

Integrating Maguindanaon Culture in Science Instruction and Teaching Effectiveness in Lutayan: A Correlational Analysis

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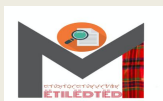
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ABSTRACT

In culturally diverse settings, where the majority of learners belong to the Maguindanaon community, there is an urgent need to ensure that science education resonates with students' cultural identity and lived experiences. This study examined the relationship between the integration of Maguindanaon culture in science

instruction and teachers' teaching effectiveness in Lutayan, Division of Sultan Kudarat, during the school year 2025–2026. Anchored in culturally responsive pedagogy, the research aimed to determine whether contextualizing science lessons through local culture enhances instructional quality. A quantitative approach employing a descriptive-correlational design was utilized. Data were collected from science teachers using a structured survey instrument that measured the extent of cultural integration across four dimensions: cultural relevance of content, use of local resources, language and communication, and respect for cultural worldview. Teaching effectiveness was assessed across five domains, including instructional clarity, classroom management, learner engagement, assessment practices, and professional competence. Findings revealed that the overall extent of integrating Maguindanaon culture in science instruction was high, indicating that teachers frequently incorporate culturally meaningful examples, indigenous knowledge, and contextualized materials in their lessons. Similarly, teachers demonstrated a high level of teaching effectiveness across all domains. Correlation analysis showed a significant positive relationship between cultural integration and teaching effectiveness, suggesting that culturally grounded instruction contributes to improved pedagogical practices and learner-centered approaches. Among the dimensions, cultural relevance of content and language use emerged as strong predictors of effective teaching. The study concludes that embedding local culture into science instruction not only enhances teacher performance but also promotes more inclusive and meaningful learning experiences. It recommends strengthening professional development programs that emphasize culturally responsive teaching and encouraging the development of localized instructional materials to sustain



effective science education in culturally diverse contexts.

Keywords: *indigenous knowledge, contextualization, pedagogical competence, learner engagement*

INTRODUCTION

Background of the Study

In culturally diverse settings, where the majority of learners belong to the Maguindanaon community, there is an urgent need to ensure that science education resonates with students' cultural identity and lived experiences. While national efforts like the Department of Education's Indigenous Peoples Education (IPEd) Program promote inclusive and culture-sensitive instruction, many science teachers still rely heavily on generic, Western-based teaching approaches that may not reflect indigenous ways of knowing.

In recent years, there has been a growing international call to decolonize education by integrating indigenous knowledge systems into formal curricula to foster cultural identity, inclusivity, and deeper learning. Globally, scholars argue that the integration of cultural context in science education improves student engagement, conceptual understanding, and community relevance (Aikenhead, 2018; Bang & Medin, 2021).

In the Philippine context, efforts to indigenize science teaching have been emphasized by the Department of Education (DepEd) through the Indigenous Peoples Education (IPEd) Program, yet many science teachers still face difficulties in contextualizing lessons using cultural frameworks (Lazaro & Corpuz, 2021).

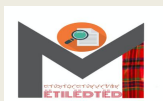
In South Central Mindanao—home to various ethnolinguistic groups such as the

Maguindanaon—culturally responsive pedagogy remains underexplored in the teaching of science despite strong cultural presence and historical richness (Masalon, 2022). Specifically in Lutayan, Sultan Kudarat, while basic education institutions serve largely Maguindanaon learners, science instruction remains predominantly Westernized, with limited empirical research on how teachers integrate local culture into their pedagogy (Abdulkarim & Musa, 2023). This gap in literature underscores the need to explore the actual teaching practices of educators and their alignment with culturally rooted content.

Anchored in SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities), this study aims to examine the extent to which Maguindanaon cultural elements are integrated in science instruction and how these practices correlate with teacher demographics and professional training.

The disconnection limits student engagement and understanding, especially among Maguindanaon learners who thrive in culturally rooted environments. Despite policy mandates, there remains a significant gap in empirical studies assessing the actual integration of Maguindanaon culture into science teaching practices. The problem lies in the lack of data on how teachers incorporate local knowledge and whether specific teacher characteristics influence this integration.

This study addresses this gap by analyzing the relationship between science teachers' teaching practices and the extent of Maguindanaon cultural integration in their instruction. It will also inform localized instructional strategies and policymaking for inclusive and culturally relevant science education in indigenous contexts.



