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Exploration of Culturally Responsive Teaching and Problem-Based Learning in The Diverse Learning of Prospective Science Teachers

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Abstract

Cultural diversity involves the learning process. This study aims to describe how the implementation of CRT and PBL affects teaching patterns and its influence on critical thinking character and awareness of cultural behaviour. The study was conducted in a class of 24 prospective science teachers which come from eight provinces in Indonesia. Course lecturers and the head of the study program also participated. The research data were obtained from observations, questionnaires and interviews. Data analysis used a qualitative approach. The results of this study reveal that CRT is more inclined to how teachers design culture-based learning, how student differences are seen as commonplace, and with in-depth communication can create a sense of care and compassion. Meanwhile, PBL connects communication through a directed and structured group activity. The appropriate collaboration between CRT and PBL can generate critical thinking figure and awareness of the cultured behaviour of prospective science teacher.

Keywords: *Culturally Responsive Teaching, Problem-Based Learning, Critical Thinking, Cultural Behaviour, Prospective Science Teacher*

INTRODUCTION

The pluralistic nature of Indonesia in terms of ethnicity, religion and level of society has made an impressive contribution to the growth and dynamics of the nation's life. Plurality has become the joint in every sector of life. There is interaction between people within the territory of the country. Society must actively manage ethnic and cultural diversity while maintaining national unity (Çiftçi & Gürol, 2015). Relationships between communities take on a very significant role.

One aspect of life is education. The education paradigm has shifted in a more positive direction. Parents in Indonesia are no longer closed and limit their children's education, even sending their children to study outside the island. Parents hope that experience and knowledge in a new place can bring changes for the better in their family and community.

The city of Yogyakarta, Indonesia is one of the destinations for young people to study at the university or college level. Science Education is one of the destination study programs for young people from various regions in Indonesia. Diversity is seen in many classes. Students from various backgrounds gather in class. There is communication interaction between students. They adapt to each other and also share their respective cultures.

The learning process in the classroom will be more meaningful if teachers can explore the cultural diversity of their students. The teacher is a bridge of information exchange between students in the learning process. Teachers can choose and design an appropriate learning strategy for diverse students. Teachers are no longer just facilitators of knowledge of science concepts or materials but can also direct differences between students as a diversity of authentic learning resources.

In 21st-century learning, studying learning materials also aims to enhance students' lifeskills and soft skills. According to the Partnership for 21st Century Learning, critical thinking is one of the essential elements of 21st-century learning (Chavez, J. C. & Napiere, 2014). It is necessary to teach, develop, improve and evaluate critical thinking skills early on to prepare for a complex global society (Ekamilasari & Pursitasari, 2021). However, Fitriani et.al. mentioned that 81% of 100 students have undeveloped critical thinking skills (Fitriani

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et al., 2019). In line with Fitriani, Welter in his research stated that the critical thinking skills of students in Germany are still low (Welter et al., 2023).

The development of the 21st century increasingly directs students to be more sensitive to the environment and critically seek solutions to problems. The existence of literacy is essential in equipping life skills. Cultural literacy is a solution to deculturization. Cultural literacy is understanding, implementing, and determining differences and similarities in attitudes, habits, beliefs, and communication (Riani et al., 2018). Iwai mentioned that the cultural literacy of students in the Midwest still needs to improve (score 2.1 out of 4) (Iwai, 2019). The young generation's concern for the surrounding environment decreases over time, making cultural literacy low (Tabi'in, 2017). There still needs to be more studies of local community knowledge to be implemented in science learning (Sudarmin et al., 2019; Suprapto et al., 2021). Students must be familiarized with learning strategies to explore their potential and skills further. Therefore, teachers must master learning strategies relevant to the circumstances and reality.

Choosing an appropriate learning model is an important step that teachers must take. Problem Based Learning (PBL) is one of the innovative learning models proposed by Howard Barrows at the Faculty of Medicine, McMaster University, Canada (Barrows, 1996; Savery, 2016; Silva et al., 2018). This model centres learning on students to apply their knowledge and skills in solving a complex, open, and authentic problem. The PBL model is implemented in the learning process to solve real problems (Orozco & Yangco, 2016). Fundamental problems in the environment around students become a stimulus to start learning activities with PBL (Silva et al., 2018).

Sometimes problems in the classroom come from the class population itself. Students with different backgrounds become a challenge in terms of classroom management. Teachers should quickly adapt to the environment in a diverse classroom and not see differences as a barrier. Teachers must find the best perspective on positioning students equally and fairly in the classroom.

