

Spirituality, scientific beliefs, and educational values of Science teachers

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ABSTRACT

This study investigated the relationship among spirituality, scientific beliefs, and educational values of science teachers in the Province of Capiz during the school year 2024–2025. Grounded in the understanding that teachers' belief systems can shape their educational practices, this mixed methods research examined how spirituality and scientific beliefs influence educational values in public and private school settings across elementary, secondary, and tertiary levels. Using a researcher-made instrument with four parts, such as the Respondents' Profile, Spirituality Questionnaire, Scientific Beliefs Questionnaire, and Educational Values Questionnaire, validated by experts, data were gathered from 377 randomly selected science teachers. This was followed by a Focus Group Discussion with 10 discussants. The study assessed the levels of spirituality, scientific beliefs, and educational values and determined their interrelationships using statistical tools, including frequency count, percentage, rank, mean, standard deviation, One-way Analysis of Variance (ANOVA), and Pearson's r , at a 0.05 significance level. Findings revealed that science teachers demonstrated very high levels of spirituality, scientific beliefs, and educational values. A significant difference was found in educational values across different levels of spirituality, but not across different levels of scientific beliefs. Furthermore, while spirituality and scientific beliefs were found to be independent of each other, spirituality showed a positive significant relationship with educational values, whereas scientific beliefs exhibited a negative significant relationship with educational values.

Keywords: spirituality, scientific beliefs, educational values

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INTRODUCTION

An area of study that is growing within science includes the interaction of spirituality, scientific beliefs, and educational values. The challenges that science educators face in balancing personal beliefs, professional responsibilities, and social pressures are closely associated with this

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topic. A necessary approach to understanding how these broader intellectual and ethical contexts both shape and are shaped by science teachers includes understanding how these contexts influence teaching approaches and the values that are transmitted to students.

Historically, science education has aimed to promote inquiry, critical thinking, and evidence-based knowledge. Nevertheless, to open a discussion beyond knowledge transfer, spirituality can bring to the fore the importance of teaching as more than knowing, but also for developing moral accountability, ethical discernment, and holistic values. Studies have revealed that teachers' belief systems, whether religious or not, always impact the way they teach, especially in science classes where discussions of evolution, environmental ethics, and technology use are common (Khodjamkulov et al., 2020).

The broad idea of spirituality includes a person's feeling of purpose, interpersonal relationships, and search for meaning beyond this world (Gardner, 2017). Unlike organized religion, spirituality often transcends specific concepts and is marked by interconnection, ethical values, and human growth. In education, spirituality provides a style and a way for the teacher to make decisions. In this, morality, empathy, and resilience are nurtured. This involves incorporating a moral and holistic view into the scientific teacher's teaching practice. It serves as a basis for discussing the ethical implications of scientific discoveries and promotes students' capacity for ethical and critical thinking. Spirituality plays a huge role in the ability of science instructors to integrate moral and holistic perspectives into their teaching practices. It influences how they handle the moral implications of scientific discoveries, including bioethics, sustainability, and the effects of technology, encouraging students' ethical reasoning and critical thinking. Spirituality fosters teaching methods that respect cultural, emotional, and moral aspects in addition to intellectual development, bringing science closer to human values. Discovering and exposing this aspect is essential because it closes a significant knowledge gap in understanding how teachers balance religious belief with scientific accuracy, allowing them to bring up morally responsible, well-rounded students.

On the contrary, scientific beliefs indicate teachers' beliefs and conceptions about science, its methods, and its social roles (Valladares, 2021). These beliefs make one recognize how science teachers orient their curricular content, using a particular pedagogical style to explain scientific concepts to students and promote inquiry-based classroom learning. Understanding the conceptions of science teachers assists in comprehending how these teachers handle scientific controversy, compromise personal values with objectivity, and set up a learning environment that fosters critical thinking. These scientific perceptions tell much about how science teachers conceptualize, present, and contextualize scientific ideas within the classroom context. Knowledge should be developed regarding diverse perspectives through which teachers may balance objectivity and personal values for sensibility in discussing controversial scientific issues such as evolution, genetic modification, and climate change. Scientific views govern classroom practices that are focused on students developing their critical thinking and ethical reasoning skills to prepare them to consider complex real-world problems sensitively. Providing strategies for educators to balance scientific fidelity and educational values is the best opportunity for improving the educational effectiveness of science education.

