

Teaching Science Across Languages: The Indigenous People Students in Focus through the Lens of Culturally Responsive Teaching

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Abstract

Poor teacher perceptions of diverse students is disconcerting. I explored science teaching with the Indigenous Peoples (IP) students across languages. I employed qualitative descriptive research design, purposive sampling, in-depth interview, and thematic analysis. I found that teachers value cultural knowledge, family involvement, and Indigenous language and culture in science instruction as ways to promote inclusivity, connect learning to students' experiences, and support authentic understanding. Teachers may use students' cultural knowledge, involve families, and incorporate native language and community culture to make science learning more meaningful and inclusive. Consequently, I see the need to explore the effects of culturally responsive strategies, teacher training and support, and the development and validation of instruments using exploratory factor analysis.

Keywords: Teaching science across languages, Indigenous People students, culturally responsive teaching

Introduction

Across the global education landscape, I observed that poor perceptions of teachers toward diverse students remain a persistent and pressing concern. Diversity in classrooms, which includes culture, language, socioeconomic status, and learning differences, has increased significantly; however, not all teachers perceive this diversity as an asset in the teaching-learning process. Recent studies indicated that some teachers continue to hold deficit-oriented views, perceiving diverse learners as academically limited or challenging to manage rather than recognizing their varied strengths and contributions (García & Weiss, 2023). Such perceptions reflect a problematic situation in which inclusivity and equity are not fully realized in educational practice despite global commitments to inclusive and quality education for all learners (UNESCO, 2023). This issue highlights a gap between policy ideals and actual classroom perceptions, raising concerns about how diversity is understood and addressed by educators worldwide.

In various national contexts, I also found that poor teacher perceptions of diverse students have been documented. In the United States, studies showed that some teachers continue to exhibit implicit biases toward students from minority and immigrant backgrounds, shaping how they view students' academic abilities and classroom behavior (Johnson, 2024). Similarly, in Australia, research revealed that teachers' perceptions of Indigenous and culturally diverse learners are often influenced by stereotypes, which affects how these students are regarded in educational settings (Bishop & Smith, 2023). In South Africa, teachers' perceptions of linguistic and cultural diversity have been described as inconsistent, with some educators struggling to view multilingualism as a valuable resource (Nkosi, 2024). These international examples illustrate that poor perceptions of diverse learners are not confined to a single context but are evident across different educational systems.

In the Philippine context, I noted that poor perceptions of teachers toward diverse students also persist as a significant issue. With the country's rich cultural, linguistic, and socioeconomic diversity, classrooms often consist of learners with varied backgrounds and learning needs. However, some studies suggested that teachers may still perceive students from marginalized communities, Indigenous groups, or non-dominant language backgrounds as less capable or less prepared for academic tasks (Reyes & Santos, 2023). Additionally, perceptions toward learners with different learning abilities or behavioral characteristics may not always align with inclusive education

principles (Dela Cruz, 2024). These findings point to a continuing challenge in fully embracing diversity within Philippine classrooms, reflecting a gap between inclusive education policies and teachers' actual perceptions.

I further recognized that the persistence of poor teacher perceptions toward diverse students has notable consequences in the educational process. Such perceptions can shape classroom interactions, instructional practices, and expectations, potentially influencing how students engage in learning and how they are supported academically. Research indicates that when teachers hold negative or limited perceptions of diverse learners, it may lead to reduced opportunities for participation, unequal access to learning experiences, and lower academic expectations (Lopez & Andrade, 2023). Over time, this can contribute to disparities in student achievement, engagement, and overall educational outcomes. Furthermore, these perceptions may affect students' sense of belonging and identity within the classroom, ultimately influencing their motivation and participation in school (Martin & Lee, 2024). Addressing this problematic situation is therefore essential in fostering equitable and inclusive learning environments.

