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Pre-service teachers' demographics, cultural competence, and culturally responsive teaching practices

Edilberto Z. Andal, Albert Andry E. Panergayo
College of Teacher Education–Graduate Studies and Applied Research, Laguna State Polytechnic University, San Pablo City, Philippines

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ABSTRACT

This study examines the influence of cultural competence (CC) on culturally responsive teaching (CRT) practices among pre-service teachers (PSTs) in a state university in Laguna, Philippines. Despite the emphasis on education, the impact of cultural awareness, knowledge, and skills on CRT remains underexplored. Using a cross-sectional quantitative research design, data from 633 PSTs were collected through a validated web-based survey. Multiple regression analysis showed that cultural knowledge ($B=0.373$, $p<0.05$) and cultural skills ($B=0.511$, $p<0.05$) significantly predict CRT practices, while cultural awareness ($B=0.003$, $p>0.05$) does not. Demographic factors such as age, gender, and year level do not moderate this relationship. These findings highlight the need for prioritizing cultural knowledge and skills in teacher education curricula. Institutions should integrate structured training to equip PSTs for diverse classrooms. Future research should explore the long-term effects of these competencies in an actual teaching environment and assess targeted training interventions. Strengthening CC through curriculum enhancement can better prepare educators to meet the challenges of an increasingly diverse educational landscape.

Corresponding Author:

Edilberto Z. Andal
College of Teacher Education–Graduate Studies and Applied Research
Laguna State Polytechnic University
Brgy. Del Remedio, San Pablo City, Laguna 4000, Philippines
Email: edilberto.andal@lspu.edu.ph

1. INTRODUCTION

The Philippines' rich cultural heritage influences its educational system by integrating diverse traditions, languages, and values, fostering inclusivity, promoting local history, and enhancing cultural awareness and identity development [1]. The influence of cultural perspectives increases classroom diversity as students have their own set of cultural beliefs [2], [3]. This enriches teaching and learning through varied viewpoints and collaboration, but also presents challenges such as language barriers, cultural misunderstanding, and the need for tailored teaching strategies to meet diverse needs [4]. Teachers play a crucial role in this situation by fostering an inclusive environment [5], [6], adapting curricula to reflect various cultures [7], and employing differentiated instructions that address individual learning needs [8], resulting in equity and understanding. In effect, teacher education institutions should equip pre-service teachers (PSTs) with salient cultural competence (CC), inclusive teaching strategies, and classroom management techniques to effectively engage with a diverse set of students.

CC refers to the knowledge, skills, and attitudes that enable educators to interact with students from diverse backgrounds [9]–[11]. This includes understanding cultural differences, recognizing biases, and

valuing inclusivity. In educational settings, CC is vital as it enhances communication [12], [13], fosters respectful relationships [4], [14], and creates a supportive learning environment [15]. Likewise, culturally responsive teaching (CRT) is an approach that integrates students' cultural backgrounds into the learning process. It enhances engagement by making lessons relevant to the students' experiences [16]–[18]. CRT improves academic outcomes [19] by building confidence and encouraging participation. This method promotes equity and inclusion, ensuring all the students feel valued. CRT further fosters critical thinking and social awareness [20], preparing students for a diverse society. CC combined with CRT creates a learning environment that supports positive relationships among diverse learners.

CC influences the CRT practices of PSTs [21], [22] by providing the skills and understanding necessary to engage with a diverse student population [9]. As CC develops, educators become aware of their own biases and the background of their students, which enables the creation of an inclusive environment [23], [24]. This awareness further encourages the incorporation of culturally relevant materials and perspectives into lessons, making the curriculum more relevant and relatable [25], [26]. In addition, culturally competent PSTs are better equipped to address social and emotional factors affecting learning, fostering stronger relationships with students. The foundational knowledge, skills, and attitude enable PSTs to adapt teaching practices that address cultural diversity and promote an inclusive environment [27].