Culturally responsive teaching is one option for teaching diverse classrooms. Culturally Responsive Teaching (CRT) is defined as using the cultural characteristics, experiences, and ethnic perspectives of diverse students as a means to teach them more effectively (Gay, 2002). Implementing CRT in the classroom provides a double benefit, namely for students and teachers. Cultural responsiveness can result in more than just learning about and maintaining students' cultural backgrounds in the classroom but can also generate excitement in teaching, collaborating, and learning (Walker, 2023).

Teacher behaviour that is responsive to diversity among students should be sustainable. Given that the culture of the students is an identity that cannot be changed. Therefore, educational policymakers need to understand the role of culture and complex contexts and adapt rather than adopt educational policies and practices (Romanowski & Karkouti, 2021). Teachers who include cultural context in their learning need to be supported by policymakers.

The above background description fosters our desire to explore the impact of implementing both CRT and PBL in diverse classrooms. The questions in this study are 1) What are the characteristics and behaviours of teachers who are responsive to the diverse backgrounds of their students? 2) How is culture positioned in learning that implements CRT and PBL? 3) How are the critical thinking behaviour and awareness of cultural behaviour of students in a class consisting of diverse backgrounds?

LITERATURE REVIEW

Culturally Responsive Teaching (CRT)

Culturally Responsive Teaching (CRT) is one of the strategies in learning that can connect students' culture, language and life experiences with what they learn in the classroom. CRT teaching is validating, comprehensive, multidimensional, empowering, transformative and emancipatory. It involves using ethnically diverse students' cultural knowledge, prior experiences, frames of reference and performance styles to make learning more relevant and effective (Gay, 2000). Its main goals include understanding and respecting the reality and relevance of ethnic and cultural diversity in the lives of all people and nations, developing cross-cultural competence, and increasing students' multidimensional achievement (Gay, 2015). CRT is essential to address the educational

needs arising from the coexistence between ethnic minorities and mainstream society (Meléndez-Luces & Couto-Cantero, 2021).

The framework of CRT includes: 1) Expanding the knowledge base of existing cultural diversity; 2) Designing a culture-appropriate curriculum and teaching responsively; 3) Beginning an attitude of caring for culture and creating study groups; 4) Initiating communication across the culture among students; 5) Creating fellowship in classroom teaching (Gay, 2002). There are three dimensions that educators can implement by using CRT modelling, including 1) Responsive teaching strategies and activities; 2) Responsive teacher behaviour and attitudes; and 3) Responsive learning environment (Acquah & Szelei, 2020). Hernandez et.al formulated five thematic frameworks of the CRT model, namely: 1) Content integration; 2) Facilitating knowledge construction; 3) Prejudice reduction; 4) Social justice; and 5) Academic development (C. M. Hernandez et al., 2013).

Many experts have researched the implementation of CRT in the classroom and found satisfactory results. CRT can reduce the disparities seen in science, creating equal learning opportunities for all students (Barron et al., 2021). CRT is the answer to what is a good strategy for teaching diverse classes. Cultural engagement in education increases students' cultural mastery and interest in science (Yoon et al., 2021). Culture is not only seen as the identity of each student but can be utilized as a potential learning resource, and students feel real context. This opinion is reinforced by the research of C. Hernandez & Shroyer (2017), which states that CRT can utilize student culture and profiles in practice. CRT builds a science-literate identity (Oemig & Baptiste, 2018). CRT increases student motivation, expands social skills, gains more visibility, and increases proficiency in using English (Meléndez-Luces & Couto-Cantero, 2021). It becomes interesting to learn about each other. It is a pleasure to understand each other. This situation makes students not feel pressured and enjoy the learning process. CRT applications also positively impact the attitudes and beliefs of prospective science teachers when teaching culturally diverse students (Titu et al., 2018).

In supporting the implementation of CRT, teachers need to modify the existing curriculum to meet the needs of all students in the classroom. The curriculum should present the connection between the home and school environment so that students will feel they have the same experience at home and school. Thus, it will help understand the importance of cultural aspects in science learning (Huang & Liu, 2017). Culturally relevant science teaching and curriculum help students learn science more meaningfully (Garvin-Hudson & Jackson, 2018).

Problem Based Learning (PBL)

PBL designs the confrontation of problems to students as a stimulus in learning (Kelly & Finlayson, 2007). In problem-based learning, students face real, authentic problems in a social context for students and follow the material. Thus, student activities are no longer listening, recording and memorizing material but instead directing to do critical thinking, problem-solving, communication, collaboration and creativity.

