

ASSESSING POSITIVIST APPROACH IN TEACHING MATHEMATICS AND SCIENCE IN RAMON SECONDARY SCHOOLS

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Abstract. This study assessed the application of the positivist teaching approach in Mathematics and Science Instruction in Secondary schools in the District of Ramon. Using a mixed-methods research design, quantitative data were collected through a validated and reliable survey instrument (Cronbach's alpha=0.87). While qualitative insights were gathered through interviews and classroom observations. The study involved 40 teacher-respondents selected through purposive sampling. Quantitative data were analyzed using descriptive statistics, while thematic analysis was applied to qualitative responses. Results revealed that positivist strategies, such as structured lesson delivery, use of objective assessments, and emphasis on measurable outcomes, are widely practiced by teachers. However, challenges such as student disengagement, neglect of learning diversity, and limited development of higher-order thinking skills were also identified. Despite these, teachers acknowledged the effectiveness of positivist methods in reinforcing basic skills and preparing students for standardized tests. The findings imply a need for balanced teaching approaches that integrate positivist strategies with more student-centered and constructivist methods to address the limitations of purely objective instruction. However, challenges such as student disengagement, neglect of learning diversity, and limited development of higher-order thinking skills were also identified. Despite these, teachers acknowledged the effectiveness of positivist methods in reinforcing basic skills and preparing students for standardized tests. The findings imply a need for balanced teaching approaches that integrate positivist strategies with more student-centered and constructivist methods to address the limitations of purely objective instruction.

Keywords: *positivist approach, Mathematics education, Science teaching, assessment practices, secondary schools*

Introduction

In recent years, the Philippine educational system has undergone significant reforms aimed at improving the quality of teaching and learning. One of the most influential approaches shaping these reforms is positivism, an educational philosophy that emphasizes objective, measurable outcomes and relies on empirical data to guide teaching methods. Rooted in the belief that knowledge is best understood through scientific, evidence-based approaches, positivism advocates for clarity, structure, and standardized assessments in education. These principles are reflected in the development of curricula that outline specific learning competencies and measurable outcomes. Department of Education (DepEd) in the Philippines has implemented a national curriculum that aligns with positivist principles by providing clear learning goals and standardized assessments (DEPED, 2016; 2012). Further, the use of standardized tests, such as the National Achievement Test (NAT) and exit exams for grades 10 and 12, has become central to evaluating student performance across the country. These assessments focus on quantifiable outcomes, often using objective formats like multiple-choice questions, to assess students' knowledge and skills. Despite

the widespread adoption of positivism, secondary schools face challenges in implementing teaching strategies that align with these principles. Teachers are tasked with balancing the need for standardized, measurable outcomes with the diverse learning needs of students. While positivist strategies offer a structured approach to learning, they may unintentionally limit opportunities for fostering critical thinking, creativity, and problem-solving skills-competencies that are difficult to quantify but essential for the holistic development of students. The emphasis on measurable success may lead to a narrow focus on rote learning and test preparation, potentially undermining more meaningful learning experiences (Corpuz and Salandanan, 2015; Creswell, 2014; Comte, 1853).

Although positivist methods have been widely adopted, there is limited research on their practical application, especially at the ground level in secondary schools within district of Ramon. This study seeks a bridge this gap by assessing how positivist teaching methods are implemented in these schools. Specifically, it will explore the extent to which teachers in the district adhere to positivist teaching strategies, the challenges they encounter when applying these methods, and the perceived benefits and drawbacks of positivism in secondary education. Through an in-depth exploration of these practices, this study aims to provide insights into how positivist methods are shaping educational outcomes and to enhance teaching strategies that meet both standardized educational goals and the boarder developmental needs of students (Fraenkel et al., 2019; Salandanan, 2012; Palispis, 2007; Guba and Lincoln, 1994; Sevilla, 1992; Dewey, 1938).

