

MS Research Thesis
EFFECTS OF CULTURALLY RESPONSIVE TEACHING ON
CRITICAL THINKING SKILLS OF STUDENTS AT
UNIVERSITY LEVEL



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A thesis submitted in partial fulfillment of the requirement for the degree of
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It is hereby declared that author of the study has completed the entire requirement for submitting this research work in partial fulfillment for the degree of MS Education. This thesis in its present form is the original work of the author except those which are acknowledged in the text. The material included in the thesis has not been submitted wholly or partially for award of any other academic certification than for which it is being presented.

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SUPERVISOR'S CERTIFICATE

The thesis titled “Effects of Culturally Responsive Teaching on Critical Thinking Skills of Students at University Level” submitted by Ms. Hina Badar Reg. No. 27-FOE/MSEDU/S23 is partial fulfillment of MS degree in Educational Leadership and management, has been completed under my guidance and supervision. I am satisfied with the quality of student’s research work and allow her to submit this for further process as per IIUI rules and regulations.

Dr. Munazza Mahmood

Dedication

I dedicate this thesis to my beloved parents, whose unwavering love, prayers, and sacrifices have been the foundation of my success. Their encouragement and belief in my abilities have been a constant source of strength and motivation throughout my educational journey. To my siblings, who have always stood by my side and shared my struggles and triumphs, this accomplishment is as much theirs as it is mine.

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Abstract

This study investigated the effect of culturally responsive teaching on the critical thinking skills of university students. Culturally responsive teaching, an educational approach that incorporates students' cultural backgrounds, learning styles, and experiences into instructional practices, is recognized for enhancing student engagement and academic achievement. However, limited research has explored its direct influence on the development of critical thinking skills. The objectives of the study were to analyze culturally responsive teaching practices among teachers, assess the critical thinking skills of students, and examine the level-wise differences in students' critical thinking skills taught by teachers with high, medium, and low culturally responsive teaching levels. The study followed a quantitative approach under the positivist paradigm using a causal-comparative research design. The population consisted of 750 students and 70 teachers from the Faculty of Education at the university level. A sample of 254 students and 12 teachers was selected using simple random sampling technique. Data were collected using two instruments: a standardized Watson-Glaser Critical Thinking Appraisal test to measure students' critical thinking and a researcher-developed culturally responsive teaching classroom observation checklist to assess the teaching practices of teachers. The reliability of the critical thinking test was calculated using Cronbach's alpha, while the observation checklist was validated by experts. Data collection was carried out through personal visits, and the results were analyzed using descriptive statistics including mean and percentage, and inferential statistics including independent samples t-tests. The findings revealed that students taught by teachers with high levels of culturally responsive teaching scored significantly higher in evaluation, inference, deduction, assumption, and interpretation skills compared to those taught by teachers with medium levels. The study concluded that culturally responsive teaching significantly enhances the development of critical thinking skills among students and that the consistent implementation of such practices leads to better academic outcomes. Based on the findings, the study recommends the introduction of structured training programs for teachers to strengthen culturally responsive teaching practices and the integration of such strategies into curriculum planning. Future research may explore the long-term impact of culturally responsive teaching on academic and professional outcomes, and its implementation across different disciplines including STEM fields.

Keywords: Culturally Responsive Teaching, Critical Thinking Skills, Higher Education, Quantitative Study, Educational Equity

CHAPTER 1

INTRODUCTION

The field of education is at the vanguard of cultural diversity and inclusivity in a globalized environment that is becoming more and more interconnected. Teachers have a key role in facilitating access to knowledge, opportunities, and societal growth. Education is an influential tool for social change. The ability to recognize, honors, and interact with the diverse cultural backgrounds and viewpoints of their pupils is vital for these gatekeepers. Teachers are crucial in determining how society will develop in the future (Chauhan, 2023). In order to meet the requirements of various learners, it is imperative to acknowledge the significance of culturally responsive teaching (CRT). Teachers must use instructional methods to create safe, empowered learning environments for students representing a variety of cultural backgrounds as educational institutions become more multicultural and diverse.

Culturally Responsive Teaching creates inclusive educational settings in which pupils are valued as well as encouraged to achieve their educational objectives by acknowledging cultural knowledge, prior experiences, frames of reference, and performance styles of ethnically diverse students as valuable assets in their educational journey (Hutchison & McAlister-Shields, 2020). Culturally responsive educators employ cultural references to transfer concepts, abilities as well as attitude in a contemporary diversified world. Culturally responsive teachers understand how important cultural and ethnic background is for children's educational development. Furthermore, culturally responsive educators understand that successful instruction which raises engagement and comprehension capabilities cannot and will not take place if they are unable to relate to their pupils' passions, demands, or situations. For this reason, in multicultural classrooms, culturally responsive teaching is essential (Hill, 2012).

The Critical Thinking Community, on the other hand, describes critical thinking as "the logically organized process of thoughtfully and effectively understanding, applying, evaluating, integrating, as well as assessing information created by experience, reflection, communication, or observation, as a guide to belief and action". Learners who possess critical thinking abilities will be better equipped to "deal effectively with societal, technical, and realistic problems." In other words, competent

critical thinkers have the capability of identifying useful solutions to difficulties. being informed or knowledgeable alone is insufficient. Students must be able to critically analyze problems to make informed and reasoned judgments that will help them in both their personal and professional lives (Snyder & Snyder, 2008). Metacognition is another term for critical thinking (Tempelaar, 2006) or the act of "the ability to think about thinking" in original definition and context of Flavell (1983). Proficiency in critical thinking is a necessary intellectual talent for success in the worldwide workforce of the 21st century. Being able to think critically is essential in today's ever-changing and multifaceted environment. In the context of the fourth industrialization, critical thinking abilities are crucial for preparing students to handle progressively complicated life situations (Safirah et al., 2024).

In addition to develop efficient instructional methods in diverse academic settings, examining the effects of culturally responsive teaching on university students' critical thinking abilities is essential to inform the creation of strategies and programs that support equitable opportunities for all pupils in an increasingly interconnected world. Studies have indicated that teaching that is sensitive to cultural differences can enhance students' critical thinking abilities. For instance, research carried out in Indonesia discovered that education that is sensitive to cultural differences improved secondary school learners critical thinking abilities (Wardani et al., 2023). Similarly, research by Safirah and Nasution revealed that pupils in primary school who received culturally relevant instruction demonstrated higher levels of critical thinking (Safirah et al., 2024).

The analysis of the literature also emphasized the value of cultural competence and familiarity with various cultures in fostering critical thinking. The proposed research study aims to examine the effects of culturally responsive teaching on university students' ability for critical thought in order to further explore it at the university level.

1.1 Background and Context of the Study

The demographic picture of many nations is changing significantly in the rapidly connected and changing world of today. Communities have become increasingly multicultural and diverse as a result of increased migration, internationalization, and globalization; classrooms generally reflect this diversity (Chauhan, 2023).

Consequently, there has been a rise in the significance and focus on the role those educational institutions and teachers play in encouraging culturally responsive teaching.

Since learning and teaching in multicultural classrooms have presented significant obstacles for pupils as well as instructors, the discussion around diversity has become a prominent and ongoing feature of academic discussion. When a teacher is empathetic to their requirements, pupils generally feel more respected, competent, and engaged with the learning environment and resources. Culturally responsive education (CRT) has been related to higher student academic achievement and increased engagement and interest in educational institutions. It is defined as "using the cultural knowledge, prior experiences, frames of reference, and performance styles of ethnically diverse students to make learning encounters more relevant to and effective for them" (Abacioglu et al., 2020).

In higher education, culturally responsive teaching (CRT) values the diversity of students' cultural origins and promotes inclusivity while improving academic outcomes (Gay, 2010). CRT develops critical thinking abilities necessary for resolving complex problems by utilizing culturally relevant content and instructional techniques (Howard, 2003). Additionally, CRT addresses equity and social justice issues while preparing students to be global citizens capable of making good contributions to a varied community (Ladson-Billings, 1995).

Universities have a significant role in forming students' cognitive skills and problem-solving aptitude in addition to their academic proficiency as safe places of learning and intellectual growth. Critical thinking is the cornerstone of effective learning, decision-making, and lifelong intellectual progress. It is defined as the capacity to analyze, evaluate, and synthesize information in order to generate reasoned judgments and make smart decisions. It goes beyond disciplinary borders and gives students the ability to tackle challenges with intellectual precision, creativity, and skepticism (Afzal et al., 2023).

The development of critical thinking in higher education is confronted with a number of obstacles, despite its widely accepted significance. Conventional teaching methods frequently place more emphasis on rote memory and passive learning than on critical thought and active participation. Further impediments to cultivating a culture of

critical inquiry and evidence-based reasoning are the spread of false information and the impact of ideological prejudices (Facione, 2015).

One of the pivotal areas of research in education is the effects of culturally responsive teaching on the development of critical thinking abilities in students at university level. This study can empower students from different cultural backgrounds and enhance the educational experience, which makes it significant. It has been demonstrated that, despite the abundance of studies on CRT improvement, classroom implementation is not at its best. This issue could be explained by the fact that effective CRT requires specific teacher competencies and expertise. This descriptive study aims to clarify the effects of culturally responsive teaching on university students' development of critical thinking abilities providing educators, policymakers, and stakeholders with useful information.

1.2 Statement of the Problem

Culturally responsive teaching is recognized for its potential to improve student engagement and academic achievement (Gay, 2018), its specific impact on the development of critical thinking skills, such as assumption, evaluation, interpretation, deduction and inference, remains under-explored. University education requires students to develop critical thinking skills (Facione, 2015). However, current pedagogical approaches may not adequately address students' diverse cultural backgrounds, potentially hindering their ability to engage in critical analysis and problem-solving (Hammond, 2015). In educational settings, a lack of culturally responsive teaching can cause students from different backgrounds to feel marginalized, which can have negative effects on their academic performance (Abacioglu et al., 2020). Furthermore, in the context of cultural variety, students' lack of critical thinking abilities may hinder their capacity for independent thinking and effective resolution of challenging social issues. Though culturally responsive teaching has been the subject of numerous researches in a variety of fields, yet there remains a significant gap in the literature regarding its effect on critical thinking skills (Ladson-Billings, 1995). Additionally, there is a lack of research examining this difference in the particular setting of Pakistan at higher education level, especially in the field of education (Bhuttah et al., 2024; Khan et al., 2023). Hence, to address this gap in the existing literature, the present study aims to investigate the effects of culturally responsive teaching on the development of critical thinking skills of students at

university level.

1.3 Objectives of the Study

The objectives of the study were:

1. To analyze the level of culturally responsive teaching practices of teachers
2. To assess the level of critical thinking skills of students
3. To analyze the level-wise difference between students' critical thinking skills taught by the high, medium, and low culturally responsive teaching.

1.4 Research Questions

The research questions of the study were:

RQ1: What are levels of culturally responsive teaching practices teachers implement in the classroom?

RQ2: What is the level of critical thinking skills of BS students?

1.5 Hypotheses

H₀₁: There is no significant difference between the students' evaluation skills taught by the high, medium, and low culturally responsive teaching.

H₀₂: There is no significant difference between the students' assumption skills taught by the high, medium, and low culturally responsive teaching.

H₀₃: There is no significant difference between the students' inferential skills taught by the high, medium, and low culturally responsive teaching.

H₀₄: There is no significant difference between the students' interpretation skills taught by the high, medium, and low culturally responsive teaching.

H₀₅: There is no significant difference between the students' deduction skills taught by the high, medium, and low culturally responsive teaching.

H₀₆: There is no significant difference between the students' critical thinking skills taught by the high, medium, and low culturally responsive teaching.

1.6 Significance of the Study

The study is crucial for university administrators, teachers, and students. The findings of the research are beneficial for administrators so they can better understand

how to adapt their practices to better meet the requirements of pupils from many cultural backgrounds in their classrooms and raise student achievement. The results also required administrators to examine their methods for assessing teachers' efficacy and incorporate evaluation criteria that accommodate with the demands of culturally diverse students. Although teachers work directly with pupils every day and directly influence their academic success, administrators are crucial because they set the groundwork and standards for teacher evaluations. The implications are particularly relevant to teachers, as the study concentrated on the ways in which teachers implement content, create an inclusive classroom environment, and take actions that support students' positive attitude. Finding strategies for instructors to become attentive to students through their teaching strategies and curricula therefore constitutes an implication of the study.

The study is significant because it ultimately raises the possibility that culturally diverse pupils will not be receiving a high-quality education if teachers and administrators do not support and implement CRT. By preparing students for academic success, employment, and upward professional mobility, culturally responsive teaching approaches benefits students. Moreover, it was a contribution to the existing literature. The study is significant because it sheds light on what needs to be addressed and how to deal with these potential flaws.

1.7 Delimitation of the Study

This study was delimited to female BS students only. The primary reason for this limitation was the institutional structure of the university, which maintains separate campuses for male and female students. As the researcher had access only to the female campus, male students were excluded from the study due to logistical and administrative constraints. This decision was not based on any presumption of gender-specific learning outcomes, but rather on the feasibility of data collection within the given timeframe and resources.

While this gender-based delimitation may reduce the generalizability of findings to the entire BS student population, it allowed for a more focused analysis of a homogenous group. Such homogeneity can help enhance internal validity by controlling for confounding variables, such as gender-based cognitive, cultural, or interactional differences. Moreover, prior research has shown that gender may influence classroom engagement and responses to culturally responsive teaching,

suggesting that studying a single-gender group can provide clearer insights within that demographic. Future research may extend this study to male or co-educational contexts for comparative analysis.

1.8 Conceptual Definitions

1.8.1 Culturally Responsive Teaching (CRT)

Culturally responsive teaching is an approach that recognizes the importance of including students' cultural references in all aspects of learning. It values students' cultural backgrounds and uses them as tools to support academic success, develop critical consciousness, and promote a sense of belonging (Gay, 2018; Hammond, 2015).