Statement of the Problem

1. What is the extent of Integration of Maguindanaon culture in Science instruction, in terms of:
 - 1.1. Cultural Relevance of Content ;
 - 1.2. Use of Local Resources;
 - 1.3. Language and Communication; and
 - 1.4. Respect for Cultural Worldview ?
2. What is the level of teachers' teaching effectiveness in Science, in terms of:
 - 2.1. Instructional Strategies;
 - 2.2. Lesson Planning;
 - 2.3. Assessment Practices; and
 - 2.4. Professional Development Participation?
3. Is there a significant relationship between the extent of Integration of Maguindanaon culture in Science instruction, and the 5level of teachers' teaching effectiveness in Science?

METHODOLOGY

Research Design

The study was quantitative in nature, specifically a descriptive-correlational to determine the relationship between the extent of Integration of Maguindanaon culture in Science instruction, and the 5level of teachers' teaching effectiveness in Science2in Lutayan, division of Sultan Kudarat during the school year 2025-2026.

According to Bhandari (2021), A correlational research design investigates relationships between variables without the researcher controlling or manipulating any of them. Further, a correlation reflects the strength and/or direction of the relationship between two (or more) variables. The direction of a correlation can be either positive or negative. Correlational research is ideal for gathering data quickly from natural settings. That helps you generalize your findings to real-life situations in an externally valid way.

Respondents of the Study

The respondents of this study were the 30 elementary school teachers teaching Science from the identified elementary schools in Lutayan, Division of Sultan Kudarat for the school year 2025–2026.

Sampling Technique

The Simple Random Sampling Technique was used to select the 30 elementary teachers from the same schools. Simple random sampling is one of the most widely accepted probability sampling methods because it gives each member of the population an equal chance of being selected, minimizing selection bias and ensuring that the sample is representative of the larger teacher population (Taherdoost, 2017; Creswell & Creswell, 2021).

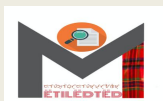
Research Instruments

This study employed a researcher-made survey questionnaire and Five-Point Likert Scale to evaluated by the panel of experts. To assess the extent of Integration of Maguindanaon culture in Science instruction.

Data Gathering Procedure

To ensure reliable and authentic findings, the researcher adhered to a methodology that aligned with the objectives of the study to determine the relationship between the extent of the teaching practices of Science teachers and the level of integration of Maguindanaon culture in Science instruction in Lutayan, Division of Sultan Kudarat during the school year 2025–2026.

Initially, the study's implementation required the endorsement of the DepEd-Division Superintendent and the CGS Dean through the affixation of their respective



signatures on a formal document. An additional letter of authorization was dispatched to the school principals. To ensure the accuracy of the data collected for this study, a survey questionnaire was utilized, developed, and assessed. The researcher employed a random sampling technique by utilizing self-generated random number tables to select participants for the study.

Prior to the conduct of the study, the research proposal underwent ethical considerations. The researcher sought approved clearance to conduct the study from the office of the EWMCI Research Ethics Committee (EREC).

Data Analysis

Upon the culmination of the study, the collected data were systematically arranged, presented in tabular form, subjected to rigorous analysis, and subsequently interpreted. Consequently, the statistical techniques outlined in Chapter I were utilized to address the aforementioned issues.

Initially, the Mean statistical measure was employed to calculate the extent of integration of Maguindanaon culture in Science instruction and the level of teachers' teaching effectiveness in Science. On the other hand, Pearson *r* Correlation was also employed to determine the significant relationship between the extent of integration of Maguindanaon culture in Science instruction and the level of teachers' teaching effectiveness in Science.

Scope and Limitations

This study focuses on integrating Maguindanaon culture into Science instruction and its relationship with teaching effectiveness in selected High school and

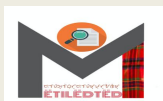
elementary schools in Lutayan, Sultan Kudarat Division during the school year 2025–2026. The study will involve Secondary and elementary Science teachers as participants, examining how culturally relevant instructional strategies, including the incorporation of local traditions, examples, and practices, influence teachers' instructional effectiveness.

Using a correlational research design, the study seeks to determine the strength and direction of the relationship between culturally integrated Science instruction and teaching effectiveness. The research is delimited to the selected schools in Lutayan District due to logistical and time constraints and will focus specifically on the integration of Maguindanaon cultural elements within Science lessons. The study aims to provide insights on why and how cultural integration enhances instructional quality, informing context-specific strategies for promoting culturally responsive teaching in multicultural classrooms.

