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Global Diversity and Academic Outcomes in Culturally Responsive Transformative Teaching

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Abstract: This research aims to reveal the effect of applying the Culturally Responsive Transformative Teaching (CRTT) learning model on students' global diversity character and learning achievement in the cognitive domain of science learning. This study employs a quasi-experimental design with a pretest-posttest control group. The experimental class in this research employed the CRTT learning model, while the control class utilized the discovery learning model. The population consists of class VIII students from State Junior High School (SMPN) 2 Karanganyar for the 2023/2024 academic year, comprising nine classes. Meanwhile, the research sample was selected using a cluster random sampling technique, with Class VIII B as the experimental class and Class VIII A as the control class. The research data were collected through a test, surveys, observations, and interviews. The survey data test results using the Independent T-test showed a sig value. (2-tailed) = 0.018 < 0.05. The N-gain test results from students' cognitive assessment data showed that the N-gain value for the experimental class (0.870) was greater than that for the control class (0.364). This indicates that the application of the CRTT learning model affects students' global diversity character and learning achievement in science.

Keywords: cognitive domain, CRTT, Global diversity character,.

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INTRODUCTION

Education in Indonesia currently faces complex challenges, including shifts in cultural values due to globalization, rapid technological advancements, and the need to prepare the younger generation to compete globally without compromising its national identity. Indonesia, a country with rich cultural diversity, has a significant responsibility to maintain its cultural values and national identity in every aspect of life, including education. In addition to its role in improving academic competence, education also plays a role in shaping students' character. Character education is crucial and mandatory because it has become one of the goals of education as stipulated in the National Education System Law Number 20 of 2003 (Hamdani et al., 2022). Therefore, character education plays a crucial role in maintaining the nation, particularly the morality of Indonesia's younger generation, which currently faces a significant challenge in the form of moral decadence among adolescents of all ages (Sulhan, 2018). Furthermore, rapid technological advancements, socio-cultural shifts, environmental changes, and differences in the future world of work in education also affect educational strategies in Indonesia. One of the Indonesian government's efforts to develop the character of Indonesian students is through the development of the Independent Curriculum. The implementation of this curriculum establishes the Pancasila Student Profile as a policy that supports the realization of national education goals and the continuation of character-building programs (Irawati et al., 2022).

The Pancasila student profile embodies Indonesian students as lifelong learners who possess global competence and behave in accordance with Pancasila values. These six dimensions include: 1)

faith and devotion to God Almighty and noble character, 2) global diversity, 3) cooperation, 4) independence, 5) critical thinking, and 6) creativity (Kahfi, 2022). Through the six dimensions of the Pancasila student profile, it is expected that students will be able to become intelligent and characterful individuals and be able to face the challenges of the 21st century, and of course, consistently instil the values contained in Pancasila as the state philosophy, and ultimately to be able to realize a prosperous and dignified national life as stated in the Constitution 1945.

Global diversity is one dimension of the Pancasila student profile, defined as Indonesian students who maintain their noble culture, locality, and identity, while remaining open-minded in their interactions with other cultures. This fosters mutual respect and the possibility of forming a new, positive culture that aligns with the nation's noble values (Kemendikbudristek, 2022). The Decree of the Head of the Education Standards, Curriculum, and Assessment Agency of the Ministry of Education, Culture, Research, and Technology No. 009/H/KR/2022 states that key elements of the global diversity dimension include: 1) recognizing and appreciating culture, 2) intercultural communication skills in interacting with others, 3) reflection and responsibility for experiences of diversity, and 4) social justice.

Global diversity is becoming increasingly important for Indonesian students, given that Indonesia is a country with diverse religions, ethnicities, races, groups, and cultures, and has entered the era of globalization. Strengthening global diversity insights from an early age is crucial for ensuring students develop their social interaction skills. Students need to develop a global diversity character because it influences their academic achievement, perspective, and behavior (Yulisa et al., 2023). The research conducted by Simanjuntak (2023) shows that students with high diversity values perform better than those with low diversity values. Therefore, a strong global diversity character is also necessary to facilitate learning activities using various models to achieve learning objectives.