Educational values are based on concepts and priorities that define teaching practice, curriculum, and the way of communication with learners. These values, respect for diversity, lifelong learning, and facilitation of critical thinking, define educators' roles in facilitating holistic development (Chowdhury, 2018). Such beliefs also shape the approach of science

teachers to contextual relevance and ethical considerations in science teaching. Educational values, therefore, become a bridge connecting science teachers' professional duty to influence students' moral, social, and cognitive development and personal spiritual and scientific beliefs. Curriculum design decisions are made using these values, pedagogical approaches are chosen based on such values, and ethics is integrated within the teaching of science above. They help bring educators' teaching practices in line with the twin goals of scientific rigor and moral growth through critical thinking, empathy, and responsibility in society learners. Then, such values would be able to provide the study into identifying how teaching philosophies of educators converge with the latter broader goals, such as ethical reasoning, environmental stewardship, and societal well-being, while getting an insight or guideline on how to enhance the transformation potential of science education. In the subject of science education, the relationship between spirituality, scientific views, and educational principles is still a complicated and developing topic of study.

Knight (2016) noted that "spirituality in education" is an emerging concern where spirituality intersects with a broader discussion on values and ethics in the context of the technologically driven era. Compared to that nascent one, most societies tend to move toward greater secularization among themselves, whereby such movement has succeeded among American and European democracies. Meanwhile, spiritual education is still among the significant aspects of education in other cultural areas, such as nations or regions falling under Islamic and Asian groupings, where holism in education tends to incorporate, besides other aspects, moral, spiritual, and intellectual dimensions. All in all, contrasts demand a more balanced understanding of the navigation of science educators through their belief systems and ethical duties in different sociocultural conditions.

Studies like those by Zidny et al., (2020) and Cochran-Smith et al., (2020) indicate that scientists and teachers worldwide have different views regarding spirituality, often depending on regional cultural backgrounds and professional settings. For example, in Western countries, Lombaard et al., (2019) assert that secularizing public education has often resulted in the curriculum's marginalization of spirituality. In contrast, according to research by Chan and Ananthram (2019) and Moorthy et al., (2021), countries like Malaysia and India continue to have educational systems that include moral and spiritual instruction as essential elements. Studies conducted within religious contexts emphasized that including spirituality can complement character development and facilitate a sense of relationship among students, improving the educational process and society as a whole.

However, reconciling scientific beliefs with spiritual perspectives often leads to conflicts. There is usually friction when scientific beliefs meet spiritual perspectives. Hence, whether reconciliation is possible is even more controversial - whether it should take place is the subject of much scholarly debate. Some assert that scientists who are engaged in this endeavor reflect their values rather than professional ideals. Other researchers, however, propose that it is merely complementary dimensions contributing to the holistic approach of 'in education'. In this sense, recent studies indicate that those educators who skillfully negotiate this intersection will encourage their students to think more critically and ethically about real-world challenges (Peters, 2018; Dixon and Shapiro, 2022; Ferngren, 2022).

Many things in the Philippines have specifically defined their ways of integrating spirituality with scientific views and educational principles. For instance, the country is predominantly Christian in culture. By that, it carries along a legacy of Catholicism that constructs a student's moral and spiritual development apart from intellectual growth (Cornelio,

2018). Hence, in this cultural scenario, teachers, including science teachers, devote their spiritual beliefs to teaching practice without making themselves less strict about scientific rigor. In this regard, however, some challenges emerge. Filipino science teachers are often pressured to fit into the global standards of scientific objectivity, which can sometimes conflict with personal spiritual convictions or community expectations (Joseph, 2022).

Even though the importance of moral and spiritual education is becoming more widely recognized, the question of how science teachers specifically balance these elements within their professional roles still needs to be studied. While the studies above focused broadly on character education and ethics in teaching, only a few have explored the lived experiences of science educators as they go about their daily lives with these intersections. In addition, local research in the Philippines is limited, especially that which examines how cultural and religious contexts influence science instructors' educational values, even if international research has yielded insightful findings.