RESULTS AND DISCUSSIONS

Extent of Integration of Maguindanaon culture in Science instruction

Results show that the the extent of integration of Maguindanaon culture in Science instruction, yielding a grand mean of 3.59 (SD = 0.91), interpreted as "Fairly Agree" and described as "Great." This indicates that, in general, teachers demonstrate a strong and consistent effort to integrate cultural elements into science teaching. Among the variables, Respect for Cultural Worldview obtained the highest mean (3.76), suggesting that teachers highly value and incorporate learners' beliefs, traditions, and perspectives into classroom practices. This is followed by Cultural Relevance of Content (3.68), which reflects the alignment of science lessons with students' lived experiences.



Meanwhile, Language and Communication (3.49) and Use of Local Resources (3.43), although still rated positively, obtained relatively lower means, indicating areas that may require further enhancement, particularly in maximizing mother tongue use and indigenous materials.

These findings imply that while culturally responsive teaching practices are evident, some dimensions of integration are more consistently implemented than others. The strong emphasis on cultural worldview suggests that teachers are sensitive to students' identities, which fosters inclusivity and engagement. However, the comparatively lower ratings in the use of local resources and language integration highlight the need for additional support, training, and resource development to fully realize culturally grounded instruction.

The results are supported by literature emphasizing that culturally responsive teaching enhances student engagement, comprehension, and academic success when instruction is aligned with learners' cultural contexts (Gay, 2020). Similarly, Ladson-Billings (2021) asserts that integrating students' cultural backgrounds into teaching promotes equity and meaningful learning by bridging the gap between home and school experiences.

Overall, the findings suggest that the integration of Maguindanaon culture in science instruction is well-established but can be further strengthened through targeted strategies that enhance language use and resource contextualization.

Level of teachers' teaching effectiveness in Science

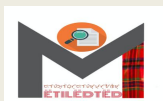
The results indicate that teachers demonstrate an overall high level of teaching effectiveness in Science, with an overall mean of 3.98, interpreted as "Highly Effective." This suggests that teachers

consistently exhibit competence across multiple domains of instruction, contributing to effective teaching and meaningful student learning. Among the sub-variables, Instructional Strategies obtained the highest composite mean (4.12), reflecting teachers' strong ability to employ diverse, engaging, and learner-centered approaches in delivering science content. This is followed by Lesson Planning (4.05), which shows that teachers are generally well-prepared, with structured, aligned, and goal-oriented lesson designs that support effective classroom implementation. Assessment Practices (3.98) also indicate that teachers are proficient in evaluating student learning through varied methods and meaningful feedback, ensuring that assessment is used as a tool for both measurement and improvement. Meanwhile, Professional Development Participation recorded the lowest mean (3.75), though still within the highly effective range, suggesting that while teachers engage in professional growth activities, there remains potential to further enhance participation in sustained and targeted professional learning opportunities.

These findings imply that teachers' effectiveness is strongest in direct classroom practices such as instruction and planning, while professional development may require additional support to further strengthen continuous improvement.

The relatively balanced but slightly lower engagement in professional development suggests the need for more accessible, relevant, and sustained training programs to support teachers' evolving instructional needs.

The results are supported by research indicating that effective teaching is multidimensional, encompassing instructional practices, planning, assessment, and ongoing professional learning. Darling-Hammond et al. (2020) emphasize that



teacher effectiveness is significantly enhanced when professional development is continuous, collaborative, and aligned with classroom practice. Similarly, Hattie (2020) highlights that high-impact teaching practices—such as clear instruction, feedback, and strategic planning—are key contributors to improved student achievement.

Overall, the findings suggest that while teachers demonstrate strong overall effectiveness in Science instruction, reinforcing professional development opportunities can further enhance and sustain high-quality teaching practices.

Relationship Between Integration of Maguindanaon Culture and Teaching Effectiveness in Science

The data reveal that there is a statistically significant and positive relationship between the integration of Maguindanaon culture and teachers' teaching effectiveness in Science across all examined variables. The correlations for Cultural Relevance of Content ($r = 0.68$, $p = 0.001$), Use of Local Resources ($r = 0.64$, $p = 0.002$), Language and Communication ($r = 0.71$, $p = 0.000$), and Respect for Cultural Worldview ($r = 0.66$, $p = 0.001$) indicate moderate to strong associations with teaching effectiveness.