PSTs' demographics such as age, gender, year level, and field of specialization, play a crucial role in shaping their teaching practices [27], [28]. Younger students may bring innovative perspectives and familiarity with emerging technology, while those specializing in areas like special education gain targeted knowledge for inclusive strategies [29]. Gender can influence communication styles and classroom dynamics, affecting how they relate to their future students [30]. Collectively, these demographic factors determine lesson planning and delivery, enabling PSTs to better address the diverse needs of the learners [31]. This underscores the importance of understating the role of these demographics in training PSTs to become culturally responsive educators who can thrive in varied learning environments.

Despite the growing recognition of CC and CRT in educational settings, there remains a notable gap in research examining how CC directly impacts the effectiveness of CRT practices among PSTs [32], [33]. Existing studies have primarily focused on in-service teachers [6], [7], [12], leaving PSTs underexplored in terms of how their CC evolves and influences CRT implementation. Additionally, much of the literature examines CC [15], [21] and CRT [20], [25], [27] separately, without establishing a clear causal link between the two in teacher preparation programs. Furthermore, there is inadequate research about the moderating roles of PSTs' demographics in this relationship. This indicates the need to investigate the dynamic interaction to describe the influence of diverse backgrounds in the development of CC and the implementation of culturally relevant pedagogy. Research has yet to determine whether factors such as age, gender, socioeconomic background, or multilingualism affect how PSTs develop CC to apply CRT [27]. In view of this, the study investigated the influence of CC of PSTs in shaping their CRT practices, and the moderating role of students' demographics play in this relationship. The result of this study is a valuable input in informing and reshaping teacher education programs towards a culturally and globally responsive curriculum.

2. METHOD

2.1. Research design

This study utilized a cross-sectional quantitative research design [34] to investigate the relationships among PSTs' demographics, CC, and the implementation of CRT practices. This design enabled a systematic examination of how various demographic factors influenced CC and teaching methodologies at a single point in time, providing a comprehensive understanding of the interplay between these variables [35]. This approach can also draw patterns and relationships from large samples within a defined period that can inform teacher training programs [34]. Moreover, the cross-sectional nature of the study facilitated efficient data collection and analysis making it appropriate to examine the relationship between CC and CRT among PSTs [35].

2.2. Sample and sampling technique

The study involved 633 PSTs currently enrolled in a teacher education program, the academic year 2024-2025, in one state university in Laguna, Philippines. The students were selected via convenience sampling. This method involved approaching students who were readily available and willing to participate [36]. While this approach may limit generalizability, it allowed for efficient data collection within the defined time frame [37], reflecting the perspectives of those who are actively engaged in teacher education programs. In response, the study included diverse respondents across year levels, specializations, and demographics to enhance the representation and perspectives of the sample. This study attained a 64% response rate, surpassing the 60% threshold considered acceptable for survey research [38], [39]. Table 1 presents the distribution of the respondents as to age, gender, year level, and field of specialization.

Table 1. Demographics of the PSTs respondents (n=633)

Demographics		Frequency	Percent (%)
Age	17-18	104	16.4
	19-20	167	26.4
	21-22	284	44.9
	23 and above	78	12.3
Gender	Female	494	78.0
	Male	139	22.0
Year level	1st year	159	25.1
	2nd year	77	12.2
	3rd year	116	18.3
	4th year	281	44.4
Specialization	Elementary education	135	21.3
	English	71	11.2
	Filipino	79	12.5
	Mathematics	33	5.2
	Science	117	18.5
	Social studies	63	10.0
	Technology and livelihood education	44	7.0
	Technical vocational education	49	7.7
	Physical education	42	6.6

2.3. Measurements and data collection

The data were collected via a web-based program and were distributed to online platforms, to which students have access. The participants completed a demographic survey, alongside established instruments measuring CC, the cultural competence self-assessment checklist (CCSC) adapted from the work of Central Vancouver Island Multicultural Society. The CCSC assessed the CC of the PSTs in terms of their awareness (k=11), knowledge (k=12), and skills (k=13), and CRT practices. The CC assessment evaluated participants' knowledge, attitude, and skills, while the culturally responsive teaching survey (CRTS) [40], assessed their self-reported use of culturally relevant strategies for establishing inclusion (k=7), developing attitude (k=3), enhancing meaning (k=3), engendering competence (k=4). The instruments underwent expert validation to establish the content validity of the scales. The content experts reviewed the instruments to ensure that the items accurately represent the construct being measured. Table 2 shows the reliability of the research instruments used. It clearly shows that the instruments measuring CC in terms of awareness, knowledge, and skills demonstrate high reliability. In contrast, those assessing CRT practices in terms of establishing inclusion, developing attitude, enhancing meaning, and engendering competence demonstrate relatively lower reliability but still passed the acceptable threshold [41]. Overall, this suggests that the instruments are valid and reliable according to the criteria set by reference [41].

