Exploring Culturally Responsive Teaching in Online Learning Practices and Challenges among Pre-service Teachers

Bertha N. Silitonga[1*] , Kimura P. Tamba[2] , and
Graciella Opit[3]

[1,2,3] Pelita Harapan University, Tangerang 15811, Indonesia
[1]*bertha.silitonga@uph.edu

Abstract. The digital era is increasingly stimulating student differences in terms of culture, language, race, and background knowledge. This happens because students from various backgrounds can access the same class with the help of technology. In this context, education must be concerned with inclusivity, equality, and diversity. Culturally Responsive Teaching encourages educators, including pre-service teachers, to design learning by seeing diversity as a strength, not a barrier. Meanwhile, learning in the digital era is claimed to be able to provide a more inclusive learning experience through personalized learning. This study aims to explore culturally responsive teaching practices in online learning conducted by pre-service teachers. The research method used is descriptive qualitative research involving 265 pre-service teachers. Data was collected from the portfolio document of the pre-service teacher's teaching implementation in the form of lesson plans, assessment documents, and self-reflection. The documents are analyzed qualitatively using the theoretical coding method. The results show that pre-service teachers use various strategies to get to know their students and build effective communication. Pre-service teachers also seek to make significant and contextual learning. However, several features of Culturally Responsive Teaching, including incorporating student culture into the curriculum and helping students question hegemony have not appeared yet.

Keywords: Culturally Responsive Teaching, Culture, Pre-service Teachers, Online Learning.

1   Introduction

The digital era has made a significant contribution to increasing student diversity [1] This happens because students from various backgrounds can access the same class with the help of technology [2]. Digital technologies allow students from different places to meet and come together virtually. They can use platforms such as video conferencing, online forums, or other collaborative tools to share their ideas, thoughts, and experiences. It becomes possible for students to interact with people from different cultural backgrounds.

In the context of online learning, students are expected to learn to accept and respect diversity [3], [4]. Students are expected to work together and build important social skills in learning activities [5], [6]. Thus, learning designed by the teacher must take inclusivity, equality, and diversity among students into account [7]–[9]. Thus, learning designed by the teacher must take inclusivity, equality, and diversity among students into account [7]–[10]. To maximize the benefits of the digital era in increasing student diversity, stakeholders in education need to ensure equal access to technology, provide the necessary training and support for students and teachers, and integrate an inclusive approach to curriculum design and use of technology [8].

On the other hand, learning in the digital era is claimed to be able to provide a more inclusive learning experience through personalized learning where teachers can adjust learning methods to meet the individual needs of each student [11], [12]. For example, students with learning difficulties may be provided with additional resources, audio or visual support, or different learning methods. In the context of student diversity, personalized learning can be achieved through culturally responsive teaching designs [13].

Culturally Responsive Teaching (CRT) encourages educators, especially pre-service teachers, to design learning by interpreting student diversity as a strength rather than an obstacle [14]. Personalized learning design can be done by implementing the model of culturally responsive teaching proposed by Hernandez et al. [12] contains five thematic categories: (1) content integration, (2) facilitating knowledge construction, (3) prejudice reduction, (4) social justice, and (5) academic development. These five categories are interrelated, and they all contribute to creating a culturally responsive classroom. When teachers implement these strategies, they are creating a learning environment where all students feel valued, respected, and included.

The first category "Content integration" requires using examples and content that are relevant to students' cultures and experiences. This can be done by incorporating literature, art, music, and other artifacts from diverse cultures into the curriculum [12], [15]. It can also be done by using real-world examples that are relevant to students' lives [12], [16]. A teacher could teach a unit on the Civic subject by using primary sources from different cultures, such as speeches, songs, and artwork. They could also bring in guest speakers from different cultures to share their experiences with the students.

The second one, "Facilitating knowledge construction" involves creating a learning environment where students are actively engaged in constructing their knowledge [12]. This can be done by using inquiry-based learning, problem-based learning, and other active learning strategies. It can also be done by providing students with opportunities to share their ideas and perspectives [12], [17]. A teacher could have students work in small groups to research a topic related to their culture. The students could then present their findings to the class and discuss how the topic relates to their own lives.

The third category "Prejudice reduction" focuses on helping students to understand and challenge stereotypes and biases. This can be done by explicitly discussing issues of race, ethnicity, and culture in the classroom. It can also be done by using role-playing, simulations, and other activities that help students see the world from differ-

ent perspectives. A teacher could have students read a book about a character who experiences discrimination. The students could then discuss the book and how it made them feel [17]. They could also write letters to the characters in the book to offer their support.