The PBL model begins with presenting a problem, and then students search and analyze the problem through direct experiments or scientific studies (Williams, 2017). Through these activities, students' scientific thinking activities and processes become more logical, organized, and thorough, making it easier to understand concepts (Belland et al., 2006). In summary, this model consists of 5 stages, namely: a) provide orientation about the problem to students; b) organize students to research; c) guide students to investigate independently or in groups; d) develop and present work; and e) analyze and evaluate the problem-solving process (Arends, 2012). Hung developed the concept of PBL within the 3C3R framework consisting of two components: core and processing (Hung, 2009). The core components are content, context, and connection, and these three Cs are related to the focus of content/concept learning in PBL. Furthermore, the processing component consists of researching, reasoning, and reflecting, which support the cognitive process of problem-solving skills and independent learning. Hung presents PBL into 9 steps, namely (1) Set goals and objectives; (2) Perform content/task analysis; (3) Analyze context specifications; (4) Select/generate PBL problems; (5) Perform affordability analysis of PBL problems; (6) Perform correspondence analysis; (7) Perform calibration process; (8) Build reflection component; and (9) Check the inter-supporting relationship of 3C3R components.

The advantages of problem-based learning models include: 1) problem-solving can develop students' critical thinking skills and provide satisfaction to discover new knowledge, 2) learning with problem-based learning models is considered more fun and preferred by students, 3) problem-based learning models can increase student activity in the learning process, and 4) problem-based learning models can provide opportunities for students to apply their knowledge to the real world (Gijselaers, 1996). Students are given the freedom to be literate and interact in order to solve problems. The PBL model is recommended to improve students' critical thinking skills because students share ideas in finding solutions (Yuan et al., 2014). EL-Shaer & Gaber corroborated previous research by showing a significant increase in students' critical thinking skills after applying the PBL model (EL-Shaer & Gaber, 2014).

The PBL model can be applied and developed in different cultural contexts (Frambach et al., 2012). PBL can be implemented in classes with diverse student backgrounds. Sabah & Du suggested that to achieve long-term implementation of PBL, the national and local school cultural contexts and the unique characteristics of students and teachers are very important (Sabah & Du, 2018). The interaction between students based on culture should expand student knowledge related to cultural diversity among friends. Septiani & Maftuh's research successfully showed that PBL could improve students' cultural literacy skills (Septiani & Maftuh, 2020).

METHODS

Types of Research

This research is a qualitative exploration of prospective science teacher students that aims to explore the extent of the application and impact of CRT and PBL in learning.

Research Subject

Participants were selected purposively, namely a class with diverse backgrounds of origin. One class consisted of 24 students from different regions (N = 24). Data on the distribution of student background areas are shown in Figure 1.

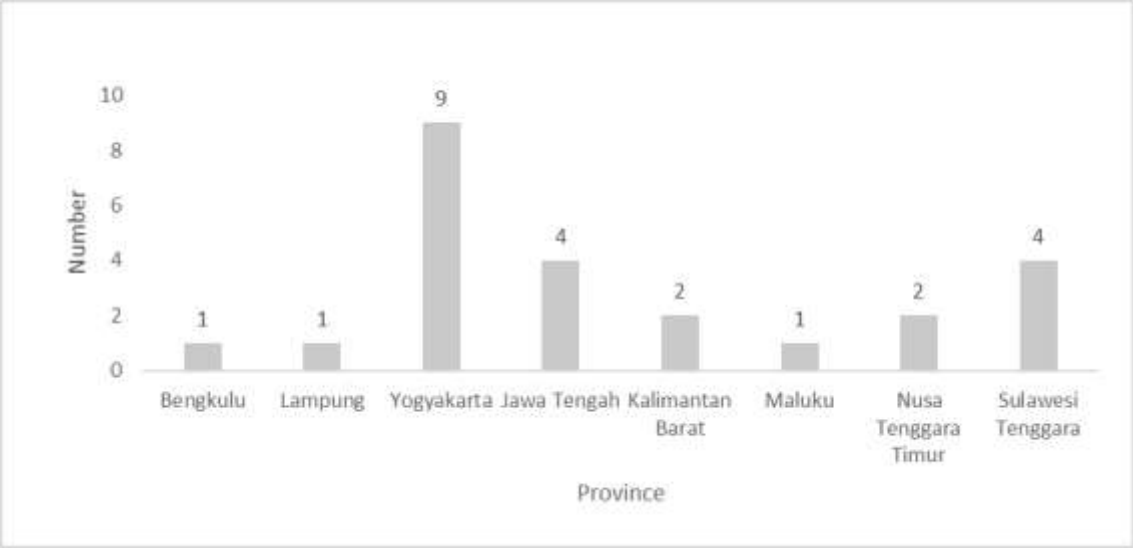

Figure 1. The origin of participants

Based on the data in Figure 1, prospective science teacher students come from eight provinces in Indonesia. The eight provinces are spread over six islands that are located far apart. Thus, there is cross-cultural interaction in the classroom.