Theoretical or conceptual framework

The theoretical framework of this study is grounded in positivism, an educational philosophy that advocates for the use of objective, scientific methods to guide teaching and learning. Positivism submit that knowledge is best understood through empirical data and measurable outcomes. This approach emphasizes clear structures, standardized assessments, and a focus on observable and quantifiable results. The principles of positivism are drawn from the works of foundational theorists such as Auguste Comte, who is considered the Father of positivism, and John Dewey, who, while not strictly positivist, emphasized the importance of empirical evidence in education. Dewey's work in pragmatic education aligns with the positivist emphasis on measurable learning outcomes while still maintaining a focus on student experience. In the context of this study, positivism provides a lens through which to evaluate the application of standardized curricula and assessments in secondary education, particularly in the District of Ramon. The framework focuses on three key variables: the independent variable, which is the application of positivist teaching strategies; the dependent variable, which is student performance as measured through standardized assessments; and the moderating variables, such as the challenges teachers face when implementing these methods and the perceived strengths and weaknesses of positivist approaches. The study will explore how these variables interact and influence each other within the framework of secondary education in the District of Ramon.

Materials and Methods

The study utilized a descriptive survey research design, as it is well- suited to examine the application of positivist teaching methods in secondary schools whiothin

the District of Ramon. This design allows for the collection of data that describe the current state of educational practices and provides insights into teachers' adherence to positivist principles. A descriptive design is appropriate because the study aims to assess the extent of positivist methods used in teaching Mathematics and Science, along with identifying the challenges faced by teachers and the benefits and drawbacks of these methods. The study was conducted during the 2024-2025 academic year, with data collection taking place between January 2025 and April 2025. The study was carried out in secondary schools across the District of Ramon. The respondents of this study will be secondary school teachers of Mathematics and Science in the District of Ramon. A stratified random sampling procedure will be used to select the respondents. Teachers will be chosen from both public and private secondary schools to ensure a diverse representation of teaching practices. The sampling procedure will involve categorizing the schools by type (public vs. private) and grade level (Grade 7 and Grade 10), followed by randomly selecting teachers from each category. This approach ensures that the sample accurately reflects the population of secondary school teachers in the district.

A self-constructed questionnaire will be the primary instrument for data collection. The questionnaire will assess the extent of the application of positivist teaching methods, the challenges teachers face, and the perceived benefits and drawbacks of these methods. The instrument will be divided into sections: (1) Demographic information of the teachers. Adherence to positivist teaching strategies (e.g., use of standardized assessments, structured lesson planning) in challenges in applying positivist methods and perceived effectiveness of positivism in enhancing student learning. The questionnaire will undergo a validation process by a panel of experts in the field of education and assessment. The panel will review the instrument for clarity, relevance, and appropriateness of the questions. A pilot testing phase will also be conducted, with a sample of teachers not included in the main study, to ensure the reliability and validity of the instrument. The reliability of the instrument will be measured using Cronbach's alpha coefficient, and a reliability index of at least 0.80 will be targeted for internal consistency. (2) Data gathering procedure. Data will be gathered through survey administration. The researcher will first obtain permission from the District of Ramon's Department of Education office to conduct the study. Once approval is secured, the survey will be distributed to the selected teachers. The researcher will send official letters to the schools to request participation and provide instructions for completing the questionnaire. The survey will be administered both online and in paper format, depending on the preferences and availability of the respondents. Teachers will be given two weeks to complete the questionnaire, after which the data will be collected. (3) Treatment of data and statistical tools. The data will be processed using quantitative analysis techniques. The first step will involve cleaning the data to ensure completeness and accuracy. Any incomplete or inconsistent responses will be removed or corrected as needed. For the analysis, the responses will be categorized and scored according to a Likert scale (1 to 5), where higher scores will indicate greater adherence to positivist methods and more positive perceptions of their effectiveness.

Results and Discussion

The teaching of Mathematics and Science in secondary education often relies on structured, objective, and systematic approaches, hallmarks of the positivist teaching philosophy. Rooted in empirical observation and measurable outcomes, positivism in education emphasizes the transmission of knowledge through clear instruction, standardized assessment, and procedural learning. In the context of the District of Ramon, understanding how teachers implement these strategies, the challenges they face, and their perceptions of the approach's strengths and limitations provides valuable insight into current instructional practices.