Moreover, the overall integration of Maguindanaon culture shows the strongest correlation ($r = 0.72$, $p = 0.000$), suggesting that as cultural integration increases, teaching effectiveness also improves. The rejection of the null hypothesis across all variables confirms that these relationships are significant at the 0.05 level. Among the variables, language and communication yielded the highest correlation, highlighting the critical role of linguistically responsive instruction in facilitating understanding and engagement in science learning.

These findings imply that embedding cultural elements into science instruction enhances teachers' effectiveness by making lessons more meaningful, accessible, and relevant to learners. When instruction reflects students' cultural backgrounds, utilizes local resources, incorporates familiar language, and respects indigenous worldviews, it fosters a more inclusive and engaging learning environment. Such culturally responsive practices support better comprehension, participation, and interaction, which ultimately contribute to improved teaching performance and learner outcomes.

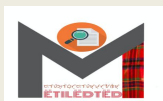
The results are supported by literature emphasizing the impact of culturally responsive pedagogy on educational effectiveness. Gay (2020) explains that aligning instruction with students' cultural experiences strengthens engagement and improves learning outcomes by making content more relatable.

Similarly, Ladson-Billings (2021) highlights that culturally relevant teaching enhances instructional effectiveness by connecting academic content to students' lived experiences, thereby promoting deeper understanding and meaningful learning. Overall, the findings affirm that integrating culture into science instruction is significantly associated with improved teaching effectiveness, reinforcing the importance of culturally responsive approaches in education.

Conclusion

The following conclusions were made in light of this study's findings:

The meaningful cultural integration in education goes beyond recognition of learners' identities and requires deeper, more intentional application of language and localized resources.



Also, while teachers are already performing effectively in their instructional roles, sustaining and enhancing their effectiveness requires greater investment in continuous professional learning.

Finally, the culturally responsive practices are not merely supportive elements but integral components of effective science instruction.

Recommendations

In light of the findings of the study, the following were recommended:

1. DepEd may strengthen policies and provide targeted training programs that specifically promote the use of mother tongue (Maguindanaon) and localized instructional materials in Science, ensuring that cultural integration is not only valued in principle but consistently practiced in classrooms.
2. School Administrators may encourage and monitor the regular use of local resources and indigenous language in teaching by providing support mechanisms such as classroom-based mentoring, instructional supervision, and availability of culturally relevant teaching materials.
3. Curriculum Planners may design and enrich Science curriculum guides with explicit integration of Maguindanaon cultural contexts, including sample lessons, localized examples, and activities that actively incorporate community knowledge, language, and indigenous resources.

Teachers may intensify the use of Maguindanaon language and local materials in Science instruction while actively engaging in continuous professional development activities to enhance skills in culturally responsive teaching and sustain instructional effectiveness.

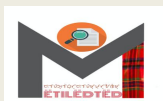
Future Researchers may conduct further studies focusing on interventions that

strengthen the use of local resources and language integration in culturally responsive teaching, and explore their direct impact on student learning outcomes and classroom engagement.

Compliance with Ethical Standards

In conducting this study, it was imperative to emphasize the paramount importance of adhering to ethical standards to ensure the protection, dignity, and well-being of all participants involved. Prior to the commencement of the research, the study underwent the necessary institutional review and approval processes to ensure compliance with established ethical guidelines and research protocols. Participants were fully informed about the purpose, procedures, potential benefits, and possible risks associated with the study, and their participation was strictly voluntary.

The researcher upheld the principles of informed consent, confidentiality, anonymity, beneficence, non-maleficence, integrity, and respect for persons throughout the research process. Measures were implemented to safeguard participants' identities and personal information through secure data management practices, while ensuring that no physical, emotional, psychological, or social harm resulted from their involvement. Furthermore, the researcher maintained objectivity, honesty, and transparency in data collection, analysis, interpretation, and reporting of findings, avoiding any form of bias, manipulation, or misrepresentation. Cultural sensitivity, inclusivity, and respect for diversity were likewise observed to ensure that all participants were treated fairly and with dignity. By adhering to these ethical principles, the study maintained its credibility, integrity, and trustworthiness while protecting the rights and welfare of the participants.



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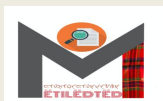
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Declaration AI Tools Utilization

I do hereby declare the use AI tools, such as Chat GPT and Grammarly for grammar checking and sentence organization purposes only.

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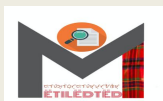
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