Significance of the study

I believed that schools and policymakers can use the insights from this research to design and implement more effective training programs, learning materials, and language-sensitive policies that may promote inclusive science education. Future researchers may also build upon this study to further explore language use in science education across diverse cultural and linguistic contexts. Ultimately, this study contributes to the broader goal of achieving Sustainable Development Goal 4 (Quality Education) by promoting equity, inclusivity, and cultural responsiveness in science teaching, ensuring that no learner is left behind in understanding and valuing science. My study also aligns with the goals of Holy Cross of Davao College (HCDC), as it supports the institution's commitment to providing quality, innovative, and student-centered education.

Research Questions

I explored science teachers in teaching Indigenous Peoples (IP) students across languages. Specifically, I sought to answer the following questions:

1. What are teachers' perceptions of using cultural knowledge in science instruction, particularly in designing lessons that reflect students' cultural and historical backgrounds?
2. What are teachers' perceptions of involving families in Indigenous learners' science learning, and its role in integrating students' prior experiences into classroom learning?
3. What are teachers' perceptions of using Indigenous history, culture, and native language in science teaching to make instruction more meaningful and relatable to students' frames of reference?
4. What are teachers' perceptions of integrating community culture into science instruction, and its alignment with students' performance styles in encouraging authentic participation and expression?

Theoretical Framework

This study is anchored in the theory of Culturally Responsive Teaching (CRT) developed by Geneva Gay (2000). CRT is defined as the use of students’ cultural knowledge, prior experiences, frames of reference, and performance styles to make learning encounters more relevant and effective for diverse learners. This perspective emphasizes that students’ cultural backgrounds are essential resources in the teaching and learning process.

In this study, CRT provides a framework for understanding how instructional practices such as the use of native language, family involvement, and the integration of community culture and history contribute to meaningful learning experiences. By aligning teaching strategies with students’ cultural contexts, educators are able to enhance engagement, comprehension, and participation. This theoretical lens supports the idea that culturally grounded instruction leads to more inclusive and effective educational outcomes.

Furthermore, the principles of CRT are supported by Gloria Ladson-Billings (1995), who emphasized the importance of promoting academic success, cultural competence, and critical consciousness among learners. Together, these perspectives strengthen the foundation of the study in examining culturally responsive practices in education.

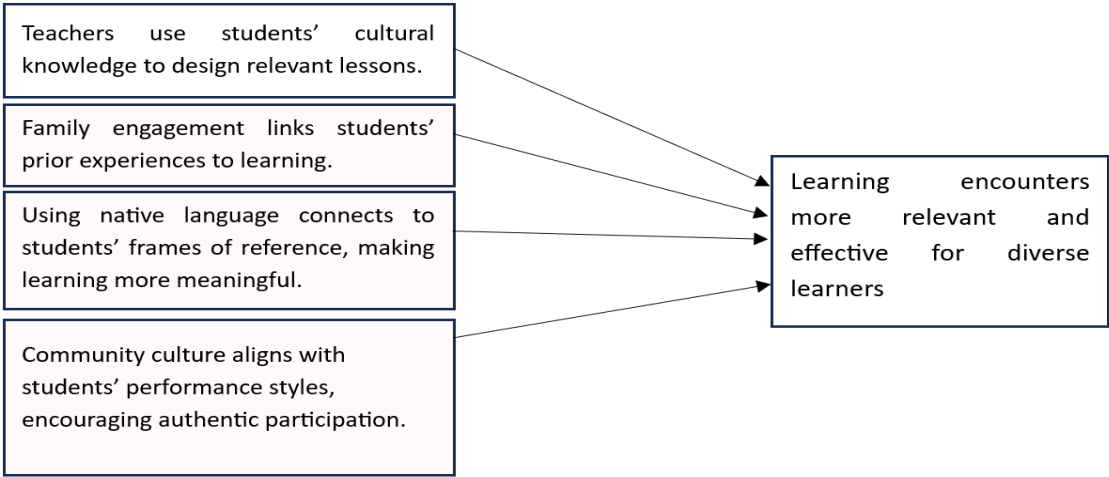


Figure 1. This Framework is Adapted from Culturally Responsive Teaching Theory by Geneva Gay (2000) and Culturally Relevant Pedagogy by Gloria Ladson-Billings (1995)

