



Assessing Teachers' Practices and Cultural Factors for Culturally Relevant Comprehensive Sexuality Education in Grade 10 Science

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ABSTRACT

This study examines the practices of Grade 10 science teachers in relation to integrating Comprehensive Sexuality Education (CSE) into the science curriculum and also highlights key cultural considerations for culturally responsive classroom-based lesson exemplars. The study was conducted in Esperanza, Philippines, where twenty-one science teachers, across ten secondary schools, were studied in relation to four aspects of teaching conceptual formation, scientific skill acquisition, scientific value, and classroom instruction. The study additionally examined some critical cultural aspects, such as beliefs and values, language and terminology, religious and ethical issues, and gender and sexual orientation. The findings indicate that teachers are mostly favorable towards CSE integration; however, due to cultural sensitivity, there are challenges related to resource inadequacies and a need for professional development. Teachers realize the importance of cultural respect, the use of inclusive language, and engaging classroom discussions on sexual health. The study, therefore, affirms that there is a need for culturally relevant instructional materials for the purpose of tackling these challenges, with suggestions regarding improving teacher training and collaborative practices within the community. This research serves as a foundation for the development of culturally responsive and scientifically accurate CSE lesson exemplars, thereby guaranteeing inclusivity within Grade 10 science education.

Keywords: *Comprehensive Sexuality Education (CSE), Culturally Relevant Teaching, Cultural Considerations, Lesson Exemplars*

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1 Introduction

The integration of Comprehensive Sexuality Education (CSE) into the science curriculum has been increasingly recognized as a critical approach to equip students with accurate knowledge, positive values, and life skills that promote healthy sexual and reproductive behaviors (UNESCO 2018). CSE faces implementation challenges in various contexts, particularly in low- and middle-income countries. Teachers often experience conflicts due to cultural and religious sensitivities, leading to hesitancy in discussing sex education (Shibuya et al. 2023). The integration of CSE into educational systems is influenced by factors such as awareness of sexual health issues, availability of resources,

and community perceptions (Chavula et al. 2022).

In the Philippine context, the Department of Education (DepEd) mandates the incorporation of CSE in subjects like science, focusing on developing students' understanding of the reproductive system, sexual health, and informed decision-making (DepEd Order No. 31, 2018). However, the implementation of reproductive health education remains controversial due to socio-cultural norms and religious beliefs (Kim et al. 2023). Teachers lack proper training and tend to minimize or modify their teaching due to fear of stimulating student interest in sex (Kim et al. 2023). The challenge of culturally relevant science teaching is evident, as demonstrated by a case study

of the Obo Monuvu tribe, where teachers developed specific practices to address cultural competence and academic success (Pejaner & Mistades 2020). Similarly, Pasay-An et al. (2020) stressed the value of culturally contextualized sexuality education for indigenous youth in the Cordillera Region, and recommended inclusive, values-based sexuality education anchored in local traditions and beliefs. Also pertinent is a qualitative study by Bruno et al. (2024) that examined teachers' attitudes toward CSE, finding hesitancy and unease, which appeared to be a result of little training, parental pushback, and competing personal values. These findings highlight the need for contextualized and culturally sensitive approaches to CSE implementation.

This study, conducted in the municipality of Esperanza, Philippines, addresses these gaps by profiling the existing practices of Grade 10 science teachers in teaching science concepts integrated with CSE and by identifying key cultural considerations in the development of lesson exemplars. Specifically, this research focuses on four dimensions of teaching practices: concept formation, scientific skill acquisition, scientific attitudes, and classroom instruction. Furthermore, it examines cultural considerations essential for developing classroom-based sexuality education lesson exemplars, including cultural beliefs and values, language and terminology, religious and ethical considerations, and gender and sexual orientation.

By addressing these objectives, this research aims to provide valuable insights for educators and curriculum developers in creating instructional materials that are scientifically accurate and culturally relevant. The study's findings have the potential to contribute to the literature on culturally relevant teaching and CSE integration, offering a framework for designing instructional materials that are not only informative but also reflective of the cultural contexts in which students and teachers operate. Such an approach is crucial in ensuring that students receive comprehensive sexuality education that promotes informed decision-making, healthy lifestyles, and positive attitudes towards sexual and reproductive health.

2 MATERIALS AND METHODS

Research Design

This study employed a descriptive research design to assess the current practices of Grade 10 science teachers in integrating Comprehensive

Sexuality Education (CSE) into science concepts and to identify the cultural considerations relevant to the development of culturally relevant classroom-based sexuality education lesson exemplars. A descriptive design was considered suitable as it facilitates the methodical collection, analysis, and presentation of data that illustrate the status and attributes of the study variables. This approach offers a comprehensive overview of current teaching techniques and aspects to consider while creating culturally relevant instructional materials.

Population and Participants of the Study

The research was carried out in the municipality of Esperanza, Philippines, focusing on all secondary schools in the region. The research participants were 21 science teachers presently instructing Grade 10 science across 10 secondary schools. Due to the limited population size, the study utilized a total enumeration sample method, guaranteeing that all teachers engaged in Grade 10 scientific education were incorporated as respondents. This methodology offered an extensive understanding of the educators' practices and viewpoints, enhancing the findings' representativeness and relevance to the study's specific context. The study's distribution and participants are shown in Table 1.

Research Instrument

The research instrument utilized in this study was a researcher-made questionnaire specifically designed to gather data on the two research objectives. The questionnaire was structured into two sections. The first section aimed to determine the current practices of science teachers in integrating CSE into Grade 10 science concepts, focusing on four dimensions: concept formation, scientific skill acquisition, scientific attitudes, and classroom instruction. The second section sought to identify cultural considerations for developing culturally relevant sexuality education lesson exemplars, covering cultural beliefs and values, language and terminology, religious and ethical considerations, and gender and sexual orientation.

