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Teaching Chemical Reactions Through Local Practices: A Contextual Approach for School Education

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Abstract

This study explores the integration of local knowledge into the teaching of chemical reactions in school education. The research aims to explore local knowledge related to chemical reactions and incorporate it into science classroom practices. It was based on the qualitative method with an interpretative phenomenological design. The unstructured interviews with three science teachers of Kathmandu Valley, who have more than 15 years of teaching experience in science teaching, were involved in the interview as participants. The interviews were transcribed, coded, and themes were constructed through the categorization of codes. Thematic analysis is employed to identify key insights and patterns. The findings reveal that integrating local practices enhances science education through culturally relevant teaching methods and fostering deeper student engagement.

Keywords: *Local knowledge, contextualized learning, chemical reactions, science education*

Introduction

Teaching science is related to the students' daily lives that is essential for meaningful learning. Chemical reactions are fundamental concepts in science, yet many students struggle to understand them due to the abstract nature of the subject. Integrating local practices, such as traditional fermentation methods, metal extraction, and food preservation, can provide relatable examples that enhance students' comprehension. The contextualization of science education aligns with the constructivist learning approach, which emphasizes learning through experience and interaction with the environment (Vygotsky, 1978). In various communities, traditional knowledge has played a critical role in explaining natural phenomena, including chemical reactions, in ways that align with students' lived experiences. However, conventional science curricula often overlook these practices, making science seem detached from students' cultural and social realities (Carlone & Johnson, 2015). This study explores how local practices can be used in teaching chemical reactions and develops a framework that merges these practices with scientific explanations. Integrating local knowledge into chemical reactions education can create a more inclusive and meaningful learning experience (El Yazidi & Rijal, 2024).

Science education research presents chemical reactions as abstract concepts disconnected from students' everyday experiences. These concepts also resonate with my fifteen years of teaching experience in science education, from school to higher education. This disconnection creates learning challenges, particularly for students from diverse cultural backgrounds who engage with chemical processes in their daily lives through traditional practices such as food fermentation, herbal medicine preparation, and metal extraction (Timilsena, 2022). Conventional science curricula rarely incorporate these culturally significant practices, leading to a gap between students' lived experiences and scientific explanations (Aikenhead & Michell, 2011). Despite the recognized importance of contextual learning, limited research has been conducted on integrating local knowledge into the teaching of chemical reactions. Existing studies focus primarily on Indigenous knowledge in broader science education but rarely address its application to specific scientific concepts like chemical reactions (Snively & Corsiglia, 2001). Furthermore, teachers often lack pedagogical strategies and institutional support to integrate local knowledge effectively, reinforcing a Western approach to science education (Jegede & Aikenhead, 1999).

This study addresses this gap by investigating what local knowledge can be involved in teaching chemical reactions at the secondary level and how local knowledge can be meaningfully integrated into chemical reactions education at the secondary level. By exploring traditional practices that involve chemical changes, examining students' conceptual development, and analyzing teachers' experiences with a contextualized pedagogical framework, this research aims to develop strategies that bridge the gap between scientific inquiry and cultural knowledge. The findings will provide educators, policymakers, and curriculum developers with insights to enhance science education in culturally diverse contexts.

Objectives

The study has the following objectives:

1. To explore local knowledge in teaching chemical reactions at the secondary level.
2. To incorporate science teachers' local knowledge in teaching chemical reactions into science classroom practices.

Research Questions

Based on the research objectives, the study has the following research questions:

1. What local knowledge can be involved in teaching chemical reactions?
2. How do teachers integrate local knowledge to teach chemical reactions in science classroom practices?
3. How do science teachers face challenges while incorporating local knowledge to teach chemical reactions in science classroom practices?