Assumptions

In the Davao Region, science teachers working with Indigenous Peoples (IP) learners faced language and cultural challenges that influenced their teaching. They addressed these through training, cultural awareness, and classroom experience. This study examined how teachers navigated multilingual and multicultural science classrooms, focusing on their perceptions, challenges, and use of culturally responsive strategies to support IP students' learning.

Method

In this chapter, I presented the research design, locale of the study, sample and sampling technique, data gathering technique, data analysis technique, trustworthiness.

Research Design

I employed descriptive qualitative research design to gain a comprehensive understanding of the participants' experiences, perceptions, and viewpoints in their natural setting. I used this design because it allowed me to explore and describe the phenomenon in depth without manipulating variables or relying on statistical analysis (Colorafi & Evans, 2016; Doyle et al., 2020). It also enabled me to gather rich, detailed, and context-based information through qualitative methods such as interviews and observations, making it suitable for examining real-life educational experiences and social situations.

Research Locale

This study was conducted in one of the schools under Cluster 12 in Davao City, where all learners belong to the Ata Indigenous Peoples community. I chose this setting because it provided a meaningful context for examining the language-related challenges I experienced as a science teacher. The multilingual and multicultural classroom environment allowed me to explore how teachers, including myself, navigate linguistic diversity and adapt instructional practices to make science learning more accessible, inclusive, and meaningful for Indigenous learners.

Sample and Sampling Technique

In this study, I engaged six science teachers, three males and three females, with at least three years of teaching experience handling Grades 4 to 10 in a public school under Cluster 12 in Davao City during the school year 2025- 2026, all of whom were teaching IP learners. I selected them through purposive sampling because they had direct experience teaching science in multilingual and multicultural classrooms with IP learners. I used purposive sampling, a non-probability technique where participants are intentionally chosen based on their relevance to the study, to ensure rich and in-depth data. I applied this in qualitative research to explore the participants' experiences and perceptions, which provided detailed insights while saving time and resources and strengthening the depth of my findings.

Data Gathering Technique

I used in-depth interview technique as a qualitative data gathering method to obtain detailed information about the participants' experiences, perceptions, beliefs, and insights regarding the study. I conducted one-on-one, open-ended conversations that allowed me to ask probing questions and explore their responses in depth. I applied this technique in qualitative research to understand complex phenomena and lived experiences within a specific context. Its main advantage is that it generates rich and detailed data, allows flexibility in questioning, enables clarification through probing, and helps build rapport with participants, encouraging open and honest sharing of experiences (Robinson, 2023).

Data Analysis Technique

I employed thematic analysis to identify, analyze, and interpret patterns or themes from the participants'
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responses. I used this technique to organize qualitative data into meaningful categories and gain a deeper understanding of the teachers' perceptions and experiences. I followed the six steps of thematic analysis: familiarizing myself with the data, generating codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report (Naeem et al., 2023).

Trustworthiness

In conducting this study, I strictly adhered to the ethical standards set forth in Republic Act No. 10532 and the guidelines of Holy Cross of Davao College's Society for Moral Integration and Legal Ethics (HCDC-SMILE). I secured informed consent from all study participants through proper procedures and ensured their participation remained voluntary throughout the research process. To establish trustworthiness, I applied Guba's (1981) criteria, including credibility, which was achieved through member checking to ensure the accurate representation of participants' accounts; dependability, which was maintained through systematic documentation of research procedures; conformability, which was ensured through reflexive journaling and transparent records to minimize researcher bias; and transferability, which was addressed by providing sufficient contextual descriptions to support applicability in similar settings. Finally, I upheld fairness in this research by selecting participants inclusively and respectfully.