1.8.2 Critical Thinking Skills

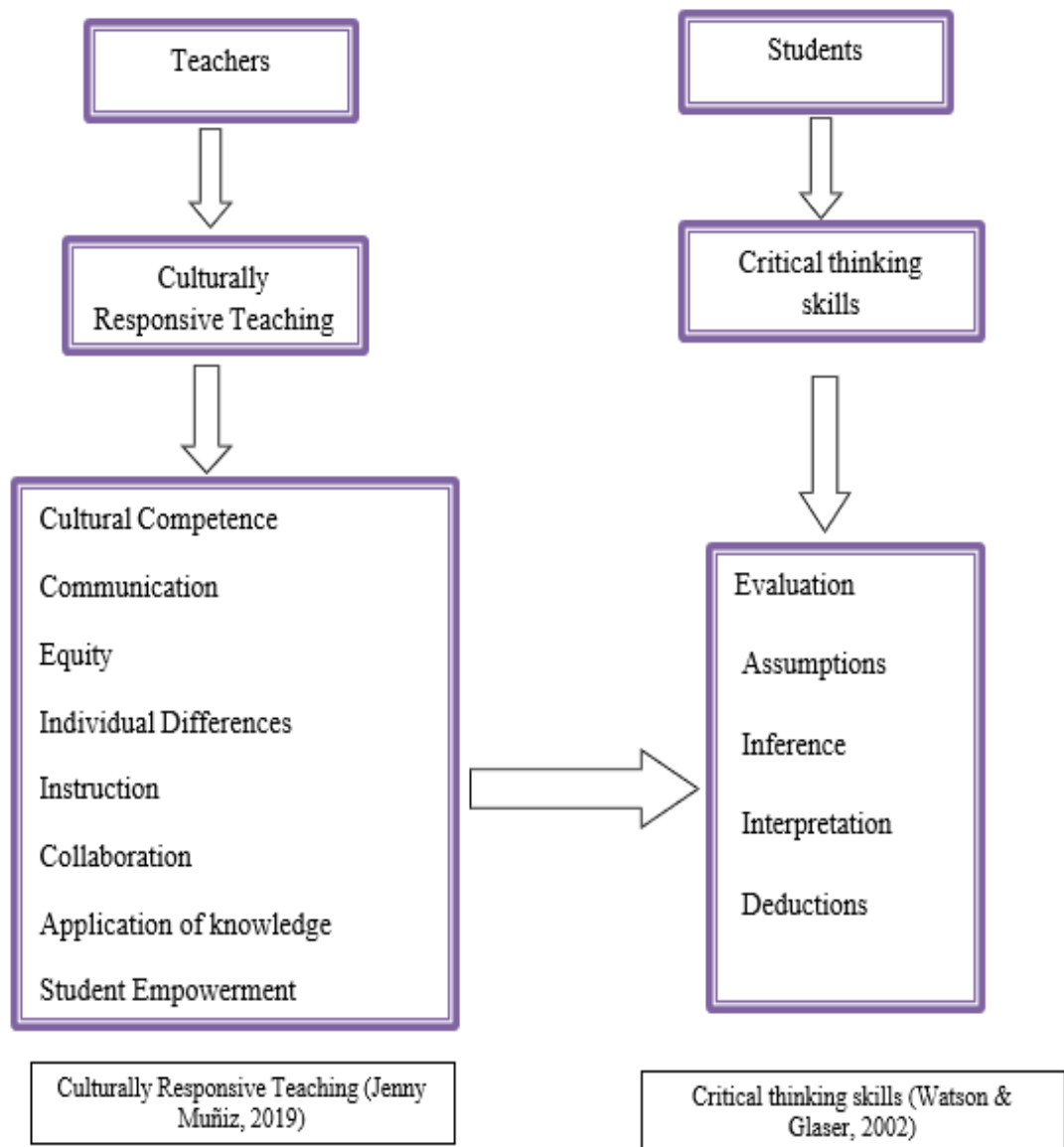
Thinking critically involves attentively, logically, and critically analyzing, assessing, and solving problems. Learners who possess critical thinking abilities will be able to think more deeply, carefully assess ideas or arguments, make better decisions, and rationally and effectively communicate answers. Learners possessing critical thinking abilities are able to solve complicated problems rapidly, assess multiple pieces of information, and make connections between them and other concepts (Safirah et al., 2024).

1.8.3 Operational Definition

Culturally responsive teaching (CRT) is described as an instructional approach that not only acknowledges students' cultural backgrounds but also integrates them into the learning process to enhance cognitive skills, including critical thinking. It involves eight core practices: instruction, collaboration, cultural competence, communication, individual differences, equity, application of knowledge, and student empowerment. CRT creates a learning environment where students' cultural experiences are valued and used as a foundation to strengthen their critical thinking skills specifically evaluation, assumption, inference, interpretation, and deduction, enabling them to analyze, assess, and understand information in deeper and more meaningful ways.

1.9 Conceptual Framework

Figure 1.1: Conceptual Framework



The conceptual framework for this study is built on the understanding that culturally responsive teaching (CRT) practices serve as a foundational influence on the development of students' critical thinking skills. Drawing upon established literature, the framework identifies eight key components of CRT: instruction, collaboration, cultural competence, communication, individual differences, equity, application of knowledge, and student empowerment. These dimensions represent the core practices that culturally responsive educators implement to create inclusive and effective learning environments (Muñiz, 2019).

Within the framework, these CRT practices are assumed to shape teaching

approaches in ways that foster active student engagement, respect for diversity, and meaningful learning experiences. These practices are expected to affect students' performance in five core domains of critical thinking: evaluation, assumption, inference, interpretation, and deduction. The selection of these five domains is informed by Watson and Glaser's (2002) model of critical thinking, which outlines key cognitive skills essential for effective reasoning and judgment.

By incorporating CRT into instructional methods, the framework proposes that students are more likely to develop the ability to question assumptions, analyze information critically, and apply reasoning in complex academic and real-world contexts.

This conceptual framework thus provides a structured lens through which the effect of culturally responsive teaching on critical thinking can be examined. It supports the view that student learning is enhanced when teachers intentionally respond to learners' cultural identities and promote equitable, student-centered practices that stimulate higher-order thinking.

CHAPTER 2

LITERATURE REVIEW

This scholastic area of study can benefit from having a literature review section, which would present an overview over the main notions that can be connected to this study, and that are Culturally Responsive Teaching (CRT) and how it affects critical thinking development in university level. CRT is a learning-teaching model that works with students' cultural selves and experiences more as a way of improving on collaborative learning practices and establishing an understanding and appreciative education context. Given that higher education is expanding its diversity timeframe especially in countries like Pakistan, CRT play very important roles of creating equitable academy.

2.1 Review of Related Literature

This systematic literature review is concerned with critical thinking improvement with the help of CRT, the importance of which is appreciated in students of universities and colleges worldwide. Reasoning, problem-solving and evaluation of ideas make thinking critical and therefore can be said to form an important part of learning aspirations especially at a university level. This review not only provides definition on what CRT and critical thinking entails but also explains how the two relate with one another. Hence, this review examines how CRT in higher education facilitates critical thinking because it makes learning environments that endorse and embrace student cultural backgrounds.

The link between CRT and critical thinking is significant to this study since it wants to establish the effect of CRT to the critical thinking abilities of university students. Due to multicultural and globalization of education systems, students need to possess the skill of ethical analysis of multiple worlds views, including culturally grounded ones. This study will employ the literature review to show how CRT enhances critical thinking and it pars in higher education especially in Pakistani context, albeit still under researched.

2.2 Origins of Culturally Responsive Teaching

Culturally Responsive Teaching originated from a more general theory of multicultural education which emerged as a reaction to the civil rights campaigns in

USA in the 1960 and 1970s. CRT can be traced to the work of Ladson-Billings (1995) and Gay (2018) who concentrate on the injustice that minority students, especially the black, witnesses in schools. Their work ensured education systems that embrace cultural factors of students to improve in education and equity.

Proceeding from such background, Ladson-Billings has introduced the concept of culturally relevant pedagogy, which implies the methods of teaching aimed at native students' cultural and academic okay to shape critical persons who have a sense of pride in their own culture. Her work emphasized three key goals: achievement motivation, cultural sensitivity, and the sociopolitical perspective which entirety is an effort at educational emancipation of underprivileged learners and fight against social injustice. In addition to these ideas, Gay (2018) went further in writing about CRT systematically by stressing the reality of the necessity for educators to help their students use their cultural assets to build a connection to new learning.

From this perspective, Gay (2018) gave definition of CRT that differs from simply recognizing and appreciating the diversity of culture; the latter implies that culture is a kind of mediation that must be used in teaching and learning practice in order to enhance students' understanding and motivation. CRT therefore supports pedagogy practices that promote and acknowledge students' cultural realities in order to enhance absorption as well as performance. Gay was most insistent on one aspect that teachers must endeavor to attain cultural sensitivity, or cultural proficiency as a way of possibly responding to the multicultural diverse students in terms of implementing CRT within diverse school settings.

While CRT begun in the United States it has spread across the world and evidently plays a significant role in regarding diversity in education. The globalization of higher education has become necessary in an attempt to meet the needs of culturally diverse students making CRT especially essential. Some research indicated that CRT is successful with gains in student interest and also critical thinking skills through inclusive classroom practices (Chávez & Longerbeam, 2016).

Over the years of CRT development, it has been implemented not only in primary and secondary education but also in tertiary level of education since student diversity in the latter context requires more sensitive treatment. Operationalization of CRT by Gay (2018) noted that strategies of teaching must be informed by cultural

experiences of learners especially in universities whose curricula have traditionally been informed by the western paradigm. The purpose of CRT in higher education is not only to make education inclusive for several students but also to foster they suggest that all forms of critical engagement with course content can be achieved and enhanced by relating such content to culturally meaningful experiences (Abacioglu et al., 2020).

The need to produce CRT in higher education has been informed by the fact that students backgrounds shape their learning profiles. In the context of higher education, therefore, CRT regards multiculturalism as an important approach to curriculum and urges higher education institutions to develop cultural sensitivity of their institutions. Empirical evidence shows that with the use of CRT by educators, students in classrooms feel valued and thus are able to maximize their performance than when they feel demeaned (Hutchison & McAlister-Shields, 2020).

For instance, Han et al. (2014) described that performance of learning outcomes of university students was raised due to the use of culturally responsive teaching approaches. Some of the strategies practiced to include culture as a way of developing CA included word example from cultures that are similar to students and appreciating variability in learning and teaching strategies. Due to these reasons, CRT fosters the learning of critical thinking skills once learners are encouraged to interact with different ways of learning while challenging the norm.

2.3 Role of Culturally Responsive Teaching in Addressing Diversity

Culturally Responsive Teaching is therefore especially important for confronting this rising diversity in education, especially in colleges and universities. As the number of students traveling across borders to pursue their education has risen, and with the rise in intakes of international students, universities have no option but to ensure that the teaching strategies used in the classroom reflect the demographics of the students in the class (Banks, 2015). CRT can help education facilitate a classroom setting those honors and addresses these different cultural ways of knowing in the classroom.

CRT can not only be used as a way to increase diversity in higher education but also as the effective method for improving students' critical thinking and problem-solving skills. This is because through recognizing and respecting students' cultural beliefs, CRT, fosters the creation of a class context in which students are motivated to be actively involved in the class learning process. Gay (2018) notes that students who

are willing to learn with cultural references valued in the classroom are better placed to develop critical thinking skills as they are able to reason through their personally held experiences and the pre suppositions of what is being taught in class.

For example, current research indicates that CRT promote students' attention and achievement. Culturally responsive teaching practices were also effective in enhancing students' learning critical thinking and problem-solving skills according to Abacioglu et al (2020). Hutchison and McAlister-Shields (2020) backed these findings by explaining that CRT enhances the learning options of the students from all cultural backgrounds improves the equity in the classroom.

In addition, CRT considers cultural displacements that may exist between the learner and the teacher and that may cause confusion and loss of interest in lessons (Gay, 2018). So, by raising cultural awareness of educators, CRT contributes to meeting the connection between students' everyday practice and the knowledge they are to comprehend (Villegas & Lucas, 2002). This not only enhances learner participation, but also the students have to analyse their worldviews through their culture in a critical thinking manner (Ladson-Billings, 2017).

2.4 Culturally Responsive Teaching in Higher Education

Culturally Responsive Teaching (CRT) in higher education is more than just an instructional delivery method change that means it is a social justice oriented pedagogical approach designed to make education more meaningful, accessible and engaging to students of color (Gay, 2018). Multiculturalism is therefore becoming the norm in university populations because Education is a global business and the student composition represents ethnic, cultural and linguistic diversity from all corners of the world (Banks, 2015). These issues make it necessary that CRT be adopted or practiced in order to ensure that institutional culture does accommodate and affirm students' multicultural experience in learning (Ladson-Billings, 2017).

This applicability in higher learning institution is more important because the material handled is a bit complex and abstract as compared to that handled by primary or secondary learners. Hence making sure that the students have the ability to localize this content is important for effective comprehension and critical thinking towards it. According to Gay (2018), CRT in higher education is designed to promote teaching of academic knowledge and skills supported by cultural references to ensure all students

belonging to different cultures, would experience they are valued and understood.

This is because CRT has been proved to increase students' activation and achievement levels in an educational environment of a university. For instance, Han et al. (2014) conducted a cross-sectional comparison study in which students in STEM fields who were taught using culturally responsive methods scored better than other students. According to the study, if the culture of students is taken into account in determining the sort of curriculum, they are likely to be more interested in the program and thus be more intelligent in their thinking.

Furthermore, the use of CRT in higher learning institutions endeavours to bring equity because learners from diverse cultural backgrounds have different academic achievements. Chávez and Longerbeam (2016) found that students from groups usually left out of curricular emphasized in universities from a Eurocentric focus have more academic success when CRT is used. This is so because CRT fosters a learning atmosphere that makes student feel valued in their cultural ways hence self-participation and success.

2.5 Qualities of Teacher for Culturally Responsive Teaching

Research highlights that when teachers acknowledge the diverse needs and experiences of students, especially from minority backgrounds, they can enhance educational outcomes. While many studies show the positive effects of CRT and offer guidance for improving pedagogy, others point out that CRT is often misunderstood or applied in a shallow way. For example, Kim and Pulido (2015) and Ladson-Billings (2014) noted that some educators reduce CRT to surface-level practices, while Sleeter and McLaren (2009) criticized token gestures like celebrating ethnic foods without deeper engagement. These critiques reveal that many teachers still need support to fully implement CRT in meaningful ways.

Rychly and Graves (2012) identified three key traits for teachers using CRT effectively. First, teachers should understand students' perspectives, which means being able to see the classroom through students' cultural lenses. This view is supported by Cooper (2004) and McAllister and Irvine (2002), who argue that classroom materials and teaching methods should reflect students' realities. Second, teachers must be aware of their own cultural identities and biases. Grant and Asimeng-Boahene (2006) emphasized that self-awareness helps teachers avoid stereotyping. Third, teachers

should have knowledge about the cultures represented in their classrooms so they can adjust lessons accordingly. These ideas are supported by the notion that culturally aware teachers create more inclusive learning environments.

Several studies show how perspective-taking can improve CRT practices. Teachers who can take on students' viewpoints tend to be more flexible and less biased (Galinsky & Moskowitz, 2000; Germain, 1998). Darling-Hammond (2000) and McAllister and Irvine (2002) also suggest that such teachers are more likely to adjust their teaching to meet students' needs. These findings support the idea that teachers with strong perspective-taking abilities engage more frequently in culturally responsive teaching.

The shift to online and hybrid learning during the COVID-19 pandemic has created new challenges and opportunities for CRT. Bond (2020) emphasized the need to maintain cultural responsiveness in virtual classrooms. Hammond (2015) noted that traditional face-to-face teaching relies on cultural signals and informal cues, which are harder to replicate online. Lowenthal and Dunlap (2010) pointed out that these missing cues can make it harder to engage students from diverse backgrounds.

To address this, researchers like Woodley et al. (2017) and Pacansky-Brock et al. (2020) recommend integrating multicultural content into online materials. This includes using videos, readings, and case studies that reflect various cultures. Teachers are also encouraged to design assignments that allow students to express their identities, such as digital storytelling or cultural blogs. These practices help students feel seen and valued in virtual spaces.

Communication tools like video calls or real-time chat can also support CRT in online settings. Hall (1981) argued that students from high-context cultures prefer synchronous communication where body language and tone are visible. Using these tools helps students express themselves more fully and improves their interaction with peers and instructors.