Literature Review

The review is based on the role of context learning in science education, local knowledge, chemical reactions, and challenges and opportunities in integrating local knowledge. Contextual learning theory suggests students learn more effectively when concepts are taught in familiar and meaningful contexts (Brown, 2009). Research has shown that incorporating local knowledge in science education enhances students' engagement and comprehension (Aikenhead & Michell, 2011). Studies have also highlighted the significance of culturally responsive teaching in improving learning outcomes for diverse student populations (Gay, 2018). Indigenous and local knowledge systems include rich insights into chemical processes, such as fermentation in food processing, metal extraction from ores, and herbal medicine preparation (Semali & Kincheloe, 1999). These practices provide practical illustrations of chemical reactions that can be used in classroom instruction. For example, traditional soap-making techniques involve saponification, a chemical reaction between fats and alkaline substances, which serves as an excellent educational tool for understanding reaction mechanisms. Despite the benefits, challenges exist in integrating local knowledge with scientific curricula. Teachers often lack adequate resources and training to bridge traditional practices with formal scientific explanations (Snively & Corsiglia, 2001). Additionally, some educators perceive local knowledge as less valid than scientific principles, creating resistance to integration (Jegede & Aikenhead, 1999). However, successful integration models have been reported in various contexts, demonstrating that culturally inclusive approaches can enhance student learning (McKinley, 2005).

Methodology

This study employs a qualitative research approach using Interpretative Phenomenology. This design helps explore how participants experience and interpret the integration of local practices in science education. The semi-structured interviews were conducted with three science teachers to understand the integration of local knowledge within science education. This approach allows for an in-depth exploration of their experiences and perspectives, enabling a richer dialogue about the challenges of such integration in the curriculum. This methodology aims to triangulate qualitative data with existing educational frameworks, providing a clearer picture of current practices and potential areas for development in science teaching. Thematic analysis was used to identify key patterns and insights from the qualitative data. Additionally, integrating contextualized local knowledge into chemical reactions was emerged as the pedagogical output.

Findings and Discussion

The findings and discussion are based on themes like local knowledge involved in the chemical reaction, Local Knowledge Practices in Classroom Teaching, and Challenges in Using Local Practices in Teaching Chemical Reactions.

Local knowledge involved in Chemical Reactions

This study explored that how local knowledge is deeply involved in chemical reactions through everyday practices from the interviews of three local science teachers of Kathmandu Valley. They had more than 15 years of experience in science teaching. The participants shared that people can naturally use (soil circle) *Matoko dalla* to understand physical changes like wood burning and chemical changes, such as the rusting of iron (*khiya lagnu*), and cooking rice and vegetables. My study shows how processes like *dahi jamaune* (making curd), *mahi banaune* (making buttermilk), and fermenting food to make *Aila* reveal a rich tradition of understanding fermentation. They also explore using *ash* as a cleaning agent, purifying water with *phitikiri*, preserving food with salt and acids, and producing lime from limestone and local *choona*, which involve essential chemical reactions. In my study, I identified that practices like baking, frying, burning food, and soap-making from ash and animal fat demonstrate a strong local knowledge of chemical changes passed down through generations. Regarding this theme, one of the science teachers, $T_{1,}$ shared his views as follows:

> *The unit chemical reaction consists of a physical and chemical change. Many local wisdoms can be used to teach chemical reactions, such as Matoko dalla, paper, metal wire, ice, etc., which can be used for physical change. Similarly, burning wood, burning paper, burning matchsticks, etc., can be used for chemical change.*

The views of T_1 explore how lessons on physical and chemical changes can be enriched by incorporating local knowledge. For physical changes, examples like Matoko dalla, paper tearing, bending metal wire, and melting ice illustrate the concept without altering substances chemically (Acharya, 2020). For chemical changes, practices such as burning wood paper and lighting matchsticks show how new substances are formed, aligning well with local experiences (Pant, 2018). It highlights that connecting these familiar activities with classroom science helps students relate better to abstract concepts and enhances their understanding of chemical reactions. It emphasizes that valuing indigenous knowledge not only makes science more accessible but also preserves essential cultural practices. Similarly, the participants T_3 extended the supportive views as follows:

> *The chemical reaction can be connected with rusting of iron (khiya lagnu), cooking rice and vegetables, dahi jamaune, mahi banaune, using phitikiri (*Alum*) for water purification, using ash as a cleaning agent, preserving food by using salt and acid, etc.*

Chemical reactions are deeply connected to many daily activities. For instance, the rusting of iron (khiya lagnu) is a chemical process where iron reacts with oxygen and moisture to form iron oxide (Brady & Senese, 2009). Similarly, cooking rice and vegetables causes irreversible chemical changes that alter their texture and flavour. At the same time, fermentation processes like making curd (dahi jamaune) and alcohol (mahi banaune) involve the transformation of sugars by bacteria or yeast into new substances (Brown et al., 2017). Water purification using alum (phitikiri) is another chemical reaction where the alum causes impurities to clump together and settle out of the water. These examples show that chemical changes are essential for food preparation, water purification, and household cleaning. Regarding the local knowledge that can be involved in teaching and learning chemical reactions. The teacher T_2 expresses the following view:

> *The teaching of chemical reactions can be connected with many local practices such as baking, frying and burning food, lime production from limestone and local*

> *choona, soap making from ash and animal fat, fermentation of food, and making Aila.*

The participant highlights that teaching chemical reactions can be made more meaningful by linking them to local practices such as baking, frying, burning food, and producing lime from limestone and local choona. These everyday examples help students see chemistry as part of their daily lives rather than an abstract concept (Taber, 2011). Activities like soap making from ash and animal fat and fermenting food or brewing Aila involve observable chemical transformations, which can deepen students' conceptual understanding (Abrahams & Millar, 2008). The participant's view supports the argument that culturally relevant examples can increase student engagement and comprehension. Integrating local practices into science education fosters contextual learning and promotes the appreciation of indigenous knowledge systems alongside scientific concepts.

In summary, it deeply explores local knowledge involved in teaching chemical reactions (Acharya, 2020). Daily practices such as using a traditional soil ball (Matoko dalla), burning wood, iron rusting, and cooking illustrate fundamental physical and chemical changes. Conventional fermentation methods, for example, making dahi (yoghurt), mahi (fermented milk), and Aila (distilled liquor), demonstrate an indigenous understanding of underlying chemical processes. Likewise, familiar community practices such as soap-making, purifying water with alum, and preserving food with salt or acid are a rich base of local chemistry knowledge. Integrating these culturally familiar examples into chemistry lessons can enhance student engagement and understanding while helping to preserve indigenous knowledge (Pant, 2018). Therefore, local knowledge can be connected to science teaching and learning that ensures meaningful learning engagement.

Local Knowledge Practices in the Classroom Teaching

In my study, participants integrate local knowledge practices to make science concepts more relatable and engaging for students. They use locally available materials like soil spheres (matoko dallo), paper, metal wire, and ice to demonstrate physical changes, emphasizing their reversible nature through interactive activities. To explain chemical changes, they allow students to observe the burning of wood and paper, the rusting of iron (*khiya lagnu*), and traditional practices like dahi jamaune (*curdling*) and mahi banaune (*obtained cream from curd*), connecting these to scientific processes such as combustion, hydrolysis, and fermentation. Contextualizing lessons with familiar activities like making soap from ash and animal fat and producing lime from limestone helps students understand endothermic and exothermic reactions. This approach deepens students' understanding of physical and chemical changes and enhances classroom interaction by connecting scientific theories with everyday experiences. Regarding the local knowledge practices in classroom teaching, participant T_3 shared his views as follows:

> *I use soil spheres (Matoko dalla), paper, metal wire, ice, etc., to teach physical change as the local materials. By allowing students to demonstrate the breakdown of the soil sphere (matoko dallo) in two or three parts and again fused in a single form., Classroom interaction followed by physical change is a reversible change with the same intrinsic characteristic of each fragment of the soil sphere. Similarly, the role of a metal wire can be demonstrated, and the role of a long wire can be opened. Similarly, I provide the paper to students and allow them to make a sphere, break it into small pieces, and then reverse it into its previous form. Finally,*

students concluded that the physical change is a temporary change during which no new substance is formed. Similarly, students demonstrate ice melting and make an inference from the observation. I allow students to demonstrate that burning wood, paper, matchsticks, etc., can be converted into ash as a new substance that cannot be reversed into its previous form. The students concluded that chemical change is a permanent change during which a new substance is formed, which is an irreversible change from observation. They further discuss it as combustion chemical reactions and conclude from the observation and experimentation. I facilitate the students as a facilitator.