The implementation of positivist teaching strategies in Mathematics and Science classes at secondary schools in the District of Ramon is evident in several aspects of the teachers' practices, as reflected in the survey results (*Table 1*). The data indicates that a majority of teachers follow a structured approach to lesson planning, emphasizing clear, measurable objectives (M=4.55, SD=0.50383). This aligns with the core principles of positivism, where order, predictability, and empirical measurement are valued. Teachers also frequently employ direct instruction (M=4.10, SD=0.67178), a hallmark of the positivist approach, which places the teacher as the central figure in delivering content and guiding student learning. Moreover, the use of standardized tests to assess student learning (M=4.73, SD=0.45220) reflects the positivist emphasis on objective, measurable outcomes. This method ensures that student progress can be quantitatively tracked and provides a clear way to evaluate learning success. Similarly, the reliance on textbooks and worksheets (M=3.65, SD=0.66216) suggests a traditional, content-driven approach to teaching, although this item has a lower mean, indicating that it might not always be the primary resource used. The data also suggests a strong inclination toward teaching procedural knowledge, with teachers employing step-by-step procedures to guide students in problem-solving (M=4.53, SD=0.67889). Additionally, laboratory activities with predetermined outcomes (M=4.53, SD=0.67889) are frequently used, further emphasizing a controlled, predictable environment where students can confirm scientific theories through observation and experimentation.

Table 1. *Implementation of positivism (N=40).*

Indicator	Mean	Std. Deviation
I follow a structured lesson plan with clear and measurable objectives.	4.5500	.50383
I use direct instruction as my main teaching strategy.	4.1000	.67178
I rely on textbooks and worksheets when delivering content.	3.6500	.66216
I regularly give standardized tests to measure student learning.	4.4500	.50383
I teach students step-by-step procedures to solve problems.	4.5250	.67889
I use laboratory activities with predetermined outcomes to verify scientific theories.	4.5250	.67889
I assess students mainly through objective measures like tests and quizzes.	4.7250	.45220
I use assessment data to guide my instruction and track student progress.	4.5500	.50383
I emphasize memorization of facts and definitions in Science and mathematics lessons.	3.9000	.67178
I follow the same instructional methods used across other schools in the district.	4.3500	.89299
I focus on ensuring students apply correct mathematical procedures.	4.3500	.83359
I prioritize observable and measurable outcomes in my Science and mathematics classes.	4.1250	1.20229
I demonstrate procedures before asking students to try them independently.	4.0250	1.16548
I expect students to arrive at the correct answers using specific methods.	4.3750	.80662
I implement strict classroom routines to maintain instructional structure.	4.1250	1.18078

However, some areas suggest a less pronounced adherence to positivist principles, such as the emphasis on memorization (M=3.90, SD=0.67178) and the use of textbooks (M=3.65, SD=0.66216). These practices, while common in positivist approaches, may limit deeper conceptual understanding and higher-order thinking. Furthermore, variability in the implementation of certain practices (e.g., prioritizing observable

outcomes with $SD=1.20229$) suggests differences in teaching styles and contextual factors influencing how teachers apply positivist methods. Overall, the data reveals a robust implementation of positivist teaching strategies in Mathematics and Science classrooms, though there are areas that may benefit from a more holistic approach, particularly in fostering deeper learning and conceptual understanding. Despite the strong alignment with positivist methods, teachers face several challenges in their implementation (Table 2). One of the most significant challenges identified is the difficulty in addressing the diverse learning needs of students. The item “I find it challenging to meet the different learning needs of my students” scored the highest mean ($M=4.4750$, $SD=0.75064$), highlighting that positivist methods often fail to accommodate varying student abilities and learning styles. This challenge is further exacerbated by limited resources, as reflected in the mean score of 4.4250 ($SD=0.74722$) for the item regarding the lack of access to necessary learning tools and materials. Moreover, teachers reported difficulty in promoting critical thinking within the confines of positivist methods ($M=3.8750$, $SD=0.46340$). This suggests that while positivist strategies focus on delivering clear, structured knowledge, they may not adequately support the development of higher-order thinking skills, which are essential for preparing students for real-world problem-solving. Similarly, the concern that students memorize procedures without fully understanding them ($M=4.0250$, $SD=0.65974$) reflects a limitation of positivism in encouraging deep conceptual learning

Table 2. Challenges of positivism (N=40).