A survey conducted in August 2023 at SMPN 2 Karanganyar, using a self-assessment questionnaire on Pancasila student character profiles, revealed that several students with diverse global values still need to improve. This is indicated by scores below the average (67.8) for 54% of students (25 out of 46). Meanwhile, the diagnostic assessment data for the science subject show that the average result of the cognitive aspect assessment is 64. This indicates that there are opportunities for efforts and actions to enhance the global diversity character and learning achievement of SMP N 2 Karanganyar students.

The creation of quality science learning is inseparable from the selection and use of appropriate learning models. Culture-based learning models are crucial for fostering students' socio-emotional well-being, encompassing cultural identity, self-efficacy, and social relationships, which ultimately have a positive impact on students' cultural skills, awareness, literacy, and learning outcomes (Rahmawati et al., 2023). The CRTT learning model is a development of the culturally responsive teaching (CRT) approach, which utilizes students' cultural backgrounds, perspectives, and experiences as effective channels for teaching. The CRRT model was developed by marrying CRT principles with transformative learning (Rahmawati et al., 2023).

The CRTT learning model is designed to: (1) develop students' academic knowledge and its relationship to local culture, (2) enable students to learn to appreciate and empathize with cultural diversity, and (3) empower students as communicative agents for cultural sustainability (Rahmawati et al., 2023). The CRTT learning model is a culture-based learning approach that can be utilized to address cultural shifts resulting from globalization. This model consists of five stages: self-identification, cultural understanding, collaboration, critical reflection, and transformative construction (Rahmawati et al., 2023). The following are some comparisons of the CRTT learning model with other learning models.

Discovery learning is more universal and focuses more on students' direct, independent exploration. However, it does not provide explicit integration into the learning process to emphasize the value of diversity. CRTT, on the other hand, emphasizes not only knowledge transfer but also the strengthening of students' cultural identity and the preservation of cultural heritage. Thus, increasing students' emotional and intellectual involvement and strengthening awareness of local cultural values. Culturally Responsive Transformative Teaching vs. Problem-Based Learning

Culturally Responsive Transformative Teaching (CRTT) emphasizes the integration of students' cultural characteristics and life experiences into the learning process, thereby making academic content more meaningful and engaging (Gay, 2022; Xin et al., 2023). Although problem-based learning (PBL) promotes problem-solving and critical thinking skills through real-world problems (Caires-Hurley et al., 2020), this approach often lacks a multicultural dimension, resulting in less attention to issues of social

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justice and equity. Therefore, CRTT fills this gap by fostering cultural awareness, self-confidence, social cohesion, and a more holistic approach to education in multicultural environments.

This study examines the impact of the CRTT learning model on the global diversity character and learning achievement of students at SMP N 2 Karanganyar in science classes focusing on vibrations and waves. This material has the potential to utilize learning resources from cultures in Central Java. This study offers significant novelty in the context of developing a global diversity character, one of the dimensions of the Pancasila student profile. Through the application of the CRTT learning model to science learning in junior high school on vibrations and waves, this study contributes to the development of culture-based learning models and valuable information regarding the effect of the CRTT model on students' global diversity character and learning achievement.

Karanganyar is a regency located in Central Java Province, Indonesia, situated on the slope of Mount Lawu. This area is renowned for its stunning natural scenery and rich cultural heritage, featuring notable sites such as Sukuh Temple and Cetho Temple. Furthermore, Karanganyar is rich in Javanese cultural heritage, such as gamelan music. This provides a significant opportunity to integrate local cultural elements into education. SMP Negeri 2 Karanganyar is one of the public junior high schools in Karanganyar Regency. This school is accredited A and has implemented the Independent Curriculum, which allows for the implementation of learning models such as Culturally Responsive Transformative Teaching (CRTT). The selection of SMP Negeri 2 Karanganyar as the research location was based on the following considerations.

SMP Negeri 2 Karanganyar has students from diverse cultural backgrounds, providing an opportunity to examine the effectiveness of Culturally Relevant Teaching and Training (CRTT) in creating inclusive and meaningful learning experiences for all students. The surrounding environment, which is rich in Javanese cultural heritage, particularly traditions such as gamelan, offers authentic resources to be integrated into culture-based learning, for instance through the use of traditional musical instruments and the Javanese language in the teaching process. In addition, SMP Negeri 2 Karanganyar demonstrates a strong commitment to the Independent Curriculum by showing flexibility and openness in adopting it. This makes the school a representative place for developing and implementing teaching models that are tailored to students' needs, including the application of CRTT. This research was conducted by utilizing local cultural potential to prove that cultural integration in teaching can create more relevant, inclusive, and practical education.

