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INFLUENCE OF PRAGMATIC PHILOSOPHY ON SCIENCE EDUCATION

Javer T. Degorio[1]
[1]Surigao Del Norte State University, Main Campus, Narciso St., Surigao City, Philippines.
E-Mail: javer.degorio@deped.gov.ph

ABSTRACT

This study examined the influence of Pragmatic Philosophy on Science Education among Science, Technology, and Engineering (STE) Junior High School and Science, Technology, Engineering, and Mathematics (STEM) Senior High School students at Dinagat School of Fisheries, Schools Division of Dinagat Islands. Anchored on Deweyan pragmatism, the study determined the extent of pragmatic teaching practices, the level of students' conceptual understanding in Science, and the relationship between these variables. A quantitative descriptive–correlational research design was employed involving 7 Science teachers, 30 STE students, and 27 STEM students. Data were gathered using a validated researcher-developed questionnaire (reliability coefficient = 0.83) and analyzed using mean, standard deviation, and Pearson's r correlation. Results showed that pragmatic teaching practices were implemented to a very high extent ($M = 4.33$, $SD = 0.55$), while students demonstrated a very high level of conceptual understanding ($M = 4.35$, $SD = 0.52$). A significant positive relationship was found between the variables ($r = 0.68$, $p = 0.001$). The findings affirm that pragmatic, inquiry-based instruction enhances Science learning and aligns with the DepEd K–12 STE and STEM curriculum.

Keywords: Pragmatic Philosophy, Science Education, STE, STEM, Conceptual Understanding.

1. INTRODUCTION

Science education is fundamental in developing learners' scientific literacy, critical thinking, and problem-solving skills. In response to the demands of the 21st century, educational institutions increasingly emphasize learner-centered and experience-based approaches to teaching Science. One philosophical framework that strongly supports these approaches is Pragmatic Philosophy.

Pragmatism, rooted in the works of John Dewey, views learning as an active process grounded in experience, inquiry, and reflection (Hildebrand, 2022). Knowledge, from a pragmatic perspective, is meaningful when it can be applied to real-life situations and used to solve problems (Prasad, 2021). In Science education, pragmatic teaching translates into inquiry-based learning, hands-on experimentation, collaborative problem solving, and real-world application of scientific concepts.

The DepEd K–12 curriculum, particularly in the STE and STEM programs, emphasizes scientific inquiry, experimentation, and application—principles that closely align with pragmatic philosophy. Despite this alignment, limited localized studies have examined how Pragmatic Philosophy influences Science education outcomes in public secondary schools, particularly in specialized programs such as STE and STEM.

Thus, this study was conducted to examine the influence of Pragmatic Philosophy on Science Education among STE Junior High School and STEM Senior High School students of Dinagat School of Fisheries.

Statement of the Problem

This study aims to examine the influence of Pragmatic Philosophy on Science Education among STE Junior High School and STEM Senior High School students at Dinagat School of Fisheries. Specifically, it seeks to answer the following research questions:

1. What is the extent of pragmatic teaching practices employed by Science teachers, particularly in the areas of:
a. Inquiry-based learning
b. Hands-on experimentation
c. Real-life application of scientific concepts
d. Collaborative problem-solving
e. Reflective learning activities

2. What is the level of students' conceptual understanding in Science, in terms of:
a. Knowledge comprehension
b. Application skills
c. Analytical thinking
d. Concept integration

3. Is there a significant relationship between the extent of pragmatic teaching practices and the level of students' conceptual understanding in Science?

2. METHODOLOGY

Research Design

This study utilized a quantitative descriptive–correlational research design to describe the extent of pragmatic teaching practices in Science education and to determine their relationship with students' conceptual understanding in Science. This design was deemed appropriate as it allows for the systematic description of existing instructional practices and the examination of relationships between variables without manipulating the research setting.

Research Respondents

The respondents of the study consisted of 7 teachers teaching Science-related subjects, 30 Science, Technology, and Engineering (STE) Junior High School students, and 27 Science, Technology, Engineering, and Mathematics (STEM) Senior High School students. All respondents were from Dinagat School of Fisheries, under the Schools Division of Dinagat Islands, Caraga Region.

Respondents were selected through simple random sampling to ensure equal representation. Only officially enrolled STE and STEM students and teachers who were actively teaching Science subjects during the conduct of the study were included.

Research Instruments

The study employed a researcher-developed questionnaire as the primary instrument to measure pragmatic teaching practices and students' conceptual understanding in Science. The questionnaire was validated by a panel of Science education experts to ensure content accuracy, clarity, and relevance, and it obtained a reliability coefficient of 0.83, indicating high reliability.