This dissertation seeks to address this gap by analyzing the distinctive interplay of spirituality, scientific beliefs, and educational values among Filipino science teachers in the Province of Capiz in both public and private schools at the elementary, secondary, and tertiary levels. The study aimed to contribute a deeper understanding of how these educators reconcile their spiritual and scientific worldviews in shaping their teaching philosophies and practices. It is intended to provide knowledge that contributes to the worldwide conversation on incorporating spirituality and scientific inquiry in science education and that influences Philippine teacher preparation programs and educational policy.

This study is anchored on a firm theoretical basis of three related theories: Constructivist Theory, Moral Development Theory, and Theory of Holistic Education. All these frames of reference provide insights into how spirituality, scientific beliefs, and educational values combine to shape science teachers' professional practices and philosophies.

According to the Constructivist Theory, knowledge is constructed by individuals through active interaction with their environment and their past experiences. According to Xu (2019), Jean Piaget wrote about the stages of cognitive development, emphasizing how students assimilate and accommodate new information into existing mental schemas, while Lev Vygotsky expanded upon this by highlighting social and cultural contexts of learning by introducing concepts such as Zone of Proximal Development and scaffolding. In the context of the current study, Constructivist Theory presents a lens to explore how science teachers construct their pedagogical approaches in light of their spiritual beliefs and scientific understanding. This theory shows that private perspectives play pivotal roles in the instruction decisions of individuals and how they fashion powerful learning experiences that process ethical reason and scientific inquiry.

Lawrence Kohlberg's Moral Development Theory identifies stages of ethical reasoning, starting from essential obedience (pre-conventional) to principled moral reasoning (post-conventional) as cited by Joshi (2023). This model emphasizes the importance of education in advancing individuals' moral reasoning and fosters justice, care, and ethical responsibility. This theory is specifically helpful in explaining how science teachers find a balance between spiritual values and scientific knowledge when responding to ethical dilemmas in educational settings. For example, dilemmas such as environmental sustainability, bioethics, or technological advancements require the modeling and facilitation of moral reasoning by teachers and their students. Anchoring on Kohlberg's theory, the present study critically examines how a teacher's moral reasoning relates to the values and practices that inform his or her teaching to create an

even more reflective and ethically conscious classroom environment through this model framework.

Lastly, the Theory of Holistic Education developed by Ron Miller, as cited by John (2017), supports a holistic approach that addresses the needs of learners intellectually, emotionally, socially, and spiritually. This perspective is on nurturing the whole person: critical thinking, empathy, and a sense of interrelatedness. In this research study, holistic education is a theoretical anchor to explore integrating spirituality and scientific beliefs in teaching. It focuses on the fact that science education should not only be able to provide technical knowledge but also help learners develop ethically and spiritually. Teachers adopting holistic education values are likelier to balance scientific inquiry with empathy, ethical reflection, and moral responsibility.

These theories highlight the science teachers' multifaceted role as knowledge facilitators and ethical mentors. The constructivist theory sheds light on a teacher's beliefs affecting a particular teaching style. At the same time, the moral development theory represents the ethical components of professional responsibilities. As a combination of these aspects, Holistic Education Theory symbolizes an organization that presents doctrines formulated for education's emotional, curricular, and spiritual dimensions. These frameworks are critical to fulfilling the research objectives of this study because they provide an in-depth understanding of how spirituality, scientific beliefs, and educational ideals influence science teaching.

Statement of the problem

This study aimed to investigate the relationship between spirituality, scientific beliefs, and educational values of science teachers in both public and private schools at elementary, secondary, and tertiary levels in the Province of Capiz.

METHODOLOGY

This study utilized mixed methods research to establish the relationship among spirituality, scientific beliefs, and educational values of science teachers in both public and private schools at elementary, secondary, and tertiary levels in the Province of Capiz for the school year 2024 – 2025.

The respondents of this study were the 377 randomly selected science teachers taken from an undetermined population in the whole province of Capiz, computed using the Raosoft Sample Size Calculator using an unknown population size.