The Ethnoscience course is an option in the implementation of CRT and PBL because the learning outcomes of this course are: 1) Able to explain and understand the nature of ethnoscience and its ecology; 2) Able to think critically in analyzing various cultures, local wisdom, and local potential in Indonesia in scientific studies;

3) Able to integrate culture and local wisdom in science learning through ethnoscience studies; and 4) Able to play an active role in cultural preservation in Indonesia by compiling ethnoscience-based science study materials or learning resources. This course positions culture as the main topic during lectures. Implementing CRT in ethno courses can improve generic science skills such as problem-solving, reasoning, and understanding abstract concepts (Derlina et al., 2021).

The lecturer teaching the course was also a sample in the study (N = 1). The lecturer came from Central Java Province. Previously, the lecturer was unfamiliar with CRT; the research team provided a CRT perspective and CRT framework from Gay to be implemented in the classroom. On the other hand, the lecturers have been accustomed to using PBL with the syntax formulated by Arends. The head of the study program was also involved in obtaining research data related to the policies made (N = 1).

Research Procedure

Data Collection Instrument

The instruments used in this study have gone through the content validation stage by experts and obtained an assessment worthy of use. Research data were obtained from classroom observations, questionnaires, and interviews.

Observations were made to determine how culture is treated in the classroom in the context of PBL and CRT and how culture affects students' critical thinking skills and cultural literacy. In the Semester Learning Plan sheet written by the lecturer, in the meetings of weeks 6, 9, and 10, the lecture uses the PBL model. So observations were made in those weeks. The lesson observation guidelines followed Arends' PBL syntax and Gay's CRT framework. As observers, the research team and we can also provide notes during implementation.

Another research instrument was a questionnaire. The questionnaire was given to all participants involved in the study (N = 26). In general, there were three aspects measured in this study. These aspects are 1) Implementation of culture in learning, 2) Critical thinking behaviour, and 3) Cultural behaviour awareness. Critical thinking indicators refer to the formulation of indicators developed by Ennis, namely: 1) Basic clarification; 2) Bases for a decision; 3) Inference; 4) Advance clarification; and 5) Employ rhetorical strategies (Ennis, 2018). Meanwhile, awareness of cultural behaviour follows Polistina's cultural literacy indicators, including 1) Cross-cultural awareness; 2) Local cultural awareness; 3) Critical reflection and thinking; 4) Personal skills for acting as a change agent (Polistina, 2009).

Interviews were conducted with eight students, one lecturer, and the head of the study program. The selection of 8 students with the criteria of 3 students from the group with high learning outcomes, 3 from the medium group, and 2 from the low group. The grouping of students was obtained from the data owned by the lecturer teaching the course. Interviews were used as reinforcement for observation and questionnaire data. The interview used open-ended questions such as:

(1) Did you like the cultural examples presented by your friends?

(2) Did you feel comfortable while learning in class?

(3) Are the learning resources provided by the lecturer enough to represent the culture you are studying?

(4) How did you answer the questions given by the lecturer?

(5) Did you gain new knowledge and experience about the culture being studied in class?

Data Analysis Technique

Data processing uses a qualitative approach. Data in qualitative research, mainly in the form of sentences and discussions, are analyzed into areas through analysis and classification methods. This study used the Miles and Huberman model to overcome the large variety of data that resulted in unclear patterns during analysis. There are 4 steps in the process of drawing research results.

(1) Data Collection, obtained from observation, questionnaire filling, and interviews.

a. Observation was conducted to find out the condition of the class, how the teacher made the learning flow, what learning tools the teacher used, and how students responded during class.

b. Questionnaires were given to explore perceptions of the involvement of PBL and CRT in the course's critical thinking skills and cultural literacy, as well as how to position cultural diversity in the classroom. The questionnaire used positive and negative statements, with answer options using a Likert scale of 1 - 5 with the categories Very good-5, Good-4, Fair-3, Poor-2, and Very poor-1.

c. Interviews as reinforcing data from instruments that have previously been given.

(2) Data Reduction is the selection, focusing, simplification, abstraction, and transformation of data that appears in field notes or written transcriptions. As data collection progresses, further data reduction episodes occur (writing summaries, coding, making partitions). With data reduction, the researcher can discard unnecessary parts and organize the data to get conclusions that can be drawn and verified.

(3) Data Display, displaying the results of an organized analysis of a series of data that has been obtained. The data is displayed as a reference for drawing conclusions based on consideration of the input provided.

(4) Conclusion Drawing/ Verification, based on verified data, a conclusion can be drawn, which is the meaning of this research. Data verification uses triangulation techniques by comparing existing studies, methods, and theories.

RESULT AND DISCUSSION

Culture Implementation in Learning

The components of classroom learning consist of students, teachers and learning resources. Students and teachers are the result of their respective cultural backgrounds. It is easy if the background comes from the same culture. Teachers and students have the same habits, the same mindset, and the same way of communicating. It will be a challenge if we are dealing with very different individuals. Culture will characterize each person.