The participants' views on integrating local knowledge and materials into classroom teaching help students connect scientific concepts with everyday experiences (Aikenhead & Michell, 2011). Using familiar items such as soil spheres (matoko dallo), metal wires, paper, and ice, students engage in hands-on demonstrations illustrating reversible and irreversible physical changes. Activities like observing combustion, rusting, fermentation, and soap-making contextualize chemical reactions within students' cultural practices, making learning more meaningful (Semali & Kincheloe, 1999). This approach supports a culturally responsive pedagogy where students' prior knowledge and community experiences are valued alongside formal scientific knowledge. Ultimately, connecting local practices to scientific inquiry not only improves conceptual understanding but also promotes active classroom participation and critical thinking. Similarly, another participant, $T_{1,}$ supports local knowledge practices in teaching chemical reactions and expresses his views as follows:

*In classroom teaching, I teach that chemical reactions can be connected with the demonstration rusting of iron (khiya lagnu); iron is exposed to air containing oxygen to form iron oxide as rust coats the surface of the iron tag. Many local activities students have experience with cooking rice and vegetables, dahi jamaune, and mahi banaune, using phitikiri (*Alum*) for water purification, using ash as a cleaning agent, preserving food using salt and acid, etc. These are discussed as hydrolysis, fermentation, coagulation, and emulsification reactions. It also enhances classroom interaction.*

The view of participants highlights the classroom teaching, and he connects chemical reactions to students' everyday experiences by demonstrating local practices such as the rusting of iron (khiya lagnu), where iron reacts with oxygen to form iron oxide (Aikenhead & Michell, 2011). Students also relate their home experiences, like cooking rice, making dahi and mahi, purifying water with phitikiri, and cleaning with ash, to scientific processes such as hydrolysis, fermentation, coagulation, and emulsification. Integrating these local activities into science lessons makes abstract concepts more concrete and meaningful for learners (Semali & Kincheloe, 1999). This culturally grounded approach strengthens students' understanding of chemical reactions and promotes active classroom interaction and critical discussion. Valuing students' lived experiences fosters a more inclusive and engaging science learning environment. Concerning the local knowledge practices, one of the participants, $T_{2,}$ shared his views below:

I contextualized the teaching of chemical reactions with many local practices such as baking, frying and burning food, lime production from limestone and local choona, soap making from ash and animal fat, fermentation of food, and making Aila. Students experienced the endothermic and exothermic reactions from baking and frying and the reaction of choona with water to form lime. Made soap from the

> *reaction between animal fat and ash, they contextualize the fermentation reaction from the traditional process of making Aila (local rakshi).*

Participants contextualized chemical reactions through familiar local practices such as baking, frying, burning food, lime production from limestone and choona, soap making from ash and animal fat, and fermenting food and Aila (Aikenhead & Michell, 2011). These activities allowed students to experience endothermic and exothermic reactions, such as heat absorption during baking and heat release during frying, making abstract scientific concepts more concrete. Demonstrating the reaction of choona with water to form lime and the traditional method of soap-making helped students visualize chemical transformations in culturally meaningful ways. By linking the fermentation process of Aila production to scientific principles, students could connect traditional knowledge with modern scientific understanding (Semali & Kincheloe, 1999). This approach enhanced student engagement, encouraged critical thinking, and validated local knowledge as a powerful tool for science education.

In summary, participants in the study integrated local knowledge practices, such as using soil spheres, metal wires, ice, and traditional food processes, to teach physical and chemical changes, making science concepts more relatable and meaningful for students. By contextualizing lessons with familiar activities like burning wood, rusting iron, soap making, and fermenting food, students experienced and understood scientific processes such as combustion, hydrolysis, fermentation, and endothermic and exothermic reactions (Aikenhead & Michell, 2011; Semali & Kincheloe, 1999). This culturally responsive approach strengthened students' conceptual understanding and enhanced classroom interaction, critical thinking, and appreciation for local knowledge in science education.

Challenges in Using Local Practices in Teaching Chemical Reaction

Teaching chemical reactions through local practices presents several challenges. In my study, many teachers expressed that they are less willing to incorporate local knowledge due to the pressure of completing a packed syllabus within a limited time. They also share that bridging the gap between students' modern experiences and traditional knowledge is difficult, especially with little support from school administrations, parents, and a system still dominated by Western scientific thought. Without stronger encouragement and structural changes, valuable indigenous knowledge risks being ignored, disappointing students with a deeper connection to their cultural tradition. Regarding the challenges faced by science teachers while integrating local knowledge in teaching chemical reactions, participant T_3 expresses his view as follows:

> *I have noticed that many teachers, including myself, show less willingness to integrate local practices into classroom teaching. One major reason is that using local knowledge often makes it more time-consuming and challenging to finish the already packed course syllabus. I struggle to balance the expectations of completing the curriculum and taking the extra time needed to explain local traditions. Sometimes, I struggle because many students, especially those from urban areas, do not easily understand or connect with traditional practices.*

Integrating local practices into teaching chemical reactions is often difficult because teachers face pressure to complete a tightly packed curriculum, leaving little space for deeper exploration of traditional knowledge (Aikenhead, 2006). Many students, especially from urban backgrounds, struggle to relate to indigenous practices, making it challenging for teachers to bridge the gap between cultural traditions and modern experiences. Additionally, the lack of school programs, such as guest lectures or mentorships by community elders, further weakens opportunities to connect classroom science with local wisdom (Semali & Kincheloe, 1999). The dominance of Western scientific paradigms in formal education marginalizes local knowledge systems, leaving teachers who attempt integration feeling isolated and unsupported. Without systemic reforms that equally value scientific and indigenous knowledge, students risk losing connection with important cultural traditions and a broader understanding of science rooted in their communities. In the line of challenges faced by teachers, participant T_1 shared the following views.

> *It becomes a challenge for me to bridge the gap between their modern experiences and the local knowledge I try to share. I also feel that our schools do not encourage sharing traditional practices through programs like guest lectures or mentorship initiatives. There is no strong culture of inviting elders or community experts to guide students, which makes me feel unsupported. I often wish that school administrations would provide more encouragement and resources for integrating local practices into teaching. However, I experience very little support from school leadership and parents when introducing indigenous knowledge. Sometimes, parents only value the formal, textbook-driven education system.*

Bridging the gap between students' modern experiences and local knowledge is a significant challenge, as many students are disconnected from traditional practices due to urbanization and global influences (Aikenhead & Michell, 2011). Schools often lack the infrastructure and culture necessary to support the integration of Indigenous knowledge, with few programs or initiatives like guest lectures or mentorships from community elders to encourage such learning. This lack of institutional support makes teachers feel isolated and unsupported when attempting to incorporate local practices into the curriculum (Semali & Kincheloe, 1999). Additionally, the predominance of formal, textbook-driven education in many schools, often backed by parents who prioritize Western educational models, further discourages recognizing indigenous knowledge. Without greater backing from school administrations and families, incorporating local knowledge into teaching remains a marginalized effort, ultimately hindering students' connection to their cultural knowledge. Similarly, concerning the further problem faced by a science teacher while incorporating local knowledge in teaching chemical reactions, participant T_1 input his views as follows:

> *I feel frustrated because our formal education system is still heavily colonized by Western scientific thought. This dominance leaves little space for local knowledge, such as Eastern philosophy and traditional practices, to be respected or even mentioned. I sometimes feel isolated and misunderstood when I attempt to bring local practices into my classroom. It saddens me to realize that valuable local wisdom is being marginalized in favour of imported ideas. Without systemic changes, our students will continue to miss out on the richness of their heritage. Integrating local practices is about teaching tradition and restoring balance and pride in who we are.*

The dominance of Western scientific paradigms in the formal education system continues to marginalize local knowledge systems, such as Eastern philosophy and traditional practices, leaving little room for their inclusion (Aikenhead, 2006). This systemic bias towards Western thought makes it challenging for teachers to incorporate indigenous knowledge, often leading to isolation and frustration when attempting to bring these practices into the classroom (Semali & Kincheloe, 1999). As a result, valuable local wisdom is overlooked in favour of imported ideas, depriving students of the opportunity to connect with their cultural heritage and local traditions. Without systemic changes that value indigenous knowledge alongside formal science education, students will continue to miss the richness of their cultural identity and the broader scope of knowledge (McKinley, 2012). Integrating local practices into teaching is about preserving tradition, restoring balance, and fostering pride in one's heritage, offering students a more holistic education.