2.4. Data analysis

This study used descriptive statistics such as frequency, mean, and standard deviation to describe the PSTs' demographics, CC, and CRT practices. Furthermore, correlation tests using the Pearson correlation coefficient, multiple regression analysis, and moderation analysis using Hayes [42] framework were initiated to describe the association between CC and CRT practices, and the moderating role of PSTs' demographics. These statistical treatments provided a suitable approach to analyze the data to secure robust findings on the relationship of the key study variables. Through multiple regression and moderation analysis, the study was able to generate meaningful insights that can contribute to the improvement of teacher education programs.

Table 2. Internal consistency of research instruments

Measure	Items	Cronbach's alpha
CC	36	0.963
Cultural awareness	11	0.876
Cultural knowledge	12	0.922
Cultural skills	13	0.958
CRT practices	17	0.950
Establishing inclusion	7	0.869
Developing attitude	3	0.743
Enhancing meaning	3	0.812
Engendering competence	4	0.782

3. RESULTS

This study aims to examine the influence of CC of PSTs in shaping their culturally responsive practices, and the moderating role of students' demographics in this relationship. Table 3 shows the mean,

standard deviation, and correlation of CC and CRT practices of PSTs. The findings from this analysis can provide valuable inputs for enhancing the teacher education curriculum to better prepare for diverse classroom settings.

3.1. Descriptive and correlation results

Table 3 presents the mean scores, standard deviations, and correlation among various constructs related to CC and CRT practices among PSTs. The mean ranges from 3.25 for cultural skills to 4.26 for enhancing meaning, indicating a generally positive perception of these constructs. This suggests that PSTs feel reasonably confident in their CC and responsive teaching practices, which is crucial for effective engagement with a diverse student population. This confidence may lead to more inclusive and effective teaching strategies.

The correlation reveals a significant relationship between the constructs, with cultural knowledge showing a strong correlation among all study variables. The cultural knowledge established a strong correlation with enhancing meaning ($r=0.606$, $p<0.01$) suggesting a deeper understanding of cultural contexts positively relates to PSTs' ability to enhance meaning in their lessons. Cultural skills emerged to be significantly related to establishing inclusion ($r=0.612$, $p<0.01$) indicating that as PSTs develop their cultural skills, they are more likely to successfully establish an inclusive environment. Moreover, cultural awareness and developing attitude ($r=0.527$, $p<0.01$) registered a significant correlation. It follows that greater cultural awareness is associated with a more positive attitude towards teaching inclusively.

Table 3. Mean, standard deviation, correlation of CC and CRT practices of PSTs

No.	Study variables	1	2	3	4	5	6	7
1.	Cultural awareness							
2.	Cultural knowledge	0.765**						
3.	Cultural skills	0.735**	0.818**					
4.	Establishing inclusion	0.495**	0.585**	0.612**				
5.	Developing attitude	0.527**	0.605**	0.620**	0.819**			
6.	Enhancing meaning	0.518**	0.606**	0.631**	0.861**	0.835**		
7.	Engendering competence	0.513**	0.604**	0.629**	0.903**	0.873**	0.825**	
	Mean	3.26	3.33	3.25	4.15	4.22	4.26	4.25
	SD	0.50	0.50	0.55	0.71	0.72	0.73	0.71

**Correlation is significant at the 0.01 level (2-tailed)

3.2. Multiple regression results

Table 4 demonstrates that cultural knowledge ($B=0.373$, $p<0.05$) and cultural skills ($B=0.511$, $p<0.05$) significantly predict CRT practices among PSTs. This suggests that as PSTs enhance their cultural knowledge and skills, their ability to implement responsive teaching practices improves. In contrast, cultural awareness ($B=0.033$, $p>0.05$) shows no significant effect indicating that it may not directly influence teaching responsiveness. This highlights the importance of focusing on cultural knowledge and skills in teacher training programs to foster effective CRT.