Let us look at cultural identity from an unusual perspective. As a teacher, looking at diverse students certainly has its difficulties. It is not easy to accommodate the learning objectives. CRT offers how you can comfortably condition your classroom based on differences for equality. Teachers first recognize what is meant by culture. Culture includes ideas, norms, interaction patterns, behaviours, habits, and artefacts. Introducing the culture of one student to another can be done through the placement of culture as a learning resource.

The observations showed that lecturers include examples of culture to be studied by students. At the sixth meeting, the lecturer divided the students into several groups. The heterogeneity of the groups was based on different levels of academic ability and the diversity of background areas. Furthermore, the lecturer explained the local potential in the community, then directed to how local potential is as scientific knowledge. Group students were asked to find other local potentials in their respective regions. It was seen that students were enthusiastic about conveying the results of crafts, food products, and medicines that are commonly available and used by the people in their respective hometowns. Furthermore, the lecturer and students together evaluated each group's work.

In the 9th and 10th meetings, students were asked to identify local science related to science topics. Students in groups worked on tasks determined by the lecturer by choosing one of the topics, namely 1) Basic ingredients and making of traditional herbal medicine; 2) Utilization of spice plants as herbal drinks such as Wedang Uwuh; 3) The process of making and colouring Batik cloth; 4) The use of gamelan in every art and cultural performance event; and 5) The process of making pottery. The results of each group's work were presented in front of the class and received responses or input from the lecturer and other groups. The questionnaires given to 24 students obtained results as shown in Figure 2 below.

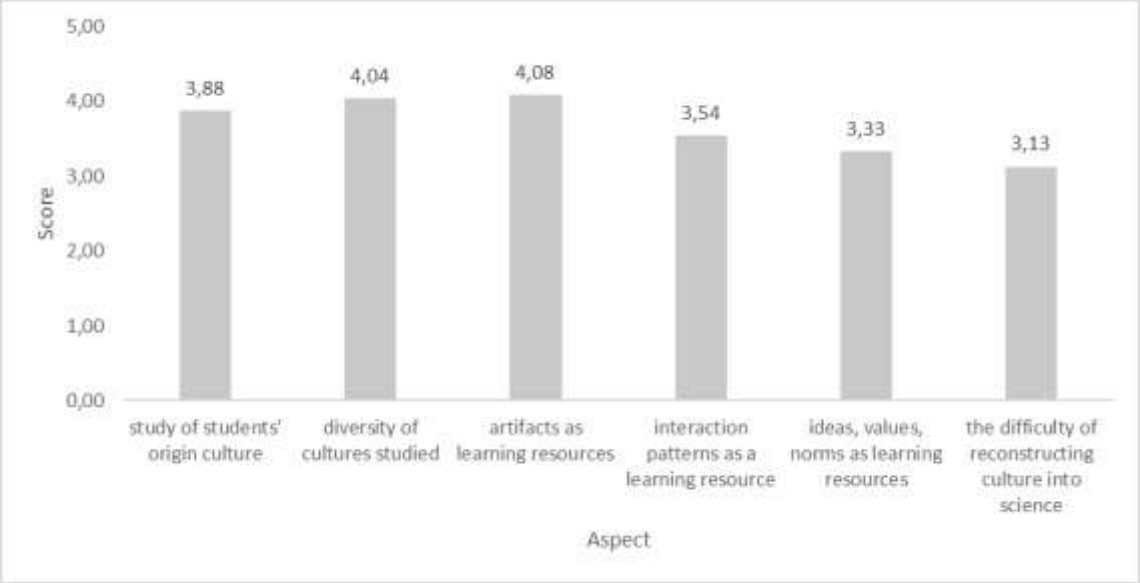

Figure 2. Culture implementation in learning

The questionnaire data shows that the implementation of CRT and PBL has an average score of 3.67 for all aspects, so it is classified as a good criterion. Lecturers showed an outstanding response to culture. Lecturers include culture as a learning resource, with a high level of cultural diversity of 4.04. However, the culture from the area of origin of each student has yet to be maximally explored. Of the three forms of culture, lecturers mainly directed to cultural artefacts owned by local communities, such as Jamu, Wedang Uwuh, Gamelan, pottery, and Batik. However, the lecturer also directed to the value of community interaction patterns, namely the use of gamelan in every cultural event.

Students feel satisfied when studying these topics. However, there are still difficulties when students list the reconstruction of local knowledge obtained to become scientific science. An average score of 3.13 was obtained. The conditions are because the lecturer introduced a culture closely related to the people of Java Island, while 11 out of 24 students came from outside Java Island. From this point of view, the lecturer still uses learning resources from his region. However, students from outside the island also get the advantage of knowing the cross-island culture. Nevertheless, lecturers and students must explore a broader range of cultural references.