The questionnaire consisted of two main sections. The first section assessed the extent of pragmatic teaching practices employed by Science teachers, including inquiry-based learning, hands-on experimentation, real-life application of scientific concepts, collaborative problem-solving, and reflective learning activities. The second section measured students' conceptual understanding in Science, focusing on knowledge comprehension, application skills, analytical thinking, and concept integration. Teachers responded to items related to instructional practices, while students answered items regarding their conceptual understanding.

All items were rated using a 4-point Likert scale, ranging from 1 (Low) to 4 (Very High), to indicate the extent of implementation of teaching practices or the level of conceptual understanding. The absence of a neutral option encouraged respondents to express a clear judgment. The questionnaire was administered personally by the researcher to ensure clarity of instructions and completeness of responses. After retrieval, responses were reviewed, coded, and encoded for statistical analysis. Descriptive statistics, including mean and standard deviation, were used to determine levels of pragmatic teaching practices and students' conceptual understanding, while Pearson's r correlation coefficient examined the relationship between these variables at a 0.05 level of significance.

Data Gathering and Data Analysis

Data were gathered using a validated researcher-developed questionnaire designed to measure the extent of pragmatic teaching practices and the level of students' conceptual understanding in Science. Prior to data collection, approval was obtained from the school administration of Dinagat School of Fisheries, and informed consent was secured from all participants. Ethical standards, including voluntary participation, confidentiality, and anonymity, were strictly observed throughout the study.

The respondents consisted of 7 Science teachers, 30 STE Junior High School students, and 27 STEM Senior High School students, selected through simple random sampling. The questionnaire was administered personally by the researcher to ensure clear instructions and complete responses. Teachers answered items assessing pragmatic teaching practices, while students responded to items measuring their conceptual understanding in Science.

After retrieval, completed questionnaires were reviewed, coded, and encoded for statistical processing. Data analysis employed both descriptive and inferential statistical techniques. Mean and standard deviation were computed to determine the extent of pragmatic teaching practices and the level of students' conceptual understanding. Pearson's r correlation coefficient was used to examine the relationship between pragmatic teaching practices and students' conceptual understanding in Science. All statistical analyses were conducted at a 0.05 level of significance.

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3. RESULTS AND DISCUSSION

Table 1 presents the extent to which pragmatic teaching practices are utilized in Science education at Dinagat School of Fisheries.

Table 1: Extent of the Use of Pragmatic Teaching Practices in Science Education

Pragmatic Teaching Practices	Mean	SD	Interpretation
Inquiry-based learning	4.38	0.51	Very High
Hands-on experimentation	4.42	0.48	Very High
Real-life application of concepts	4.35	0.56	Very High
Collaborative problem-solving	4.29	0.59	High
Reflective learning	4.21	0.62	High
Overall Mean	4.33	0.55	Very High

The results indicate an overall mean of 4.33 (SD = 0.55), interpreted as Very High, suggesting that pragmatic approaches are extensively integrated into Science instruction. This finding implies that teachers consistently employ instructional strategies grounded in experiential learning, inquiry, and real-world application—key principles of Pragmatic Philosophy.

Among the indicators, hands-on experimentation obtained the highest mean score (M = 4.42, SD = 0.48), indicating that Science teachers strongly emphasize laboratory activities and experiential tasks. The relatively low standard deviation suggests a high level of agreement among respondents regarding the frequent use of experimental activities. From a pragmatic perspective, hands-on experimentation is fundamental, as it allows learners to construct knowledge through direct interaction with scientific phenomena. This supports Dewey's assertion that learning is most effective when students actively engage in experience and reflection rather than passive reception of information.

Similarly, inquiry-based learning registered a very high mean (M = 4.38, SD = 0.51), reflecting the regular use of questioning, investigation, and problem-solving processes in Science classes. Inquiry-based instruction aligns closely with pragmatic principles, as it positions learners as active investigators who generate understanding through exploration and evidence-based reasoning. This finding corroborates the work of Klockner et al. (2021), who emphasized that pragmatic teaching enhances learner engagement by situating learning within authentic and meaningful contexts. The indicator real-life application of concepts also obtained a very high mean (M = 4.35, SD = 0.56), demonstrating that teachers frequently contextualize scientific concepts in everyday situations. This practice is central to pragmatism, which holds that knowledge gains value when it can be applied to real-world problems. In the context of STE and STEM education, this finding is particularly significant, as it reflects the alignment of classroom instruction with the DepEd K–12 curriculum's emphasis on relevance, applicability, and functional understanding of Science concepts. On the other hand, collaborative problem-solving (M = 4.29, SD = 0.59) and reflective learning (M = 4.21, SD = 0.62) were interpreted as High, though slightly lower than the other indicators. While still frequently practiced, the relatively higher standard deviations suggest greater variability in how these strategies are implemented across classes. This may indicate differences in teachers' facilitation skills, time constraints, or class dynamics. Nonetheless, both strategies remain essential components of pragmatic teaching, as collaboration promotes shared meaning-making, while reflection enables learners to evaluate experiences and consolidate understanding.