To ensure content validity and reliability, the questionnaire underwent expert validation by a panel specializing in science education, CSE integration, and culturally relevant pedagogy. Suggestions and recommendations from the experts were incorporated to refine the instrument and align it with the study's objectives. In addition, the questionnaire was piloted with a small group of teachers (n = 30)

Table 1. Distribution of the Participants of the Study

Schools	Actual Science Teachers	Percentage (%)	Sex		Age			
			Male	Female	20-30	31-40	41-50	51 - 60 , up
Esperanza NHS	7	33.33	2	5	1	3	2	1
Catmonon NHS	1	4.76	-	1	-	1	-	-
Nato NHS	2	9.52	1	1	-	2	-	-
Duangan NHS	2	9.52	-	2	1	1	-	-
Guadalupe NHS	3	14.31	1	2	2	1	-	-
Salu NHS	1	4.76	-	1	-	1	-	-
Santa Fe NHS	1	4.76	1	-	1	-	-	-
Hawilian NHS	2	9.52	1	1	-	2	-	-
Oro NHS	1	4.76	-	1	1	-	-	-
San Toribio NHS	1	4.76	-	1	-	1	-	-

Legend: a complete enumeration sampling method, also known as universal sampling, was employed in the identification of participants. A total of 21 Science teachers are distributed across 10 secondary schools.

who were not involved as participants in the larger study but had similar demographic characteristics. The purpose of the pilot was to assess the clarity, relevance, and internal consistency of the items. Participants were asked to identify confusing wording, unclear instructions, and items that were difficult to understand. Based on their feedback and suggestions, changes were made, such as rewording confusing items, changing formatting for clarity, and dropping redundant items, in an effort to increase the validity and reliability of the instrument prior to final administration.

Data Gathering Procedure

The data collection process commenced after obtaining approval from the Department of Education and securing consent from the school heads of the participating secondary schools in the municipality of Esperanza. The validated questionnaires were then personally distributed by the researcher to the 21 Grade 10 science teachers. A brief orientation was conducted to inform the participants about the purpose of the study, the confidentiality of their responses, and their voluntary participation.

The respondents were given ample time to complete the questionnaire at their convenience. The researcher ensured accessibility during the data collection period to address any concerns or questions from the respondents. After the allotted time, the completed questionnaires were collected, and the responses were organized and encoded for data analysis.

Statistical Treatment

Descriptive statistical methods were employed to examine and interpret the gathered data. The study largely calculated techniques to summarize comments regarding teachers' current practices in integrating Comprehensive Sexuality Education (CSE) and cultural factors in their instruction. The computed means elucidated the degree of consensus for each item, presenting a clear representation of the educators' practices and perspectives. The results were subsequently connected with the research objectives to underscore key findings that could guide the creation of culturally responsive classroom-based CSE lesson exemplars for Grade 10 Science.

Ethics Statement and Declaration

An ethics clearance was not secured before the conduct of the study; however, the research study adhered to minimum ethical standards, including voluntary participation, anonymity, and the collection of signed Free, Prior, and Informed Consent forms, with all authors agreeing to these provisions prior to the manuscript's submission.

3 RESULTS AND DISCUSSION

Level of agreement of the current practices of teachers in teaching science concepts integrating CSE in terms of the following: Concept formations, Scientific Skill Acquisition, Scientific Attitudes, and Classroom instructions

The results in Table 2 summarize how teachers now teach science as a part of sexuality instruction

Table 1. Profile of teachers' current practices in teaching science concepts with integration of CSE in terms of concept formation

Item	Mean	Response
1. I integrate concepts related to sexual health and reproductive processes into my teaching of Living Things and Their Environment.	4.24	Agree
2. I emphasize the connections between biological concepts and sexual health in my lessons.	4.38	Agree
3. I use examples related to sexual health to illustrate biological concepts.	4.41	Agree
4. I encourage students to explore the impact of biological concepts on sexual health in their projects or assignments.	4.22	Agree
5. I provide opportunities for students to discuss cultural and societal influences on sexual health.	4.19	Agree
6. I create a safe and inclusive environment for discussing sexual health topics in my classroom.	4.46	Agree
7. I use a variety of teaching strategies to help students understand the relevance of sexual health to biology.	4.51	Strongly Agree
8. I incorporate current research and developments in sexual health into my teaching of biological concepts.	4.08	Agree
9. I emphasize the importance of understanding sexual health as part of a comprehensive understanding of biology.	4.46	Agree
10. I encourage students to critically analyze the implications of biological concepts on sexual health.	4.43	Agree
Average	4.34	Agree

Mean: 1.00-1.49 – Strongly Disagree, 1.50-2.49 – Disagree, 2.50-3.49 – Neutral, 3.50-4.49 – Agree, 4.50-5.00 – Strongly Agree

and how they form concepts. An overall mean score of 4.34 in the table, yielded within the range of 3.50-4.49 (Agree), indicates that the statements did not receive disagreement but, rather, received agreement from teachers. This clearly explains that teachers are ready to integrate ideas on reproductive processes and sexual health into their science lessons.

More specifically, item 7, "I use a variety of teaching strategies to help students understand the relevance of sexual health to biology," had the highest average score of 4.51, which assumed the meaning of Strongly Agree. This suggests a markedly positive commitment to employing a range of pedagogical approaches on the part of the teachers to make sure that students integrate sexuality education and biology. Interestingly, this supports recent research that emphasizes the importance of diverse and innovative teaching strategies in biology and sexual health education. Elkhidir (2020) highlights the shift towards student-centered learning in biology education, incorporating computer modeling, simulations, and problem-based learning to enhance critical thinking. Bhoi (2024) advocates for personalized learning, differentiated instruction, and interdisciplinary approaches to create engaging biology learning environments. Haruna et al. (2018) focus on sexual health education, noting the efficacy of game-based learning and gamification in developed countries for improving knowledge transformation, critical thinking, and motivation among students.

Nonetheless, while these encouraging self-

report scores are promising, it is important to question whether those perceived practices are actually demonstrated in classroom instruction. Perceived practices do not equal real practice. Without classroom observations, student feedback, or some other form of data, it is unclear whether such strategies are actually employed and consistently effective in classrooms. Examining the extent of alignment between teachers' beliefs and teaching actions is important, even more so for culturally sensitive topics such as sexuality education, when teachers might experience internal or external obstruction from particular strategies—whether to use a certain strategy or whether to teach sexuality education altogether.