Interviews conducted with 8 students corroborated the questionnaire and observation results.

Students from Java Island answered:

> A: "I am happy with this course. I got the opportunity to show the local potential of my region. I also understand that studying culture is studying science."

Students from outside Java answered:

> B: "It is interesting to learn about the culture of my friends. It is almost the same as what our region used to do. What is different is that there are more instruments (gamelan)."
>
> C: "These plants are not all available in our area. However, this is enough to give us the information (as medicinal plants)."

The learning process in the classroom positions the teacher as the director, who is one of the keys to successful learning. The teacher must make preparations before teaching. We also interviewed the lecturer. The lecturer said that he realized that his students came from diverse regions. Nevertheless, he presents culture to foster awareness, care, and empathy among his students.

> "Our students come from various regions. I present the culture of Java Island to learn. Java Island is rich in culture and can be used to teach science, which our students will do when they become teachers.

> What I have conveyed at this time is still very little. Through this activity, it will be their first step to loving culture and exploring it further to be used in classroom learning."

Lecturers have made cultural responses in their learning. Lecturers implement CRT in learning. Lecturers direct students to explore cultural knowledge in the form of group activities. Lecturers discuss culture in their classes to foster awareness of each student. Students do not show objections when doing assignments. They are eager to discuss. Group work fosters cross-cultural communication.

Lecturers choose a strategy by using the PBL model in learning. The lecturer has written it in the semester teaching plan and implemented it according to the schedule. Lecturers complete the teaching plan with handouts and evaluation test questions. Students are given responsibility in their respective groups. Students are allowed to interact to solve problems given by the teacher. Lecturer as a facilitator. The results of group work are then jointly evaluated. The lecturer's teaching strategy is reinforced by the results of previous research, which states that there are three patterns of culturally responsive learning experiences, namely: a) Engage with teachers' cultural knowledge; b) Create strategies for culturally inclusive learning; and c) Develop cultural diversity as an asset (Liao et al., 2021).

Support from leaders is needed in the form of curriculum policies (De Jager, 2019). The results of interviews with policymakers in the study program stated:

> "We have instructed every lecturer to incorporate cultural elements into their classes. Culture is the identity of each student that should not fade. There should be no discriminatory practices in the classroom by teachers or students. We invite lecturers to make plans and learning tools to accommodate the culture of our students."

His support can maintain consistency in the way teachers respond to diversity. Appropriate responses packaged through appropriate strategies will make learning more conducive. Incorporating culture into learning has many benefits. In addition to knowledge, the elements of care and empathy also adorn the classroom. Reorganizing science education study programs can create equitable science learning opportunities for all student (Barron et al., 2021).

Critical Thinking Behavior and Cultured Behavior Awareness

Critical thinking is dominant for prospective science teachers to meet the challenges of the 21st century. Critical thinking behaviour should be instilled earlier in order to habituate behaviour. This research implements CRT and PBL to direct students to critical thinking behaviour. Students are given cultural problems closely related to the habits of friends to solve together. Here students interact, communicate, and explore deeper information.

Observations at meetings 6th, 9th, and 10th showed that lecturers had implemented CRT and PBL comprehensively. Lecturers gave problems to be solved in their respective groups, then asked group representatives to present the results of their discussions to the front of the class. In the sixth meeting, students experienced minimal obstacles when asked to mention and explain examples of the local potential of their respective regions. Each group member took part. Difficulties began to appear at the 9th and 10th meetings, where students received rules related to the topics they would discuss. Not all students mastered the topic; some were even new to it. This difficulty was due to cultural differences across islands. In addition, students have not fully mastered junior high school science materials that can be reconstructed from the culture they find. Hence, the basis for decision-making still needs to be stronger, even though they understand exactly what the teacher has instructed. So that can affect the explanations they will make. They need time to understand the new topic that must be completed. Nevertheless, the lecturer deftly provided scaffolding assistance for students still experiencing obstacles in reconstructing original science into scientific science. Lecturers also do not restrict the references that students will use for discussion.

Based on Figure 3, it is known that the aspects of the ability to maintain the flow of thinking and formulate alternative solutions have a score of 2.71 and 2.92 as the two lowest, respectively. Furthermore, the two highest were achieved by making conclusions and the accuracy of choosing answer references with scores of 3.46 and 3.54, respectively. It is expected that it takes time to adapt when facing something new. The flow of thinking is

often disrupted by pre-existing knowledge. However, the interaction in the group makes students quick in determining the answer reference. Students can accept the differences between them. The average of all aspects is at a score of 3.15 and is still in the good category.