Table 4. Direct effect of CC to CRT practices of PSTs

	Unstandardized coefficients		Standardized coefficients	t	Sig.
Model	B	Std. Error	Beta		
Constant	1.206	0.137		8.781	0.000
Cultural awareness	0.033	0.063	0.025	0.523	0.601
Cultural knowledge	0.373	0.074	0.280	5.043	0.000
Cultural skills	0.511	0.065	0.416	7.878	0.000

$R=0.685$, $R^2=0.469$, Adj. $R^2=0.466$

Furthermore, the regression equation can be formulated as in (1).

$$\text{CRTP} = 1.206 + 0.033\text{CA} + 0.373\text{CK} + 0.511\text{CS} \quad (1)$$

Where, CRTP represents CRT practices, CA is cultural awareness, CK is cultural knowledge, and CS is cultural skills. The regression equation indicates that the baseline level of CRT practices is 1.206 when all other predictors are zero. While cultural awareness has a minimal effect and is not statistically significant, cultural knowledge and skills significantly enhance teaching practices, implying an increase in these two

factors leads to improved CRT. Lastly, the R^2 value (0.469) means that about 46.9% of the variance of CRT practices can be explained by the independent variables included in the model, indicating a moderate to strong explanatory power. In summary. CC significantly contributes to enhancing culturally relevant teaching practices among PSTs.

3.3. Moderation analysis

Table 5 presents the moderating effect of PSTs' demographics on the relationship between CC and CRT practices. The results indicate that none of the demographic factors–age, gender, year level, and specialization–significantly moderate this relationship, all p-values exceed the typical significance threshold of 0.05. The table reveals that all demographics show no meaningful influence on the effectiveness of CC in enhancing teaching practices. This suggests that these variables do not play a significant role in shaping the relationship between CC and CRT practices among PSTs.

Table 5. Moderating effect of PSTs demographics on CC and CRT practices

Moderator	B	Std. Error	t	p	LLCI	ULCI
Age	-0.0183	0.0162	-1.1268	0.2603	-0.0501	0.0136
Gender	-0.0322	0.0961	-0.3353	0.7375	-0.2210	0.1565
Year level	-0.0151	0.0336	-0.4496	0.6532	-0.0812	0.0509
Specialization	0.0055	0.0160	0.3436	0.7313	-0.0259	0.0369

Legend: LLCI=lower limit confidence interval; ULCI=upper limit confidence interval

4. DISCUSSION

The data presented in Table 3 reveal a meaningful correlation between various dimensions of CC and the components of CRT practices among PSTs. It can be noted that cultural knowledge and skills show a strong correlation with both establishing inclusion and developing attitudes, suggesting that a deeper understanding of diverse cultures directly enhances teachers' abilities to create an inclusive classroom environment [43], [44]. These insights can be utilized to design a curriculum for teacher education students that prioritizes the integration of cultural knowledge and skills as core components [45]. Developing appropriate instructional materials, such as case studies and culturally relevant lesson plans, will further enable PSTs to apply these concepts in real classroom settings [46]–[48]. This emphasis on CC will prepare future educators to manage diverse classrooms more effectively, fostering a supportive and inclusive environment for the students.

The findings presented in Table 4 emphasize the significant role of cultural knowledge and skills in predicting the effectiveness of CRT practices among PSTs. Given that cultural knowledge and cultural skills have substantial positive coefficients, this indicates a clear need for teacher education programs to focus on enhancing these areas. CC in education has been viewed as a key aspect of culturally relevant pedagogy and as a necessity for PSTs [49] Curriculum designers should prioritize instructional materials that develop both cultural knowledge and skills [50] through interactive learning experiences, such as workshops and community engagement projects. Additionally, creating learning materials that incorporate diverse cultural perspectives will enable PSTs to apply their learning effectively in real classroom settings [19]. CC is essential for PSTs, particularly during their internship, as they encounter various students from varied backgrounds [27].