A researcher-made instrument was used to gather the needed data. The instrument was composed of four (4) parts. Part 1 focused on the profile of the respondents, which was limited to their age, sex, level taught, educational attainment, years in service, and religion. Part 2 focused on the level of spirituality among science teachers. Part 3 focused on their scientific beliefs. Part 4 focused on the science teachers' educational values. This instrument underwent a content validity check by a panel of experts, a reliability test conducted on fifty (50) science teachers who were not part of this study, and a construct validity test to further strengthen the instrument's validity. The results were used to identify potential flaws and ensure that the instrument is reliable and appropriate for the intended population.

The independent variables in this study were the spirituality and scientific beliefs of science teachers, while the dependent variable was the educational values of science teachers.

The data analysis used statistical tools such as frequency count, percentage, rank, mean, standard deviation, One-way Analysis of Variance (ANOVA), and Pearson's r . All inferential tests were conducted with a significance level of 0.05 alpha.

RESULTS AND DISCUSSION

Spirituality of science teachers

In terms of spirituality, the highest-rated aspect was the feeling of being connected to a higher purpose beyond oneself, closely followed by a strong sense of belonging in social circles and the practice of expressing gratitude toward those who have positively influenced their lives. Teachers also reported equally high engagement in daily reflection, trust in a higher power, recognition of divine guidance, empathy toward others, and efforts to support others in their personal growth. These results suggest that spirituality is not only a source of personal meaning and resilience for science teachers but also a driving force behind their compassion, ethical conduct, and supportive relationships in the educational setting.

The Focus Group Discussion (FGD) highlighted varied interpretations of spirituality, with some participants linking it to religious faith and connection to God, while others described it as a sense of inner peace, ethical principles, or personal purpose. While most teachers rated their spirituality highly, some expressed hesitation in assigning a numerical value, viewing it as a deeply personal and evolving aspect of life. Participants generally agreed that spirituality shapes patience, empathy, and dedication to students, underscoring its role in promoting inclusive, supportive, and values-driven teaching practices. These perspectives are consistent with prior research, such as Mata-McMahon et al. (2019), who linked spirituality to greater resilience and job satisfaction; Counted et al. (2018), who found that it fosters social connectedness; Gouda et al. (2016), who emphasized its connection to mindfulness and emotional well-being; and Husamah et al. (2024), who highlighted its role in enhancing empathy and moral responsibility.

Scientific beliefs of science teachers

The results also showed that science teachers held very high scientific beliefs, with strong agreement that objective observation is critical to the scientific process and that science reflects the interconnectedness of all living and nonliving systems. They equally valued the evolving nature of scientific knowledge, the effectiveness of inquiry-based learning, the role of science in appreciating the natural world, the importance of a scientific mindset in daily life, and the use of science to counter misinformation. These findings suggest that teachers possess a robust foundation in scientific thinking, enabling them to foster curiosity, critical thinking, and openness to new discoveries among students. The FGD revealed that while most participants associated scientific beliefs with adherence to evidence-based principles, others emphasized their application in daily decision-making. Many agreed that scientific beliefs could coexist with spirituality, reinforcing the idea that these domains operate independently. The results align with existing literature, including McGrath (2020), Mohammed (2022), Petermann and Vorholzer (2022), Johnson (2017), and Ortho and Yangco (2024), all of whom emphasized the role of

strong scientific beliefs in promoting effective, evidence-based, and inquiry-driven science education.

Educational values of science teachers

Educational values among science teachers were likewise rated very high, with equal emphasis on maintaining professional boundaries, understanding student challenges, adapting teaching to individual needs, ensuring inclusivity, considering emotional well-being, aligning materials with the curriculum, integrating technology, and regularly assessing teaching effectiveness. These results indicate a balanced prioritization of ethical conduct, student-centered learning, and professional responsibility. Such findings support Chowdhury (2018), who stressed the link between strong educational values and positive classroom environments, and Gomez (2024), who emphasized the benefits of flexible pedagogy and technology integration in enhancing student outcomes.