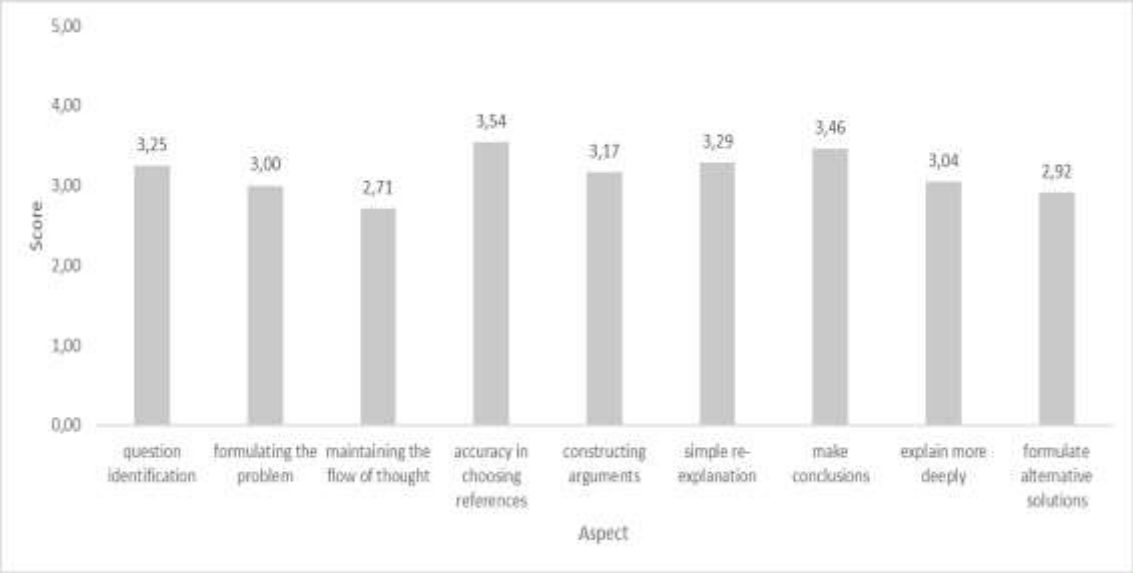

Figure 3. Critical thinking behavior

Interviews with students were conducted based on the grouping of student learning outcome criteria, namely high (X), medium (Y) and low (Z) learning outcome groups.

> X: "The batik colouring process involves many chemicals, often polluting the environment. Batik-making techniques have varied, one of which is the eco-print technique. This technique is much more environmentally friendly, resulting in less beautiful products."
>
> Y: "Reconstructing the process of making spice-based drinks into science is interesting. So far, all I know is boiling or brewing. It turns out that when boiling ingredients, we can learn the extraction process..."
>
> Z: "After hearing an explanation from a friend, I am interested in making traditional herbal medicine because I want to prove its efficacy. If I fail to make it, I will buy it at the store in this area."

The interview results generally provide information that students are interested in learning new things. Interest becomes the gateway to completing the next task. By working in groups, the flow of problem-solving becomes more directed.

Awareness of cultural behaviour is fundamental to working on tasks in teams with diverse backgrounds. Observations showed that the lecturers had readily directed the technical work of the students. This teacher's attention can be seen in the group patterns made by lecturers in class. The results of the interview mentioned that the lecturer made groups consisting of members with different backgrounds with the aim of more intense interaction between students. With problems, the communication that occurs will be more systematic.

Awareness of cultural behaviour can be seen in this study. Communication difficulties have the lowest score, which is 2.46. The problems can occur because the diversity of backgrounds often affects how a person speaks and thinks. According to the basis of group formation, there may be difficulties in conveying and receiving information (score 2.92). However, acceptance of diversity occupies the top position, namely at a score of 4.25. It means the students know different circumstances and do not make differences a problem. The observation results reinforce This acceptance of diversity, which shows no significant obstacles when working in teams. Students can accept culture as a source of learning and are willing to learn for their limitations. Generally, this awareness of cultural behaviour is at an average score of 3.53, with a good category.