METHOD

Research Setting

This research was conducted at SMP N 2 Karanganyar during the 2023/2024 academic year, from December 2023 to January 2024. This research used a mixed-methods explanatory sequential design to determine the effect of implementing learning models on predetermined dependent variables. The dependent variables were global diversity character and learning achievement. The independent variable was the implementation of the CRTT learning model.

The population of this study consisted of all eighth-grade students at SMP Negeri 2 Karanganyar during the 2023/2024 academic year, comprising nine classes in the even semester. Of the nine classes, two homogeneous classes were established as the research sample using the cluster random sampling technique, a probability sampling technique. With this technique, all members have an equal chance of being sampled, not as individual students but as a group. The two classes were divided into a control class (VIII A) comprising 28 students and an experimental class (VIII B) comprising 32 students. Although there are differences in the number of students in the two sampled classes, this does not directly affect the validity of the results from the pretest, posttest, and student learning achievement. This has been confirmed by the results of the Levene test, which indicate that the variance between the two classes is homogeneous, meaning that the distribution of data in the two classes is not significantly different. In other words, although there is a slight difference in the number of students, the data obtained from the two classes have the same level of variability, so they can be considered equivalent for further analysis purposes. In the experimental class, treatment was administered, specifically the application of the CRTT learning model. In contrast, the control class employed the discovery learning model, as is typically used by teachers at the school.

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Research Instrument

This study utilized four instruments that have been validated by two experts. The first instrument was a global diversity character questionnaire, consisting of 14 statements that asked for agreement or disagreement. The statements included in the questionnaire are based on elements related to the global diversity dimension, as defined by the Ministry of Education, Culture, Research, and Technology. This questionnaire was used to obtain pretest and posttest score data. The questionnaire used was previously tested and declared valid and reliable based on analysis using the Rasch model. The pretest and posttest scores obtained were then used to obtain the average score between the two classes. The second instrument was a cognitive assessment consisting of five multiple-choice questions, which were tailored to the learning objectives of the vibration and wave material. The third instrument was an observation sheet for the implementation of teacher and student activities that functioned to obtain supporting data on the application of each syntax of each learning model in the control class and the experimental class. This instrument showed evidence of the application of the CRTT learning model in this study. The fourth instrument was an interview guide used to strengthen the questionnaire results, consisting of 11 questions. Nine students from each class were interviewed, categorized by high, medium, and low questionnaire scores.

Data Analysis

In data analysis, an independent t-test was used to determine whether or not there was a significant difference between the means of the two groups. This test was administered to students after they had undergone prerequisite tests, such as normality and homogeneity. The N-gain test was used for data obtained from cognitive assessments. Observation and interview results were analyzed using the qualitative data analysis technique by Miles and Huberman, which consisted of three stages: data reduction, data presentation, and conclusion drawing.

Research Procedure

The research began with school observations to identify existing problems. Next, proposals and permits were developed. Instruments were then created and validated. Samples were then taken, and the learning model was implemented in each class. Prior to the teaching, a pretest was administered to measure students' initial understanding of global diversity. The CRTT learning model was implemented in the experimental class, and the discovery learning model was implemented in the control class, both face-to-face, covering topics such as vibrations and waves. After the learning was completed, a post-test was administered to measure global diversity characteristics following the application of the two teaching models. Cognitive assessments were also conducted at each session to determine student achievement. Final conclusions were drawn based on the analysis of the data.

RESULT AND DISCUSSION

The implementation of learning activities demonstrated the implementation of the science learning model for vibrations and waves in accordance with the CRTT syntax. This model provides students with opportunities to develop self-understanding regarding character and cultural identity through its five syntaxes: 1) self-identification, 2) cultural understanding, 3) collaboration, 4) critical reflection, and 5) transformative construction (Rahmawati et al., 2023).