Correspondingly, Items 6 and 9, both emphasizing the importance of safe and inclusive environments for sexual health discussion within a broad-based understanding of biology, received high mean scores of 4.46. Thereby, they mean that the teachers recognize the need to create a safe environment within the classroom where students are comfortable discussing sexuality and health. This is linked to the work of Scholer (2002), which highlights the need to go beyond basic anatomy, advocating for a comprehensive approach that includes critical thinking and field-specific relevance. Walker et al. (2020) identifies key factors influencing the quality of sexual and reproductive health education, including teacher confidence, school policies, and prioritization of the subject. While these responses show positive attitudes, we need to consider how these beliefs are put into

practice. These teachers could be proponents of inclusive and safe learning environments, and yet their practice may be eclipsed by a lack of training, their own discomfort, school culture, or opposition from parents. Therefore, the magnitude of the gap between perception and practice is a crucial component of ensuring that Comprehensive Sexuality Education (CSE) is both well-intentioned and intentionally practiced.

It's interesting to note that question 8, "I incorporate current research and developments in sexual health into my teaching of biological concepts," had a mean score of 4.08, which was somewhat lower. Therefore, teachers see this as an opportunity for improvement, especially because it lingers on the Agree range. Teachers must be aware of updated materials when applying research, but this is often blocked by restricted access or professional development opportunities on the subject. Research indicates that professional development (PD) and access to resources significantly impact teachers' ability to deliver comprehensive sexual health education. Studies show that PD is associated with increased coverage of sexual health topics and time devoted to teaching them (Clayton et al. 2017).

However, barriers such as teacher comfort, time constraints, and lack of training persist (Cummings et al. 2021). While some research supports the effectiveness of comprehensive sex education (CSE), critics argue that many studies cited as evidence for CSE do not meet scientific standards for program effectiveness (Ericksen & Weed 2023). To improve sexual health education, ongoing professional development is needed to broaden teachers' understanding of comprehensive approaches, address barriers, and strengthen educator capacity and self-efficacy. This highlights the importance of providing teachers with up-to-date resources and training opportunities in sexual health education.

In terms of scientific skill acquisition, the results in Table 3 shed light on how teachers are currently teaching science ideas while incorporating sexuality education.

In the context of sexuality education, teachers generally concur on integrating approaches that foster the cultivation of scientific competencies, as evidenced by an average mean score of 4.37. This indicates that, especially for topics relevant to sexual health, teachers consistently involve their students in

Table 3. Profile of the current practices of teachers in teaching science concepts integrating sexuality education in terms of Scientific Skill Acquisition

Item	Mean	Response
1. I promote inquiry-based learning methods to help students develop scientific skills related to sexual health.	4.32	Agree
2. I provide opportunities for students to develop skills in data analysis and interpretation within the context of sexual health.	4.27	Agree
3. I encourage students to use evidence-based reasoning when discussing topics related to sexual health in Living Things and Their Environment.	4.35	Agree
4. I integrate opportunities for students to develop skills in scientific communication when discussing sexual health concepts.	4.35	Agree
5. I use formative assessments to gauge students' understanding of scientific skills related to sexual health.	4.32	Agree
6. I provide constructive feedback to students to help them improve their scientific skills in the context of sexual health.	4.43	Agree
7. I incorporate hands-on activities that help students apply scientific skills to understand sexual health and reproductive processes.	4.30	Agree
8. I encourage students to collaborate and communicate effectively when working on projects related to sexual health.	4.49	Agree
9. I provide opportunities for students to engage in discussions and debates about scientific concepts related to sexual health.]	4.32	Agree
10. I create learning experiences that allow students to explore their own interests and questions related to sexual health.	4.54	Strongly Agree
Average	4.37	Agree

Mean: 1.00-1.49 – Strongly Disagree, 1.50-2.49 – Disagree, 2.50-3.49 – Neutral, 3.50-4.49 – Agree, 4.50-5.00 – Strongly Agree

activities that cultivate vital scientific competencies such as inquiry, data analysis, evidence-based reasoning, and scientific communication. Recent professional development initiatives, including the Comprehensive Sexuality Education (CSE) Training developed by the Department of Education (DepEd), in partnership with UNESCO and UNFPA, help teachers further develop these pedagogical skills. The DepEd-UNESCO CSE program, which

started in 2018 and trialed in various regions, helps give teachers the skills needed to incorporate sexuality education into their Science, MAPEH, and Values Education subjects through a rights-based and gender-responsive perspective (UNESCO 2019). The Family Planning Organization of the Philippines (FPOP) also offers teacher training and peer educator training for youth-centered sexual and reproductive health education (FPOP 2020). This

provides opportunities for educators to combine sex education with science-based thinking, making sure that lessons are based on evidence and are appropriate for the development of the majority of young people we teach.

The highest mean score was 4.54, which reveals Strongly Agree in Item 10, "I create learning experiences that let students explore their own interests and questions around sexual health." Educators are thus encouraged to engage with these kinds of student-directed sexuality education topics that land in the wheelhouses or zones of proximal development for students' personal interests and curiosities. Game-based learning and gamification have shown significant benefits in increasing student engagement, motivation, attitude, and knowledge compared to traditional teaching methods (Haruna et al. 2018, Haruna et al. 2019). The MAKE framework (Motivation, Attitude, Knowledge, and Engagement) has been validated as a comprehensive tool for evaluating the efficacy of these approaches (Haruna et al. 2019). In this study, teachers demonstrated classroom practices aligned with the MAKE components, such as motivational hooks, integration of values, fact-based teaching, and active learning for students. The framework also aligns with the Department of Education's lesson planning format, which emphasizes motivation, values, content mastery, and learner engagement. Long-term studies of sexual health education programs have shown increasing student support for the inclusion of social health topics, such as consent, in the curriculum (Kedzior et al. 2021). These findings suggest that student-centered, interest-driven approaches can significantly improve the effectiveness of sexual health education for adolescents.