The fourth category "Social justice" embraces teaching students about the importance of social justice and equity. This can be done by discussing issues of social justice in the classroom, such as poverty, discrimination, and inequality [13]. It can also be done by encouraging students to take action to address these issues. A teacher could have students research a social justice issue that is important to them. The students could then create a presentation or write a letter to their elected officials about the issue.

Lastly, "Academic development" includes ensuring that all students have the opportunity to succeed academically. This can be done by providing students with high-quality instruction, challenging them academically, and providing them with the support they need to succeed. A teacher could provide students with extra help during after-school tutoring sessions. They could also create a study group for students who are struggling in a particular subject.

Several studies have analyzed the implementation of CRT in online learning settings. Research on secondary online teachers [18] showed that CRT practices in online learning include caring, communication, curriculum, and instruction. Secondary online teachers engaged in frequent and ongoing dialogue with their students, but some CRT characteristics, such as infusing students' cultures into the curriculum, have not emerged yet. Another study conducted by Mc Dermott [19] in the context of higher education revealed that although faculty members were aware of the diverse learning needs of their students, culture was not considered either in the design or the teaching phase. Another study on CRT in online learning settings can be found in a book titled "A Collection of Innovative Research" edited by Kyei-Blankson et al. [20]. This collection of research shows innovative studies on the incorporation of culturally sensitive teaching practices in online classrooms and their impact on student learning. From the various studies mentioned above, it is evident that there has been no specific research focused on examining CRT practices in the context of online learning for pre-service teachers. However, investigating CRT practices in online learning settings for pre-service teachers is crucial for their preparation and to prevent misconceptions about CRT concepts and practices [21]–[23]. Therefore, there is still a lack of research on CRT practices in online learning settings for pre-service teachers.

Hence, this study aims to analyze CRT practices in the context of online learning for pre-service teachers. This research focuses on the following questions: 1) What does culturally responsive teaching among pre-service teachers look like? and 2) What are the characteristics and behaviors that culturally responsive pre-service teachers demonstrate in practice? Thus, this study aims to explore the practice of culturally responsive teaching in online learning conducted by pre-service teachers by using the five categories and sub-categories of the model.

2   Method

This research is qualitative research with a descriptive design. This design was chosen because the research aims to describe CRT practices in online learning conducted by pre-service teachers. This research was conducted at the Faculty of Education, Pelita Harapan University. The research method used is descriptive qualitative research. This study involved 265 pre-service teachers who had practiced teaching in a field experience programme (PPL programme) in Juli-August 2022, as detailed in Table 1. During the PPL each participant conducts a minimum of 10 teaching practices. Pre-service teachers compiled a reflection journal regarding the implementation of the teaching practice. The data in this study were obtained from the pre-service teacher's reflection journal documents. The reflection journal is compiled by pre-service teachers based on according to several guiding questions related to teaching practices.

Table 1. Participants

Study Programs	Female	Male	Total
Primary Teacher Education	56	13	69
Mathematics Education	26	6	32
Biology Education	23	3	26
Chemistry Education	8	7	15
Physics Education	14	7	21
Economics Education	18	8	26
Social Education	14	7	21
Christian Education	14	3	17
English Language Education	12	4	16
Indonesian Language Education	16	6	22
Total	201	64	265

Data were analyzed by coding. The coding technique used is theoretical coding. This technique is used because researchers want to use a theoretical framework regarding the model of applying CRT in learning as a coding theme. The theoretical framework of the CRT application model is taken from Hernandez et al. [12] which propose a CRT model with five thematic categories: (1) content integration, (2) facilitating knowledge construction, (3) prejudice reduction, (4) social justice, and (5) academic development. Each of these themes is further divided into sub-themes. The description of the theme framework used is shown in Figure 1.