1. Self-Identification

This syntax is the initial stage of understanding student identity and characteristics before entering the core learning, and is intended to ensure that learning is tailored to students' needs. Teachers can seek information about students' backgrounds and learning style characteristics and provide students with opportunities to understand their own characteristics through reflective journals (Rahmawati et al., 2019).

2. Cultural Understanding

By applying the principle of content integration, students are facilitated in understanding their culture at this stage by reading ethnoscience texts and seeking information from various sources, including assignments that require them to discuss their family's cultural background with their families.

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3. Collaboration

At this stage, the teacher assigns discussion, debate, or project assignments based on ethnoscience articles, allowing students to collaborate based on the type of assignment given. Collaboration at this stage is based on social constructivism. It aims to help students develop an appreciation for the value of cooperation and a sense of acceptance of cultural and other differences (Rahmawati et al., 2023).

4. Critical Reflective Thinking

At this stage, the teacher facilitates the development of each student's unique thinking skills. Students are asked to engage in reflection and critical thinking on problems or issues presented through discussion or debate.

5. Transformative Construction

At this final stage, students construct their understanding and critically reflect on their values based on their CRTT learning experiences (Rahmawati et al., 2023)

Table 1 below presents the syntax matrix of the CRTT learning model for global diversity characteristics.

Table 1. Syntax Matrix of the CRTT Learning Model for Global Diversity Characters

CRTT Stages	Students' Activities	Global Diversity Elements Trained
Self-identification	Students are allowed to understand their own characteristics.	Understanding and appreciating culture
Cultural understanding	Students are facilitated to understand their culture by researching various sources.	Understanding and appreciating culture
Collaboration	Students discuss ethnochemistry articles in their groups.	Intercultural communication skills in interacting with others and achieving social justice
Critical reflection	Students reflect and think critically about the issues presented through discussions and debates.	Social justice
Transformative construction	Students construct understanding and values based on the experiences provided	Reflection and responsibility on the experiences of diversity

The four elements of the global diversity character served as guidelines for developing the questionnaire used as an instrument in this study. The questionnaire consisted of 14 statements of agreement, with each element represented by a specific number of statements. The questionnaire was declared valid based on analysis using the Rasch model. Table 2 below explains the number and content of statements representing each element.

Table 2. Number and Content of Statements in the Global Diversity Questionnaire

Global Diversity Elements	Number of Statements	Content of Question
Understanding and appreciating culture	5	Cultural change in Indonesia is a key aspect of the country's adaptation to global demands.
Intercultural communication and interaction		I am proud to be a citizen of Indonesia, a nation with its rich and diverse cultures.
Reflecting on and taking responsibility for experiences of diversity		I believe that Indonesian culture evolved due to the influence of religion and beliefs, as well as its rich history.
		I understand that preserving culture can help me better adapt to my living environment.
		Foreign culture does not influence the communication or language styles of Indonesians.
Social justice	1	I express my opinions based on correct and logical information from various perspectives.
Understanding and appreciating culture	4	I prefer to recognize my own mistakes so that I can be more helpful to others. When meeting strangers, I am always alert, yet I still think well of them. In society, positive and cautious thinking must be adapted to the conditions/environment in which we find ourselves.
Intercultural communication and interaction		

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Reflecting on and taking responsibility for experiences of diversity	4	When working in groups, I always respect and accept the group's opinions obtained through collective deliberation. I often think of solutions for people, animals, and plants that are not being adequately cared for. Thinking about solutions to problems related to justice for people, animals, and plants is not my responsibility. I always express opinions that align with the issues being discussed openly in group deliberations. I defend group members who are not allowed to express their opinions. Cultural change in Indonesia is a key aspect of the country's adaptation to global demands. I am proud to be a citizen of Indonesia, a nation with its rich and diverse cultures.

Research data from a survey using a questionnaire on students' global diversity character in the experimental and control classes in the science lesson on vibrations and waves was collected during the pretest and posttest. The questionnaire is a five-point scale with options ranging from "strongly agree" to "strongly disagree." The obtained data were then converted using points 5, 4, 3, 2, and 1, followed by transforming the ordinal data into interval data using the Method of Successive Intervals (MSI). The obtained data played a role in assessing improvements or changes in student grades. A statistical description of the research data is presented in Table 3.