2.6 Culturally Responsive Teaching Practices

Culturally responsive teaching (CRT) is rooted in the belief that all students, regardless of their cultural background, deserve equal opportunities to learn and succeed. This approach does not treat culture as a barrier but as a bridge that connects academic content with students' lived experiences. According to Gay (2010), effective

CRT acknowledges students' cultural heritages, integrates multicultural content into everyday instruction, and builds meaningful links between school and home environments. These elements aim to make learning more relevant and inclusive.

While the theoretical foundations of CRT are well established, their practical application often varies. For instance, although Gay (2010) outlines detailed characteristics of CRT, including differentiated strategies for diverse learning styles, research suggests that implementation frequently falls short. Jayakumar (2008) argues that teacher preparation programs are not sufficiently equipping educators with the skills needed to work across cultures. This claim is supported by Villegas, A. M., & Lucas, T. (2002), who emphasize that teachers unaware of their own cultural assumptions may misinterpret student behavior, reinforcing inequities rather than reducing them.

Santamaria (2009) presents CRT as a transformative practice that increases student achievement by embracing rather than ignoring cultural identity. However, the challenge lies in moving beyond superficial practices such as token multicultural days and embedding culture in curriculum, pedagogy, and classroom relationships. While Gay (2002) underscores the importance of preparing teachers to meet these challenges, many programs remain limited in scope and depth.

The need for flexible, context-based instructional strategies is critical. CRT cannot follow a rigid checklist. Instead, teachers must continuously evaluate how well their methods align with the cultural and cognitive needs of their students. This includes recognizing that CRT is both reflective and adaptive, shaped by who the students are and how they experience the world. As such, research must go beyond description and assess how CRT is interpreted and practiced within real classrooms.

2.6.1 Communication

Communication is a central part of culturally responsive teaching. It helps build respectful and inclusive relationships between teachers and students from different cultural backgrounds. Gay (2018) explains that culturally responsive teachers understand and respect the language and communication styles of their students. This includes spoken and written words, as well as non-verbal cues like gestures, facial expressions, and tone of voice that hold meaning in different cultures.

Teachers need to be aware of how students from various cultures prefer to

express themselves. For example, some cultures value detailed storytelling, while others prefer direct and structured speech. Recognizing these preferences helps teachers make their classrooms more welcoming and inclusive.

Hammond (2015) emphasizes that effective communication in CRT is not one-sided. Teachers must not only speak but also actively listen. When students feel heard, they are more likely to participate in discussions. This two-way communication builds trust and boosts students' confidence. It also helps reduce misunderstandings that may arise due to cultural differences and improves overall classroom interaction.

2.6.2 Cultural Competence

Cultural competence is a key element of culturally responsive teaching. It refers to a teacher's ability to acknowledge and respect the cultural backgrounds of students. Ladson-Billings (2017) highlights that teachers who integrate students' cultures into classroom instruction build stronger relationships and create a more inclusive learning environment. This not only increases student comfort but also enhances their engagement.

Gay (2018) adds a critical dimension by stressing that cultural competence involves self-reflection. Teachers must recognize their own biases and avoid letting assumptions lead to stereotyping. While Ladson-Billings focuses on external inclusion through classroom content, Gay (2018) pushes for internal reflection and awareness. Both perspectives underline that competence is not only about knowledge of others' cultures but also about awareness of one's own.

However, developing cultural competence is not automatic. It requires effort from teachers to learn from their students and intentionally shape the learning environment to reflect shared values and experiences. This dual focus on internal attitudes and external teaching strategies creates a balanced foundation for culturally responsive classrooms.

Together, these views suggest that cultural competence is both personal and practical. It requires teachers to be learners themselves, open to cultural knowledge and committed to transforming it into meaningful educational experiences.

2.6.3 Instruction

Culturally responsive instruction emphasizes the integration of students'

cultural backgrounds into classroom teaching. Banks (2015) argues that connecting lessons to students' personal experiences makes learning more meaningful. This approach helps students relate content to real life, which enhances understanding and retention.

Hammond (2015) expands this idea by focusing on learning strategies. She suggests that culturally responsive instruction should include varied techniques that reflect different learning styles. This flexibility not only supports diverse learners but also strengthens their engagement with content. Unlike Banks, who emphasizes cultural relevance through content, Hammond highlights the importance of instructional delivery.

Both perspectives agree on the value of connecting teaching to culture but offer different routes, Banks (2015) through lesson content, Hammond through pedagogy. Together, they show that effective CRT requires both what is taught and how it is taught to reflect students' realities.

Critically, this dual focus helps close achievement gaps, particularly for students from underserved communities. When teaching strategies align with students' cultural and cognitive needs, learning becomes more accessible and equitable.

2.6.4 Application of Knowledge

Applying classroom knowledge to real-world contexts is a key element of culturally responsive teaching. Villegas and Lucas (2002) emphasize that culturally aware teachers design tasks that align with students lived experiences, enabling them to connect learning with familiar settings. For example, involving students in projects that explore local community issues helps bridge theory with practice in culturally meaningful ways.

Hammond (2015) supports this view by arguing that knowledge becomes transformative when students can apply it to their own lives. She sees relevance as a driver for deeper understanding and social empowerment. While Villegas and Lucas focus on task design rooted in cultural context, Hammond (2015) takes it further by linking application to the development of agency and change-making.

Comparing both perspectives highlight a shared belief in the power of contextual learning, though they differ in emphasis. Villegas and Lucas center their approach on cultural coherence, while Hammond foregrounds empowerment and

identity development. Together, their work underlines that culturally responsive teaching must go beyond content delivery and intentionally foster the application of knowledge in ways that resonate with students' environments.

This synthesis demonstrates that effective CRT not only enhances learning outcomes but also nurtures students' ability to think critically and act meaningfully within their communities.

2.6.5 Student Empowerment

Empowering students is a central goal of culturally responsive teaching. Gay (2018) emphasizes that when students are encouraged to express their opinions and take responsibility for their learning, they develop stronger identities and gain confidence. This form of empowerment supports the development of agency and self-efficacy, both of which are linked to academic success.

In contrast, Hammond (2015) focuses on the cognitive and emotional impact of empowerment, suggesting that CRT helps students adopt a growth mindset by affirming their cultural backgrounds. She argues that this mindset not only improves academic performance but also prepares students to function in diverse and global societies.

Comparing these perspectives reveals a shared understanding of empowerment as essential for student development. However, Gay stresses the structural and relational aspects of empowerment within the classroom, while Hammond emphasizes its transformative effects on thinking and long-term success. Together, they show that culturally responsive teaching must go beyond surface-level support and actively build students' capacity to participate confidently and critically in their learning journey.

2.6.6 Collaboration

Collaboration plays a crucial role in culturally responsive teaching as it encourages students from diverse backgrounds to learn together. Powell and Rightmyer (2012) assert that when educators design group tasks that align with students' cultural understandings, it fosters mutual learning and reduces classroom tensions. Such collaboration promotes respect and peer appreciation, which are essential in multicultural classrooms.

Beyond student interactions, Gay (2018) emphasizes that collaboration should extend to teachers, families, and communities. Involving parents and local community

members not only strengthens the support system for students but also bridges gaps between home and school environments. This perspective highlights that education is not just academic but also deeply social and relational.

Comparing both views reveals that while Powell and Rightmyer focus on student-centered collaboration within the classroom, Gay (2018) expands the scope to include broader networks of support. Together, these approaches stress that successful CRT requires strong partnerships among all stakeholders to create inclusive and nurturing educational spaces.

2.6.7 Equity

Equity is a central pillar of culturally responsive teaching. Ladson-Billings (2017) argues that culturally responsive educators actively work to challenge systemic inequalities in education. This involves adapting teaching and assessment methods to ensure they are culturally fair and accessible to all learners. Her focus lies in meeting students where they are and designing practices that reflect their unique contexts.

Hammond (2015) adds another layer by distinguishing equity from equality. She emphasizes that equity is not about treating all students the same but giving each learner what they need to succeed. This interpretation underscores the need for personalized support that responds to individual backgrounds and learning styles.

While Ladson-Billings (2017) stresses structural changes to counter injustice, Hammond draws attention to differentiated classroom practices. Together, their views highlight that equity in CRT requires both systemic reform and day-to-day instructional adjustments. When applied effectively, these approaches reduce learning barriers and promote inclusive participation.

2.6.8 Individual Differences

Culturally responsive teaching emphasizes the need to acknowledge and address the diverse learning preferences, abilities, and styles of students. Gay (2018) suggests that effective teachers adapt their instructional strategies to reflect these individual differences. This adaptation may include using various modalities such as visual aids, manipulatives, or technology to support differentiated learning.

Hammond (2015) complements this view by highlighting how honoring individual learning preferences fosters student engagement and achievement. Her

emphasis on cultivating a sense of belonging aligns with perspective of Gay (2018) that students perform better when their individuality is acknowledged and respected.

While both authors advocate adapting instruction to learner variability, Gay (2018) focuses more on instructional flexibility, whereas Hammond (2015) underscores emotional safety and motivation. Together, they argue that CRT must move beyond group-level cultural generalizations and attend to the unique needs of each student. This attention to individual differences makes CRT more inclusive and responsive in practice.

2.7 Methods for Culturally Responsive Teaching

Research indicates that culturally responsive teaching methods are multifaceted, intricate, interconnected, and implemented differently by many educators (Gay, 2018; Han et al., 2014; Larke, 2013; Rhodes, 2018). Han et al. (2014) discovered that while seven higher education instructors engaged in collaborative self-study, they were unable to establish a clear framework while using comparable culturally responsive pedagogies. But two essential elements that enabled teachers to explain how they consistently implemented the practices across three domains i.e., constructivist instruction, fostering student relationships, and integrating cultural responsiveness into the curriculum that were emphasizing culture and making learning relevant (Han et al., 2014). Rather than being viewed as distinct elements, these components interacted to form a socially and culturally built learning environment that was inclusive and culturally sensitive. Emphasizing culture refers to making the curriculum relevant to the students' cultural backgrounds, while making learning relevant focuses on connecting academic content to real-world applications and students' lived experiences. Both elements are crucial for creating a meaningful and engaging learning environment that fosters critical thinking and deeper learning (Gay, 2018; Hammond, 2015).

Culturally conscious educator engages in ongoing critical reflection of their own culture, the social and cultural groups they belong to, and how their assumptions, attitudes, and behaviors influence their teaching (Villegas & Lucas, 2002). In the literature this is often referred to as "Cultural competence" (Aronson & Laughter, 2016; Ladson- Billings, 1994; Milner, 2011; Plots, 2018) or cultural consciousness the practice of understanding one's own culture followed by deepening the knowledge of the cultures of others (Jabbar & Hardaker, 2013; Villegas & Lucas, 2002). Educators,

who delve into intrapersonal awareness, engage in an iterative process of self-reflection and growth that explores one's assumptions and practices in relation to their impact on the learning and teaching environment (Salazar et al., 2010).

An example is to engage in a cultural context inventory that reflects one's preferred cultural context and its impacts when interacting across cultural differences in the learning environment (Halverson, 2008). Because preferences are contextual and dynamic given the setting, educators can explore them in relation to their own teaching. Cultural competence goes beyond mere awareness of diversity; it requires educators to understand and integrate students' cultural perspectives into every aspect of their teaching, from lesson planning to classroom interaction (Hammond, 2015). For example, educators can use a cultural context inventory (Halverson, 2008), a reflective tool that allows them to explore how their own cultural preferences shape their interactions with students. This continuous process of reflection helps educators adjust their teaching methods to be more inclusive and effective.

Teachers gain empathy through cultural awareness, which is a necessary component of a compassionate, adaptable teacher. By appreciating cultural diversity, a caring instructor fosters a community of learners by learning about and comprehending the cultures of their students (Gay, 2018). Setting and upholding high standards for all students is part of this, as research has demonstrated to benefit learning outcomes for all students, but especially for those from varied cultural backgrounds (Gay, 2018; Hammond, 2015; Kleinfeld, 1975; Ladson-Billings, 1995). High standards are set by compassionate teachers, and when students feel confident in their teachers, they put in more effort (Hammond, 2015; Kleinfeld, 1975). A pupil has a higher chance of success when their teacher demonstrates their concern and belief in them (Jaggars & Xu, 2016; Kleinfeld, 1975).

Research by Jaggars and Xu (2016) highlights that when teachers express belief in their students' capabilities, particularly in online learning environments, students are more motivated to succeed. Compassionate communication is another crucial element of CRT, where teachers recognize the multiple ways in which students express themselves, including non-verbal cues, which are essential in high-context cultures that rely heavily on non-verbal communication (Hall, 1981). By reading these cues, teachers can better understand their students' needs and provide the necessary support. Intrusiveness is another indication of a compassionate online teacher (Wood & Harris,

2020). Being overbearing entails not waiting for pupils who might be having trouble asking questions. Through culturally responsive communication, which emphasizes accepting the many ways in which students communicate, this care is extended. In a typical classroom, teachers and students can establish a connection by "reading" key non-verbal including emphasis and feelings expressed on the face and in other body language. This can be particularly difficult for high context cultures that rely heavily on non-verbal (Hall, 1981).

Another method to engage with pupils is through storytelling, which also gives them a platform to express their own tales and use their cultures to make sense of the world. When students can create a story around what they have learned, learning can be improved (Hammond, 2015). A trustworthy, interesting online learning environment where students' learning is relevant can be created by sharing stories with one another (Lowenthal & Dunlap, 2010; Pacansky-Brock et al., 2020). In the digital age, storytelling can be adapted for online platforms through the use of blogs, podcasts, or discussion forums where students narrate their cultural experiences. Such activities create a trustworthy and engaging learning environment where students feel their contributions are valued, and they can connect their academic learning to personal experiences (Lowenthal & Dunlap, 2010). This leads to increased student engagement and academic success.

To accommodate students' culturally diverse mental schemas and learning styles, culturally responsive instruction contextualizes the instructional frameworks and tactics (Gay, 2018). In order to help students, make connections between their new knowledge and their existing knowledge, culturally responsive education employs a range of tactics to scaffold and contextualize the learning (Hammond, 2015). Several tactics can be used to cast a wider net because teachers might not always be aware of the unique schemas and learning styles of their students. Using real evaluations that let students rely on their own learning rather than presumptions about what they ought to know is one example. This could involve students producing essays that are relevant to their lives, starting a blog, or debating issues that are important to them. The notion that a certain teaching method, such as project-based learning, is the only effective way to educate can be refuted by authentic instruction that is tailored to meet students where they are when the elements of the socio-cultural lens are taken into consideration, teaching is emphasized as the social and cultural practice of assisting students in

developing knowledge through relationships, participating in interpersonal communication, offering compassionate support, understanding how culture affects the learning environment, and adapting the curriculum to meet the needs of the students.

2.8 Challenges and Barriers in Implementing CRT

When using culturally responsive teaching approaches, educators may run against institutional, practical, and/or personal obstacles, just like with any other teaching approach. Research on the subject of culturally responsive online education has shown obstacles concerning cultural awareness, knowledge, and abilities of educators (Larke, 2013; Woodley et al., 2017), the digital fluencies required for effective online instruction, and the requirement for institutional support (Rhodes, 2018; Wooley et al, 2017). It's a popular idea that teachers "teach how they were taught," but studies have shown that this isn't quite true. A person's teaching style can be influenced by a wide range of things, such as their cultural background, experiences, and past learning (Dewsbury, 2017; Gay, 2018; Jung, 2014). Yet, most higher education instructors have not been prepared to design and teach in increasingly diverse classrooms (Dewsbury, 2017; Gay, 2002, 2018; Rhodes, 2018).

