

## THE INFLUENCE OF CULTURE AND BELIEFS ON SCIENCE LEARNING

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Science learning is deeply influenced by cultural backgrounds and personal beliefs, shaping students' attitudes, perceptions, and engagement with scientific concepts. While scientific knowledge is often considered universal, the way students interact with and interpret science is shaped by their traditions, religious beliefs, and societal norms. Understanding these influences is crucial for educators in developing teaching approaches that respect cultural diversity while promoting scientific literacy.

According to Aikenhead and Jegede (1999), Science education must acknowledge the cultural contexts that shape students' understanding. They argue that students from non-Western backgrounds may experience a "cultural border crossing" when engaging with mainstream Science curricula, which can lead to conflicts between their traditional beliefs and scientific explanations. This challenge highlights the need for culturally responsive teaching approaches that bridge the gap between scientific knowledge and students' worldviews.

Furthermore, culture plays a significant role in how students approach learning, influencing their problem-solving strategies, their willingness to accept new ideas, and their motivation to engage with scientific content. Different cultural backgrounds provide varied epistemologies, or ways of knowing, which may align or conflict with mainstream scientific perspectives. For instance, indigenous knowledge systems offer valuable insights into environmental science but are often overlooked in conventional science curricula. According to Cobern (1996), students' worldviews shape how they interpret scientific concepts, and when those concepts challenge their existing beliefs, they may struggle to integrate them into their understanding.

Personal and societal beliefs also impact students' acceptance or rejection of scientific explanations. Religious perspectives, for example, can influence views on

evolution, climate change, or medical science. When science education contradicts deeply held beliefs, students may experience cognitive dissonance, leading to resistance or selective acceptance of scientific knowledge. Nott and Wellington (1996) emphasize that effective science teaching requires acknowledging these conflicts and finding ways to encourage students to critically engage with scientific evidence without dismissing their cultural perspectives.

One of the main challenges in integrating cultural and scientific perspectives is addressing conflicts between traditional beliefs and evidence-based science. Some students may struggle with reconciling scientific explanations with their cultural or religious teachings. Additionally, Western-centric approaches to science education may marginalize non-Western perspectives, making science seem less relevant or accessible to students from diverse backgrounds.

To address these challenges, educators can implement several strategies to create a more inclusive science learning environment. Integrating indigenous and local knowledge into the science curriculum can enhance relevance and engagement. Encouraging open dialogue in the classroom allows students to express their beliefs and critically analyze different viewpoints, fostering a deeper understanding of science. Using contextualized learning approaches that relate scientific concepts to culturally relevant examples helps students connect their learning to real-life experiences. Additionally, professional development programs for educators can improve their ability to recognize and respect cultural influences on science learning. Finally, promoting scientific inquiry and critical thinking encourages students to explore, question, and evaluate evidence, supporting the development of a balanced perspective on science and cultural beliefs.

In conclusion, culture and beliefs significantly shape students' engagement with science learning. Acknowledging and integrating diverse cultural perspectives in science education can create more inclusive and effective learning environments. By adopting culturally responsive teaching strategies, educators can foster scientific literacy while

respecting students' diverse backgrounds and belief systems. Future research should explore innovative methods for bridging cultural and scientific perspectives in diverse educational settings.

## References:

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