Table 3. Statistical Description of Pretest and Posttest Scores on Global Diversity in the Experimental and Control Classes

Description	Experimental Class		Control Class	
	Pretest	Postest	Pretest	Postest
Average Score	43.84	45.20	42.66	41.40
Highest Score	56.27	54.97	52.60	51.01
Lowest Score	34.12	33.65	30.41	25.77
Range	22.14	21.32	22.19	25.23
Standard Deviation	5.98	5.91	6.29	6.20
Variant	35.80	34.94	39.60	38.40

Table 3 presents descriptive analysis, indicating differences in pretest and posttest scores for global diversity character between the experimental and control classes. Specifically, the posttest results in the experimental class are higher than those in the control class. Furthermore, differences in students' global diversity character can be seen through a comparison of achievement in each element of global diversity, as shown in Figures 1.

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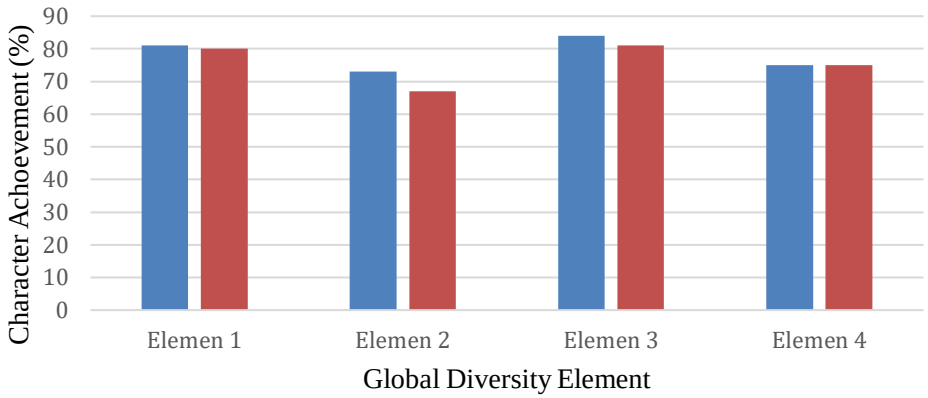

Figure 1. Achievement of Global Diversity Character in the Control Class

Figure 1 shows that no improvement is found in any element of global diversity in the control class based on the pretest-posttest results. Meanwhile, Figure 2 shows that in the experimental class, there is improvement in the elements of cultural awareness and appreciation, intercultural communication and interaction skills, and social justice, based on the pretest-posttest results in the experimental class.

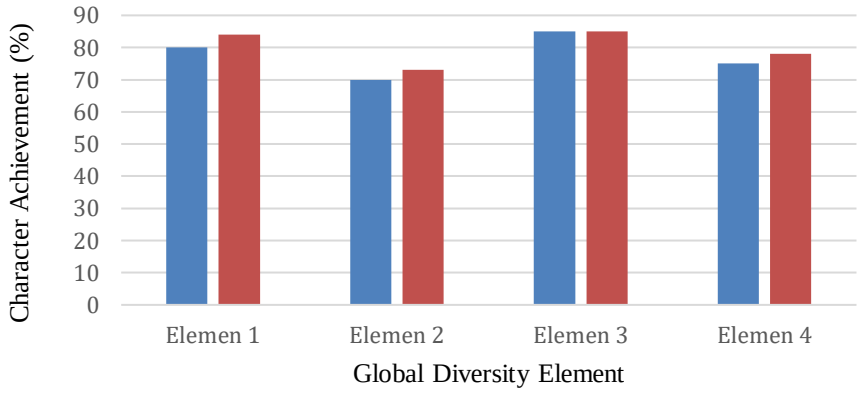

Figure 2. Achievement of Global Diversity Character in the Experimental Class

Observations indicate that each control and experimental class (as seen from teacher and student activities) implemented learning with their own syntax. The CRTT model syntax was applied in the experimental class, and the Discovery Learning model syntax was applied in the control class. Interview results support and strengthen the questionnaire results, as they concluded that students in the experimental class acknowledged that the CRTT learning model had improved elements of global diversity. Accounts from the control and experimental classes also indicate that students completed the questionnaires seriously and in accordance with their conditions and experiences. Next, the questionnaire data were subjected to a series of tests to verify the research hypothesis, specifically the effect of the independent variable on the dependent variable. The tests began with prerequisite tests and continued with hypothesis tests using independent t-tests.