The third and fourth items, promoting scientific communication skills (mean 4.35), overlap largely with advocacy of evidence-based reasoning. This indicates that in conversations on sexuality, educators should be focusing on or giving more attention to the development of critical thinking and communication skills, which is a central theme to being scientifically literate. In fact, teachers are already integrating these methods by working with students: debating structured topics on reproductive health, completing small group presentations involving the content of STIs and prevention strategies, and writing reflective essays on topics related to gender identity and respectful relationships. The results support the argument made by Cavagnetto (2010) that scientific education should focus on more than just delivering

knowledge, especially in relation to sensitive and important topics such as sexual health.

The second highest mean score of 4.49 is item 8, "I encourage students to work together with effective communication as a project or initiative based on sexual health," which means that educators are developing strategies for the importance of group participation in science education. Teaching practices have been structured around Vygotsky's Social Constructivist Theory. Collaborative learning is central to modern science education standards, fostering conceptual understanding through interaction with more capable peers and cultural tools (Holley 2019). Engaging students in collaborative discourse and argumentation enhances their conceptual understanding and scientific reasoning abilities (Osborne 2010). These approaches collectively support the idea that science education should focus on more than just delivering knowledge, particularly for sensitive topics like sexual health.

Item number 2, "I provide students with opportunities to analyze and interpret data related to sexual health," received the lowest mean score that fell within the anonymous Agree range as well. This would imply that sexuality education should be chosen as a priority exercise and activity related to information. Božović (2023) and Gibson and Mourad (2018) argue that data literacy is a key requirement for understanding scientific claims, because students must be able to exercise judgment over the evidence they can encounter as medical information; misinformation in health contexts may have serious consequences.

The findings demonstrate that teachers are utilizing ways that successfully promote the development of scientific skills through the incorporation of sexuality education. Nonetheless, more opportunities should be provided to analyze and understand the data. Improving this component could aid students in making better educated decisions regarding their health and well-being based on true facts. Offering teachers professional development opportunities focused on data literacy in sexuality education could improve these techniques.

The results in Table 4 outline the profile of teachers' current practices in teaching science concepts integrated with sexuality education, focusing on fostering Scientific Attitudes among students. The overall average mean score of 4.56 means that teachers Strongly Agree with their

Table 4. Profile of the current practices of teachers in teaching science concepts integrating sexuality education in terms of Scientific Attitudes

Item	Mean	Response
1. I create a supportive environment where students feel comfortable discussing topics related to sexual health.	4.57	Strongly Agree
2. I encourage students to approach discussions about sexual health with an open and respectful attitude.	4.57	Strongly Agree
3. I promote a positive attitude towards learning about sexual health and reproductive processes.	4.59	Strongly Agree
4. I emphasize the importance of respecting diverse perspectives and experiences when discussing sexual health.	4.68	Strongly Agree
5. I provide opportunities for students to reflect on their own attitudes and beliefs about sexual health.	4.59	Strongly Agree
6. I address misconceptions and stereotypes related to sexual health in my teaching.	4.54	Strongly Agree
7. I encourage students to consider ethical and moral implications of scientific concepts related to sexual health.	4.51	Strongly Agree
8. I promote empathy and understanding towards individuals with different sexual orientations and gender identities.	4.49	Agree
9. I use inclusive language and examples that reflect the diversity of experiences related to sexual health.	4.46	Agree
10. I model positive attitudes and behaviors when discussing sensitive topics related to sexual health.	4.62	Strongly Agree
Average	4.56	Agree

Mean: 1.00-1.49 – Strongly Disagree, 1.50-2.49 – Disagree, 2.50-3.49 – Neutral, 3.50-4.49 – Agree, 4.50-5.00– Strongly Agree

attempts to promote positive scientific attitudes when they talk about sexual health and reproduction in the classroom. This finding shows that teachers are actively creating an atmosphere that promotes respect, acceptance, and an open mind, all of which are necessary for sexuality education to work. However, it is important to note that these results are based on the participants' self-perceptions and self-reported practices. Although self-perceptions are informative, they may not rise to the level of reality in the classroom. Therefore, additional levels of confirmation through classroom observations, lesson plans, or student-related information would be needed to confirm this evidence. For the study, it is important to note that classroom observations were not used; therefore, this limitation could be addressed through future research.

Items 1 and 2, pertaining to the establishment of a supportive environment and the promotion of openness and respect in talks, received high mean scores of 4.57. This points towards creating a comfortable and valued classroom environment where students feel free to talk openly about sensitive issues, cultivating positive attitudes and strong critical thinking skills in students. As for the respective theoretical grounds, Monteiro et al. (2021) posited that secure and accepting environments are necessary for profoundly engaging in sexuality discussions, thereby propelling scholars toward positive attitudes and robust critical thought development. The statement with the highest average score of 4.68 out of 5, "I emphasize the importance of respecting diverse perspectives and experiences when discussing sexual health.", prioritizes the

idea that teachers tremendously aid in establishing an inclusive and tolerant environment within their schools, which is crucial for teaching sexuality education. Respect for varied opinions gives insight and concern in students for people belonging to varied national, social, and humane backgrounds, which matches Phillips et al. (2023) findings that respect for difference is an important component to avoid discrimination and rally the community.

Both item 3, "I encourage a positive attitude toward learning about sexual health and reproductive processes," and Item 5, "I provide chances for students to reflect on their own beliefs and attitudes regarding their sexual health," concluded with a mean of 4.59, upholding the right business of the teachers in establishing a positive and reflective environment for learning. Similar findings are derived by Biswakarma et al. (2024), who state that students are more likely to obtain positive rewards and knowledge on sensitive topics such as sexual health when they are asked to consider their attitudes and beliefs. There were high average scores in items 8 and 9, though they received slightly lower mean scores of 4.49 and 4.46, respectively. These refer to encouraging understanding and inclusive use of language. This means that, although the teachers encourage understanding and acceptance, they should have performed even better. This could also suggest that barriers may inhibit this from being achieved, such as an inability to use inclusive language or a lack of training regarding the handling of people from varying sexual orientations and gender identities. This goes hand in hand with what was noticed by Dewi (2024) and Fernández-Portero

(2022), whereby it was noted that some teachers were insufficiently trained and therefore only felt less confident about using inclusive and gender-sensitive language.