In order to effectively teach in today's classrooms, teachers must understand both their own culture (Gay, 2018) and the interconnected sociocultural factors that affect students' learning outcomes (Gay, 2018). Understanding their own cultural background and considering how it affects their teaching and interactions with others, especially pupils who might not have similar tastes or values, these are characteristics of a culturally aware educator (Chávez & Longerbeam, 2016). Milner (2011) discovered a strong relationship between cultural awareness among educator sand their impact on implementing culturally relevant instruction, as well as good effects on students' understanding of their own identities and cultures. 75% of full-time professors in higher education nationwide identify as White, despite ongoing changes in the racial and cultural diversity of student populations (NCES, 2018c). Consequently, if teachers don't engage in cultural understandings in the classroom, it can lead to a culture mismatch that could negatively affect learning.

Instructors must possess the knowledge and abilities to successfully incorporate culturally responsive teaching; cultural sensitivity alone is insufficient (Gay, 2018). Most educators collect ideas and methods for their lessons from a variety of sources,

but they simply do not have mental examples of what teaching online must be. “When we teach online, the knowledge that we need changes, and we experience faculty knowledge in new ways” (Major, 2015, p.25). Hence, instructors’ knowledge of their content and pedagogy are communicated and actualized differently online as they intersect with technology. Koehler and Mishra (2009) argued that “teaching with technology is a complex, ill-structured task” (p. 62) that requires instructors to find new ways to navigate the complexity.

Technological knowledge is not separate from content or pedagogical knowledge, rather the intersection of these three forms of knowledge creates opportunities for new knowledge (Koehler & Mishra, 2009). Teachers' decisions are blatantly culturally sensitive and differ accordingly depending on the setting. This goes beyond merely implementing a particular approach; it involves the deliberate integration of cultural understandings into learning through links to the unique backgrounds, experiences, and learning styles of each student (Hammond, 2015). Implementing culturally responsive teaching is crucial as a framework for bringing together behavior that upholds culture, but it can get tricky if there aren't any predetermined concepts (Larke, 2013). These complexities stem from the premise that culture is complex and includes varying meaning and understandings that cannot be addressed by a one-size-fit all approach.

The fundamental elements of student interactions and interaction that occur online can differ greatly from those that occur in traditional contexts (Smith & Ayers, 2006; Wang, 2007). However, professional development for online educators varies, but frequently center on technological instruction instead of balancing design, pedagogy, and technology with a focus on culture (Rhodes, 2018; Woodley et al., 2017). Students must perceive themselves and their cultures in the curriculum, environment, and pedagogy rather than only through the lens of the dominant culture if they are to participate in meaningful learning experiences and build relationships with teachers and peers (Gay, 2002, 2013, 2018). Scholars have argued that learning that is situated in the context in which it occurs, e.g., within one’s culture, has been shown to positively influence the learning (Brown et al., 1989; Chávez & Longerbeam, 2016). Culturally responsive teaching is intentionally crafted to draw upon the cultural strengths of the students in the classroom.

2.9 Case Studies of Effective CRT in Higher Education

Despite these challenges, there are several examples of universities successfully implementing CRT to enhance student learning outcomes. One such example is a study conducted in the United States that examined the effects of CRT on student engagement and academic performance in a university setting (Chávez & Longerbeam, 2016). This research concluded that when educators teach students from minority backgrounds with culturally relevant pedagogy, those minority students claim to have a closer relativity to the contents of the course content and are likely to be engaged during discussions. The children were more involved both in their thinking processes, and in their academic performance as a result of this.

The second Indonesian case study documented the benefits of CRT for students in the higher learning institution expansive in terms of critical thinking improvement among learners (Wardani et al., 2023). The study shows that when teachers used cultural references and homework familiar to the students as a way of relating chemistry concepts to real life situations, the students' overall critical thinking improved greatly. This research thus brings to light the practice of relating content taught to learners' culture as a valuable approach in enhancing understanding and interaction.

These examples demonstrate how CRT can be used to change the culture of learning in higher education by creating an inclusive environment, encouraging engagement and enhancing attainment, for all learners especially, but not exclusively, those from diverse backgrounds.

2.10 Critical Thinking

Since time immemorial, critical thinking has been viewed as a requirement in college education to foster understanding of the content, ability to learn, analyze and make decisions. By definition, critical thinking is disciplined thinking, including understanding, analyzing and evaluating information in a fair-minded and reasonable manner, (Paul & Elder, 2006). Far exceeds recall and procedural knowledge, it involves analysis of assumptions, evaluation of the information, and synthesis of the information.

In the current education scenario, critical thinking skills are even more useful since so many problems can't be solved through simple memorization. Butler et al. (2017) argue that critical thinking is a better factor for success in life than intelligence because the latter helped an individual choose the right decision on academic and life practice. By so doing, the cultivation of critical thinking becomes a fundamental goal

of higher learning institutions with students expected to reason independently in order to solve problems.

In the perspective of this research, critical thinking is important because it provides students with the ability to reason with diverse cultures meanings. CRT promotes critical thinking as it allows the learners to challenge the prevailing paradigms, and make them consider how culture impacts their perception of what they learn. This type of critical analysis is important in critical thinking because they involve self-scrutiny of personal prejudiced and belief systems.

2.11 Importance of Critical Thinking in Education

It goes without saying that critical thinking comprises one of the key competencies for students in the process of their studying at universities. Safirah et al. (2024) aptly observe that critical thinking is valuable because students who will form the future workforce will need to solve problems and make decision in dynamic, globalized contexts. In higher education, critical thinking is not only a useful skill that leads a student to succeed academically, but also a practical strategy for a constant adaptation to a constantly changing environment.

Scholars have always appreciated critical thinking as an essential precondition for students' success in educational establishments. Teachers in higher education institutions ought to ensure that their clients are ready to reason critically on matters of substance and transform knowledge in order to make sound decisions. Emir (2009) noted that critical thinkers can easily discern bias, separate the wheat from the chaff, and make the right decisions on matters of concern in their students' personal, academic, and professional lives.

As well, analysis and evaluation are essential in creativity and innovation processes. If students are encouraged to think critically then it means they will be able to solve a problem more approach, and find unique solutions to it. This ability to manage the perspective that deviates from common approaches and patterns may be considered a desired quality as employers of today's global economy are on the lookout for candidates who can not only assess the problem but also suggest a proper way of solving it (McGregor, 2007).

2.12 Relation of Critical Thinking to Student Success

It is widely known that there is a connection between critical thinking and success

of students in educational process. So, it is crucial to determine that the views and opinions developed throughout the, process, critical thinking skills predict successful academic and professional outcomes among students. For instance, Snyder and Snyder (2008) confirmed this notion, arguing that identification of critical thinking directly correlates with the evaluation of performance since it excellently works on complicated areas of learning.

Critical thinking correlation with student achievement in higher learning institution is well grounded and justified because it provides students with opportunity to dwell more on the content that has been provided, develop relationship between the content as well as to demonstrate their mastery of the content provided to them in various creative ways. It is pertinent under multicultural settings where students come to learn from each other as well as exposing them to their own Productive Cultural Attitudes. Through teaching students' critical perspectives, CRT enables them find viable solutions to social and academic questions to enhance the outcomes (Gay, 2018).

Also, critical thinking skills that are an important factor in a global competitive job market must also be developed. In the current world, employers look at critical thinking as one of the essential elements of competency since those people who are capable of analyzing information and data, developing solutions to encompassing problems and engage in creative thinking are capable of matching the increasing complexity of and competition in the business world (Butler et al., 2017). Consequently, higher education institutions have a mandate of guaranteeing that students they admit acquire tendencies of critical thinking that can come in handy in their subsequent success.

2.13 Critical Thinking Skills

2.13.1 Evaluation

This includes determining the credibility, relevance and importance of data that is collected for purposes of evaluation so as to establish its reliability and validity. Ennis (2011) claimed that critical thinkers are supposed to analyze argument and evidences critically separating fact from opinion and bias. This skill is important in resource management as students are supposed to filter information from different source, distinguish between valid arguments and fallacies, and sort information by relevance. Evaluation must also be considered from different approaches in order to come up with

coherent conclusions.

In the context of CRT, the concept of evaluation assumes a new and different dimension since the student is expected to evaluate different perspectives of cultural bothers. Gay (2018) indicated that culturally responsive teachers ought to engage students into the critical examination of information through diversity lens for global perspective. The rationality that comes with it helps equip the students with the necessary knowledge to make good decisions, to contest prejudices and to fight for equality. Through evaluation, educators train students on how to handle issues of the society in a critical manner for them to reason in today's society especially in an interconnected world.

2.13.2 Assumption

In assumption there is an understanding and analyzing of propositions that are considered to be true. In critical thinking, identified and questioned assumptions are taught to be evaluated in order to check for biases by Paul & Elder (2006). Again, when learning, learners tend to make some hidden assumptions which shape their perception of the world and their choices. Through engaging in thinking that questions these assumptions, the learners learn how to determine the validity of their perceptions, and how to avoid making faulty decisions. For instance, to suppose that a given cultural practice is congruous with excellence may entail misconceptions; knowing that this is an imposed assumption is the initial stage in performing criticism.

Assumption is crucial in CRT as it helps students challenge what they consider as facts about a particular group. In her article, Ladson-Billings (2017) stated that teachers have to respond to presumption about race culture and identity in order to foster equal learning. Such an approach opens students' minds and helps them appreciate a variety of perspectives when they look at concepts and notions with suspicion regarding the stance they were taking. They use critical thinking in this process, and at the same time, get ready to find themselves in more complicated social and career scenarios.

2.13.3 Inference

Inference can be explained as the provision of logical conclusions with respect to certain evidence and or information. Facione (2011) described inference as the reason making process whereby one deduces relationships between concepts and then use these relationships to determine other variables. This skill is pivotal for most problem-

solving and analytical thinking types because, to progress, the participants have to go beyond the superficial level of analysis. For instance, inferential learning would encourage students learning history to establish how events related and their causes hence leading to a richer learning experience.

CRT aims at enhancing inferential skills from the aspect of cultural relevancy of the content of knowledge learnt in class. According to Powell and Rightmyer (2012), culturally relevant teachers explain new information and concepts using present day scenarios, or current case studies. As I have mentioned earlier, not only does this approach improve the relevance of the material in the classroom but it also sharpens the students' skills of analyzing and applying the information in a range of contexts. Thus, creating strong inferential skills as the tools to solve those and other problems students will improve the effectiveness of their problem-solving activities in teams.

2.13.4 Interpretation

Interpretation has to do with explaining the meaning of content in written, graphic, or numerical form. It is basic to critical thinking since it takes care of an essential condition of comprehension, which is the capacity to express a thought. According to Facione (2011), interpretation rely on identifying a code and recognizing regularities and latent meaning of stimuli, which are functional in problem-solution and decision-making. Educational interpretation skills on the other hand are learnt by making the learners to decipher different sources of information and relate the content thereof to their lives. This creates a higher penetration and set students for an interaction and evaluation of multiple opinions.

Additionally, interpretation cannot be left out of the CRT model because of the value that the teaching strategy places on applicability of information to students' cultures. According to Gay (2018), when the cultural content of student experience is included in the learner's content and frameworks for interpreting content, students are more meaningful in comprehending the meaning of such concepts. This skill also has connection with the communication skill since the accurate interpretation boosts the capacity to effectively pass information to other people. Interpretation, in fact, suggests that extra work needs to be done to ensure that the mediums of the intended message take into consideration factors such as context, culture and person difference so as to rightly interpret the meaning and rightly relay the message.

2.13.5 Deduction

As mentioned initially deduction is the process whereby from specified general principles or specific rules, logical conclusions are arrived at regarding particular events. Paul and Elder (2006) showed that deduction forms one of the subtypes of DIA, and it involves use of given structures to analyze situations in a logical way. This skill is common in problem-solving so that the students are well equipped to deduce conclusions from gathered evidence as well as logical conclusion making. For example, in mathematics class individuals solve problems by using formal theorems and uniform logic which proves that student applies deductive reasoning.

In line with culturally responsive practices, facilitators use deduction to assist students use their theoretical understanding in real-life situations. Villegas and Lucas (2002) stated that CRT highlights the relationship between theory and practice and helps students to reason out the probable solution to an existing problem. Through deductive reasoning, teachers prepare learners for problems arising from cultural differences that may be required to solve with diverse groups. This skill does not only improve the scores on the academic assignments but also equip the student with the outlook on problem solving in general with confidence and accuracy.

2.14 Association between CRT and Critical Thinking

CRT is not simply an approach to increasing student's interest but a powerful means of enhancing the critical consciousness in university setting. Basic to the whole CRT approach is the belief that students achieve more when their cultural selves are acknowledged, and this inspires them to learn more and think critically. This links with the nurturance of CRT as a critical thinking strategy since this approach makes learners challenge assumptions, review different people's viewpoints, and contemplate about their own contexts within the learning materials being taught (Gay, 2018).

CRT research indicates that CRT forms environments that by themselves promote critical thinking. Students are also likely to be active providers of information and be receptive to learning experiences, when their cultures are represented in the learning content. Such an approach to education makes it possible to develop an agents' critical thinking when it comes to subjects and ideas and introduce them to questioning of a hegemonic discourse. According to Wardani et al. (2023), criticism of racial matters in CRT sharpens the intellectual skills by associating the facts from classroom with

experiences in their daily life. Likewise, Safirah et al., (2024) the study showed CRT helps create an environment that allows students to freely share their views and derive meaningful discourse which is all part of critical thinking.

Moreover, CRT prepares students for the role of active agents in transforming society and analytical examination of the contexts in which learners and citizens find themselves. This process is basic to critical thinking, a skill that compels students to go beyond memorization, recall and reproduce by learning how to assess information, argument and evidence. CRT, subsequently, plays the role of an enabler in the enhancement of other cognitive skills that will enable the learners embrace the global society that significantly values critical and innovative thinking (Abacioglu et al., 2020).

At this level, cultural competence is another connection that exists between CRT and critical thinking. Cultural sensitivity is the capacity of individuals to perform certain tasks or negotiate with culturally different people. Within the scope of CRT, culturally relevant educators are those, who are aware of their students' culture and inculcate these features into practice. In this way, teachers establish learning conditions which help students compare their own cultural selves to the cultural selves of others (Gay, 2018).

Cultural competence in higher learners' environment is essential in developing an environment that enhances learners' critical thinking abilities. Of course, culturally competent educators are precisely the ones who can create curricula that will force learners to think in terms of specific cultural contexts and question their own biases. This kind of reflective process forms a part of critical thinking since the students are put through a difficult task of making them to understand beyond the surface of what they hold as true. In their study of cultural competence of educators Hutchison & McAlister-Shields (2020) established that culturally competent teachers had higher critical thinking skills among their students as compared their counterparts; this was because the former fostered diverse classroom environment where students are encouraged to express their ideas freely.

In addition, the competence in cultural factors is highly related to aid students to thinking critically to live in the diversity of culture. By interacting with such approach's students acquire strong critical thinking skills and better understand how

culture affects people's perception and approach to different things. Such cultural sensitization can be hugely beneficial when approaching critical thinking to systems of thought and systems of knowledge production; it assists the learner in thinking beyond the box as well as learning to embrace a broad perspective to issues (Rhodes, 2018).