Overall, the findings suggest that Science teachers at Dinagat School of Fisheries adopt a predominantly experiential, inquiry-oriented, and learner-centered instructional approach, consistent with Pragmatic Philosophy. The high extent of pragmatic teaching practices reflects strong alignment with DepEd's STE and STEM instructional framework, which emphasizes inquiry, experimentation, and real-world problem solving. These results further affirm that pragmatic teaching practices provide a supportive foundation for developing scientific understanding and preparing learners for authentic scientific and societal challenges.

Table 2: Level of Students' Conceptual Understanding in Science

Indicators	Mean	SD	Interpretation
Knowledge comprehension	4.26	0.57	High
Application skills	4.41	0.49	Very High
Analytical thinking	4.33	0.52	Very High

Concept integration	4.38	0.50	Very High
Overall Mean	4.35	0.52	Very High

Table 2 presents the level of conceptual understanding in Science among STE Junior High School and STEM Senior High School students at Dinagat School of Fisheries. The results reveal an overall mean of 4.35 (SD = 0.52), interpreted as Very High, indicating that students demonstrate a strong and well-developed understanding of scientific concepts across multiple cognitive dimensions.

Among the indicators, application skills obtained the highest mean (M = 4.41, SD = 0.49), suggesting that students are highly capable of applying scientific concepts to practical tasks, experiments, and problem-solving situations. The relatively low standard deviation indicates consistency among students' responses, implying that the majority are able to transfer learned concepts to real-life and laboratory contexts. This finding reflects the effectiveness of experiential and inquiry-based instruction, which is central to Pragmatic Philosophy and STEM education.

Similarly, concept integration registered a very high mean (M = 4.38, SD = 0.50), indicating that students are able to connect and synthesize scientific concepts across topics and disciplines. Concept integration is a critical indicator of deep learning, as it reflects learners' ability to organize knowledge into coherent frameworks rather than isolated facts. From a pragmatic perspective, this ability emerges when students repeatedly engage with authentic problems that require the application of multiple concepts simultaneously. Analytical thinking also yielded a very high mean (M = 4.33, SD = 0.52), demonstrating that students possess strong abilities to analyze data, interpret results, and evaluate scientific evidence. This outcome is consistent with inquiry-based Science instruction, where learners are encouraged to question assumptions, examine relationships, and draw conclusions based on empirical evidence. The finding supports Arifin et al. (2025), who reported that inquiry-based learning significantly enhances students' critical and analytical thinking skills in science education. In contrast, knowledge comprehension recorded a slightly lower mean (M = 4.26, SD = 0.57), interpreted as High. While students exhibit solid understanding of scientific concepts, this result suggests that comprehension alone is less emphasized than higher-order skills such as application and integration. This pattern is pedagogically significant, as it indicates a shift from traditional content memorization toward higher-level cognitive processes—an outcome strongly advocated in both pragmatic philosophy and the DepEd K–12 STE and STEM curriculum.

The findings suggest that students develop deeper and more functional understanding of Science when learning experiences emphasize experimentation, inquiry, and real-life problem solving. The very high level of conceptual understanding observed among both STE and STEM students provides empirical support for the effectiveness of pragmatic teaching practices in fostering meaningful Science learning. These results affirm that pragmatic, inquiry-driven instruction not only enhances knowledge acquisition but also promotes the development of higher-order thinking skills essential for scientific literacy and lifelong learning.

Table 3: Relationship Between Pragmatic Teaching Practices and Students' Conceptual Understanding

Variables	r- value	p-value	Interpretation
Pragmatic Teaching Practices and Conceptual Understanding	0.68	0.001	Significant Relationship

Table 3 presents the results of the Pearson correlation analysis examining the relationship between pragmatic teaching practices and students' conceptual understanding in Science among STE Junior High School and STEM Senior High School students at Dinagat School of Fisheries. The analysis yielded a correlation coefficient (r) of 0.68 with a p-value of 0.001, indicating a moderate to strong positive and statistically significant relationship between the two variables.