Pre-requisite Test

The normality of the data in this study was determined using the Kolmogorov-Smirnov test in SPSS 25. This test was conducted on two data groups (pretest and posttest) of the global diversity character of the students in both classes. The test results showed a significant value of 0.060 for the pretest in the control class (normal) and 0.200 for the experimental class (standard). The posttest scores for the control class were 0.184 (normal), and those for the experimental class were 0.200 (normal). Based on the applicable provisions (sig. > 0.05), it is known that both groups of data in each control and experimental class were normally distributed, both in terms of pretest and posttest scores.

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Homogeneity Test

The homogeneity of the data in this study was confirmed using Levene's test in SPSS 25. The homogeneity test for the pretest score was 0.391, and for the posttest score was 0.993. Both were considered homogeneous because the final scores exceeded 0.05 ($\alpha \geq 0.05$).

Independent T-Test

The independent t-test was used to evaluate the effect of the treatment by comparing the average of the two groups: the experimental group and the control group. In this study, the experimental class used the CRTT model, while the control class used the discovery learning model. Data processing for the independent t-test was assisted by SPSS 25. The results of the independent t-test are presented in Table 4.

Table 4. Independent T-Test Result

α	Sig. (2-tailed)	Result
0.05	0.018	H_0 rejected

Based on the results of the independent t-test, a sig (2-tailed) value of 0.018 was obtained, which is smaller than the significance level of $\alpha = 0.05$. Therefore, H0 is rejected, indicating a significant difference in the average scores between the control and experimental groups in students' global diversity character. This suggests that the implementation of the CRTT learning model has the potential to influence student character in the context of vibration and wave materials. The cognitive assessment results for the five multiple-choice questions were obtained by summing the scores, each with a maximum score of 20. The results of the cognitive assessments for the experimental and control classes at the first and second meetings are presented in Table 5.

Table 5. Cognitive Assessment Result

Class	Meeting	Average Score of Cognitive Assessment
Experimental Class	1	53
	2	93
Control Class	1	65
	2	79

Further details regarding the distribution of students' levels of understanding of the cognitive aspects of each question are presented in Table 6. The average cognitive assessment results of the first and second meetings in the experimental class showed a greater increase compared to the control class, as shown in Table 5. This is in line with the increase in global diversity characters in Table 3, where the experimental class outperformed the control class. Further elaboration of the cognitive aspects presented in Table 6 reveals that Questions 1, 2, and 3 are classified as the ability to explain, while Questions 4 and 5 are categorized under the ability to understand. Table 5 shows that the percentage of correct answers in the experimental class in the realm of explaining and understanding is higher than in the control class. The global diversity of characters mastered by students worldwide can support them in facilitating the learning activities they undertake and help achieve learning objectives through a variety of activities. This character helps overcome passive students, the tendency to form circles, individualism, and low academic performance. The ability to appreciate, communicate, interact, be responsible, and be fair fosters students who are generous and intelligent in receiving learning. Therefore, the global diversity character not only affects students' social interactions, but also contributes to improving learning outcomes by creating a supportive, safe, and comfortable learning environment, honing fair collaboration skills, encouraging effective communication and mutual respect, and developing empathy and deep understanding.

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Table 6. Distribution of Students' Level of Understanding in the Cognitive Aspect

Quest. No	Applied Teaching Model	Number of Students with Right Answers	Number of Students with Wrong Answers	Percentage of Students with Right Answers (%)
1	Discovery Learning	28	0	100
	CRTT	31	1	97
2	Discovery Learning	26	2	93
	CRTT	29	3	91
3	Discovery Learning	12	16	43
	CRTT	29	3	91
4	Discovery Learning	25	3	90
	CRTT	31	1	97
5	Discovery Learning	21	7	75
	CRTT	29	3	91

