

## Effectiveness of the Culturally Responsive Instruction (CRI) Package on Teachers' Comprehension of Culturally Responsive Behaviours

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### Abstract

India is a country of great cultural heritage, as seen in its art, literature, traditions, languages, and historical sites. Its diversity and vitality make it a unique place on the world map, drawing individuals from across the globe through tourism, festivals, yoga, and classical literature. Every state in India has its own distinct cultural and linguistic identity. Consider Bihar, for instance—it has been a key player in the educational history of the world, with ancient centres of learning such as Nalanda University and Taxila University being a testament to its intellectual heritage. This research aimed to explore how a Culturally Responsive Instruction (CRI) package can assist school teachers in embracing more culturally responsive teaching practices. The study employed pre-test and post-test control group design and had 68 teachers from six schools in Gaya district, Bihar. Experimental group teachers were oriented to apply the CRI package, which entails interactive and hands-on activities to inculcate culturally responsive behaviours. On the other hand, the control group continued with traditional teaching practices. To assess the teachers' culturally responsive behaviours, the Culturally Responsive Instruction Scale (CRIS) was employed by the researchers. Through a t-test analysis, the study found that teachers who were oriented for implementing the CRI package improved significantly over teachers using conventional teaching techniques, particularly in curricular and co-curricular aspects. The results point to the fact that incorporating the CRI package in teaching practices can more effectively prepare teachers to develop an inclusive and culturally responsive learning environment

**Keywords:** Culturally responsive instruction, curricular aspects, co-curricular aspects

### INTRODUCTION

In a diverse country like India, adopting culturally responsive teaching methods is vital for creating an inclusive educational environment (Gay, 2022) [9]. The Culturally Responsive Instruction (CRI) package is designed to help teachers incorporate cultural elements into their teaching practices, making lessons more engaging and relatable for students (Ladson-Billings, 1995) [14]. For example, teachers

in Bihar can enhance their teaching by integrating the region's linguistic and cultural diversity into their classrooms (Nieto, 2017) [20]. Using local languages such as Maithili and Bhojpuri in storytelling, discussing historical landmarks like Nalanda University, and including traditional music and art in lessons can foster a deeper cultural connection among students.

Studies on culturally responsive instruction indicate that such methods significantly improve teachers' ability to create inclusive and engaging learning environments (Villegas & Lucas, 2002) [17]. When teachers incorporate cultural elements into their teaching, students develop a greater sense

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of pride in their heritage and gain a broader appreciation for diverse traditions (NCERT, 2023). This not only enhances academic achievement but also cultivates respect, empathy, and a deeper understanding of India's cultural richness.

By encouraging culturally responsive behaviours among school teachers, India's education system can more effectively reflect its rich cultural heritage, ensuring that learning remains meaningful and enriching for teachers and students (NEP, 2020).

### **Culturally Responsive Learning Environment**

Culturally responsive instruction is designed to foster the inclusive and equitable learning environment by incorporating students' diverse backgrounds and cultural experiences into educational curricula (Donahue-Keegan, Villegas-Reimers, & Cressey, 2019) [7]. This approach is particularly crucial in teacher education programs, where teachers must be equipped with the skills required to address equity and inclusion. One emerging model that integrates social-emotional learning (SEL) with culturally responsive teaching (CRT)—referred to as SEL/CRT—has been found effective in teacher preparation programs. By embedding culturally responsive SEL practices, this model helps future teachers and supports students' academic, emotional, and social development (Gallagher & Haan, 2018) [8].

A study on university faculty perceptions of culturally responsive behaviours revealed key challenges, particularly in addressing the linguistic diversity of students (Polleck & Shabdin, 2013) [23]. Many teachers have expressed the need for additional training and institutional support to better meet the linguistic and cultural needs of their students. This highlights the importance of ongoing professional development in shaping culturally responsive teaching behaviours. Teachers who employ these strategies strengthen student-teacher relationships, fostering an environment where diverse learners feel valued and engaged (Alaca & Pyle, 2018) [2].