The analysis indicates that teachers do promote science in a certain innovative dimension, that is, the incorporation of sexuality education within science instruction. Teachers' approaches should be optimized with even more exposure to inclusivity and empathy, including diverse cultural examples and language, with which an environment of inclusion and equity can be established, allowing students to have a full understanding of sexual health and reproduction.

A comprehensive analysis in Table 5 summarizes the teachers' current practices for teaching science concepts related to sexuality education, particularly around Classroom Discussions, with an overall mean score of 4.50, thus indicating "Strongly Agree." Such a conclusion implies that teachers must use a variety of discussion techniques to get students to grasp concepts of sexual health in a science class context.

Item 3 garnered the highest mean, exhibiting a score of 4.59 with the statement "In my classroom, I provide accurate information about sexual health and reproductive processes." This comes with a big note to a teacher that explicitly giving proper and reliable bits of information is a must when teaching, especially for difficult topics. There's a major importance in sexual education of correct information dissemination because misinformation

or lack of knowledge could keep alive the root cause of some myths and stereotypes. This tally with the findings of Zamponi et al. (2024), placed great emphasis on the fact that teachers ought to be well trained to communicate correct and scientifically reliable materials on sexual health to avert misunderstanding and re-circulating misinformation on the subject.

Items 5 and 9 have both landed on an average mean of 4.54. It said, "I encourage students' engagement and participation when discussing sexual health topics in my classroom," and "I create a classroom environment that fosters collaboration and respectful dialogue about sexual health." These figures reflect that teachers are actively instilling in students a sense of participation while also creating a culture that respects learning in the classroom, both of which are very desirable for good class discussion. Discussions where students think critically and are more willing to voice their opinions can happen if they are encouraged to participate and are assured of safety. This also reiterates Lin et al. (2021), that interactive discussions not only build student self-confidence but also ensure the successful acquisition of knowledge in sexual education.

Item 6, "I give students opportunities to ask questions and know more information about sexual health concepts," with a notably high score of 4.57, depicts the teachers as highly supportive of a sort of inquiry-based learning technique for eliciting the natural interest of students. By clearing up their doubts and expressing their feelings, the students can

Table 5. Profile of the current practices of teachers in teaching science concepts integrating sexuality education in terms of Classroom discussions

Item	Mean	Response
1. I use a variety of instructional methods (e.g., lectures, discussions, group activities) to teach concepts related to sexual health in Living Things and Their Environment.	4.41	Agree
2. I adapt my teaching strategies to meet the diverse learning needs of students when discussing sexual health.	4.46	Agree
3. I provide clear and accurate information about sexual health and reproductive processes in my classroom instructions.	4.59	Strongly Agree
4. I incorporate multimedia resources (e.g., videos, websites, guest speakers) to enhance students' understanding of sexual health concepts.	4.46	Agree
5. I encourage student engagement and participation when discussing sexual health topics in my classroom.	4.54	Strongly Agree
6. I provide opportunities for students to ask questions and seek clarification about sexual health concepts.	4.57	Strongly Agree
7. I use assessments that allow students to demonstrate their understanding of sexual health concepts in different ways.	4.46	Agree
8. I provide timely and constructive feedback on students' understanding of sexual health concepts.	4.46	Agree
9. I create a classroom environment that fosters collaboration and respectful dialogue about sexual health.	4.54	Strongly Agree
10. I use real-world examples and case studies to illustrate the relevance of sexual health to students' lives.	4.49	Agree
Average	4.50	Agree

Mean: 1.00-1.49– Strongly Disagree, 1.50-2.49 – Disagree, 2.50-3.49 – Neutral, 3.50-4.49 – Agree, 4.50-5.00– Strongly Agree

better understand and make the exercise worthwhile. Vilaça (2017) and Helbekkmo et al. (2021), revealed that having open conversations and allowing the students to ask questions is a sure method to ensure the students understand sexual health. It also helps to ease students into talking about these issues.

Although the scores for item 1 "I use a variety of instructional methods (e.g., lectures, discussions, group activities) to teach concepts related to sexual health in Living Things and Their Environment" and item 10 "I use real-world examples and case studies to illustrate how sexual health is relevant to students' lives" were a little less high, which indicates an Agree response (4.41 and 4.49), there is still some distance that can be covered yet in these two areas. Even if teachers do use a variety of teaching methods and models from real life— inquiry-based learning (IBL), problem-based learning (PBL), concept mapping, collaborative learning, reflective journaling, and values through learning, there is still potential for them to continue evolving in these areas. Such a combination would put more experience in the hands of students regarding learning and make the subject connect with them, thus making it more applicable to their lives. In sexuality education, Couto et al. (2023) state that using real-life situations, and a variety of teaching methods can help bridge the gap between theoretical knowledge and practical application, thus completing the learning circle.

The results clearly indicate that teachers generally lead discussions on sexuality education quite well within their science classes. Basically, this shows that the teachers are indeed making efforts

to engage students, provide them with accurate information, and maintain respectful conversations. Hence, making the thoughtful dialogue slightly better with more teaching methods and real-life examples will enhance general discussions with students. Such improvements would make sexuality education even more practical, making students more thoughtful, analytical, and tolerant.

The profile considerations for developing culturally responsive classroom-based sexuality education lesson exemplars for grade 10 science in terms of: Cultural beliefs and values, Language and Terminology, Religious and Ethical considerations, and Gender and Sexual Orientation

The results in Table 6 show the profile considerations for developing culturally relevant classroom-based sexuality education lesson exemplars for Grade 10 Science in terms of Cultural Beliefs and Values.