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Table 7. N-Gain Test Result

Class	N-Gain	Criteria
Experimental	0.870	High
Control	0.364	Medium

The N-gain value of the CRTT learning model was 0.870, categorized as high, while the class using the discovery learning model achieved a value of 0.3642, categorized as medium. These data indicate that Class B, the experimental class, outperformed Class A, the control class, in terms of its relationship to cognitive learning outcomes. Based on the data obtained in this study, science learning using the CRTT model has a significant impact on students' global diversity character and learning achievement. Learning using the CRTT model significantly improves students' global diversity character and learning achievement in the cognitive aspect compared to the discovery learning model. This can be observed in the differences in the average scores of the global diversity character questionnaires between the control and experimental classes, their achievement of each element of global diversity character, and the percentage of students who answered correctly on the cognitive aspect assessment questions. In addition, the questions asked in the interview focused on students' impressions and messages during the learning process and how they influenced their mastery of elements of global

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diversity. The interview results showed that each class was happy because they had learned something new. However, for the mastery of elements of global diversity, it was acknowledged that the application of the CRTT model was more facilitated. The experimental class that implemented the CRTT learning model incorporated learning that emphasized multicultural values. This CRTT learning model was developed based on the Culturally Responsive Teaching (CRT) approach, which incorporates student characteristics and cultural backgrounds into all aspects of learning, within a transformative learning framework (Rahmawati et al., 2019). The presence of student activities that recognize and integrate students' diverse identities and cultural experiences in this learning activity is expected to have a positive impact on increasing student motivation and learning performance (Chou et al., 2018). More clearly, Munawaroh (2023) explains that the lack of learning that promotes an understanding of global diversity is one of the factors contributing to the low awareness of global diversity among students. The following is a further explanation of each element of the global diversity dimension:

1. Elements of recognizing and appreciating culture

This element is clearly facilitated by the CRTT model, particularly in the syntax of self-identification and cultural understanding. As in the learning conducted in the experimental class, students have the opportunity to identify and appreciate the culture around them through reflective journal entries and also have the opportunity to understand their culture from various sources through assignments. However, in the discovery learning model, there is not yet a clear and explicit integration of culture into the learning components. This aligns with Sabanil (2022), who states that one strategy teachers can employ to foster elements of recognizing and appreciating culture is to encourage students to collect various literature related to Indonesian culture online. The implementation of the CRTT learning model is one strategy for integrating culture into the learning process. It can play a role in providing space for the development of students' socio-emotional well-being, encompassing cultural identity, self-efficacy, and social relationships (Rahmawati et al., 2023). This also proves that local wisdom applied in the learning process can be a form of introduction to regional culture as well as character education for students, so that they better understand that we are diverse and must uphold local culture, and of course, with the global diversity character (Syafaah et al., 2023).

2. Elements of Intercultural Communication and Interaction Skills

The CRTT model facilitates students' practice of intercultural communication and interaction skills through group discussions and debates centered on cultural examples discussed within each group. The use of the CRTT model in the experimental class demonstrated that students actively communicated while working on group assignments, engaging in discussions, and responding to one another during debates on various cultures discussed within each group. One strategy teachers can employ to foster elements of intercultural communication and interaction is by inviting students to participate in group discussions (Sabanil et al., 2022). Debates, on the other hand, can encourage students to express their opinions, deepen their knowledge, develop critical thinking skills, explore multiple perspectives, and collaborate among group members (Rahmawati et al., 2023). The ability to speak, think critically, listen to others' arguments, and respond effectively is well-honed in debates.

Transformative teaching will accommodate students to demonstrate active engagement by negotiating or exploring new relationships or roles, planning actions, and expressing their opinions about solutions in life (Aboytes & Barth, 2020). The teaching that is closely related to students' cultural backgrounds not only improves intercultural competence but can also have a long-term impact on students' overall personal development (Liao & Li, 2023, p. 2). Culturally responsive teaching can help students hone their ability to express opinions, facilitate social interactions through the exchange of cultural information, and respect diversity (Rahmawati et al., 2023).