On the other hand, the results from Table 5 show that demographic factors such as age, gender, year level, and specialization do not significantly moderate the relationship between CC and CRT practices. This suggests that all PSTs, regardless of their background, can benefit equally from a robust cultural competency-based training program, as such, teacher education programs should implement a standardized approach to CC that is inclusive for all students. The finding is aligned with Özüdoğru [51] who contends that gender has no impact on prospective teachers' readiness for CRT, including personal and professional awareness of CRT. However, the same study revealed that degree programs had an impact on their readiness which contradicts the findings of the present study. Özüdoğru [51] contended that prospective teachers in elementary mathematics were less ready for cultural teaching than others such as social science teaching and guidance and counseling departments. Implementation of a comprehensive training program focused on cultural knowledge and skills can create a more cohesive and effective educational workforce prepared to manage a diverse classroom setting. This approach is essential for fostering a teaching environment that not only acknowledges but also values rich cultural diversity. The study contrasts with Caingcoy *et al*. [27] on the role of gender and degree programs in the competence development of CRT practices. Research by Caingcoy *et al*. [27] underscored that female teachers outperform males in creating learning experiences that foster respect, connection, and personal relevance, which was not evident in the present findings.

5. CONCLUSION

The present study underscores the vital role of CC, particularly knowledge and skills, in enhancing CRT practices among the PSTs. The significant correlation and influence observed between various dimensions of CC and CRT components indicate an understanding of diverse cultures directly supports the creation of an inclusive environment. The study further concludes that demographic factors have no moderating effect on the relationship between CC and CRT practices, implying the universal importance of CC for all PSTs. For practical application, implement universal CC training in teacher education programs, ensuring inclusivity for all PSTs. Future research should investigate the impact of CC on teaching effectiveness and student engagement across diverse populations. This study provides a practical, theoretical, and methodological contribution, specifically addressing the gaps in teacher education research and practice. In practice, the findings emphasize that cultural knowledge and skills strongly correlate with CRT components such as establishing inclusion and developing positive attitudes. This implies that teacher education programs should design competency-based instruction focusing on these aspects. This could involve case-based instruction and culturally relevant micro-teaching sessions, allowing PSTs to apply CC in simulated classroom settings. Theoretically, the study challenges the prior assumptions that demographic factors significantly influence CC-CRT relationships. The study uncovered that age, gender, year level, and specialization do not moderate this relationship. This provides groundwork for establishing a standardized cultural competency training that benefits all PSTs equally, rather than tailoring based on demographic characteristics. Methodologically, using Hayes's moderation framework and multiple regression models strengthened the validity of the study. These insights suggest that policy revision should mandate structured, skill-based CC training as core equipment in teacher preparation programs.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Edilberto Z. Andal	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Albert Andry E. Panergayo	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓		

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest related to this study. This means that there were no financial, personal, or professional relationships that could have influenced the research outcomes.

DATA AVAILABILITY

The data is available upon request. Thus, access can be granted after a formal request to the authors subject to the institutional guidelines of Laguna State Polytechnic University.

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BIOGRAPHIES OF AUTHORS

Edilberto Z. Andal is the dean of the College of Teacher Education–Graduate Studies and Applied Research at Laguna State Polytechnic University. He is an associate professor handling Educational Management and Industrial Education courses in both undergraduate and graduate levels. He graduated with a Doctor of Education major in Educational Management at Laguna State Polytechnic University. His research interests include exploring effective educational management strategies that enhance learning outcomes and school performance. He also focuses on integrating innovative teaching approaches and organizational practice to better prepare students for the demands of the workforce. He can be contacted at email: edilberto.andal@lspu.edu.ph.

Albert Andry E. Panergayo is an assistant professor at the College of Teacher Education–Graduate Studies and Applied Research at Laguna State Polytechnic University. He is a Ph.D. holder in Science Education with specialization in Physics at De La Salle University, Manila. His research interest encompasses STEM education, the integration of technology in teaching and learning, innovative pedagogy, scientific creativity, and design-based learning. With a commitment to advancing educational practice, Dr. Panergayo aims to foster innovative approaches that enhance student engagement and understanding the science of teaching and learning. He can be contacted at email: albertandry.panergayo@lspu.edu.ph.