A number of emphases in education theory may be used to support the blending of CRT with critical thinking development: the constructivist learning theories CLT, which argue for the contextual basis of learning. Sociocultural theory of Vygotsky (1978) is most appropriate in this regard because the kind of learning being described is fundamentally social. While learning, the students are in a better position when the new knowledge has relation to the cultural experiences, they have familiarized themselves with, a standpoint that is embraced by CRT. Besides, it fosters critical thinking at first, because CLT integrates learning in cultural context, and second, because the CLT encourages students to construct meaning from the academic content in the context of cultural orientation.

The other theory relevant to this study is Experiential Learning Theory of Dewey (1938) where the experience takes the central role in education. According to Dewey the best approach of learning is very active one whereby a student can get to relate his new knowledge and experiences. CRT corresponds with this theory in the sense that it compels educators to help teachers to include religious and cultural practices of students and make learning all the more interesting. Whenever students are able to make connections to the content they are learning with their own lives, students are more inclined to think critically, because, in order to make connections, they must analyze the content in a way beyond passive consumption.

Other learning theories that give support to the view of learning as an active constructive process are constructivism learning theories: Piaget (1977) and Bruner (1996). Based on constructivism students learn by associating new knowledge to their previous experience and cultural background. CRT allows for accomplishing this task to occur because it values and attributes significance to student's cultural realities (Han et al., 2014), which enables critical thinking by assisting students engage with the content that is scholarly in a culturally relevant manner.

2.15 Global Perspectives on CRT and Critical Thinking

Studies on CRT and their effectiveness on critical thinking have been of various

educational types across the globe. These researches have shown that invariably as having been evidenced by CRT insisting on the improvement of the critical thinking skills of students through the provision of culturally sensitive learning environments. In the country as a whole, where CRT has been researched most extensively, the findings have illustrated that CRT enhances pupil participation, academic performance, and acquisition of critical thinking skills (Gay, 2018). Similarly, Chávez and Longerbeam (2016) established that CRT enhanced critical thinking ability of learners from diverse cultural background because it allowed them to consider other group's point of view and also the cultural self-identity.

Similarly, another study conducted among university students in Indonesia show that CRT assist in developing critical thinking skills among the students. Wardani, et al. (2023) assessed the effectiveness of CRT to promote cognitive learning in students with different chemistry classes. I showed that where the teaching was based on ethnic chemistry-based culturally sensitive teaching and learning, there was significant improvement in their critical thinking skills. This implies that if students can fit what they are learning in class to their culture, they will be able to reason out more and analyze and these two are integral part of critical thinking.

These results concur with other studies conducted in other countries, for example, Australia and South Africa, and reveal that CRT increases the level of students' interest and critical thinking due to meaningful values of cultural difference and perspective greetings. Similarly, in each of these contexts, CRT has also been found not too not only raise an academic achievement of students but also their judgments of multifaceted problems (Hutchison & McAlister-Shields, 2020).

2.16 Empirical Research in Pakistan's Higher Education

While culturally responsive teaching (CRT) has been widely examined in international contexts, its application within Pakistan's higher education system remained underexplored. Most available studies focused on primary and secondary levels, with limited empirical evidence addressing how CRT supports critical thinking at the university level in Pakistan. This gap was notable, especially given the shifting landscape of higher education in the country, where increasing enrolments and greater cultural, linguistic, and socioeconomic diversity called for more inclusive pedagogical approaches (Abacioglu et al., 2020).

The limited studies that existed on CRT in Pakistani universities tended to be descriptive, lacking robust empirical investigation into the connection between culturally responsive pedagogy and students' development of higher-order thinking skills. In particular, there was insufficient exploration of how CRT influences students' ability to engage critically with content in culturally heterogeneous classrooms. Rhodes (2018) observed that students from minority or less dominant cultural groups often reported feeling excluded in traditional university classrooms due to the lack of cultural representation in curricula, which in turn limited their critical engagement and academic success.

This study addressed that gap by examining how CRT practices influenced the critical thinking abilities of university students in Pakistan. By investigating the relationship between culturally responsive pedagogy and cognitive skill development, the research contributed empirical insights to a context that was previously underrepresented in CRT-critical thinking literature. Rather than focusing on an underrepresented population, the study critically examined a conceptual and practical gap: the limited empirical understanding of how CRT operates in non-Western, higher education environments—specifically within Pakistan's rapidly diversifying academic landscape. In doing so, it expanded the applicability of CRT scholarship and highlighted the importance of localized, context-sensitive pedagogy in fostering critical engagement.

2.17 Empirical Insights on the Impact of CRT on Critical Thinking

Research exploring the link between culturally responsive teaching (CRT) and critical thinking has employed both qualitative and quantitative methods. Quantitative studies have often relied on tools like the Watson-Glaser Critical Thinking Appraisal to compare students' skills before and after exposure to CRT-based instruction (Wardani et al., 2023). These studies generally suggest that CRT supports improvements in reasoning, evaluation, and decision-making. However, many of these findings are based on small-scale interventions that capture short-term gains rather than sustained cognitive development.

Qualitative research has added depth by examining students' experiences with CRT through interviews and focus groups. These methods have helped uncover how students perceive classroom environments shaped by CRT. While such findings

highlight the value of inclusive pedagogy, they often rely heavily on self-reported data from students and teachers, raising concerns about bias and subjectivity (Rhodes, 2018).

Critically, much of the current literature remains geographically concentrated. Most empirical studies come from contexts such as the United States, Indonesia, or Australia, with limited work investigating how CRT supports critical thinking in culturally complex and developing higher education systems like Pakistan's. Additionally, CRT research has largely focused on the humanities and social sciences. There is little empirical evidence on how CRT can be effectively integrated into STEM disciplines, which are often perceived as culturally neutral (Han et al., 2014).

This study addressed some of these gaps by exploring CRT's impact on critical thinking in Pakistani universities. It added context-specific evidence to the field, where practical applications of CRT in higher education remained under-researched. By focusing on both implementation and outcomes, this study contributed to the broader conversation about how CRT can function across disciplines and regions.

2.18 Teacher's Role in Promoting Critical Thinking

In a CRT framework, the task of the educator is central. Teachers help learners to think and reason individually and collectively by relating the material they teach to the cultural realities within which they exist. In my opinion, culturally sensitive teachers are at the center of the assessment of critical thinking since they foster the learners by acknowledging their cultures. Gay (2018) posited that culturally responsible teachers who understand students and even the way they learn because of culture will encourage them to question realities and think critically about what they are learning.

2.18.1 Engaging in Critical Dialogue

Where CRT is employed, teachers in particular involve themselves in critical conversations with students as well as demonstrate critical analysis. They ask questions that require the student to weigh all the possibilities before arriving at an answer they provide loosely defined premises that require the student to think beyond what a correct answer can be. Based on Hutchison and McAlister-Shields (2020), teachers were found to cultivate critical thinking effectively through the modeling of critical thinking behaviour, including ways in which the teacher challenged the evidence, considered other possibilities, and, considered personal bias in some ways. This approach ensures

that critical-ness belongs to the classroom; students think critically and are encouraged to challenge norms or policies.

2.18.2 Implementing Collaborative Learning Strategies

But count also networks allow teachers to establish group work that motivates students to discuss content with other top performers. Large group discourse, debates and collaborations that involve students' group work in pairs or teams where a number of members come from different cultures, makes them appreciate different views and always engage in a critical evaluation of the opinions that they hold or that are held by others. When carrying out CRT practices at the higher learning institutions, Abacioglu et al. (2020) noted that collaborative learning activities CLAs brought about enhancement of students' critical thinking skills since the students are able to look for the interconnection between opposite ideas and come up with solutions for the same.

Some classroom-based investigations have revealed that CRT strategies decrease critical thinking. In a study conducted on a university in the United States, Chávez (2007) noted that the classroom which used CRT approach in teaching, including using texts that reflect diversity, and noting the connection of their learning to the students' culture, lead to positive performance especially in the aspect of critical thinking of the students. Through the use of the text's students were able to place much more focus on critical analysis and questioning of all the underlying assumptions inherent in the texts that the class was dealing with.

2.18.3 Usage of Ethno-Based Teaching

In another case study from Indonesia, Wardani et al. (2023) found that participants' critical thinking skills were improved when lessons in chemistry were taught through ethnic chemistry context, the context that involves local cultural and environmental setting. The strategy used involved students being encouraged to analyze the consequences of chemical processes on their surrounding environments which increased interaction with the content and the ability to reason. These examples from different classrooms indicate that besides rendering the content taught in classrooms more meaningful, CRT involves the learners in critical thinking processes.

2.19 Culturally Responsive Teaching Challenges in Developing Critical Thinking

Although CRT has shown promise in fostering critical thinking, its implementation in higher education is not without barriers. These challenges are

embedded in institutional structures, teacher readiness, curriculum rigidity, and cultural misalignments that can undermine CRT's potential. While much of the literature acknowledges the effectiveness of CRT in principle, the practical realities within higher education contexts complicate its execution. Particularly in traditional academic environments, efforts to promote critical thinking through culturally responsive means are often constrained by a lack of systemic reform and support. Several recurring issues have been identified in existing research, including outdated teaching models, underprepared faculty, inflexible curricula, cultural gaps between students and educators, and technological complications arising from the globalization of education.

2.19.1 Traditional Models of Education

Traditional university systems are often modeled on Western pedagogical frameworks that prioritize uniformity and standardized content delivery. These frameworks rarely accommodate diverse cultural narratives or experiential knowledge. As a result, implementing CRT in such rigid structures becomes difficult. Gay (2018) notes that institutions frequently fail to update curricula to reflect multicultural perspectives, thereby limiting the relevance of learning for students from different cultural backgrounds. This reliance on conventional models reinforces dominant cultural norms and marginalizes others, making it difficult to foster meaningful critical thinking. The literature points out that these models often prioritize content memorization and passive absorption over culturally grounded dialogue and analytical engagement (Banks, 2015). Thus, without a shift in institutional thinking, the goals of CRT risk being reduced to symbolic efforts rather than transformative pedagogical change.

2.19.2 Lack of Teachers' Preparation

Another major obstacle lies in faculty preparedness. Many university instructors are not trained in CRT principles, which limits their capacity to engage students from diverse backgrounds effectively. Rhodes (2018) observed that even well-meaning educators often lack the tools to apply CRT beyond superficial activities. The absence of professional development focused on cultural competence further compounds this issue. Teachers who are unfamiliar with students' cultural contexts may unintentionally reinforce biases or rely on generalized assumptions. This undermines critical thinking by failing to create space for multiple perspectives. Moreover, several studies suggest

that the majority of faculty in higher education have been socialized into teaching models that reflect their own cultural experiences, which may not align with the increasingly diverse student population (Dewsbury, 2017; Gay, 2018). As a result, there remains a critical gap between CRT theory and its pedagogical enactment in classrooms.

2.19.3 Curriculum Constraints

Curriculum design also plays a limiting role in advancing CRT and critical thinking. In many institutions, syllabi are tightly structured with predetermined content, leaving little room for flexible or student-centered learning. Hutchison and McAlister-Shields (2020) argue that this rigidity stifles opportunities to incorporate multicultural content or promote inquiry-based instruction. The literature reflects a consensus that current curricula often prioritize standardized testing and measurable outcomes over critical engagement with content. This emphasis on efficiency and accountability discourages experimentation with CRT-based approaches. Additionally, existing course materials are frequently designed around Eurocentric knowledge systems, further marginalizing culturally diverse perspectives. Educators working within such constraints may find it difficult to deviate from prescribed content, even when they recognize the value of culturally responsive teaching. Without structural curriculum reform, the goals of CRT remain undercut by the limited flexibility afforded to educators.

2.19.4 Cultural Misalignment

Cultural misalignment between students and educators presents another significant barrier. When educators are unfamiliar with students' cultural backgrounds, or when classroom practices are disconnected from students' lived experiences, learning becomes fragmented. Rhodes (2018) highlights that such misalignment often leads to student disengagement, especially among minority learners who do not see their values or identities reflected in the curriculum. This lack of connection can inhibit the development of critical thinking, which depends on the ability to question assumptions and evaluate multiple viewpoints. Moreover, when critical thinking frameworks are presented without cultural context, students may struggle to engage meaningfully. Safirah et al. (2024) caution that students may resist CRT practices when they conflict with cultural norms that prioritize conformity over critique. In these cases,

educators must be especially attentive to introducing CRT in a way that respects students' cultural orientations while gradually expanding their capacity for analytical thinking.

2.19.5 Globalization of Higher Education

The rise of online education and globalized classrooms adds further complexity to CRT implementation. In virtual learning environments, meaningful cultural interactions are harder to cultivate. Students may feel disconnected from peers and instructors, particularly when courses lack culturally inclusive content. Woodley et al. (2017) report that the absence of face-to-face interaction limits non-verbal communication cues, which are vital for high-context learners who rely on tone, gesture, and facial expressions. This detachment can reduce engagement and restrict the development of critical thinking skills. Furthermore, standardized online platforms often prioritize technical functionality over cultural responsiveness. As higher education continues to globalize, the challenge will be to design digital learning environments that honor cultural diversity while promoting critical engagement. Without intentional design, online education risks replicating the same exclusionary practices found in traditional classrooms.

2.20 Critical Summary of Literature Review

In summary, the intersection of culturally responsive teaching (CRT) and critical thinking forms the theoretical foundation of this study. The reviewed literature emphasizes the role of student experience, cultural context, and interaction in shaping educational outcomes. CRT is shown to support critical thinking by creating inclusive spaces where students connect new knowledge to their lived experiences. However, most studies tend to generalize CRT's benefits without systematically linking it to critical thinking development in higher education. This creates a need to investigate CRT not only as a pedagogy for inclusion but also as a strategy for enhancing specific cognitive outcomes such as critical thinking, particularly in diverse and evolving systems like that of Pakistan.

The literature calls for a more nuanced and practically grounded understanding of CRT in higher education. Yet, much of the existing work remains conceptual or anecdotal. There is limited empirical evidence directly examining how CRT practices develop critical thinking across different learning environments. Furthermore, current

models often assume that all students automatically benefit from culturally inclusive practices without considering variations in student response based on cultural familiarity or academic readiness. This inconsistency suggests a need for research that explores not just whether CRT works, but how it works in different institutional and cultural settings, such as Pakistani universities.

Although research linking CRT with critical thinking is growing, there are conceptual ambiguities in how critical thinking is defined and measured across studies. Some literature treats critical thinking as a generic skill, while others emphasize culturally situated reasoning. The inconsistent use of frameworks makes it difficult to evaluate CRT's effectiveness in a standardized way (Abacioglu et al., 2020; Wardani et al., 2023). Furthermore, few studies critically analyze whether CRT fosters long-term dispositions for reflective thinking or simply improves short-term academic performance. This gap highlights the need for studies that assess sustained cognitive growth as an outcome of culturally responsive instruction.

While CRT's emphasis on cultural grounding has been theoretically justified through learning theories like Vygotsky's sociocultural theory (1978) and Dewey's experiential learning (1938), the empirical support in non-Western contexts remains limited. Many assumptions in the literature rely on Western classroom dynamics, making the findings less transferable. For example, most frameworks presume a level of student autonomy and classroom participation that may not align with educational norms in Pakistan. This disconnection underscores the importance of contextualizing CRT research to ensure its relevance to local pedagogical realities (Rhodes, 2018).