Results and Discussion

In this section, I presented the modified paradigm and the themes that emerged from the focus group discussion derived from perceptions of teachers with diverse students.

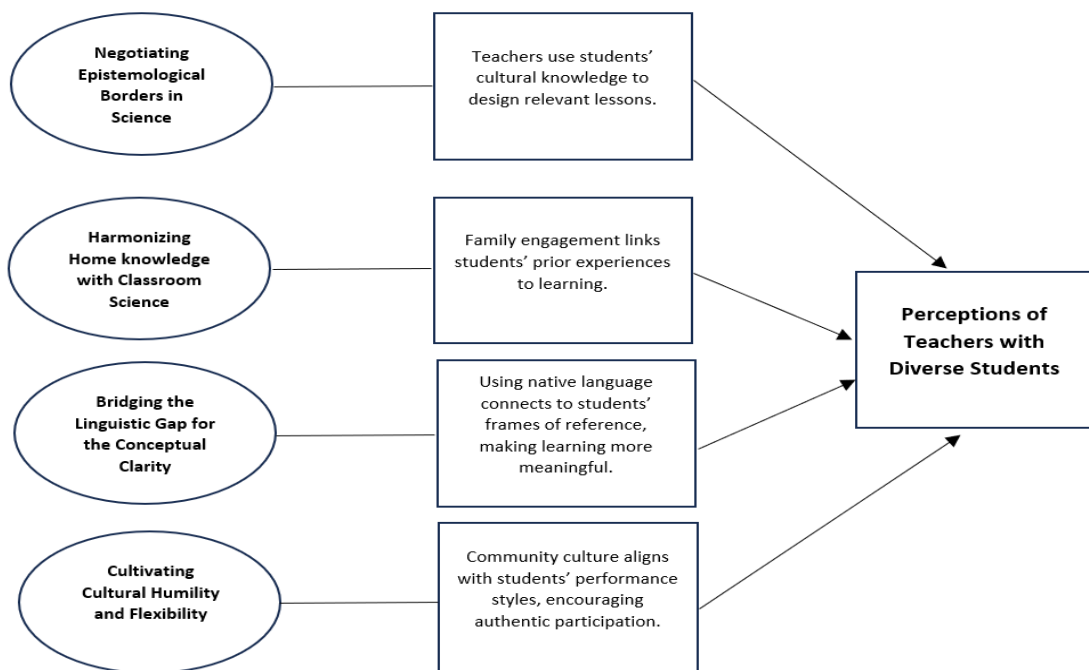


Figure 2. Modified Paradigm of Culturally Responsive teaching Theory

Using cultural knowledge in science instruction

To better understand my research question on teachers' perceptions in using their understanding of Indigenous history and culture in science teaching, I observed the participants. They appeared serious, with slightly furrowed brows, reflecting both concern and respect. One of them stated:

Bawal mag dissect og any animals like frogs kay naa silay ginatuohan...if

ever magbuhat gyud ani kay naay mga calamities... I provide pictures as examples instead. - P1 (IDI-Line no. 7-9)

Another participant supported this perspective with evident respect reflected on his face as he said:
 I take their ideas with respect... I never say 'No, you're wrong.' I explain my side so they realize my point also makes sense. - P2 (IDI-Line no. 4-6)

Expanding on this perspective, another participant, with evident amazement and curiosity in her expression, reflected on how Indigenous observations are connected to science learning. The participant said:

For me, I was amazed when we discussed weather predictions. For example, if bad weather or the rainy season is coming, they relate it to certain animals you can observe beforehand, like millipedes. If the millipedes start climbing slowly, it means a storm is coming. – P3 (IDI-Line no. 1-3)

Building on this insight, another participant highlighted how students connect science concepts with observations at home. He shared:

I asked students to talk with someone at home about how they predict the weather. They described how certain birds fly lower before a storm and how the air feels heavier before rain.” - P4 (IDI-Line no. 1-3)

