others (Cottrell 2005).

In simple words, critical thinking is a thoughtful and reasonable process that has a purpose to make sensible decisions about what to believe and what to do. Therefore, critical thinker is aware of their recognitions. Haberlin (2018) concludes several theories of critical thinking as the ability of gathering information, analyzing the information accuracy, organizing the thoughts so they can distinguish the information between logical and illogical inferences. Moreover, critical thinking focuses on the activity of problem solving through the performance/practice which can be driven by such strategic managements that is used by the teacher (Samaras et al., 2021).

Student C stated "in one of my courses, we have to write our journal about our learning after a meeting and we have to collect it next week in one semester." From the responses, she obviously got a task to write a journal diary of their learning, and this assessment is included as a portfolio assessment in a form of journal diary to describe their learning activity each meeting, this activity unconsciously encourages students to reflect to what they have learned before they prepare a good learning activity next, because portfolio assessment will provide the journey or progress of students' learning in a period of time, so the students will notice their learning process along with the learning time is passed. According to Lund (1997), "portfolios are collections of students work gathered over time."

The purpose of collecting students' work in intended to see the progress of students' learning. Other study conducted by Virgin and Bharati (2020) also argue that portfolio is an assessment where the teacher collects students' works in purpose to see students' progress in a certain period, it consists of students' writings that are based on the curricular goals, this assessment may need self-assessment as the key element. In this process, whether the teacher and students will reflect their performance for the certain of time.

The findings confirm Thonney and Montgomery (2019) mentioning five dimensions of critical thinking based on the perspectives of Lai and Crotts such as (1) evaluating evidence, (2) analyzing and evaluating arguments, (3) understanding implications and consequences, (4) producing original arguments, and (5) understanding causation. Critical thinking does not develop spontaneously, but it is dynamic and it can be trained by giving the task that are relevant to their world as the way in attracting students' critical thinking to handle it. The study by Espey (2018) examines that critical thinking cannot be improved without training and practicing.

Advantages and disadvantages of authentic assessment in the EFL context

Student D delivered that "the use of authentic assessment in the learning must need enough time to adjust to the techniques that the lecturer uses in the learning, and if there is a project assessment, the lecturer should responsible in implementing that authentic assessment to the students that are handled."

From these insights, we know that the use of authentic assessment needs a long time/long term in the process of applying it, so the teacher/lecturer have to put eyes on them from the beginning of the assessment until the end of reporting/scoring it. Furthermore, authentic assessment should be adjusted to the students' need and the students can find it attractive so they will perform their assessment without any burden, because basically the implementation of authentic assessment aims to motivate them in developing their learning that relevant to them.

A study overtaken by Raymond et al. (2013) revealed that authentic assessment generally aims to stimulate students to learn more deeply, enable students to develop professionally and increase learning motivation with students' perceptions that are relevant to where they are studying. Beside many advantages from authentic assessment that build performance activities that corresponds with students' learning context, authentic assessment needs a period of time along with the purposes of authentic assessment that focuses on the process and progress of students' learning context.

In the interview session there are also some suggestions that they have claimed as their insights about the advantages and disadvantages of authentic assessment. Student C stated that "it is better to let us to know the way we will be scored along with the implementation of authentic assessment in the first meeting of the course, and given more directions/information about the authentic assessment use in the class".

In this case, the students needed to be given more understanding about the application of authentic assessment where the teacher/lecturer applied in the classroom, the understanding includes the way they will be scored, the way when the students need any feedbacks through the applied assessment, and the way they have to evaluate their learning context that must need teacher/lecturer's direction whether it is clear or not. In general, teachers are required to involve students in the assessment rubric level so that it can encourage students' enthusiasm for learning. The involvement of the students by regarding authentic assessment design leads them to evaluate their learning activity.

Conclusion

This study showed that authentic assessment enabled students to promote their critical thinking and their HOTS. Various techniques that were implemented in a form of authentic assessment promoted the students to be creative in analyzing contexts, evaluating even developing or creating something new. The results of the participants' interview also showed that their authentic assessment that was applied in their classroom, unconsciously gave them the effort to be analytic people. Chances have encouraged them in finding the information, evaluating the source of the obtained information, and figuring out the solution. They became more critical because the authentic assessment provided the learning that was suitable to the context of the students in and their real world. Next, authentic assessment provided learning experience which engaged students with practice-based activities, gave the opportunity to respond their real-world challenges, and developed their practice-based knowledge and skills. The activity of giving feedback that was aligned with authentic assessment would help students to prepare for their professional practices.

The implementation of authentic assessment had to be adjusted to the students' need and appropriate through students' learning level, so they also could adapt their learning according to their understanding. Furthermore, the implementation of authentic assessment became a method that promoted students to build their critical thinking and HOTS through the activity of the authentic assessment technique that monitored students' process of their learning activity. For the future research, the researcher suggests the study to focuses more on the study of the role of authentic assessment due to students' HOTS to be deepened.

Acknowledgements

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