In Pakistan, limited empirical research has explored the systematic use of CRT to enhance students' critical thinking. Some studies have highlighted the lack of cultural representation in content as a barrier to student engagement Muhammad & Brett (2020), yet these insights are not grounded in structured CRT interventions. Consequently, students from diverse backgrounds may not develop the analytical skills required to critique knowledge systems or reflect on their own beliefs (Abacioglu et al., 2020). This reveals a specific knowledge gap in understanding how CRT can be used not only for engagement but for cognitive development in higher education.

This study was conducted to address these inconsistencies. It examined how CRT influenced the critical thinking of university students in Pakistan, where higher

education systems are undergoing rapid diversification. By applying CRT practices in a structured way and analyzing their impact on students' reasoning skills, the study added to the existing literature. It provided insights into how CRT functions in Pakistani classrooms and how it can be adapted to support deeper learning across cultural and academic divides.

The findings of this study contribute to practical reforms in educational leadership and policy. They offer guidance for designing culturally competent pedagogies that do not merely promote inclusion but actively enhance higher-order thinking. Institutions can use this knowledge to better train teachers and revise curricula to reflect local student realities. In doing so, the results help bridge the gap between CRT theory and its application in Pakistan and similar educational contexts where cultural sensitivity is often overlooked in cognitive development strategies.

Therefore, the literature review established that CRT has potential beyond fostering inclusive classrooms. It can enhance students' ability to think independently and critically. However, this potential has not been sufficiently explored in countries like Pakistan. This study addressed that gap and joined the broader conversation on how culturally informed education contributes to academic and cognitive success in global learning environments.

In light of the literature reviewed, it becomes evident that while CRT has gained considerable recognition for enhancing critical thinking in global contexts, significant gaps remain in its empirical application within Pakistan's higher education landscape. Existing research has largely focused on Western contexts, with minimal attention to how CRT operates in culturally diverse, non-Western academic environments such as Pakistan. Ethnic and linguistic minority students in Pakistani universities continue to be underrepresented in curricula, limiting their engagement and critical thinking development (Muhammad & Brett, 2020; Rhodes, 2018). Furthermore, most studies center on qualitative findings in the humanities, leaving its implementation in STEM fields and long-term academic outcomes insufficiently explored. By addressing these gaps, the present study contributed to extending CRT discourse into under-researched regions and disciplines, offering meaningful insights for fostering inclusive and critically engaging pedagogy within Pakistan's evolving higher education system.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the methodology used to analyze the factors that underpin the use of culturally responsive teaching (CRT) and the development of students' critical thinking skills (CTS). It consists of research paradigm, population, sampling technique, instruments, methods of data collection, method of data analysis and consideration of ethical issue.

3.1 Research Design

This study was conducted within the positivist paradigm and followed a quantitative causal comparative research design to examine the effect of culturally responsive teaching practices on students' critical thinking skills. This design was appropriate because it allowed the researcher to study patterns and differences between groups without introducing any changes or interventions. The use of structured classroom observations and the Watson and Glaser Critical Thinking Appraisal ensured consistency, objectivity, and reliability in data collection. A quantitative approach was the best fit for this study because it focused on measuring differences in critical thinking skills across a larger sample using numerical data. This allowed for statistical analysis and broader generalization of results, helping to provide clear findings (Creswell and Creswell, 2018; Johnson and Onwuegbuzie, 2004).

3.2 Population

The population of the study consisted of 70 teachers (43 from ELM and 27 from TE) and 750 undergraduate students (482 from ELM and 268 from TE) from the Faculty of Education at the Female Campus of International Islamic University, Islamabad.

Table 3.1

Population of the Study

Faculty/Department	Teachers	Program	Semester	No. of Students
Educational Leadership and Management (ELM)	43	BS ELM	Semester 1	82
			Semester 2	72
			Semester 3	80
			Semester 4	70
			Semester 5	68
			Semester 6	55
			Semester 7	55
			Total (ELM)	482
Teacher Education (TE)	27	BS ELT	2nd Semester	46
			3rd Semester	45
			4th Semester	45
		BS I.T	1st Semester	67
			2nd Semester	65
			Total (TE)	268
Overall Total	70			750

3.3 Sample and Sampling Technique

This study used the Simple Random Sampling (SRS) technique to select 12 teachers and 252 students from both departments of the Faculty of Education. Out of a total population of 70 teachers and 750 students, the selected student sample represents approximately 33.6 percent of the total student population. Although this percentage exceeds the commonly recommended 10 to 20 percent range, Gay, Mills, and Airasian (2012) emphasize that larger sample sizes are acceptable and often desirable when the population is accessible, and the goal is to enhance the reliability of results. Therefore, the chosen sample size is not only appropriate but also strengthens the study's ability to identify meaningful patterns related to culturally responsive teaching and students' critical thinking skills.

Table 3.2

Sample of the study

Faculty/Department	Teachers	Program	Semester	No. of Students
Educational Leadership and Management (ELM)	7	BS ELM	Semester 1	23
			Semester 2	23
			Semester 3	23
			Semester 4	22
			Semester 5	21
			Semester 6	21
			Semester 7	22
			Total (ELM)	155
Teacher Education (TE)	5	BS ELT	2nd Semester	17
			3rd Semester	17
			4th Semester	16
		BS I.T	1st Semester	23
			2nd Semester	24
			Total (TE)	97
Overall Total	12			252

3.4 Instrumentation

Two instruments were used as the means of gaining data for the study.

Critical Thinking Test

A standardized Watson and Glaser Critical Thinking Appraisal was adapted to assess students' CTS. The test comprised five sub-constructs: Evaluation, Assumptions, Inference, Interpretation, and Deduction, each with 4 items, totaling 20 statements. The instrument was chosen for its reliability and ability to measure the specific cognitive skills relevant to the study.

CRT Observation Checklist

A self-designed observation checklist was employed in the assessment of teachers' CRT practices. The checklist consisted of 20 statements divided into key dimensions: Cultural Competence, Communication, Equity, Individual Differences, Collaboration, Application of Knowledge, and Student Empowerment.

3.5 Procedure (Validity, Reliability, and Pilot Testing)

3.5.1 Validity

The CRT observation checklist used in this study was launched to the expertise of researchers in the Faculty of Education, International Islamic University, Islamabad. The tools associated with the checklist were checked for content validity by the experts in view of the proposed dimension with culturally responsive teaching. The responses received were integrated into the last copy of the used instrument. The process of validation pointed out that the checklist indeed appropriately focused on the intended CRT characteristics: Cultural Competence, Communication, Equity, Collaboration, and others. From the experts, a validation certificate was issued to show this process.

3.5.2 Pilot Testing and the Reliability of the Instruments

Before starting the main study, a pilot test was done using the Watson and Glaser Critical Thinking Appraisal. This pilot test was carried out with a group of students who were not part of the main sample. The purpose was to check if the test was clear, easy to understand, and suitable for the students who would later take it in the main study.

The results of the pilot test showed that the test was reliable. The same group of students took the test twice, and their scores were compared. The test-retest reliability value was 0.80, which means the test gave consistent results over time. This shows that the Watson and Glaser test is a trustworthy tool for measuring students' critical thinking skills.

3.6 Data Collection

The data collection process involved personal visits to the classrooms after taking permission from the department and teachers. Teachers' CRT practices were observed using the checklist across multiple classroom sessions. Simultaneously, students

completed the critical thinking test under standardized conditions. The entire data collection process spanned approximately four weeks. Challenges, such as scheduling conflicts and participant availability, were addressed through flexible planning and communication with institutional authorities.

To ensure objectivity and avoid observer bias, classroom observations were conducted thrice on different times. This repeated observation helped capture a more accurate picture of teaching practices and reduced the chances of personal judgment affecting the results. The observation checklist was designed based on well-known culturally responsive teaching (CRT) frameworks and was reviewed by senior professors from the Faculty of Education. Although teachers were aware of the researcher's presence, the use of a structured and validated tool helped ensure fairness and consistency in the data collected.

3.7 Data Analysis

Descriptive statistics (mean, frequencies, and percentages) were used to analyze the CRT observation checklist and critical thinking test scores, providing an overview of participants' performance. Inferential statistics were applied using independent sample t-test to examine differences in CTS across CRT levels. This approach ensured a comprehensive analysis of the data.

3.8 Ethical Considerations

This study fully adhered to ethical guidelines to protect the rights, privacy, and well-being of all participants. Before data collection, informed consent was obtained from both students and teachers. They were clearly informed about the purpose of the study, the nature of their participation, and their freedom to withdraw at any point without facing any consequences.

To ensure confidentiality and anonymity, all responses were coded, and no personally identifiable information was included in the findings. All data were securely stored, and access was limited to prevent unauthorized use. The researcher made every effort to safeguard the personal and academic information of all participants.

In addition, the principles of honesty, accuracy, and fairness were upheld throughout the research. Data collection and analysis were conducted without any personal bias and with a commitment to academic integrity. The study was designed to

minimize any potential psychological or emotional risk to participants.

The research was conducted within the researcher's own department under the supervision of the Dean, who also served as the research supervisor. Due to the internal nature of the research and the minimal risk involved, formal approval from an external ethics committee or institutional review board was not sought. However, the study was reviewed and approved at the departmental level. All ethical practices, including informed consent, voluntary participation, and data protection, were strictly followed.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATIONS

This chapter presents the analysis and interpretation of the data collected to address the research objectives and hypotheses. The analysis was carried out using descriptive and inferential statistical techniques. Descriptive statistics, such as mean scores and percentages, were used to summarize the levels of culturally responsive teaching (CRT) practices among teachers and the critical thinking (CT) skills of students. Inferential statistics, including t-tests were applied to determine significant differences in students' critical thinking skills based on their exposure to different CRT levels.

The chapter is structured in alignment with the research objectives. The first section analyzes the culturally responsive teaching practices implemented by teachers, categorized by their CRT levels. The second section examines the critical thinking skills of students, using their scores to classify them into medium and high categories. Finally, the third section explores the differences in students' critical thinking skills taught by teachers with high and medium CRT levels. The findings are interpreted within the context of existing literature and research to derive meaningful conclusions and implications.

4.1 Cut off Range to Categorize Teachers and Students into Categories

The critical thinking test scores of students were categorized as Low, Medium, and High, following the criteria used by Alarcon et al. (2024).

Scale	Value	Range
Low	1	1 to 49
Medium	2	50 to 69
High	3	70 to 82

The CRT levels of teachers were categorized into different categories based on their mean scores using the following predetermined criteria as per Mangiafico (2016):

Scale	Value	Range
Low	1	0 to 1
Medium	2	1.1 to 2
High	3	2.1 to 3

Objective 1

To analyze the level of culturally responsive teaching practices of teachers.

Table 4.1

Representation of teachers' CRT level.

Sr No.	Mean	Category
1	2.60	High
2	2.35	High
3	2.35	High
4	2.35	High
5	2.90	High
6	1.50	Medium
7	2.30	High
8	1.35	Medium
9	2.35	High
10	1.90	Medium
11	1.20	Medium
12	2.35	High

Table 4.1 shows the categorization of teachers based on their mean scores for culturally responsive teaching (CRT). Most teachers are in the "High" category, reflecting a strong use of culturally responsive teaching practices, with mean scores ranging from 2.30 to 2.90. A few teachers fall into the "Medium" category, with mean scores between 1.20 and 1.90, demonstrating moderate use of CRT practices. No teacher is categorized as "Low," indicating that all participants exhibited at least a moderate level of culturally responsive teaching practices. This demonstrates that the majority of teachers actively incorporate culturally responsive strategies in their teaching, with a smaller proportion showing room for improvement in their implementation.

Table 4.2

Mean Scores of Teacher CRT Practice Components.

Factors	N	Mean
Communication	12	2.46
Cultural Competence	12	2.03
Instruction	12	2.11
Application of Knowledge	12	2.14
Student Empowerment	12	2.1
Collaboration	12	1.83
Equity	12	2.13
Individual Differences	12	2.3

Table 4.2 shows the mean scores for various factors of culturally responsive teaching practices among 12 teachers. Communication achieved the highest mean score (2.46), indicating strong implementation in classroom practices. Individual differences also received significant attention, with a mean score of 2.3. Equity (2.13), application of knowledge (2.14), and instruction (2.11) were moderately emphasized. Student empowerment (2.1) and cultural competence (2.03) followed closely, reflecting a balanced focus. However, collaboration scored the lowest mean (1.83), suggesting that this area might require further improvement. Overall, the findings highlight communication and attention to individual differences as strengths while identifying collaboration as an area that could benefit from greater emphasis in teaching practices.

Objective 2

To assess the level of critical thinking skills of students

Table 4.3

Distribution of Students' Critical Thinking Skill Levels.

CT Levels	Percentage (%)
Low	23.4
Medium	21.4
High	55.2
Total	100.0

Table 4.3 shows the distribution of students' critical thinking (CT) levels categorized into low, medium, and high, along with their respective frequencies and percentages. Among the 252 students, 55.2% are classified as having high critical thinking levels, indicating a considerable proportion of students demonstrating strong critical thinking skills. 21.4% students fall under the medium critical thinking level, showing moderate abilities in critical thinking. The lowest critical thinking level includes 23.4% students, reflecting a notable minority with limited critical thinking skills. This distribution suggests that while the majority of students exhibit high critical thinking capabilities, there remains a significant portion with lower or moderate skills that may benefit from targeted interventions.

Objective 3

To analyze the level-wise difference between students' critical thinking skills taught by the high, medium, and low culturally responsive teaching.

Hypothesis 1

H₀₁: There is no significant difference between the students' evaluation skills taught by the high, medium, and low culturally responsive teaching.

Table 4.4

The difference between the students' evaluation taught by the high and medium culturally responsive teaching.

Variable	Groups	N	Df	t-value	Sig.	d
Evaluation	Medium	95	250	10.8	.000	1.40
	High	157				

Table 4.4 shows that the t value is 10.8 and the p value is .000, which is smaller than the significance level of 0.05. This means there is a clear difference in students' evaluation skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 1.40, which shows a large difference between the two groups. A higher Cohen's d value means the teaching style had a strong effect on students. Students who were taught by teachers with high culturally responsive teaching scored better in evaluation skills. This means they are better at thinking deeply, judging information fairly, and making wise choices. These skills help students face real life problems, make better decisions, and take part in academic and work life more confidently.

Hypothesis 2

H₀₂: There is no significant difference between the students' assumption skills taught by the high, medium, and low culturally responsive teaching.

Table 4.5

The difference between the students' assumptions taught by the high and medium culturally responsive teaching.

Variable	Groups	N	df	t-value	Sig.	d
Assumption	Medium	95	250	4.45	.017	.58
	High	157				

Table 4.5 shows that the t value is 4.45 and the p value is .017, which is smaller than the significance level of 0.05. This means there is a clear difference in students' assumptions between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.58, which shows a moderate difference between the two groups. A moderate Cohen's d value means the teaching style had a noticeable impact. Students who taught by teachers with high culturally responsive teaching were more likely to question old beliefs, think with an open mind, and see things from different points of view. These thinking habits help students handle real life problems more wisely and become more flexible in their learning and decision making.

Hypothesis 3

H₀₃: There is no significant difference between the students' inference skills taught by the high, medium, and low culturally responsive teaching.