Going back to our conversations, I noticed recurring ideas in the participants’ responses such as beliefs, respect, local knowledge, weather prediction, and real-life observation. These repeated ideas show how teachers consistently connect science instruction with students’ cultural understanding and everyday experiences. Throughout the interviews, I heard participants speaking in a serious and careful tone, with pauses and slightly lowered voices when discussing cultural beliefs. I also observed furrowed brows, head scratching when explaining sensitive practices, and moments of amazement and curiosity when linking Indigenous observations to scientific concepts. These non-verbal cues reflected both thoughtfulness and deep respect for the topics being discussed. From these observations, I understand that teachers view Indigenous history and culture as an important foundation for making science meaningful. They perceive cultural knowledge as a way to respect students’ beliefs and adjust science lessons through culturally appropriate strategies, making instruction more inclusive and meaningful. They navigate between respecting students’ beliefs and explaining scientific perspectives, often using examples, pictures, and real-life observations to bridge understanding. In reflecting on the interview experience, I felt a sense of admiration and respect for the participants, as if tradition and science quietly meet in every insight they share.

Family Involvement in the Learning of Science

This section presents teachers’ perceptions in involving families in Indigenous learners’ science learning. In one participant, I observed confidence, resourcefulness, and kindness in the expression. The participant ended saying:

They prefer using indigenous materials like cogon... ma relate nako siya sa science nga its more on the insulation process... the use of ratan instead of nail... stretchable ang ratan so dili siya dilikado." – P1 (IDI-Line no. 3-6)

In addition to this perspective, another participant spoke with evident enthusiasm. I observed that the participant’s facial expression reflected interest and excitement. The participant stated:

Students interview their family members... these assignments often lead to intergenerational conversations. - P3 (IDI-Line no. 1-2)

Expanding on this perspective, another participant spoke in a mindful and reflective tone. I observed that the

participant's facial expression showed thoughtfulness and concern. The participant said:

Scheduling events that work for families... mindful ta not to pressure families... ang uban kay naa sa uma (farm)." – P2 (IDI-Line no. 2-3)

Another participant was being mindful of their experiences. I observed that the participant's face showed attentiveness and care as she said:

I practice their language... para mapasabot nako sa ilang ginikanaan kung unsa man gyud ang dapat na buhaton. P6 (IDI-Line no. 3-4)

Going back to our conversations, I noticed frequent ideas such as indigenous materials, family involvement, and reminders to be mindful of families' contexts. These patterns reflect their focus on cultural relevance, practicality, and sensitivity in instruction. Throughout the interviews, I heard pauses, shifts in language, and softened voices when discussing families. I also observed head scratching when recalling examples and moments of emotion when describing learners' home realities. Taken together, these observations suggest that teachers see family engagement as a relational and culturally grounded process that connects science learning to students lived experiences. They perceive involving families as a way to link science learning with students' real-life experiences and integrate prior knowledge into more meaningful classroom learning. They use indigenous materials, native language, and family-based activities to make instruction more relevant and meaningful. In reflecting on the interview experience, I felt respect and empathy toward the participants, as their responses reflected both commitment and awareness of learners' challenges, like voices carrying stories beyond the classroom walls.

Using Indigenous history, culture, and native language in science teaching

In line with my research question on teachers' perceptions in using cultural knowledge in science instruction, I felt a deep sense of sadness during the interview. The participant's expression and tone conveyed emotional strain and concern, reflecting a mixture of frustration and empathy. I observed the participant's eyes appearing heavy and downcast, with a subdued facial expression. The participant said:

The challenge for me as a teacher is that I have to learn their language, translate it to English, and also translate English back to their language." – P1 (IDI-Line no. 1-3)

In another participant, I noticed sadness on the face, yet it was accompanied by hope, dedication, and a strong sense of commitment. I observed the participant's eyes showing concern and determination, saying:

Translating scientific terms also required creativity." P5 (IDI-Line no. 1)