Content Inclusion		
The inclusion of content from other cultures	**The fostering of positive teacher-student relationships**	**Holding high expectations**
• Incorporating information and/or examples from different cultures. • Making connections to students' everyday lives. • Relating teacher background to their CLD students through language and similarities in home culture.	• Building of positive student-teacher relationships • Building of a safe learning environment to participate in classroom discussions without fear of reprisals or negative comments from the teacher.	• Holding high expectations for all students in the science and math classroom. • Identifying the importance of high expectations in helping the students to achieve academically as well as socially.
Facilitating Knowledge Construction		
Build on what the students know	**"Real world" examples**	**Assist students in learning to be critical, independent thinkers who are open to other ways of knowing**
• Demonstrating the ability to build on students' background/ prior knowledge as a means to making science and math concepts accessible.	• Using 'real world' examples during science and math lessons, especially when introducing new concepts.	• Assisting students in effective communication. • Motivating students to desire to learn and think independently.
Prejudice Reduction		
The use of native language support	**Positive student-student interactions**	**Safe learning environment**
• Using native language support for ELL students. • Communicating with parents in the native language.	• Fostering positive student-student interactions.	• Creating a safe environment.
Social Justice		
The teacher's willingness to act as agents of change	**Encouraging their students to question and/or challenge the status quo in order to aid them in the development of sociopolitical or critical consciousness accomplished through *modeling***	
• Advocating for students; act as agents of change.	• Encouraging students to question and/or challenge the status quo. • Assisting students in becoming good citizens.	
Academic Development		
The teacher's ability to create opportunities in the classroom that aid all students in developing as learners to achieve academic success	**The use of research-based instructional strategies that reflect the needs of a diversity of backgrounds and learning styles**	
• Using a variety of methods to create learning opportunities. • Using visuals, grouping, and hands-on or manipulatives during instruction in order to assist their students in meeting the objectives of the science and math lessons. • Using modeling to illustrate difficult science and math concepts.	• Using the sheltered instruction model as well as the SIOP model. • Using real world models such as rocks, plants, clocks, etc. when introducing new or difficult concepts in science and math lessons. • Using whole and small group collaborations.	

Fig. 1. Coding Framework[12].

Therefore, the coding themes used in analyzing the data are the five categorical themes. Each theme will be given a scale of 0 and 1, where a value of 1 means that the reflection journal contains that theme and 0 otherwise. The coding process was carried out by a third researcher (third author). Coding result validation was carried out by randomly selecting 10 coding results, and then the first and second researchers

(first and second authors) conducted a review to see whether the coding results matched the framework that had been used. After the coding process is complete, the frequency of the five themes is calculated to get a description of the CRT model carried out by pre-service teachers in online learning.

3   Results and Discussion

The results of the research are presented based on the theme of the CRT model category used as coding in analyzing pre-service teacher reflection journals regarding the implementation of learning. Table 2 shows an example of coding results in the pre-service teacher's reflection journal. The results of Indah's reflection journal (not her real name) in Table 2 are categorized under the theme of "academic development". This category was chosen because, in this reflection journal, pre-service teachers provide support in the form of guidance and feedback so that students can achieve enduring understanding. In the category of "academic development", the results of this reflection are categorized in the sub-theme "The teacher's ability to create opportunities in the classroom that aid all students in developing as learners to achieve academic success". This sub-theme was chosen because the reflection results show the ability of pre-service teachers to create opportunities in the form of "providing various questions, activities, and discussions", "providing feedback", and "providing guidance".

Table 2. Example of Coding Results

Reflection Journal	Theme	Sub Theme
This is so that the knowledge they acquire can be applied according to the needs of the 21st century through a lifelong understanding. I encourage students to do this by guiding them in teaching and providing various questions, activities, and discussions that can be used to achieve these goals. In addition, I also try to provide detailed feedback to students so they can understand mistakes and rethink what is right	Academic Development	The teacher's ability to create opportunities in the classroom that assist all students in developing as learners to achieve academic success
(*Reflections from Indah/not her real name*)		

In total, the CRT model applied by pre-service teachers in online learning can be seen in Table 3. From Table 3 below it can be seen that the CRT theme that is most widely applied by pre-service teachers in online learning is the academic development model (theme), meaning that most (82, 6%) pre-service teachers apply academic development in online learning. Pre-service teachers can create opportunities in the classroom that assist learners to achieve academic success and use research-based instructional strategies that reflect the needs of a diversity of backgrounds and learning styles. The least (3.8%) has never been applied by pre-service teachers in online learning is the theme (model) of social justice. This means that pre-service teachers do not realize or see the importance of the theme of social justice in the learning process.

Meanwhile, based on the study program, the content integration theme was mostly applied by pre-service mathematics education teachers and the least by pre-service economics education teachers. This means that more pre-service math teachers consider cultural factors and student experience in delivering learning material. On the other hand, pre-service economics teachers do not consider cultural factors and student experiences in their learning materials. The theme of facilitating knowledge construction is mostly applied by pre-service physics education teachers (100%) and at least by pre-service chemistry education teachers (60%). These results indicate that for all study programs, the theme of facilitating knowledge construction is highly considered (all study programs are above 60%). In other words, most pre-service teachers are able to build on what the students are, use "Real world" examples in learning, and Assist students in learning to be critical, independent thinkers who are open to other ways of knowing.