Conclusion

This study highlights the critical importance of integrating local knowledge into teaching chemical reactions, emphasizing that educational approaches should not solely rely on conventional scientific principles but also incorporate the experiences and understandings of local communities. This study focused on the rich connection between local knowledge and chemical reactions in everyday practices, as explored through interviews with science teachers in Kathmandu Valley. It revealed that local practices such as cooking, rusting of iron (khiya lagnu), and fermentation techniques like making curd (dahi jamaune) and buttermilk (mahi banaune) exemplify an Indigenous understanding of chemical processes. These practices offer valuable insights into physical and chemical changes, such as oxidation, fermentation, and combustion, which can be connected to scientific principles in the classroom. Moreover, integrating local knowledge helps contextualize complex scientific concepts, making them more relatable for students, especially in rural and culturally rich settings. The study also highlights that local knowledge practices such as soap-making, water purification, and lime production illustrate chemical reactions and preserve important cultural traditions. These practices allow students to engage in hands-on learning and experience chemical changes in their everyday lives. Educators can bridge the gap between students' cultural traditions and the formal science education system by incorporating such practices into the curriculum. However, the study also reveals essential challenges, including the dominance of Western scientific paradigms, limited institutional support, and the disconnect between urban students and traditional knowledge. Despite these challenges, integrating local practices in chemical reaction teaching offers a promising pathway to a more inclusive and holistic education system that values formal science and indigenous knowledge. Therefore, integrating local knowledge in science education enriches students' understanding of chemical reactions and fosters cultural pride and a deeper connection to their culture.

Implications

The findings from this study have significant implications for science education, especially in contexts where local knowledge can be a powerful tool for enhancing students' understanding of chemical reactions. First, educators should recognize and embrace the potential of local knowledge to make abstract scientific concepts more concrete and relatable for students. Incorporating familiar practices such as cooking, rusting, and fermentation into chemistry lessons helps students connect classroom learning with their experiences. Second, schools and educational institutions should foster an environment that encourages local knowledge sharing through programs like guest lectures, mentorships, and community engagement. It would help bridge the gap between students' modern experiences and cultural heritage, creating a more inclusive learning environment. Third, science curricula should be adapted to include local practices, ensuring students' cultural backgrounds are integrated into their education. Fourth, teacher training programs should provide educators with the tools and resources to incorporate local knowledge into their teaching, emphasizing the importance of cultural relevance in science education. Fifth, policymakers should recognize the value of indigenous knowledge systems and work to create educational reforms supporting local practices in the formal curriculum. Sixth, families and communities need to be encouraged to support the integration of local knowledge into science education, valuing both modern and traditional forms of learning. Seventh, further research should explore the challenges and opportunities of integrating local knowledge in science classrooms across different regions, ensuring that the perspectives of both urban and rural educators are considered. Eighth, there is a need for greater collaboration between schools, local communities, and cultural experts to develop resources that highlight the chemical processes inherent in everyday practices. Ninth, integrating local knowledge into science education promotes critical thinking by encouraging students to question and understand the world from scientific and cultural perspectives. Finally, encouraging local knowledge to teach chemical reactions enriches the curriculum and empowers students to appreciate the value of their cultural heritage while acquiring scientific knowledge.

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Appendix-I

Unstructured Interview Guideline

1. Can you share any traditional/local practices in your community that involve processes like changes in substances or reactions (fermentation, burning, metalwork, etc.)? *(Explores locally rooted chemical reaction examples.)*
2. Have you ever used or seen traditional examples or practices while teaching or learning about chemical reactions in science classes? *(Examines existing connections or gaps.)*
3. How do students respond when science topics like chemical reactions are linked to local knowledge they already know from everyday life or cultural practices? *(Investigates student engagement and cultural relevance.)*
4. Can you share an example where you think scientific and traditional/local explanations about a process (like cooking, rusting, or fermentation) complement each other? *(Looks at the intersection of cultural and scientific understanding.)*
5. What kinds of knowledge do you think are essential for students to learn about chemical reactions besides what is found in textbooks? *(Invites reflection on broader sources of knowledge.)*
6. How do you think including local practices in science lessons might change how students learn or understand chemistry? *(Explores the impact of contextualization.)*
7. What role do community elders or knowledge holders play in preserving and explaining traditional practices that involve chemical changes?

   (Focuses on the role of local knowledge holders.)

8. Have you seen or imagined any local materials or examples that could be used as teaching aids in explaining chemical reactions?

   (Encourages ideas for curriculum innovation.)

9. What challenges do you face or imagine when trying to integrate local knowledge into teaching scientific concepts like chemical reactions? *(Identifies barriers and teacher/student perspectives.)*

10. What support or changes would you like to see (from schools, curriculum, training, etc.) to include better local knowledge in teaching chemical reactions?

    (Invites practical recommendations from participants.)