Despite the challenges experienced, a quiet but powerful happiness was reflected on the face of the teacher who had endured so much. In that moment, I observed a mix of struggle and fulfillment, as the participant said:

When they are using their own language, they can relate more... they are not hesitant to share because they can express themselves better. – P2 (IDI-Line no. 2-3)

Expanding on this perspective, I saw hope, along with nervousness, on the face of one participant, The participant ended saying:

Concepts like ecosystems... suddenly make more sense because many Indigenous languages already carry those relational ideas. – P3 (IDI-Line no. 2-3)

Based on the discussions, I noticed common patterns such as translation, language, Indigenous learners, and making concepts understandable. These highlight teachers' constant effort to bridge science with students' mother tongue, showing language mediation as central to their teaching experience. Across the interviews, I heard pauses, changes in tone, and hesitation when participants described their challenges. I also observed downcast eyes, subdued expressions, and occasional head scratching when explaining difficulties in translating scientific terms, alongside moments of softened tone showing hope and dedication when discussing students' understanding through their own language. In light of these observations, I understand that cultural knowledge integration is both challenging and meaningful. Teachers perceive the use of Indigenous history, culture, and native language as demanding but valuable, as it makes science instruction more relatable and improves students' understanding. Translation becomes not only a difficulty but also a bridge that carries meaning across worlds of learning and experience. Reflecting on the interview experience, I felt compassion and admiration, as their experiences reflected both emotional strain and strong commitment to their students, as if every word they spoke carried the weight of lived realities and quiet dedication.

Integrating community culture into science instruction

In line with my research question on teachers' experiences in integrating community culture into science instruction, I observed that the participant's facial expression showed engagement and thoughtfulness. The participant said:

I realized that I wasn't really ready to immerse myself... I learned that being a strong teacher doesn't mean having all the answers; it means being willing to listen, adjust, and admit when you don't know." - P3 (IDI-Line no. 1-3)

Supporting this perspective, I observed another participant's facial expression showing awareness, sincerity, and deep reflection, with slightly focused eyes and a calm demeanor, as he said:

I realize that I need to study their language to deliver lessons effectively." - P4 (IDI-Line no. 2)

In line with this perspective, I observed the participant's facial expression showing awareness, sincerity, and reflection, with a calm and focused demeanor, saying:

I noticed that when I used their native language to explain concepts, learners became more confident and engaged. They really opened up and interacted more using their own language, and they were more willing to ask questions." - P5 (IDI-Line no.3-5)

Adding to this perspective, another participant showed concern and deep reflection, with a serious yet thoughtful expression, saying:

In my experience, bringing Indigenous learners' native language into my science classroom is very challenging, especially because of their culture." - P2 (IDI-Line no. 2-3)

Going back to our conversations, I noticed recurring ideas in their responses such as listening, adjusting, language, immersion, and understanding learners. These highlight teachers' emphasis on flexibility and connecting instruction to students' cultural and linguistic backgrounds. As the interviews unfolded, I heard reflective tones, pauses, and careful word choices. I also observed engaged yet serious expressions, with downcast eyes, furrowed brows, and occasional head scratching when explaining challenges in language and immersion. In light of these observations, I understand that integrating community culture into science instruction is a continuous process of learning and adaptation. Teachers perceive it as a reflective process that aligns instruction with students' learning styles and promotes authentic participation and expression. Language serves as both a challenge and a bridge in making learning more meaningful. Reflecting on the interaction, I felt respect and admiration for the participants, as if their words gently weave culture and science into a single story of understanding.

Summary of findings

1. Teacher's perception using cultural knowledge as a way to respect students' beliefs and adjust science lessons through culturally appropriate strategies, making instruction more inclusive and meaningful.
2. Teacher's perception involving families as a way to connect science learning to students' real-life experiences, helping integrate their prior knowledge into more meaningful classroom learning.
3. Teacher's perception using Indigenous history, culture, and native language as challenging but meaningful, as it helped make science instruction more relatable and improved students' understanding.
4. Teacher's perception integrating community culture as a reflective process that improved alignment with students' learning styles and promoted authentic participation and expression.