In the context of science education, the C2AST framework has been introduced to integrate students' cultural identities into the learning process. This method encourages teachers to consider power dynamics, real-world applications, and socio-political influences in the classroom, ensuring that STEM instruction remains culturally relevant and inclusive (Thompson et al., 2021) [26]. Similarly, professional learning communities dedicated to culturally responsive education provide a collaborative space for teachers to exchange experiences, reflect on challenges, and design inclusive curricula (Tsoi et al., 2024) [27]. These initiatives align closely with efforts to reduce disparities in STEM education by embedding computational thinking and culturally relevant pedagogy in teacher training programs (White et al., 2024) [29].

The integration of Culturally Responsive Pedagogy (CRP) and SEL into professional learning programs has been shown to enhance teachers' cultural competence and instructional effectiveness. Such initiatives have proven especially valuable during times of crisis, such as the COVID-19 pandemic, when students' social-emotional well-being was a primary concern (Caitlin Anne O'Keefe, 2022) [5]. Additionally, in special education, CRT has been linked to greater student participation and inclusivity, though resource limitations and conflicting curricula continue to pose challenges (Paculan & Maguilang, 2024) [21]. Addressing these barriers requires institutional commitment and sustained professional development to create an equitable learning environment.

Prominent scholars such as James A. Banks, Geneva Gay, and Gloria Ladson-Billings emphasize the importance of CRT in dismantling systemic barriers and promoting cultural competence in classrooms. Teacher education programs must address issues such as implicit bias, language diversity, and the need for adaptable teaching strategies to ensure that students from diverse backgrounds receive a fair and high-quality education (Abdalla & Moussa, 2024) [1]. By modifying instructional approaches to meet the needs of underrepresented learners, educators can bridge cultural gaps and enhance student success (Hale, 2001; Ladson-Billings, 2009; Shade, Kelly, & Oberg, 1997) [12, 15, 25].

In the broader context of comprehension of culturally responsive behaviours among school teachers, these research findings emphasise the necessity of structured professional development, culturally integrated curricula, and institutional backing. When teachers embrace culturally responsive instruction, they create learning spaces that celebrate diversity, empower students, and promote a sense of belonging—essential for an inclusive and equitable education system.

Studies underscore that culturally responsive pedagogy is responsible for enhancing student engagement, academic performance, and behavioural growth (Hoytt, Hunt, & Lovett, 2024) [13]. Yet, it is only possible for CRI to create a tangible effect on students if, initially, the culturally responsive behaviours of school teachers are moulded. The inclusion of CRI within teacher education packages ensures that instructors are equipped with the skills needed to develop culturally responsive classrooms mirroring India's vast cultural heterogeneity.

With respect to comprehension of culturally responsive behaviours among teachers, the implementation of the CRI package has been critical to supporting teachers in filling cultural voids and facilitating learners through adaptations to the curriculum. Research suggests that instructors who integrate regional arts, languages, and cultural traditions into instruction produce more inclusive and engaging lessons (Gallagher & Haan, 2018; Polleck & Shabdin, 2013) [8, 24]. To illustrate, Bihar teachers who add Maithili or Bhojpuri narration, folk traditions, and deliberations on such historic sites like Nalanda University build more profound cultural engagement among students and deepen both understanding and identity-building.

In addition, CRI has been shown to enhance students' academic motivation and promote their social-emotional learning (SEL). Teachers trained in CRI-informed pedagogies exhibit increased cultural competence, which results in the creation of empathetic, inclusive, and effective classroom practices (Mori, 2023; Xu, 2024) [18]. This is especially necessary in multilingual and multiethnic classrooms, where teachers need to navigate linguistic diversity and accommodate students from diverse backgrounds (Alaca & Pyle, 2018) [2].

Professional learning communities for culturally responsive education offer a platform where teachers can reflect, discuss, and enact culturally inclusive teaching practices. Studies indicate that collaborative professional development programs increase teachers' self-efficacy in enacting CRI, making them more flexible and effective teachers (Tsoi et al., 2024; Caitlin Anne O'Keefe, 2022) [6, 7]. The integration of computational thinking and equity-focused STEM activities into CRI-based teacher education has further been found to be effective in minimizing disparities in learning access (White et al., 2024) [29].