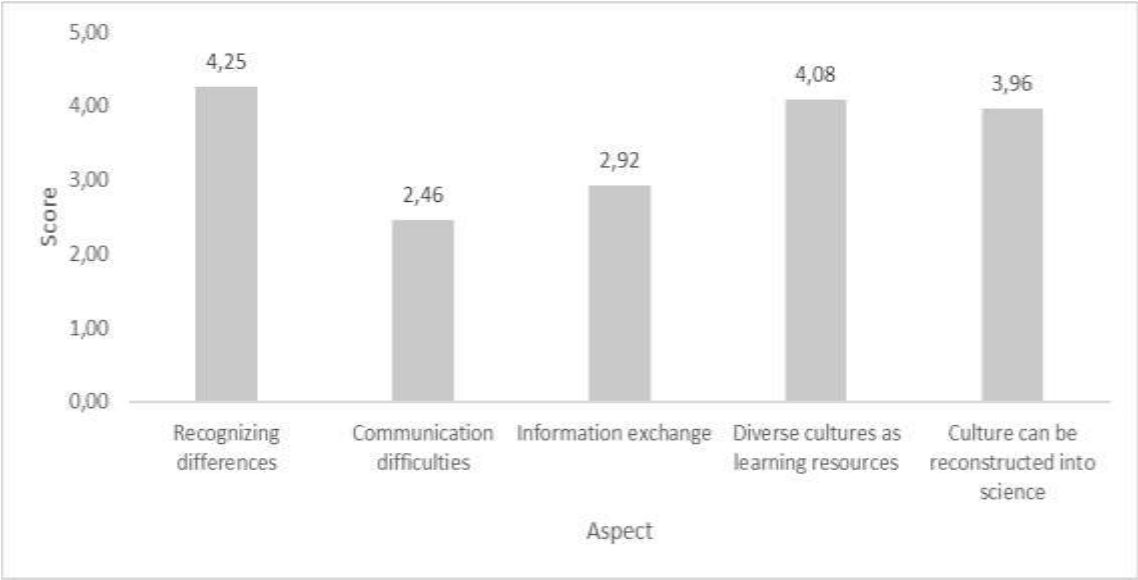

Figure 4. Cultured behavior awareness

Interviews conducted with students provided information that accent and perspective constraints coloured the discussion. However, the students could still exchange information within the work team.

> P: "I felt that the way he spoke was angry (hard) with me, but after talking longer, I found out he was like that. I do not mind that."
>
> Q: "He told me a lot about the customs in his area, one of which was about Kebat cloth from West Kalimantan. The cloth is woven and is a product of the indigenous people, while batik is characterized by the motifs attached to it."

Acceptance of diversity in the group is a form of mature attitude shown by students. Facilitating knowledge construction and reducing prejudice are necessities for communicating with peers (Keinonen & de Jager, 2017).

Interviews with lecturers mentioned that lecturers assign students to specific topics intending to introduce the culture of the people of Java Island to students who come from outside Java Island and for students who come from Java Island to get to know more about the culture. Studying science can be done by studying culture. However, lecturers need to incorporate cultural elements from outside Java Island into their classes to make learning resources more varied. Interviews with the Head of the Study Program also corroborate that learning still has a few cultural elements. Some lecturers have yet to understand culturally responsive learning but have implemented PBL. Thus, the existence of CRT and PBL can be one of the strategy options for lecturers in teaching in the classroom.

CONCLUSION

This study describes how CRT and PBL are implemented in diverse classes. CRT and PBL frameworks have been provided, but one of the determining factors for success lies with the lecturer as the director of classroom practice. Lecturers must start with themselves. First, the lecturer must realize the diversity of his/her class. Lecturers must realize that they have cultural differences with their students. Even though they belong to the majority group, lecturers should be careful in their behaviour and not be discriminatory. Lecturers can make preventive efforts against bad possibilities, for example, by creating heterogeneous class conditions when working in groups. The aims are to minimize the gap between students.

Following are what strategies are appropriate to be applied in the classroom. Lecturers should make careful planning and outline it in the semester learning plan. Lecturers need to complete teaching materials that are culturally charged. It is the right step to place culture as a learning resource. However, lecturers should not place

their background position as the primary study material to give students a more significant opportunity to actualize themselves. Thus, the exploration of culture as a learning resource can run optimally.

Lecturers' efforts to include culture as a problem-based study and use response-based strategies to culture need a policy from the university management, for example, by incorporating cultural elements into the curriculum. Culture will revive the teaching consistency of the lecturers. Class conditions conducive and comfortable for learning are the primary support for achieving learning outcomes.

The implementation of CRT and PBL is considered appropriate for use in the classroom. Both complement each other to realize classroom conditions in order to achieve the learning outcomes that have been formulated. CRT is more inclined to how teachers design culture-based learning, how student differences are seen as commonplace, and with in-depth communication can create a sense of care and compassion. PBL bridges the communication that occurs through a directed and structured group activity. Students indirectly create a flow of thinking in solving problems the lecturer gives.

This study proves that PBL and CRT can jointly direct critical thinking character and awareness of cultural behaviour. The results showed the lowest score on maintaining the flow of thinking, 2.71. However, the overall critical thinking figure was still in the good category. The highest score for cultural behaviour awareness was 4.25 on accepting differences. In general, cultural literacy behaviour in learning and implementing culture is in a good category.

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