Discussions

This section presents the discussion of the findings in relation to existing literature and theoretical perspectives. The themes derived from the participants are examined alongside relevant studies.

Using cultural knowledge as a way to respect students' beliefs and adjust science lessons

My conversations with the study participants led me to realize that teachers perceive the use of cultural knowledge as a way to respect students' beliefs and adapt science lessons through culturally appropriate strategies. This approach makes instruction more inclusive and meaningful. This finding supports the study of Avraamidou and Roth (2022), emphasizing that culturally responsive science teaching positions students' cultural and linguistic resources as essential in meaning-making, allowing teachers to design instruction that is more inclusive, relevant, and responsive to learners' experiences. Similarly, my current finding corroborates the study of Gimpaya and Ligsanan (2025), integrating Indigenous knowledge systems into science instruction enhances cultural relevance and supports teachers in adapting lessons that connect scientific concepts to students' everyday realities, resulting in more meaningful learning experiences.

In contrast, the current finding opposes the claim of Panicker (2020), stating that cultural integration may complicate instruction and reduce focus on core scientific concepts. While their study views cultural integration as a possible challenge in science teaching, the present finding suggests that cultural knowledge as a way to respect students' beliefs and adjust science lessons through culturally appropriate strategies, making instruction more inclusive and meaningful.

Family involvement as a way to connect science learning

I found that teachers perceive family involvement as a way to connect science learning to students' real-life experiences. This approach helps integrate students' prior knowledge into more meaningful classroom learning. My finding affirms the study of Avraamidou and Roth (2022), emphasizing that culturally responsive science teaching values students' home and community knowledge as essential resources for learning science, allowing teachers to build instruction that connects school science with lived experiences and prior knowledge. Similarly, my current finding affirms the assertion of Onwu and Mufundirwa (2020), revealing that integrating indigenous knowledge from families and local communities into science instruction makes learning more contextualized, relevant, and meaningful for learners, especially when lessons are grounded in everyday experiences.

In contrast, the current finding opposes the finding of Avraamidou (2021), asserting that science learning should primarily follow structured, teacher-directed instruction focused on uniform content delivery and standardized competencies, with limited integration of family or community knowledge. While their framework emphasizes a more formal and standardized approach to science instruction, the present finding reveals that teachers perceive involving families as a meaningful way to connect science learning to students' real-life experiences, thereby integrating their prior knowledge into more meaningful classroom learning.

Using Indigenous history, culture, and native language

The study revealed that teachers perceive the use of cultural knowledge as both challenging and meaningful.

They noted that it makes science instruction more relatable and improves students' understanding. My finding supports the study of Avraamidou and Roth (2022), emphasizing that culturally responsive science education requires teachers to integrate students' cultural and linguistic resources into instruction, even though this process can be challenging, in order to make science learning more meaningful and accessible. Likewise, this current finding validates the study of Khalifa et al. (2022), which highlights that culturally responsive teaching involves continuous reflection, cultural awareness, and instructional adaptation, enabling teachers to better connect lessons with students lived experiences and improve engagement and understanding. On the other hand, the current finding is in opposition to Siahaan et al. (2025), integrating cultural knowledge and native language enhances students' comprehension, engagement, and meaningful learning rather than weakening scientific understanding. While their study emphasizes the positive learning outcomes of cultural integration, the present finding further reveals that teachers perceive the use of Indigenous history, culture, and native language as challenging but meaningful, as it helps make science instruction more relatable and improves students' understanding.