By prioritizing self-determination, cultural identity, and community participation, CRI allows teachers to foster cultural pride, emotional strength, and collaborative learning among students without compromising academic intensity (Underwood, 2009; Lee, 2015) [16, 28]. The study highlights the vital importance of teachers in reimagining classroom experiences so that they become inclusive, interactive, and responsive to students' cultural identities.

Based on the multifaceted advantages of CRI, constructing culturally responsive behaviours of teachers is a cornerstone to cultivating equity in schooling. Teacher training programs must become a priority at schools since, through such an integration, it will improve relations between students and teachers, advance learning outcomes, and foster an environment that is more inclusive and socially conscious (Paculan & Maguilang, 2024; Abdalla & Moussa, 2024) [1, 22].

The literature review revealed a scarcity of research focused on the use of the CRI package in developing culturally responsive behaviours of teachers, particularly in curricular and co-curricular activities. Implementing the CRI package is an evidence-based tool designed to enhance teachers' cultural responsiveness.

### Objectives of the Study

1. To examine the effect of the CRI package on teachers' comprehension of culturally responsive behaviours concerning curricular aspects.
2. To examine the effect of the CRI package on teachers' comprehension of culturally responsive behaviours concerning co-curricular aspects.

### Hypotheses of the Study

1. The CRI package does not have a significant effect on teachers' comprehension of culturally responsive behaviours concerning curricular aspects.
2. The CRI package does not have a significant effect on teachers' comprehension of culturally responsive behaviours concerning co-curricular aspects.

### Scope of the Study

This study focuses on evaluating the effectiveness of the orientation and mentoring of CRI package in fostering culturally responsive behaviours among school teachers in Bihar Government Schools.

### Methodology

This research takes a quantitative method based on a quasi-experimental design to measure the effectiveness of the CRI package in influencing teachers' culturally responsive behaviours. A non-equivalent two-group pre-test-post-test design was used, with the CRI package and conventional teaching practices as independent variables and culturally responsive behaviours in curricular and co-curricular aspects as dependent variables. As a part of the research, a specially designed CRI package was created to enable teachers in shaping culturally responsive behaviours. The research focused on all school teachers across the Gaya district serving in Bihar Government Schools. Six schools were selected using convenience sampling, and 68 teachers were picked using purposive sampling technique. The experimental group included 38 teachers who underwent orientation and mentoring on the CRI package, whereas the control group had 30 teachers who followed the conventional method of teaching. To gauge the effectiveness of the CRI package, a self-developed CRIS was administered. The results showed that teachers who underwent the CRI package exhibited higher levels of appreciation and respect for the cultural background and environments of the students.

### CRI Package Implementation

The CRI package based on activity was tailored for Bihar Government school teachers and students to have maximum possibilities for developing culturally responsive behaviours both in curricular and co-curricular aspects. For the achievement of research objectives, the CRI package was organized into ten main components, each with activities specifically corresponding to the school learning environment and needs of students. For fulfillment, these components included: *Indigenous/local games, Traditional handicrafts and cuisine, social etiquette and norms, Traditional physical activities, Indigenous plant knowledge, Traditional agricultural practices, Awareness rallies, Traditional performing arts, Cultural attire and traditional dress and National festivals and celebrations.*

The activities were arranged in a sequential manner, guaranteeing a sequential progression that responded to the needs of learning by students and active engagement. The method allowed teachers to gain tangible strategies to implement cultural responsiveness into their pedagogy, eventually promoting inclusivity and engagement in the classroom.

### Method of Data Collection

The study lasted for 150 hours, spread over two months of usual sessions. The orientation and mentoring on CRI package took place in school premises and staff rooms, adjusted according to the teachers' needs and timetables. Teachers in the experimental group worked actively with the CRI package, having first-hand experience in culturally responsive teaching techniques. On the other hand, the control group utilized traditional teaching techniques. At the end of the experimental period, the CRIS was administered as a post-test to measure changes in teachers' culturally responsive behaviours. The CRIS was used in the same way as the pre-test to ensure consistency. The post-test was

administered at the same time across all schools, with research assistants on hand to collect and assess responses immediately. For the analysis of data, a t-test was conducted to determine the validity of the null hypotheses. The analysis was carried out using the SPSS to ensure accuracy, with significance at the 0.05 alpha level.