The overall mean score is 4.52, which falls into the "Extremely Important" range. This indicates the jubilation of the highly inclusive presentation of cultural views and values during the development of these lessons. Along with item 6, "Address stereotypes and misconceptions about cultural groups in the materials," the average score was 4.62, indicating a sense of strong opinion among teachers that stereotypes needed to be addressed and dismantled so that educational materials would be less limiting and more culturally relevant. It affirms that when students break the stereotypes, it

Table 6. Profile considerations for developing culturally responsive classroom-based sexuality education lesson exemplars for grade 10 science in terms of Cultural beliefs and values

Item	Mean	Response
1. Consider the cultural beliefs and values of my students when developing materials related to sexual health.	4.54	Extremely Important
2. Incorporate examples and scenarios in the materials that reflect the cultural diversity of my students.	4.57	Extremely Important
3. Seek input from students, parents, and community members to ensure that the materials respect cultural beliefs and values.	4.27	Very Important
4. Provide opportunities for students to discuss how cultural beliefs and values influence their understanding of sexual health.	4.46	Very Important
5. Use culturally relevant language and imagery in the materials to make them more relatable to students.	4.59	Extremely Important
6. Address stereotypes and misconceptions about cultural groups in the materials.	4.62	Extremely Important
7. Provide resources and support for students who may have different cultural perspectives on sexual health.	4.57	Extremely Important
8. Encourage students to share their cultural experiences and perspectives related to sexual health.	4.57	Extremely Important
9. Collaborate with colleagues and community members to develop culturally responsive materials.	4.46	Extremely Important
10. Regularly review and update the materials to ensure they remain culturally relevant and sensitive.	4.57	Extremely Important
Average	4.52	Extremely Important

Mean: 1.00-1.49– Not Important, 1.50-2.49 – Slightly Important, 2.50-3.49 – Moderately Important, 3.50-4.49 – Very Important, 4.50-5.00– Extremely Important

creates an atmosphere of respect and openness in the classroom, as pointed out by Ladson-Billings (2014). She also noted how culturally relevant pedagogy influences some aspects of equity and acceptance.

Items 2, 5, 7, 8, 9, and 10 received extremely important ratings on all the above counts, receiving mean scores of between 4.57 and 4.59. Some of these include using varied examples and scenarios, culturally appropriate language and images, supporting students with several perspectives, encouraging students to share their cultural experiences, collaboration with other teachers and community members, and regular reviews and updates of materials. The strong scores the teachers received in these areas are proof of their commitment as agents creating and ensuring that the content is not only inclusive of different ethnic types, but also considers that and maintains relevance to the students' lives.

Item number 3 states, "Get feedback from students, parents and community members to make sure that the materials respect cultural beliefs and values." The mean of this item is quite low at 4.27. While feedback is deemed important, it is less important than the rationale behind challenging stereotypes or using culturally-relevant language. The implication is that teachers do value input from the community, but participation in active stakeholder engagement may be tough for them. According to Ashrafova (2024) and Hatchimonji et al. (2017), it has also been difficult for communities to provide input into curriculum development because of time constraints

and differing perspectives.

The results presented in the table indicate that these educators rank cultural considerations as number one in making tools for sexuality education. Educators seek to make learning more meaningful to all by confronting stereotypes, including culturally relevant materials, and giving students an opportunity to express their cultural views. Involvement in the community is deemed important; however, school-community collaboration may need much greater efforts to strengthen partnership in the development of culturally relevant lesson examples. The overall results indicate that educators are committed to developing materials that are culturally responsive and seek to cater to their students' varied cultural backgrounds, thereby contributing to a welcoming and supportive school climate for everyone.

The results shown in Table 7 are about profile things to think through when preparing sexually based lessons in Grade 10 that are culturally sensitive, particularly in terms of the language and terminology used. Its mean score is 4.69, which falls into the category of Extremely Important. This rather reinforces the importance of using vocabulary and terms that are broadly linguistic, communicable, and considerate of students' sexual identities and backgrounds.

This shows also that item 2 had the highest mean value (4.76): "Provide explanations and definitions for terms related to sexual health to ensure understanding." An important consideration for the teaching of sexual health concepts would be to clearly explain and provide understanding.

Table 7. Profile considerations for developing culturally responsive classroom-based sexuality education lesson exemplars for grade 10 science in terms of Cultural beliefs and values

Item	Mean	Response
1. Use language and terminology in the materials that are inclusive and respectful of diverse identities.	4.70	Extremely Important
2. Provide explanations and definitions for terms related to sexual health to ensure understanding.	4.76	Extremely Important
3. Avoid using jargon or technical language that may be confusing or alienating to students.	4.70	Extremely Important
4. Use language that is gender-neutral and inclusive of different sexual orientations and gender identities.	4.62	Extremely Important
5. Consider the linguistic diversity of my students and provide materials in multiple languages if necessary.	4.62	Extremely Important
6. Provide opportunities for students to discuss and clarify any language or terminology used in the materials.	4.65	Extremely Important
7. Use language that is age-appropriate and accessible to students at different levels of understanding.	4.68	Extremely Important
8. Seek feedback from students and colleagues on the language and terminology used in the materials.	4.73	Extremely Important
9. Use language that is empowering and affirming of students' identities and experiences.	4.70	Extremely Important
10. Update the materials regularly to reflect changes in language and terminology related to sexual health.	4.70	Extremely Important
Average	4.69	Extremely Important

Mean: 1.00-1.49 – Not Important, 1.50-2.49 – Slightly Important, 2.50-3.49 – Moderately Important, 3.50-4.49 – Very Important, 4.50-5.00 – Extremely Important

It also emphasizes how important it would be to provide information without obscurity or confusion to any of the students. Bitzer (2024) indicated that information delivery should be clear enough and provide equitable health education access for students from all forms of their linguistic makeup.