Table 4.6

The difference between the students' inference taught by the high and medium culturally responsive teaching.

Variable	Groups	N	Df	t-value	Sig.	d
Inference	Medium	95	250	.733	.000	.95
	High	157				

Table 4.6 shows that the t value is 0.733 and the p value is .000, which is smaller than the significance level of 0.05. This means there is a clear difference in students' inference skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.95, which shows a large difference between the two groups. A large Cohen's d value means the teaching style had a strong impact. Students who learned from teachers with high culturally responsive teaching were better at understanding ideas, connecting different points, and giving reasons for their answers. These skills help students think clearly, solve everyday problems, and make smart decisions based on facts.

Hypothesis 4

H₀₄: There is no significant difference between the students' interpretation skills taught by the high, medium, and low culturally responsive teaching.

Table 4.7

The difference between the students' interpretation taught by the high and medium culturally responsive teaching.

Variable	Groups	N	df	t-value	Sig.	d
Interpretation	Medium	95	250	5.37	.000	.70
	High	157				

Table 4.7 shows that the t value is 5.37 and the p value is .000, which is smaller than the significance level of 0.05. This means there is a clear difference in students' interpretation skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.70, which shows a medium to large difference between the two groups. This means the teaching style had a strong impact. Students taught by teachers with high culturally responsive teaching were better at understanding and explaining information clearly. They were also more able to make sense of different ideas and connect new learning with what they already knew. These skills help students do well in their studies and make smart choices in daily life.

Hypothesis 5

H₀₅: There is no significant difference between the students' deduction skills taught by the high, medium, and low culturally responsive teaching.

Table 4.8

The difference between the students' deduction taught by the high and medium culturally responsive teaching.

Variable	Groups	N	df	t-value	Sig.	d
Deduction	Medium	95	250	4.96	.004	.65
	High	157				

Table 4.8 shows that the t value is 4.96 and the p value is .004, which is smaller than the significance level of 0.05. This means there is a clear difference in students' deduction skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.65, which shows a medium difference between the two groups. This means the teaching method made a noticeable impact. Students who were taught by teachers with high culturally responsive teaching were better at finding assumptions, thinking carefully, and reaching correct conclusions. These skills are very important in real life because they help students check facts, notice problems in arguments, and make smart and fair decisions.

Hypothesis 6

H₀₆: There is no significant difference between the students' critical thinking skills taught by the high, medium, and low culturally responsive teaching.

Table 4.9

The difference between the students' critical thinking skills taught by the high and medium culturally responsive teaching.

Variable	Groups	N	df	t-value	Sig.	d
CT Skills	Medium	95	250	6.843	.044	.89
	High	157				

Table 4.9 shows that the t value is 6.84 and the p value is .044, which is smaller than the significance level of 0.05. This means there is a clear difference in overall critical thinking skills between students taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.89, which shows a large difference between the two groups. This means the teaching method had a strong impact. Students who were taught by teachers with high culturally responsive teaching showed much better critical thinking skills. These skills include questioning ideas, understanding information deeply, and reaching good conclusions. Such thinking is very important for doing well in studies, adjusting to new situations at work, and making smart and fair choices in daily life.

Summary

In summary, the findings from this chapter provide strong statistical and practical evidence that culturally responsive teaching practices significantly influence students' critical thinking skills. Teachers who demonstrated higher levels of CRT practices were associated with students exhibiting stronger abilities in evaluation, inference, interpretation, assumption, and deduction. The effect sizes reported in each analysis affirm that these differences are not only statistically significant but also educationally meaningful. These findings support the growing body of literature suggesting that culturally responsive pedagogy enhances cognitive engagement and problem-solving among students. Overall, the results affirm the value of CRT in

fostering critical thinking skills in diverse classroom settings, particularly within the context of Pakistani higher education.

CRT Level of Teachers	No. of Teachers	CT Skills of Students	No. of Students
High	8	High	157
Medium	4	Relatively low	95
Low	0	--	0
Total	12		252

CHAPTER 5

SUMMARY, FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

This chapter consolidated the insights gained from the study, presenting a comprehensive overview of its findings, discussions, conclusions, and recommendations.

5.1 Summary

The study “Effects of Culturally Responsive Teaching on Critical Thinking Skills of Students at University Level” aimed to assess the impact of Culturally Responsive Teaching (CRT) on the development of students' Critical Thinking Skills (CTS) at the university level. It aimed to assess the teaching practices employed by teachers, analyze the level of critical thinking among students, and determine how CRT levels influenced these skills. The research focused on understanding the importance of culturally inclusive teaching strategies in a diverse academic environment. The objectives of the study were: 1. To analyze the culturally responsive teaching practices of teachers. 2. To assess the critical thinking skills of students. 3. To analyze the level-wise difference between students' critical thinking skills taught by the high and medium culturally responsive teaching. The research adopted a quantitative approach with a causal-comparative design. Simple random sampling technique was used to select the participants out of the total population of 720 students and 70 teachers. Data was collected from the sample of 12 teachers and 252 students using two instruments: the Watson-Glaser Critical Thinking Appraisal to measure students' critical thinking and a self-developed CRT observation checklist to evaluate teachers' practices. The researcher visited classrooms personally to observe the CRT levels of teachers and to conduct Watson-Glaser Critical Thinking Appraisal test from students. The data were analyzed using descriptive (mean, frequency, and percentages) and inferential statistics, including t-tests, to test the hypotheses.

5.2 Findings

Following were the findings obtained as a result of data analysis:

1. Teachers are in the "High" category, reflecting a strong use of culturally responsive teaching practices, with mean scores ranging from 2.30 to 2.90. A few teachers fall into the "Medium" category, with mean scores between 1.20 and 1.90, demonstrating moderate use of CRT practices (Table 4.1).
2. Communication with the highest mean score (2.6), indicating strong implementation in classroom practices. However, collaboration scored the lowest mean (1.8), suggesting that this area might require further improvement (Table 4.2).
3. 55.2% of students were classified having high critical thinking levels, indicating a considerable proportion of students demonstrating strong critical thinking skills. The lowest critical thinking level includes 23.4% students, and 21.4% students have medium level critical thinking skills (Table 4.3).
4. The t value is 10.8 and the p value is .000, which is smaller than the significance level of 0.05. This means there is a difference in students' evaluation skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 1.40, which shows a large difference between the two groups. A higher Cohen's d value means the teaching style had a strong effect on students. Students who were taught by teachers with high culturally responsive teaching scored better in evaluation skills. This means they are better at thinking deeply, judging information fairly, and making wise choices. These skills help students face real life problems, make better decisions, and take part in academic and work life more confidently (Table 4.4).
5. The t value is 4.45 and the p value is .017, which is smaller than the significance level of 0.05. This means there is a difference in students' assumptions between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.58, which shows a moderate difference between the two groups. A moderate Cohen's d value means the teaching style had a noticeable impact. Students who taught by teachers with high culturally responsive teaching were more likely to question old beliefs, think with an open mind, and see things from different points of view. These thinking habits help students handle real life problems more wisely and become more flexible in their learning and decision

making (Table 4.5).

6. The t value is 0.73 and the p value is .000, which is smaller than the significance level of 0.05. This means there is a difference in students' inference skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.95, which shows a large difference between the two groups. A large Cohen's d value means the teaching style had a strong impact. Students who learned from teachers with high culturally responsive teaching were better at understanding ideas, connecting different points, and giving reasons for their answers. These skills help students think clearly, solve everyday problems, and make smart decisions based on facts (Table 4.6).
7. The t value is 5.37 and the p value is .000, which is smaller than the significance level of 0.05. This means there is a difference in students' interpretation skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.70, which shows a medium to large difference between the two groups. This means the teaching style had a strong impact. Students taught by teachers with high culturally responsive teaching were better at understanding and explaining information clearly. They were also more able to make sense of different ideas and connect new learning with what they already knew. These skills help students do well in their studies and make smart choices in daily life (Table 4.7).
8. The t value is 4.96 and the p value is .004, which is smaller than the significance level of 0.05. This means there is a difference in students' deduction skills between those taught by teachers with high and medium levels of culturally responsive teaching. The Cohen's d value is 0.65, which shows a medium difference between the two groups. This means the teaching method made a noticeable impact. Students who were taught by teachers with high culturally responsive teaching were better at finding assumptions, thinking carefully, and reaching correct conclusions. These skills are very important in real life because they help students check facts, notice problems in arguments, and make smart and fair decisions (Table 4.8).
9. The t value is 6.84 and the p value is .044, which is smaller than the significance level of 0.05. This means there is a difference in overall critical thinking skills between students taught by teachers with high and medium levels of culturally

responsive teaching. The Cohen's d value is 0.89, which shows a large difference between the two groups. This means the teaching method had a strong impact. Students who were taught by teachers with high culturally responsive teaching showed much better critical thinking skills. These skills include questioning ideas, understanding information deeply, and reaching good conclusions. Such thinking is very important for doing well in studies, adjusting to new situations at work, and making smart and fair choices in daily life (Table 4.9).

5.3 Discussion

The findings of this study support a growing body of international research highlighting the positive impact of culturally responsive teaching (CRT) on the development of critical thinking skills among university students. The study revealed that students taught by teachers with high CRT levels performed significantly better across all five critical thinking dimensions: evaluation, inference, deduction, assumption, and interpretation. These findings align with Gay (2018), who emphasized that culturally grounded instruction boosts academic engagement and higher-order cognitive skills by connecting course content with students' lived experiences.

This outcome resonates with the work of Hutchison and McAlister-Shields (2020), who found that inclusive classroom environments built through CRT lead to deeper reasoning and more critical engagement among diverse learners. Similarly, Wardani et al. (2023) demonstrated that integrating cultural context into instruction, particularly in STEM fields, can significantly enhance students' reasoning abilities, further reinforcing the present study's conclusion that CRT is not limited to the humanities.

The findings also corroborate earlier claims by Villegas and Lucas (2002) and Ladson-Billings (1995) that CRT not only fosters cognitive development but also facilitates social empowerment by validating students' identities. Students exposed to high CRT practices in this study demonstrated stronger abilities to challenge assumptions, draw logical conclusions, and interpret complex ideas, confirming that CRT creates opportunities for critical engagement by valuing cultural perspectives.

Furthermore, the study observed that communication and student empowerment were the most prominent CRT components contributing to enhanced critical thinking. This parallels Hammond's (2015) assertion that culturally safe spaces and dialogic

classrooms promote metacognition and reflective thought. Teachers who practiced strong communication and empowerment strategies provided space for student voice and critical inquiry, enabling learners to question content and co-construct meaning—both vital to critical thinking.

Given these insights, it is essential to translate CRT principles into teacher education programs. Practical models such as the Culturally Responsive Teaching Continuum (Siwatu, 2007) and the Cultural Proficiency Framework (Lindsey et al., 2009) can help pre-service and in-service teachers reflect on their biases and implement responsive strategies across disciplines. Training modules should emphasize self-reflection, community-based learning, and curriculum adaptation (Gay, 2018), ensuring teachers move from cultural awareness to practice. Programs may incorporate simulation-based learning, multicultural case analyses, and observation rubrics that mirror the CRT practices found effective in this study, particularly in the areas of communication and empowerment.

However, the study also revealed that other CRT elements, such as equity and collaboration, were practiced less frequently. This observation aligns with Kim and Pulido (2015), who argued that schools often fall short of institutionalizing equity through CRT, thereby limiting its transformative potential. This study's findings echo the ongoing challenge of ensuring comprehensive CRT implementation, especially in contexts like Pakistan where CRT is still emerging.

The absence of teachers in the low CRT category indicated a general awareness of inclusive teaching, a promising sign consistent with Abacioglu et al. (2020), who noted growing institutional recognition of CRT. However, like Rhodes (2018), this study also identified a disconnect between awareness and in-depth CRT enactment, suggesting the need for structured faculty development and curriculum reform to close this gap.

In summary, this study not only reaffirmed CRT's relevance in fostering critical thinking but also extended previous research by offering empirical evidence from a non-Western context. It filled a critical void in the literature by demonstrating that when applied meaningfully, CRT enhances students' analytical capacity across disciplines and supports inclusive academic success. These findings underscore the urgency for embedding CRT into teacher preparation programs through context-sensitive models

that equip educators to build culturally safe, critically engaging learning environments.

5.4 Conclusions

1. It is concluded that the high levels of culturally responsive teaching practices were found among most teachers, with communication being the most strongly implemented component and collaboration the least. This reflects that while teachers actively apply CRT strategies in classrooms, some dimensions still require attention for balanced application (based on findings 1&2).
2. Findings of the study indicated that the majority of students demonstrated high critical thinking skills, with fewer in the medium and low categories. This indicates that the overall academic environment supports cognitive development but also highlights the presence of students who need further instructional support (based on finding 3).
3. Findings of the study indicated that there were statistically significant differences in students' critical thinking components (evaluation, assumption, inference, interpretation, and deduction) when taught by teachers with high versus medium CRT levels. This proves that higher CRT practices positively affect the development of students' critical thinking skills (based on findings 5,6,7,8 & 9).
4. Findings of the study indicated that the overall critical thinking scores of students were significantly higher when taught by teachers with high CRT levels, suggesting that culturally responsive teaching has a direct and measurable impact on students' overall critical thinking performance (based on finding 9).

5.5 Recommendations of the Study

1. Most teachers showed high levels of culturally responsive teaching (CRT), but some components such as collaboration and equity were less practiced. It is recommended that university leaders, such as Deans and Heads of Departments, organize focused training sessions to improve weaker CRT areas. These may include workshops, regular professional development, and reflective activities that help teachers use all components of CRT effectively and equally.
2. It was found that the majority of students demonstrated strong critical thinking skills, but some students still struggled and may need further academic support. Institutions may provide additional support systems such as tutoring, mentoring. Teachers may also adopt flexible instructional strategies to address students' individual learning needs and help them progress at their own pace.

3. There were statistically significant differences in students' critical thinking components such as evaluation, inference, and interpretation based on the level of CRT practices used by their teachers. Teachers may embed CRT strategies in everyday teaching through real-life examples, classroom discussions, and problem-solving activities that promote different viewpoints.
4. CRT impacts different parts of critical thinking in different ways. Academic departments may develop simple, practical guides for teachers, explaining which CRT strategies support specific thinking skills. Culturally meaningful questions may strengthen skills like deduction or interpretation. These guides may be created collaboratively and reviewed regularly.
5. Students taught by teachers with higher CRT levels had significantly better overall critical thinking scores. It is recommended that universities include CRT-related indicators in teacher evaluation systems. This may involve collecting student feedback about inclusivity, peer observations, and structured classroom checklists to encourage and recognize effective CRT practices.
6. All conclusions collectively suggested that consistent and thoughtful implementation of CRT practices benefits students' thinking skills and overall classroom experiences. Teachers may be encouraged to think about their teaching practices and learn from their peers. Schools may support this through peer mentoring, teaching circles, or learning communities where teachers share ideas and improve together. This helps keep CRT strong and consistent across all classrooms.
7. A comprehensive and structured framework for culturally responsive teaching (CRT) may be developed to guide its integration as a core part of the institutional culture, especially where CRT currently operates as a hidden curriculum. This framework may include clearly defined classroom implementation strategies, alignment with administrative policies, and mechanisms for continuous monitoring and evaluation. To ensure sustainability and effectiveness, the framework may also establish checks and balances through periodic reviews, teacher reflection cycles, and feedback from students. 69 Embedding CRT systematically in this manner may strengthen its visibility, accountability, and impact, transforming it from an informal practice into a strategic and measurable

component of educational excellence.