## RESULTS AND DISCUSSION

The study shows the results and effectiveness of CRI package on comprehension of culturally responsive behaviours of school teachers.

### Ho1- Hypothesis Testing- To Study the Effectiveness of CRI Package on Comprehension of Culturally Responsive Behaviours of School Teachers

The data analysis reveals a significant improvement in teachers' comprehension of culturally responsive behaviours due to the orientation on implementing the CRI package. The experimental group of 38 teachers substantially increased mean scores from pre-test ( $M = 46.895$ ,  $SD = 5.6702$ ) to post-test ( $M = 57.289$ ,  $SD = 4.3923$ ), yielding a mean difference of 10.394 points. This improvement was validated by a highly significant t-value of 11.020 ( $df = 37$ ,  $p < 0.001$ ), confirming the effectiveness of the intervention. The finding strongly supports the rejection of the null hypothesis and indicate that the CRI package is an effective tool for enhancing teachers' cultural responsiveness in educational settings Table 1.

The analysis of control group data demonstrates a notable improvement in teachers' comprehension of culturally responsive behaviors even without the orientation and mentoring on CRI package intervention. The control group of 30 teachers shows a significant increase in mean scores from pre-test ( $M = 38.567$ ,  $SD = 11.3705$ ) to post-test ( $M = 46.967$ ,  $SD = 7.9502$ ), resulting in a mean difference of 8.4 points. This improvement was statistically significant as indicated by the t-value of 3.490 ( $df = 29$ ,  $p = .002$ ). The finding indicates that conventional way of intervention also contributes positively to teachers' comprehension of culturally responsive behaviours Table 2.

The comparative analysis of post-test results between experimental and control groups provides compelling evidence for the effectiveness of the CRI package. The data in Table 3 reveals that the experimental group ( $n=38$ ) achieved significantly higher post-test scores ( $M=57.433$ ,  $SD=4.599$ ) compared to the control group ( $n=30$ ) who received conventional instruction ( $M=46.967$ ,  $SD=7.9502$ ). This substantial difference was confirmed by a statistically significant t-value of 5.901 ( $df=33$ ,  $p<0.001$ ). The finding emphasizes the value of specialized cultural responsiveness orientation and mentoring for teachers and its potential impact on improving educational practices Table 3.

**Table 1.** Scores of the experimental group pre-test & post-test of curricular aspect.

Group	Testing	N	Mean	S.D.	't' value	df	p-value	Remarks
Experimental	Pre-test	38	46.895	5.6702	11.020	37	.000	(S)
	Post-test	38	57.289	4.3923				

**Table 2.** Scores of control group pre-test & post-test of curricular aspect.

Group	Testing	N	Mean	S.D.	't' value	df	p-value	Remarks
Control Group	Pre-test	30	38.567	11.3705	3.490	29	.002	(S)
	Post-test	30	46.967	7.9502				

**Table 3.** Comparison of curricular aspect on post-testing mean scores of experimental groups and control group.

Testing	Group	N	Mean	S.D.	't' value	df	p-value	Remarks
Post-test	Experimental	38	57.433	4.5990	5.901	33	.000	(S)
Post-test	Control	30	46.967	7.9502				

**Table 4.** Scores of the experimental group pre-test & post-test of co-curricular aspects.

Group	Testing	N	Mean	S.D.	't' value	df	p-value	Remarks
Experimental	Pre-test	38	60.579	6.8087	13.071	37	.000	(S)
	Post-test	38	76.342	4.8728				

**Table 5.** Scores of control group pre-test & post-test of co-curricular aspects.

Group	Testing	N	Mean	S.D.	't' value	df	p-value	Remarks
Control Group	Pre-test	30	49.133	12.2100	7.123	29	.000	(S)
	Post-test	30	64.767	5.9636				

**Table 6.** Comparison of post-testing mean scores of experimental group and control group.

Testing	Group	N	Mean	S.D.	't' value	df	p-value	Remarks
Post-test	Experimental	38	75.867	5.3417	7.574	33	.000	(S)
Post-test	Control	30	64.767	5.9636				

### Ho2- Hypothesis Testing- To Study the Effectiveness of CRI Package on Comprehension of Culturally Responsive Behaviours of School Teachers