The theme of prejudice reaction was mostly applied by pre-service English teachers (100%) and the least by pre-service teachers of chemistry (6.7%). These results indicate that pre-service English teachers have a higher concern regarding prejudice in the learning process. , economic education, social studies education, Christian religious education, English language education, and Indonesian language education. These results are very interesting because there are several study programs whose pre-service teachers do not consider the theme of social justice in the learning process. The theme of academic development was most widely applied by pre-service English education teachers (100%) and the least by pre-service physics education teachers (28.6%). This result means that all pre-service English education teachers have the ability to create opportunities in the classroom that aid all students in developing as learners to achieve academic success and using research-based instructional strategies that reflect the needs of a diversity of backgrounds and learning styles.

Table 3. Description of the CRT Model of Pre-service Teachers in Total and Based on Study Programs

Study Program	Content Integration	Facilitating Knowledge Construction	Prejudice Reduction	Social Justice	Academic Development
Primary Teacher Education	68.1%	75.4%	66.7%	8.7%	95.7%
Mathematics Education	90.6%	81.3%	59.4%	9.4%	81.3%
Biology Education	46.2%	73.1%	30.8%	0.0%	69.2%
Chemistry Education	66.7%	60.0%	6.7%	0.0%	66.7%
Physics Education	61.1%	100.0%	76.2%	4.8%	28.6%
Economic Education	23.1%	76.9%	76.9%	0.0%	96.2%
Social Science Education	90.5%	81.0%	61.9%	0.0%	90.5%
Christian Education	41.2%	64.7%	47.1%	0.0%	76.5%
English Education	87.5%	93.8%	100.0%	0.0%	100.0%
Indonesian Language Education	77.3%	90.9%	68.2%	0.0%	90.9%
Total	71.7%	79.2%	61.1%	3.8%	82.6%

Based on gender, the CRT model implemented by pre-service teachers in online learning is presented in Table 4. The result shows that the percentage of male pre-service teachers who apply CRT is higher for all themes (models) other than social

justice. This also shows that female pre-service teachers pay attention to issues regarding social justice in online learning more than male pre-service teachers.

Table 4. Description of CRT Model of Prospective Teachers Based on Gender

Gender	Content Integration	Facilitating Knowledge Construction	Prejudice Reduction	Social Justice	Academic Development
Female	54.3%	59.6%	46.4%	3.4%	65.3%
Male	73.4%	79.7%	60.9%	1.6%	70.3%

Based on the results above, the findings from this study are that the majority (above 60%) of prospective teachers have implemented several features (themes/domains) of CRT, namely Content Integration, Facilitating Knowledge Construction, Prejudice Reduction, and Academic Development. Meanwhile, features regarding social justice still do not appear in the online learning process applied by prospective teachers. This result is in line with research from Lawrence [18] which shows that the theme of social justice still does not appear in online learning. Hernandez et al. [12] revealed that this could happen because simply not a strong enough component or not adequately modeled in our teacher education program. This was also confirmed by Wachira & Mburu [24] that to help prospective teachers apply CRT, they need to be equipped with knowledge, skills, and experience in adapting content knowledge in a cultural context. Other factors that may hinder prospective teachers in applying learning that is responsive to social justice issues are efficacy and confidence. Siwatu's research [25] revealed the need to build teacher efficacy regarding CRT in teacher education. Although in line with some previous research, this study contributes in terms of the context of pre-service teachers. It offers an overview of the implementation of CRT practices in online learning settings for pre-service teachers. Therefore, the findings of this research should be taken into consideration by educators and teacher training institutions in preparing future teachers to be culturally responsive educators.

4. Conclusion

Based on the results and discussion above, this study concludes that CRT practices applied by pre-service teachers in online learning are more about and tend to implement the theme (model) of Facilitating Knowledge Construction and Academic Development. Pre-service teachers are able to practice Facilitating Knowledge Construction by building on what the students know, providing "real world" examples, and assisting students in learning to be critical, independent thinkers who are open to other ways of knowing. Pre-service teachers have also been able to create opportunities in the classroom that aid all students in developing as learners to achieve academic success and use research-based instructional strategies that reflect the needs of a diversity of backgrounds and learning styles. Meanwhile, several features of Culturally Responsive Teaching, including incorporating student culture into the curriculum, social justice, and helping students question hegemony have not appeared yet. The implication of the results of this study is the importance of preparing pre-service

teachers to see comprehensively the features of Culturally Responsive Teaching, specifically regarding social justice in learning so that they can develop a vision of what it means to be a culturally responsive educator.

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