Items 1, 3, 8, 9, and 10, garnering a score of 4.70, were also categorized as Extremely Important. These include using language that is respectful and inclusive of everyone, avoiding jargon and technical terms, asking for feedback on language use, using language supporting students' identities, and regularly updating materials to reflect changing language norms. The teachers got high ratings in these areas, suggesting that they were committed to creating a safe and supportive space for all students; according to Hernández and Darling-Hammond (2022), such a commitment underscores the role of affirmation language in positive identity development and stigma reduction. The scores given to statements 4, 5, and 6, while somewhat lower at 4.62 and 4.65, were also within the range of Extremely Important. This covers such matters as using gender-neutral language, being mindful of various languages, and allowing students to express the meaning of terms. Although these aspects might not be as towering as definition and feedback about individual words and phrases, they do signify the importance of accessibility and inclusivity altogether.

The results presented in the table indicate that the teachers carefully considered the language used in the culturally sensitive lesson exemplars. The teachers understand the importance of making language respectful, non-threatening, and easily understandable to allow all the students to feel respected and understood. Saito-Stehberger (2022) posits that the language used must relate to students' real-life situations to give communication and engagement in sexuality education a greater chance. Provided with all this, teachers are sensitive to language and terminology that have implications for student understanding and the level of engagement in learning. Their materials should connect with students across a vast range of backgrounds, be sensitive and inclusive, and make learning supportive and empowering.

In Table 8, Religious and Ethical Considerations form an essential portion of the profile considerations for developing culturally responsive, classroom-based sexuality education lesson exemplars for Grade 10 Science. The overall average mean

score is 4.70, which indicates that they are all deemed Extremely Important. The acceptance and recognition of students' religions, as well as their moral beliefs, should be considered when covering sexuality education, and the material is expected to be culturally sensitive.

The questionnaire item that is most highly rated, with a mean score of 4.84, is, "Use language and examples in materials that are inclusive of different religious and ethical perspectives." This speaks about the importance of recognizing and honoring a student's uniqueness and background. This also means that teachers must adhere to becoming sensitive and welcoming, which has been, in this case, mostly emphasized by several principles propagated by the testimony of groups, among them UNESCO (2018), emphasizing the religious and moral diversities in sexuality education. Items 2 and 3 received mean scores of 4.78, which are statements that emphasize flexible instruction respecting various religious views and do not endorse any one doctrine. This observation shows that teachers are concerned with sexuality education, teaching it fairly and thus ensuring that it neither contradicts nor undermines students' religious or moral beliefs. This principle is also consistent with the principles of neutrality and inclusion advocated by Bialystok (2019). The study also adds that a sexuality education curriculum should help people learn without attempting to impose one's beliefs.

Item 4, "Provide opportunities for students to discuss how their religious beliefs influence their understanding of sexual health," got a score of 4.76. This reflects that room for talking and thinking about personal beliefs is taken to be of paramount importance for developing critical thinking and respect for different perspectives of big importance. Such discussions can develop mutual understanding and potentially avoid conflict rooted in different faith views (Sanjakdar, 2018; Phillips et al., 2023). Item 6: "Collaborate with religious leaders and community members to ensure that the materials are sensitive to religious beliefs" is rated a low 4.54, yet still clusters firmly in Extremely Important. This indicates an appreciation for working along with religious leaders but may not be assigned as much weight as some others, such as respecting views or ensuring information is unbiased. However, community involvement, as Bormet (2020) eloquently espouses, remains a vital aspect of facilitating culturally relevant tools.

The profound response demonstrates the

Table 8. Profile considerations for developing culturally responsive classroom-based sexuality education lesson exemplars for grade 10 science in terms of Religious and Ethical considerations

Item	Mean	Response
1. Respect the religious beliefs and ethical considerations of students when developing materials related to sexual health.	4.84	Extremely Important
2. Provide information about sexual health in a way that is respectful of different religious perspectives.	4.78	Extremely Important
3. Avoid promoting or endorsing specific religious beliefs in the materials.	4.78	Extremely Important
4. Provide opportunities for students to discuss how their religious beliefs influence their understanding of sexual health.	4.76	Extremely Important
5. Address common questions and concerns related to sexual health from a variety of religious perspectives.	4.68	Extremely Important
6. Collaborate with religious leaders and community members to ensure that the materials are sensitive to religious beliefs.	4.54	Extremely Important
7. Provide resources and support for students who may have ethical or religious objections to certain topics or materials.	4.62	Extremely Important
8. Use language and examples in materials that are inclusive of different religious and ethical perspectives.	4.65	Extremely Important
9. Encourage students to explore the ethical dimensions of sexual health issues.	4.68	Extremely Important
10. Regularly review and update the materials to ensure they remain respectful of religious and ethical considerations.	4.70	Extremely Important
Average	4.70	Extremely Important

Mean: 1.00-1.49– Not Important, 1.50-2.49 – Slightly Important, 2.50-3.49 – Moderately Important, 3.50-4.49 – Very Important, 4.50-5.00– Extremely Important

importance teachers give to the inclusion of religious and moral issues in culturally sensitive sexuality education materials. In their school setting, they incorporated these considerations by consulting with religious and community leaders, aligning content with commonly accepted moral values, and carefully framing discussions to respect cultural beliefs while still providing accurate information. Some teachers also included scriptural reflections, used neutral or values-sensitive language, and emphasized respect, responsibility, and the ethical implications of decision-making in sexual health topics. This approach seeks to create a classroom in which all learners will feel welcomed, and their religious beliefs and values will be appreciated, culminating in higher engagement and understanding. By engaging in such, teachers facilitate understanding of co-existence, a diversity which furthers the general health and happiness of the learners.

Table 9 depicts the profile considerations for the development of culturally responsive classroom-based sexuality education lesson exemplars for Grade 10 Science in terms of Gender and Sexual Orientation. The average mean scores across the items are 4.60, suggesting that all considerations are seen as Extremely Important. This language sets the tone for inclusivity in the battle for the right to articulate inclusive perspectives of sexual health underpinned by respect for various gender and sexual identities.