The examination of the experimental group's performance on co-curricular aspects reveals a substantial improvement due to the orientation on implementing the CRI package. As shown in Table 4, the experimental group of 38 teachers demonstrated a marked increase in mean scores from pre-test ( $M=60.579$ ,  $SD=6.8087$ ) to post-test ( $M=76.342$ ,  $SD=4.8728$ ), yielding a difference of 15.763 points. This improvement was validated by an exceptionally high t-value of 13.071 ( $df=37$ ,  $p<0.001$ ), indicating strong statistical significance. This finding extends the effectiveness of the CRI package on co-curricular aspects, demonstrating its comprehensive impact on teachers' cultural responsiveness Table 4.

The analysis of the control group's performance on co-curricular aspects demonstrates a significant improvement even without the orientation and mentoring on CRI package intervention. As detailed in Table 5, the control group of 30 teachers showed a substantial increase in mean scores from pre-test ( $M=49.133$ ,  $SD=12.2100$ ) to post-test ( $M=64.767$ ,  $SD=5.9636$ ), resulting in a difference of 15.634 points. This improvement was statistically significant as indicated by the t-value of 7.123 ( $df=29$ ,  $p<0.001$ ). This finding indicates that traditional way of intervention can also contribute positively to teachers' comprehension of cultural responsiveness in co-curricular settings Table 5.

The comparative analysis of post-test scores between experimental and control groups provides compelling evidence of the effectiveness of CRI package. Table 6 reveals that the experimental group ( $n=38$ ) achieved significantly higher post-test scores ( $M=75.867$ ,  $SD=5.3417$ ) compared to the control group ( $n=30$ ) who received conventional instruction ( $M=64.767$ ,  $SD=5.9636$ ). This substantial difference of 11.1 points was confirmed by a highly significant t-value of 7.574 ( $df=33$ ,  $p<0.001$ ). The similar standard deviations between groups indicate that both interventions produced relatively consistent results among participants, though the experimental group maintained higher scores. This finding is particularly noteworthy as it demonstrates the CRI package's effectiveness in shaping teachers' culturally responsive behaviours.

### FINDINGS AND CONCLUSIONS

The analysis of data across multiple dimensions reveals compelling evidence supporting the effectiveness of the CRI package in enhancing teachers' comprehension of culturally responsive behaviours. The experimental group demonstrated statistically significant improvements in curricular aspects ( $t=11.020$ ,  $p<0.001$ ) and co-curricular aspects ( $t=13.071$ ,  $p<0.001$ ). While the control group also showed significant gains in these areas, direct comparisons of post-test scores consistently favoured the CRI intervention, with the experimental group outperforming the control group in both curricular

( $t=5.901$ ,  $p<0.001$ ) and co-curricular ( $t=7.574$ ,  $p<0.001$ ). These findings align with Gay's (2018) [10] and Ladson-Billings (2014) [15] assertion that culturally responsive professional development can transform teachers' pedagogical approaches. The results of this study are consistent with previous research showing the positive effect of CRI on teachers' development (Hoytt, Hunt, & Lovett, 2024) [13]. As a pedagogical transformation, CRI incorporates the backgrounds of students into curriculum, engaging and empowering them. It not only enhances academic engagement but also attunes learners to key competencies that will enable them to thrive in today's interconnected and diverse world. Through inclusive learning environments, CRI promotes empathy development, collaboration, and emotional hardiness, which enables students to negotiate and overcome systemic constraints to learning equity (Lucas & Villegas, 2013; Ali & Mallepaka, 2024; Biswas, 2022) [3, 4, 17]. In addition, CRI is focused on social-emotional learning (SEL) and teamwork-based skill development, providing a comprehensive educational experience (Mori, 2023; Xu, 2024) [18]. Its focus on self-determination, cultural identity, and community empowerment builds cultural pride, emotional resilience, and cooperative involvement while keeping academic rigor culturally meaningful (Underwood, 2009; Lee, 2015) [16, 28]. As a multifaceted practice with numerous advantages, different models of culturally responsive pedagogy have proven highly promising to support teacher-student attainment and behavioural results.

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