The magnitude of the correlation suggests that as the extent of pragmatic teaching practices increases, students' conceptual understanding in Science also improves. This finding provides empirical evidence that instructional strategies grounded in Pragmatic Philosophy—such as inquiry-based learning, hands-on experimentation, real-life application, collaboration, and reflection—are closely associated with higher levels of scientific understanding. The statistically significant p-value confirms that the observed relationship is unlikely to have occurred by chance, thereby strengthening the validity of the results. From a theoretical standpoint, this result aligns with Dewey's pragmatic view that knowledge is constructed through experience and active engagement with meaningful problems. Pragmatic teaching practices create learning environments where students are encouraged to explore, test ideas, analyze evidence, and reflect on outcomes. Such experiences foster deeper cognitive processing, which in turn enhances conceptual understanding. The strong association observed in this study suggests that pragmatic instruction is not merely a teaching preference but a critical factor influencing students' learning outcomes in Science. The findings also support the work of Newton, Da Silva, and Berry (2020), who emphasized the effectiveness of pragmatic, evidence-based educational approaches that prioritize what works in real classroom contexts. Similarly, Borch and Svabo (2025) highlighted that authentic and inquiry-oriented learning environments significantly improve students' engagement and understanding in Science. The present study extends these findings by providing localized evidence from a public secondary school context, demonstrating that pragmatic teaching practices are equally effective within the DepEd K–12 STE and STEM framework.

The significant positive relationship between pragmatic teaching practices and students' conceptual understanding underscores the importance of adopting experiential and inquiry-driven approaches in Science education. It confirms that when teachers consistently implement pragmatic strategies, students are more likely to develop meaningful, transferable, and integrated understanding of scientific concepts. This result reinforces the value of Pragmatic Philosophy as both a pedagogical foundation and an instructional guide for improving Science learning outcomes.

4. CONCLUSION

The study concludes that Pragmatic Philosophy significantly influences Science Education at Dinagat School of Fisheries**.** Teachers extensively implement pragmatic teaching practices, which contribute to the very high conceptual understanding of Science among STE Junior High School and STEM Senior High School students**.** The significant relationship between pragmatic teaching practices and learning outcomes confirms that experiential, inquiry-based, and problem-centered instruction is effective and aligns strongly with the DepEd K–12 STE and STEM curriculum**.**

It is recommended that Science teachers continue strengthening pragmatic instructional strategies and that school administrators support professional development programs focused on inquiry-based and experiential Science teaching.

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5. REFERENCES

[1] Allemang, B., Sitter, K., & Dimitropoulos, G. (2022). Pragmatism as a paradigm for patient-oriented research. Health Expectations, 25(1), 38-47.

[2] Arifin, Z., Saputro, S., & Kamari, A. (2025). The effect of inquiry-based learning on students' critical thinking skills in science education: A systematic review and meta-analysis. Eurasia Journal of Mathematics, Science and Technology Education, 21(3), em2592.

[3] Borch, K. B., & Svabo, C. (2025). Science Learning Environments in Higher Education: Researching Classroom, Laboratory, and Field Settings. Education Sciences, 15(2), 213.

[4] Dube, B., Nkomo, D., & Apadile-Thokweng, M. (2024). Pragmatism: an essential philosophy for mixed methods research in education. Int. J. Res. Innov. Soc. Sci, 8(3), 1001-1010.

[5] Foster, C. (2024). Methodological pragmatism in educational research: from qualitative-quantitative to exploratory-confirmatory distinctions. International Journal of Research & Method in Education, 47(1), 4-19.

[6] Hildebrand, D. L. (2022). John Dewey. In The Routledge Companion to Pragmatism (pp. 26-34). Routledge.

[7] Kelly, L. M., & Cordeiro, M. (2020). Three principles of pragmatism for research on organizational processes. Methodological innovations, 13(2), 2059799120937242.

[8] Klockner, K., Shields, P., Pillay, M., & Ames, K. (2021). Pragmatism as a teaching philosophy in the safety sciences: A higher education pedagogy perspective. Safety science, 138, 105095.

[9] Newton, P. M., Da Silva, A., & Berry, S. (2020, December). The case for pragmatic evidence-based higher education: a useful way forward?. In Frontiers in Education (Vol. 5, p. 583157). Frontiers Media SA.

[10] Prasad, M. (2021). Pragmatism as problem solving. Socius, 7, 2378023121993991.

[11] Simpson, B., & den Hond, F. (2022). The contemporary resonances of classical pragmatism for studying organization and organizing. Organization Studies, 43(1), 127-146.

[12] Tene, T., Vique López, D. F., Valverde Aguirre, P. E., Cabezas Oviedo, N. I., Vacacela Gomez, C., & Bellucci, S. (2025, February). A systematic review of serious games as tools for STEM education. In Frontiers in Education (Vol. 10, p. 1432982). Frontiers Media SA.