5.5.1 Recommendations for Future Researchers

1. Future researchers may conduct longitudinal mixed-methods studies involving both surveys and interviews to explore how culturally responsive teaching (CRT) affects students' critical thinking over an extended academic period. This would offer deeper insight into the sustainability and progression of CRT's impact.
2. Future studies may explore CRT's effectiveness across disciplinary boundaries (e.g., humanities, natural sciences, engineering). Researchers could use discipline-specific critical thinking assessments to determine whether CRT benefits some fields more than others and why.
3. Future researchers are advised to include potentially influential variables such as students' prior academic performance (GPA), socio-economic status (SES), and medium of instruction. Accounting for these factors allows for a clearer understanding of the specific impact of culturally responsive teaching on students' critical thinking skills and helps reduce the influence of confounding variables in the analysis.

5.5.2 Practical Implications for Teacher Education Programs

1. Teacher training programs may add structured modules based on well-known CRT frameworks. One widely used model is Gay's (2010), which focuses on including students' cultural knowledge in teaching methods and classroom activities.
2. Training courses may include reflection sessions where future teachers think about their own cultural beliefs and biases. They may also use real-life classroom scenarios to help teachers practice handling diverse situations (Sleeter, 2012).
3. Programs may use the READY model (Respect, Equity, Awareness, Diversity, and Youth-centeredness) by Siwatu (2007). This model helps teacher candidates develop CRT skills through classroom observations, role-playing, and receiving feedback.
4. Institutions may organize workshops, peer coaching, and community-based projects for teachers who are already in the field (Howard, 2003). These help

teachers continue to learn and connect with students from different backgrounds.

5. CRT may not be a separate or one-time topic. It may be built into all parts of 67 teacher education so that future teachers see it as an important part of lesson planning and their overall role as educators.

5.6 Limitations of the Study

1. **Time Constraints:** The study was conducted toward the end of the academic semester, which limited the duration available for broader sampling and data triangulation. This temporal limitation constrained the scope of extended classroom observations and follow-up with participants.
2. **Generalizability of Findings:** Since the research was conducted within a single department of a public university, the results may not be generalizable across all higher education institutions in Pakistan. Different institutional cultures and student demographics may yield different outcomes.
3. **Limited Contextual Diversity:** The study focused on students from only one academic discipline, which may not reflect how culturally responsive teaching influences critical thinking across varied fields such as humanities, social sciences, and STEM.
4. **Resource Constraints:** Due to limited resources, the study was restricted to quantitative data collection using standardized instruments. Incorporating additional qualitative insights such as interviews or classroom discourse analysis would have enriched the findings.
5. **Non-Longitudinal Design:** The cross-sectional nature of the study captures only a snapshot of the relationship between CRT and CTS. A longitudinal design could provide deeper insight into how these skills evolve over time with sustained exposure to CRT practices.

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Appendix I

Classroom Observation Checklist

Sr No.	Statement	Always	Sometimes	Never
1.	The educators demonstrate respect for cultural differences by using inclusive language.	Always	Sometimes	Never
2.	The educators incorporate diverse cultural perspectives into lessons or discussions.	Always	Sometimes	Never
3.	The cultural awareness and understanding encouraged through discussions, readings, and experiential learning activities.	Always	Sometimes	Never
4.	Students are provided activities/projects to understand culture.	Always	Sometimes	Never
5.	The educators encourage and facilitate student participation in discussions.	Always	Sometimes	Never
6.	The group activities structured to ensure equitable participation from all students regardless of background or ability.	Always	Sometimes	Never
7.	The educators ensure all students have access to necessary resources and support?	Always	Sometimes	Never
8.	The educators adapt instruction to meet diverse learning needs.	Always	Sometimes	Never
9.	The educators provide individualized feedback to support student growth?	Always	Sometimes	Never

10.	The teachers seek student feedback regarding the effectiveness of culturally responsive practices.	Always	Sometimes	Never
11.	The cultural norms and values respected in well-structured lesson plans.	Always	Sometimes	Never
12.	The educators use effective strategies to engage students in learning.	Always	Sometimes	Never
13.	The teachers engage with students in a manner that respects their cultural backgrounds.	Always	Sometimes	Never
14.	The instructional materials culturally relevant and relatable to students' lived experiences.	Always	Sometimes	Never
15.	Collaboration fostered among students from diverse backgrounds, promoting a sense of community and mutual respect.	Always	Sometimes	Never
16.	The instructional strategies encourage active participation from students of all cultural backgrounds.	Always	Sometimes	Never
17.	The educator connects classroom learning to real-world applications.	Always	Sometimes	Never
18.	The educators encourage and develop critical thinking skills.	Always	Sometimes	Never
19.	The students have the opportunity to contribute what they know and have experienced about their own culture?	Always	Sometimes	Never
20.	The educators encourage student voice and choice in learning activities.	Always	Sometimes	Never

Appendix II

Watson and Glaser Critical Thinking Appraisal

Demographic Information

Name: _____

Department: _____

Semester: _____

For each statement item below, please tick the relevant box.

T= True

PF= Partially False

PT= Partially True

F= False

ID= Insufficient Data

Test 1: INFERENCE					
Statement-I: Studies have shown that there is relatively much more heart disease among people living in the north of Pakistan than people living in the south of Pakistan. There is little difference in the rate of heart disease between northerners and southerners who have the same level of income. The average income of southerners in Pakistan is considerably higher than the average income of northerners.					
Proposed Inferences:	T	PT	ID	PF	F
1. The easiest way to eliminate heart disease in Pakistan would be to raise the income.					
2. People in high-income brackets are in a better position to avoid developing heart disease than people in low-income brackets.					
3. There is a lower rate of heart disease among northerners with relatively high incomes than among northerners with much lower incomes.					
4. Whether northerners have high incomes or low incomes does not matter when it comes to developing heart disease.					
Statement-II: Two hundred school students in their early teens voluntarily attended a recent weekend student conference in Islamabad. At this conference, the topics of race relations and means of achieving lasting world peace were discussed, since these were problems that the students selected as being most vital in today's world.					
1. As a group, the students who attended this conference showed a keener interest in broad social problems than most other people in their early teens.					
2. Most of the students had not previously discussed the conference topics in the schools.					

3. The students came from different areas of the country.					
4. The students discussed mainly industrial relations problems.					
5. Some teenage students felt it worthwhile to discuss problems of race relations and ways of achieving world peace.					

Statement III: A recent survey shows that people who regularly exercise tend to have lower levels of stress compared to those who do not exercise. However, those who exercise excessively report higher levels of stress than those who exercise moderately.					
1. Exercising excessively is more stressful than not exercising at all.					
2. Moderate exercise is associated with lower stress levels.					
3. People who do not exercise at all have the highest levels of stress.					
4. Regular exercise can help reduce stress levels.					
5. People who exercise excessively do not benefit from stress reduction.					
6. Exercise has varying effects on stress depending on its intensity.					
Statement-IV: A new technology has been introduced that significantly reduces the time required to charge electric vehicles. Studies show that the technology is safe and effective in urban areas, but its effectiveness in rural areas is still under investigation.					
1. The new technology may not be effective in rural areas.					
2. Electric vehicle owners in urban areas benefit more from the new technology than those in rural areas.					
3. The safety of the new technology in rural areas is questionable.					
4. The introduction of this technology could increase the adoption of electric vehicles in urban areas.					
5. More research is needed to determine the effectiveness of the technology in rural areas.					
Test 2: ASSUMPTION					
In Test 2, you are provided with 4 statements. Read the statements and the proposed					

assumptions carefully and decide if the answer is Yes or No. Tick one block.		
Statement-I: We need to save time in getting there so we'd better go by plane.		
Proposed assumptions:	YES	NO
1. Going by plane will take less time than going by some other means of transportation.		
2. There is a plane service available to us for at least part of the distance to the destination.		
3. Travel by plane is more convenient than travel by train.		
Statement-II: The proper aim of education in a free society is to prepare the individual to make wise decisions.		
1. People who have been educated in a free society will not make unwise decisions.		
2. Some education systems in our society do not have the proper aim.		
3. Some kinds of education can help individuals make wise decisions.		
4. In a society that is not free, the individual cannot make any decisions.		
Statement-III: To ensure the safety of our employees, we should implement a mandatory training program on workplace safety.		
1. The current level of workplace safety is inadequate.		
2. A training program will effectively improve workplace safety.		
3. Employees are not already aware of workplace safety practices.		
4. The cost of implementing the training program is justified by the benefits.		
5. There are no alternative methods to improve workplace safety.		
Statement-IV: To increase productivity, we need to upgrade our computer systems to the latest technology.		
1. The current computer systems are outdated.		
2. Upgrading to the latest technology will result in increased productivity.		
3. Employees will quickly adapt to the new computer systems.		
4. The cost of upgrading is within the company's budget.		

5. The latest technology is significantly better than the current systems.		
Test 3: DEDUCTION In Test 3, you are provided with 4 statements. Read the statements and the proposed conclusions carefully and decide if the answer is Yes or No. Tick one block.		
Statement-I: No responsible leader can avoid making difficult decisions. Some responsible leaders dislike making difficult decisions. Therefore:		
Proposed Conclusions	YES	NO
1. Some difficult decisions are distasteful to some people.		
2. Irresponsible leaders avoid things they dislike.		
3. Some responsible leaders do things they dislike doing.		
Statement II: Some holidays are rainy. All rainy days are boring. Therefore:		
1. No clear days are boring.		
2. Some holidays are boring.		
3. Some holidays are not boring.		
Statement-III: All renewable energy sources are environmentally friendly. Some renewable energy sources are expensive to implement. Therefore:		
1. Some environmentally friendly energy sources are expensive to implement.		
2. All expensive energy sources are environmentally friendly.		
3. No renewable energy sources are inexpensive to implement.		
4. Some renewable energy sources are both environmentally friendly and expensive to implement.		

Statement-IV: Most people who enjoy reading are introverted. All introverts prefer isolated activities. Therefore:		
1. Some people who enjoy reading prefer isolated activities.		
2. All people who enjoy reading are introverted.		
3. Some introverts do not enjoy reading.		
4. Most introverts enjoy isolated activities.		
Test 4: INTERPRETATION		
In Test 4, you are provided with 4 statements. Read the statements and proposed interpretations carefully and decide if the answer is Yes or No. Tick one block.		
Statement-I: In 1970, 60.4% of adults (people 25 years of age and older) had completed 11 years or less of schooling, while 4.6% had completed three or more years of university. In 1990, 40.0% of adults had completed 11 years or less of schooling, while 7.1% had completed three or more years of university.		
Proposed Conclusions:	YES	NO
1. In 1970, most adults had not entered the sixth year.		
2. If the trend toward more education continues at the rate indicated by the above figures, then by 2000 more than 25% of adults will have completed three or more years of university.		
3. In 1990, for every adult who had completed three or more years of university, there were more than five adults who had completed, not more than 11 years of schooling.		
Statement-II: A study of vocabulary growth in children from eight months to six years old shows that the size of spoken vocabulary increases from 0 words at age eight months to 2,562 words at age six years.		
1. None of the children in this study had learned to talk by the age of six months.		
2. Vocabulary growth is slowest during the period when children are learning to walk.		
Statement III: A survey conducted in 2020 revealed that 70% of respondents preferred working from home, whereas in a similar survey conducted in 2010, only 30% of respondents preferred working from home.		
1. In 2020, more people preferred working from home than in 2010.		
2. The preference for working from home has more than doubled in the last		

decade.		
3. By 2030, it is likely that 100% of people will prefer working fromhome.		
4. The trend indicates a growing acceptance of remote work.		
5. In 2010, most people preferred working in an office setting.		
Statement-IV: An analysis of rainfall patterns from 2000 to 2020 shows that the amount of rainfall during the summer months has decreased by 15%, while the amount of rainfall during the winter months has increased by 20%.		
1. Summers are becoming drier over time.		
2. Winters are becoming wetter over time.		
3. Overall annual rainfall has increased.		
4. The change in rainfall patterns could impact agriculture.		
5. Climate change may be influencing rainfall patterns.		
Test 5: EVALUATION		
In Test 5, you are provided with 4 statements. Read the statements and the proposed arguments carefully and decide if the arguments are strong or weak. Tick one block.		
Statement-I: Should the government provide ‘baby grants’ to help support each dependent child in a family so that the family standard of living is not lowered byhaving children?		
Proposed Arguments:	Strong	Weak
1. Yes; many families who cannot now afford it would then provide better childcare, and this would greatly improve the general healthof the nation.		
2. No; such grants would seriously weaken parents’ sense ofpersonal responsibility for their own families.		
3. No; government provision of ‘baby grants would involveadditional public expenditure of money.		
Statement II: Should all young people in the United Kingdom go on to higher education?		
1. Yes; college provides an opportunity for them to wear college scarves.		
2. No; a large percentage of young people do not have enough ability or interest to derive any benefit from college training		

3. No; excessive studying permanently distorts an individual's personality.		
Statement III: Should the government implement a universal basic income (UBI) program to support all citizens?		
1. Yes; a UBI program would reduce poverty and economic inequality.		
2. No; a UBI program would be too expensive and strain the government's budget.		
3. Yes; a UBI program would provide financial security and encourage entrepreneurship.		
4. No; a UBI program would discourage people from seeking employment.		
5. Yes; a UBI program would simplify the welfare system and reduce administrative costs.		
Statement-IV: Should school uniforms be mandatory for all students?		
1. Yes; mandatory uniforms promote equality and reduce peer pressure among students.		
2. No; mandatory uniforms restrict students' freedom of expression.		
3. Yes; uniforms improve school discipline and student behavior.		
4. No; the cost of uniforms can be a financial burden for some families.		
5. Yes; uniforms create a sense of school identity and pride.		

Appendix III

Certificate of Validation

It is certified that instruments for the thesis "Effects of Culturally Responsive Teaching on Critical Thinking Skills of Students at University Level" were developed and adapted by researcher Hina Badar to address the following objectives:

1. To analyze the culturally responsive teaching practices of teachers
2. To assess the critical thinking skills of students
3. To analyze the level-wise difference between students' critical thinking skills taught by the high, medium, and low culturally responsive teaching

The instruments were given to experts for review, seeking feedback and validation purpose. It been reviewed and validated by following experts:

Expert 1

Name: Dr. Humaira Akram

Designation:

Institution:

Date:


Signature
DEPT. OF TEACHER EDUCATION
FACULTY OF EDUCATION

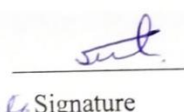
Expert 2

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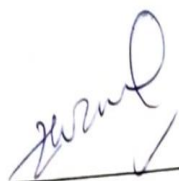
Expert 5

Name: Dr. Zarina Akhtar

Designation: Assistant Professor

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Date:



Signature

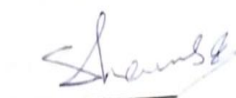
Expert 6

Name: Dr. Shamsa Aziz

Designation: NA Secretary

Institution: NACTE

Date:



Signature

We confirmed that instruments' content is aligned with research objectives, appropriate for target audience and free from bias and errors.

Best Regards