3. Elements of reflection and responsibility for diversity experiences

The teaching that uses the CRTT and discovery learning models has not shown any improvement in the elements of reflection and responsibility for diversity. However, achievement of these elements in the experimental class was higher compared to the control class. A limitation of this study was the inability to implement reflection activities due to time constraints, resulting in brief reflection sessions. Furthermore, the researcher continued to conduct reflection activities during the experimental class. As explained by Rahmawati et al (2023), the fourth syntax of the CRTT learning model is critical reflective thinking. Reflection can take the form of teacher reinforcement of student discussion responses (Surayya et al., 2024). This suggests that reflection activities are integrated into a series of learning activities. Through this process, students can take responsibility for the expressions, emotions, narratives, and

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thoughts they express during the learning process. Teachers' encouragement of students to draw conclusions can help students take responsibility for understanding the summary results of their learning (Surayya et al., 2024). Furthermore, group learning in both the experimental and control classes plays a role in fostering responsibility. Group work can train students to be responsible for their tasks and instill the values of collaboration in completing group assignments (Hayati & Utomo, 2022). Responsibility is evident in students' activities, including completing assigned tasks, following teacher instructions, and engaging in useful activities (Syafaah et al., 2023).

4. Elements of social justice

The essence of justice is ensuring that all individuals, regardless of race, gender, ability, or other qualities, have equal access to the means to achieve their maximum goals (Seijts & Milani, 2022). The CRTT learning model facilitates mastery of this element, as evidenced by the presence of learning activities that promote this element, such as collaborative syntax and critical reflective thinking, or group discussions and debates between groups using topics that exemplify different cultural perspectives. This is supported by teachers' behavior in exemplifying fairness to all students, as evidenced by providing opportunities for each group to express their opinions. Students are taught to respect the rights of others, including those with different identities, and are therefore able to behave reasonably in social settings. This is as explained by Seijts & Milani (2022), who state that people with a strong sense of justice strive to ensure that others are treated fairly, while remaining objective and minimizing personal bias. The implementation of the CRTT learning model plays a crucial role in enhancing student solidarity, which is part of improving students' social competence (Rahmawati et al., 2023).

Other factors that affect the mastery of this dimension of global diversity, some of which have been discovered by researchers, include a lack of self-confidence in students, which makes them shy and unable to openly express their opinions during learning activities, especially when interacting with researchers who are new to the participants. Students are also encouraged to have observers in the classroom, making them feel as if they are being watched during learning. This is in line with the results of research conducted by Sabanil (2022), which found that low student self-confidence was one of the factors inhibiting the development of students' global diversity characters. Furthermore, leadership skills in assigning roles in group assignments are a crucial factor in supporting collaborative activities among students. As explained by Seijts & Milani (2022), the absence of trust or information sharing, a deep sense of individualism, and individuals who are not leaders or only think of themselves will hinder the growth of collaboration. It was also found that class conditions and friendships in the class contributed to this. The expression of one of the students in the experimental class showed that, lately, many male friends had been found to like insulting. This is the right moment to use as an opportunity for learning and improvement, where yesterday's debate can train us all to respect our friends. The classroom and school environment are the most intimate settings for students, which are intended to serve as catalysts for enhancing students' global competence (Wu & Zhang, 2024).

Another factor is the family background that supports the introduction of the local culture, resulting in some students who are very interested in and knowledgeable about that culture, and their parents facilitate their participation in additional activities. A family's social and economic status is crucial in shaping students' global competencies (Wu & Zhang, 2024). It is further explained that a family's social and economic status is a combination of parental education, occupation, and home ownership. Parents with higher levels of education tend to exhibit more positive parenting practices that foster global citizenship (Wu & Zhang, 2024). Interviews also revealed that some students admitted that they were the ones in their families who had long disliked the culture. As explained by Myers-Walls & Somlai (2019), the way families convey information and worldviews to their children significantly affects their children's perceptions.

CONCLUSION

Based on the data obtained during the research and the analysis, it can be concluded that the application of the CRTT learning model has an effect on students' global diversity character and learning achievement in the cognitive aspect. These results are seen from the analysis of the independent t-test on the global diversity questionnaire data, which shows a significant (2-tailed) p-value = 0.018 < 0.05. The results of the N-gain test from the cognitive assessment data indicate that the N-gain value of the experimental class (0.870) is greater than that of the control class (0.364). The results of observations

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and interviews strengthen the analysis of the questionnaire data, which shows that the CRTT learning model facilitates and improves elements of global diversity. This research is limited by several factors, including the researcher's ability. Therefore, it is recommended that further research be conducted more broadly using different materials, but still focusing on junior high school science subjects, and minimizing external effects that can impact the students' character and competence.

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