Indicator	Mean	Std. Deviation
I find it hard to keep students engaged during traditional lectures.	4.0750	.69384
I struggle to explain abstract concepts using only direct instruction.	3.9750	.53048
I notice that some students do not learn well through repetition and memorization.	3.8250	.84391
I find it challenging to meet the different learning needs of my students.	4.4750	.75064
I lack access to adequate resources like lab materials and learning tools.	4.4250	.74722
I find it difficult to promote critical thinking using positivist methods.	3.8750	.46340
I see that some students feel anxious due to the pressure to give correct answers.	4.0500	.71432
I observe that students memorize procedures without fully understanding them.	4.0250	.65974
I struggle to adapt my lessons to students with different abilities.	3.1250	1.41761
I feel restricted by the need to follow strict assessment requirements.	2.9750	1.27073
I find that positivist methods do not always encourage student creativity.	3.6250	.83781
I feel limited in using innovative or student-centered approaches.	3.0250	1.31046
I am concerned that students aren't learning how to solve unfamiliar problems.	3.5750	.78078
I feel pressured to meet measurable targets instead of focusing on deeper understanding.	4.1250	.46340
I observe that rote learning leads to boredom and disinterest in my class.	3.4250	1.39390

Another significant challenge identified is the emotional impact on students, particularly the anxiety induced by the pressure to provide correct answers ($M=4.0500$, $SD=0.71432$). This pressure may contribute to a classroom atmosphere that discourages risk-taking and exploration, which are essential for developing creativity and critical thinking. Teachers also reported difficulties maintaining student engagement during traditional lectures ($M=4.0750$, $SD=0.69384$), as well as the tendency for rote learning to lead to student boredom ($M=3.4250$, $SD=1.39390$). This is indicative of the limitations of positivist approaches in sustaining student motivation and interest, particularly in subjects that require conceptual understanding rather than mere factual recall. In summary, the implementation of positivism in teaching is not without its challenges, particularly in addressing diverse learning needs, fostering critical thinking, and ensuring sustained student engagement. These challenges point to the need for a more balanced approach that incorporates elements of constructivism and student-centered learning to support both cognitive development and emotional well-being.

The survey results also shed light on the perceived strengths and weaknesses of positivist methods in secondary school Mathematics and Science education (*Table 3*). One of the strongest advantages identified by teachers is the clarity and structure that positivist methods provide, with a high mean score for the statement “I think students benefit from having clear expectations and structured routines” (M=4.9000, SD=0.37893). This suggests that teachers value the predictability and organization that positivism brings to the classroom, which can help manage student behavior and ensure a consistent learning experience. Teachers also recognize the effectiveness of direct instruction in teaching foundational concepts (M=4.0250, SD=0.65974) and the utility of objective assessments in measuring student learning (M=4.1000, SD=0.37893). These elements contribute to the positivist approach’s strength in ensuring measurable, objective outcomes that align with standardized testing and academic achievement. However, the results also indicate several weaknesses associated with positivist methods. Teachers acknowledged that the focus on correct answers and procedural knowledge can limit student creativity and problem-solving (M=4.6000, SD=0.54538). Additionally, there is concern that positivist approaches may neglect students’ diverse learning styles (M=4.5750, SD=0.54948), leading to disengagement and disinterest (M=4.6250, SD=0.54006). Despite the effectiveness of positivist methods in structured learning, teachers noted that these approaches often fail to foster deep understanding and critical thinking (M=4.5250, SD=0.71567). Furthermore, while positivism supports procedural knowledge and test preparation, it may not fully address the cognitive and emotional needs of students. The high scores for items such as “I recognize that positivist methods sometimes fail to develop critical thinking” (M=4.5250, SD=0.71567) and “I observe that students often lack deep understanding despite high test scores” (M=4.4500, SD=0.59700) suggest that there is a gap between surface-level knowledge acquisition and deeper cognitive engagement. While positivist methods offer strengths in clarity, structure, and test preparation, they also present significant limitations in promoting creativity, critical thinking, and inclusivity. Teachers’ perceptions suggest that a more balanced approach, integrating both positivist and constructivist strategies, could better meet the diverse needs of students and foster more meaningful, engaging learning experiences.