Integrating community culture as a reflective process

The investigation determined that teachers' perceptions integrating community culture as a reflective process that improved alignment with students' learning styles and promoted authentic participation and expression. My finding supports the study of Smith et al. (2022), emphasizing that culturally responsive science teaching requires teachers to engage in continuous reflection, adapt instruction to learners' cultural contexts, and recognize students' diverse ways of participating in learning, leading to more meaningful and inclusive science education. Furthermore, this current finding aligns with the study of Gimpaya and Ligsanan (2025), which revealed that teachers implementing culturally sustaining pedagogy undergo reflective growth as they integrate Indigenous knowledge and community practices, resulting in improved student engagement and more authentic participation in science learning. On the contrary, the current finding disagrees with the finding of Anyichie et al. (2023), reflecting integration of community culture strengthens alignment with students' performance styles and promotes authentic engagement rather than disrupting learning. While their study emphasizes the positive impact of culturally responsive practices on student engagement, the present finding further reveals that teachers perceive integrating community culture as a reflective process that improves alignment with students' learning styles and promotes authentic participation and expression.

Implication for practice

As a recommendation of the study, teachers may integrate students' cultural knowledge into the design of science lessons to make learning more relevant and meaningful. They may also engage families as partners in the learning process to help connect students' prior experiences with classroom instruction. Furthermore, teachers may use students' native language as a strategic tool in science instruction to strengthen connections to their frames of reference and deepen understanding. In addition, integrating elements of community culture into classroom practices may help align instruction with students' performance styles and promote authentic participation such as sharing of community experiences, and demonstrating learning through culturally familiar contexts. These factors may be treated as determinant variables to identify which significantly predict the Perceptions of Teachers with Diverse Students as the criterion variable.

Future Direction of my Study

Future research may examine the long-term effects of culturally responsive strategies on students' conceptual understanding and academic performance using experimental or mixed-method approaches. Additionally, further studies may explore the role of teacher training, professional development, and institutional support in strengthening culturally responsive teaching practices. Science teachers may also develop and validate instructional models that integrate learners' cultural and linguistic backgrounds to promote more meaningful and inclusive science education.

In addition, an Exploratory Factor Analysis (EFA) may be conducted to develop and validate an instrument based on these determinants, with the identified subthemes serving as measurable indicators. Prior to factor extraction, data suitability may be assessed using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. Principal Axis Factoring with Promax rotation may then be applied to determine the underlying factor structure. Finally, the reliability of the resulting constructs may be evaluated using Cronbach's alpha to ensure internal consistency.

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Appendix A. Interview Guide Questions

Research Title: Teaching Science Across Languages: The Indigenous People Students in Focus through the Lens of Culturally Responsive Teaching

RQ1: “What are teachers’ perceptions of using cultural knowledge in science instruction, particularly in designing lessons that reflect students’ cultural and historical backgrounds??”

Probing questions:

1. Can you describe your experience of bringing Indigenous learners’ native language into your science classroom?
2. What challenges did you personally experience when using the native language?
3. How did this experience influence your teaching decisions?

RQ2: “What are teachers’ perceptions of involving families in Indigenous learners’ science learning, and its role in integrating students’ prior experiences into classroom learning??”

Probing questions:

1. Can you describe your experiences involving families of Indigenous learners in science-related activities or learning?
2. Can you share a memorable interaction with a parent, elder, or family member related to science learning?
3. How did you navigate cultural or language differences during these interactions?

RQ3: “What are teachers’ perceptions of using Indigenous history, culture, and native language in science teaching to make instruction more meaningful and relatable to students’ frames of reference??”

Probing questions:

1. Can you describe a moment when your knowledge of Indigenous culture influenced a science lesson?
2. What challenges did you experience in aligning cultural understanding with science content?
3. How did these experiences change how you view culturally responsive teaching?

RQ4: “What are teachers’ perceptions of integrating community culture into science instruction, and its alignment with students’ performance styles in encouraging authentic participation and expression??”

Probing questions:

1. Can you describe your experience of integrating community culture or local practices into your science lessons?
2. How did you feel about blending community knowledge with scientific ideas?
3. How did these experiences contribute to your professional growth as a teacher?