Item number 2 had the highest mean score of 4.70, "Provide sexual health information relevant to

all students of all genders and sexual orientations," indicating the most attention should be given to ensure inclusion within the content. This implies that teachers ought to create a space where all students feel included and supported. This is consistent with results on inclusive education by Meadows (2018), which reinforce that inclusivity promotes engagement while reducing anxiety. Items 1 and 5 dealt with words and examples that include people from different sexual orientations and gender identities as well as correcting gender stereotypes and erroneous beliefs, scored 4.62 and 4.76, respectively. According to Brant and Tyson (2015), this is evidence that teachers are committed toward eliminating bias and encouraging a positive attitude toward difference, which is important for combating anti-minority sentiment and rendering a sense of belonging to all students.

While item 4, "Provide resources and support for students who may be exploring their gender identity or sexual orientation," earned a score of 4.57, this indicates that recognizing that understanding oneself is of paramount importance. From this, one can conclude that educators must create safe spaces for honest self-exploration. Shattuck et al. (2021) note that this sort of support is very much needed for students' mental health and perseverance, specifically for those who feel that they do not belong. Although item 9 received the lowest score of 4.30, a low score does not mean a poor investigation, but it does show progress on the part of the school. Though it is ranked as less

Table 9. Profile considerations for developing culturally responsive classroom-based sexuality education lesson exemplars for grade 10 science in terms of Gender and Sexual Orientation

Item	Mean	Response
1. Use language and examples in the materials that are inclusive of different gender identities and sexual orientations.	4.62	Extremely Important
2. Provide information about sexual health that is relevant to students of all gender identities and sexual orientations.	4.70	Extremely Important
3. Avoid assumptions about students' gender identities and sexual orientations in the materials.	4.54	Extremely Important
4. Provide resources and support for students who may be exploring their gender identity or sexual orientation.	4.57	Extremely Important
5. Address stereotypes and misconceptions about gender and sexual orientation in the materials.	4.76	Extremely Important
6. Use examples and stories that reflect the experiences of individuals with diverse gender identities and sexual orientations.	4.62	Extremely Important
7. Provide opportunities for students to discuss and ask questions about gender and sexual orientation in a safe and respectful environment.	4.68	Extremely Important
8. Use language that is affirming and respectful of diverse gender identities and sexual orientations.	4.65	Extremely Important
9. Collaborate with LGBTQ+ organizations and community members to ensure that the materials are inclusive and supportive.	4.30	Very Important
10. Regularly review and update the materials to ensure they remain sensitive to issues of gender and sexual orientation.	4.57	Extremely Important
Average	4.60	Extremely Important

Mean: 1.00-1.49– Not Important, 1.50-2.49 – Slightly Important, 2.50-3.49 – Moderately Important, 3.50-4.49 – Very Important, 4.50-5.00– Extremely Important

important, it emphasizes the need for community involvement in updating materials that are sensitive to diversity in culture, such as Whaley et al. (2016) descriptions of a culturally relevant approach to selecting introductory psychology textbooks.

The high scores on all items indicate that teachers consider gender and sexual orientation with much contemplation when preparing culturally sensitive materials for sexuality education. In practice, they included students of every gender and sexual orientation, incorporated gender-neutral language, appealed to families in a variety of structures, and did not assume that students were heteronormative when using examples and scenarios in their teaching. Some teachers included stories or case studies that focused on the lived experience of LGBTQ+ individuals, executed thematic discussions during classes that emphasized respect and empathy regarding gender identity and expression, and focused on discrimination, and bullying. Others worked with guidance counselors to make sure the subject matter fit with their values of inclusivity, equity, and dignity for all, and that it was appropriate for the developmental stage of their students. The lessons are open to everyone to ensure that students feel respected and appreciated, allowing for varying points of view within the classroom. The findings have highlighted the need for awareness of gender and sexual orientation in sex education for it to be a welcoming and supportive environment for all students. By doing so, teachers enable students to

engage with each other at deeper levels by fostering mutual respect for diversity and thereby promote the overall health and wellbeing of their students.

4 Conclusions and Recommendations

The present findings suggest that teachers engaged in this study generally support and endorse the inclusion of sexuality education within science lessons. In response to these topics, teachers report drawing on multiple teaching strategies to link topics of sexual health to biological content, thereby indicating a willingness to and following through with teaching reproductive processes and sexual health from a scientific perspective. It is evident that teachers encourage inquiry, data management, and critical thinking while establishing safe, inclusive spaces to discuss sensitive topics. It is also clear, however, that there is room for improvement in consistently using inclusive language and engaging in more detailed discussions regarding diverse gender identities and sexual orientations in schools. While teachers emphasize respectful discussion, accurate information, and student voice, they also recognize that if they were able to enhance their teaching by drawing on experiences and examples from life and models more embedded in specific cultures, the relevance and attention of students could improve. Cultural values and beliefs are part of their knowledge of dynamics in a classroom, and they also recognize the value that is placed on

culturally responsive content. However, teachers recognize that engaging communities, particularly about the validation of materials and cultural applications, is a particular challenge.

To enhance these efforts, schools and education authorities should provide ongoing and comprehensive PD to fully develop teachers' confidence and capacity to address sexuality education in a biology context in interactive and experiential ways, such as through case-based learning, simulations, and role-play. Accessible knowledge for teachers and the development of resources, including teacher guides or resource packs that provide current knowledge and examples that are culturally relevant, can help support implementation in their classrooms.

There is also a need to co-create instructional materials in partnership with community stakeholders such as parents, health professionals, faith-based and cultural leaders, and youth advocates. This partnership can help to ensure that the materials are cultivated respectfully and inclusively in consideration of local belief systems. Collaboration strategies could involve consultations with families, focus groups, and feedback processes to foster trust, inclusion, and transparency in how items are accepted. Such collaborative forms of practice may help to challenge stereotypes, enhance conversations, and lead to a learning environment that celebrates all students with learning opportunities, while also improving the quality and cultural competencies of sexuality education in science.

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6 Statement of Conflict of Interest

The researchers declare that there is no conflict of interest regarding the publication of this paper.

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