Relationship between spirituality, scientific beliefs, and educational values of science teachers

Statistical analysis revealed a significant difference in educational values based on levels of spirituality, suggesting that teachers with higher spirituality tend to demonstrate stronger professional ethics, compassion, and commitment to student well-being. This finding resonates with Kilag et al. (2023) and Gepila Jr. (2020), who linked spirituality to engagement, resilience, and dedication in teaching. In contrast, there was no significant difference in educational values based on levels of scientific beliefs, indicating that such values are shaped more by personal experiences, training, and institutional culture than by adherence to scientific principles alone. This perspective was supported by van der Scheer et al. (2019), Sanfo and Malgoubri (2023), and Thibaut et al. (2018), who emphasized the importance of professional development, emotional intelligence, and pedagogical training in fostering strong educational values.

The correlational analysis found no significant relationship between spirituality and scientific beliefs, reinforcing the view that these are distinct domains. However, spirituality showed a strong positive relationship with educational values, suggesting that personal beliefs and inner purpose significantly influence teachers' commitment to ethical, student-centered practices. Conversely, scientific beliefs exhibited a weak but significant negative relationship with educational values, which may reflect differences in teaching approaches, with science-focused teachers potentially prioritizing analytical and evidence-based reasoning over emotionally driven considerations. The FGD confirmed that while spirituality and scientific beliefs can coexist, they independently shape teaching practices; spirituality often nurtures compassion and ethical responsibility, while scientific beliefs foster critical thinking and truth-seeking.

These findings align with Walag et al. (2022), who linked spirituality to compassion and ethical responsibility; Walach (2021), who found no direct link between spirituality and scientific beliefs; and Ruml (2020), who observed that strong scientific beliefs often lead to evidence-based instruction, potentially influencing the balance between logical and moral considerations in education. Collectively, the results underscore that while spirituality and scientific beliefs are independent constructs, both contribute—albeit in different ways—to shaping the professional values and practices of science teachers, ultimately influencing the quality and character of science education.

CONCLUSION

Science teachers place great importance on spirituality in their personal and professional lives. Their strong connection to a higher purpose, sense of belonging, and gratitude suggest that they draw strength from their spiritual beliefs, which may positively influence their well-being and interactions with students.

Science teachers have a strong foundation in scientific beliefs, emphasizing the importance of observation, inquiry, and the evolving nature of scientific knowledge. Their recognition of the interconnectedness of all systems and the value of a scientific mindset in daily life indicates a deep appreciation for science beyond the classroom. These suggest that science teachers are well-equipped to promote critical thinking and scientific literacy among students.

Science teachers strongly uphold essential educational values, ensuring a professional and supportive learning environment. Their commitment to understanding student challenges, adapting teaching methods, and fostering inclusivity highlights their dedication to student-centered education. The high emphasis on emotional well-being, curriculum alignment, and technology integration reflects their awareness of modern teaching strategies. These suggest that science teachers are well-prepared to create meaningful and effective learning experiences.

Science teachers with different levels of spirituality also have varying levels of educational values. This suggests that spirituality may influence how teachers approach their profession, particularly in fostering student well-being, inclusivity, and ethical teaching practices. Teachers who feel a deep sense of purpose and connection may be more committed to creating a supportive and meaningful learning environment.

Regardless of their level of scientific beliefs, Science teachers uphold similar educational values. This suggests that having strong scientific beliefs does not necessarily lead to differences in how teachers value professionalism, student well-being, inclusivity, and teaching effectiveness. Educational values may be shaped more by personal experiences, training, and institutional expectations rather than by one's stance on scientific principles.

The results suggest that spirituality and scientific beliefs operate independently, meaning that a teacher's level of spirituality does not necessarily influence their scientific beliefs. However, the strong positive relationship between spirituality and educational values indicates that teachers with higher spirituality tend to uphold stronger educational values. This suggests that a sense of purpose, connection, and mindfulness may contribute to a teacher's commitment to ethical practices, student-centered learning, and emotional well-being in the classroom. On the other hand, the negative relationship between scientific beliefs and educational values may suggest that as teachers become more focused on scientific reasoning and objectivity, their emphasis on personal and emotional aspects of teaching slightly decreases. This does not mean they neglect educational values, but it could indicate a shift in priorities toward logic, evidence-based practices, and structured methodologies.

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