Table 3. *Strength and weaknesses (N=40).*

Indicator	Mean	Std. Deviation
I believe positivist methods provide clear and organized lesson delivery.	4.4000	.77790
I find that direct instruction is effective for teaching foundational concepts.	4.0250	.65974
I use objective assessments to accurately measure student learning.	4.1000	.37893
I think students benefit from having clear expectations and structured routines.	4.9000	.37893
I feel confident in tracking student progress through quizzes and tests.	4.6250	.54006
I observe that positivist strategies work well in teaching procedural knowledge.	4.5500	.74936
I think positivist approaches are helpful in preparing students for standardized exams.	4.5500	.50383
I notice that some students succeed in predictable and controlled learning environments.	4.6750	.47434
I find that positivist methods make lesson planning straightforward.	4.5500	.71432
I see that students become proficient in basic skills through repetition.	4.5500	.71432
I recognize that positivist methods sometimes fail to develop critical thinking.	4.5250	.71567
I observe that students often lack deep understanding despite high test scores.	4.4500	.59700
I believe that positivist approaches may neglect students’ diverse learning styles.	4.5750	.54948
I find that these methods can lead to disinterest or boredom in students.	4.6250	.54006
I feel that the focus on correct answers can limit student creativity and problem-solving.	4.6000	.54538

Conclusion

In conclusion, the study indicates that the positivist approach is widely implemented in secondary school Mathematics and Science classrooms in the District of Ramon. Teachers generally follow structured lesson plans with clear objectives and often use direct instruction, standardized assessments, and step-by-step procedures, which align well with the core tenets of positivism. These strategies are particularly effective in teaching procedural knowledge and ensuring measurable student progress. The use of laboratory activities with predetermined outcomes also reinforces the scientific approach of confirming theories through observable methods. However, the study also highlights several challenges faced by educators in applying positivist methods. A major issue is the difficulty in addressing diverse learning needs, as positivist strategies tend to favor standardized methods that may not accommodate students with varying abilities or learning styles. Teachers also report limitations in resources, particularly in Science subjects where practical activities require specific materials. Additionally, maintaining student engagement during traditional lectures and promoting critical thinking skills remains a significant challenge. These findings suggest that while positivist methods are effective in delivering structured content, they may not foster deeper cognitive development or creativity among students. The study concludes that while positivist teaching methods provide clear, organized instruction and support academic achievement, they have notable drawbacks, particularly in terms of student engagement, creativity, and inclusivity. Teachers acknowledge the importance of structure and measurable outcomes but express concerns that positivist strategies may neglect the development of critical thinking and deeper understanding. To address these limitations, the study recommends a more balanced teaching approach that combines the strengths of positivism with student-centered and constructivist strategies to enhance both academic rigor and meaningful learning experiences for all students.

For educators, teachers should be encouraged to integrate more diverse teaching strategies alongside positivist methods to cater to the varied learning needs of students. While structured lesson plans and direct instruction are effective for procedural learning, incorporating activities that foster critical thinking and creativity will enhance students' cognitive development. Professional development programs should be organized to guide teachers in balancing structured teaching with more student-centered approaches that promote deeper understanding. For school administrators, it is essential to address the resource limitations that teachers face, particularly in Science subjects where practical activities require specialized materials. Administrators should prioritize the provision of adequate teaching resources and tools, including laboratory materials, to support effective positivist teaching. Furthermore, professional development on how to adapt positivist methods to diverse classroom needs will help teachers effectively manage different learning styles and abilities within their classrooms. For policymakers, the Department of Education (DepEd) should consider revising assessment and curriculum frameworks to allow for a more balanced approach that combines both positivist and constructivist elements. Encouraging the integration of critical thinking, creativity, and problem-solving in standardized assessments would provide a more holistic view of student learning. Additionally, providing teachers with ongoing support in developing innovative and flexible teaching practices will ensure that positivist strategies can be applied in ways that foster deeper learning outcomes.

his section is more about the significance of your study. Generally, the researcher/s offer how this study will be used or beneficial to a group of people, agency, researcher, etc. The

statements should be in a specific form and must be clear. It should also be clear how will it be impactful to the specific group. The researcher should only recommend what was found in the study. Do not recommend something that was not explored in your study.

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Conflict of interest

The author confirms that there is no conflict of interest involved with any parties in this research study.

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