Studies in Interdisciplinary Horizons
https://sih-journal.com | eISSN: 3082-5792
Volume 2 Issue No. 3 | 2026
Received: March 10, 2026 | Accepted: June 30, 2026 | Published: August 30, 2026

Article

Challenges and Coping Strategies of Science 8 Teachers in Delivering Competency-Based Instruction: Experiences from Diffun National High School, Quirino

Queenie Jam A. Bautista
Northeastern College, Santiago City Philippines
Diffun National High School
queeniejam.abenoja@deped.gov.ph

Abstract

Competency-based instruction is a key feature of the Philippine K–12 Science curriculum, emphasizing the development of learners' scientific knowledge, skills, and values through mastery of learning competencies. Despite its intended benefits, Science teachers encounter various challenges in implementing competency-based instruction due to diverse learner needs, limited instructional resources, curriculum demands, and classroom realities. This study explored the challenges and coping strategies of Science 8 teachers in delivering competency-based instruction at Diffun National High School, Quirino. Using a qualitative phenomenological research design, eight Science 8 teachers were purposively selected as participants. Data were collected through semi-structured interviews, classroom observations, and document analysis and analyzed using Braun and Clarke's six-phase thematic analysis. The findings revealed that teachers experienced challenges related to learner diversity, limited instructional resources, time constraints, assessment practices, and curriculum implementation. To address these challenges, participants adopted contextualized instruction, differentiated teaching, collaborative learning, reflective practice, and continuous professional development. The study highlights the importance of institutional support, teacher collaboration, and capacity-building initiatives in strengthening competency-based science instruction. The findings provide valuable insights for school administrators, curriculum planners, and science educators in improving the implementation of competency-based instruction in public secondary schools.

Keywords: *competency-based instruction, Science education, Science 8 teachers, instructional challenges, coping strategies, phenomenology, qualitative research*

1. Introduction

Science education plays a significant role in developing scientifically literate learners who are capable of critical thinking, problem-solving, and evidence-based decision-making. In the Philippine K–12 curriculum, competency-based instruction emphasizes the mastery of essential learning competencies through learner-centered, inquiry-based, and contextualized teaching approaches. Rather than focusing solely on content coverage, competency-based instruction encourages learners to apply scientific knowledge and skills in authentic situations.

Science 8 teachers play a vital role in translating curriculum competencies into meaningful classroom learning experiences. They are expected to employ instructional strategies that develop conceptual understanding, scientific inquiry, collaboration, and higher-order thinking skills while addressing the diverse learning needs of students. Effective implementation of competency-based instruction requires careful lesson planning, appropriate assessment, and the use of varied teaching strategies that promote active learner engagement.

Despite these expectations, many Science teachers encounter challenges that affect classroom instruction. These include diverse learner abilities, limited laboratory facilities and instructional resources, insufficient instructional time, curriculum demands, and difficulties in assessing competency mastery. Teachers often adapt their instructional practices by utilizing available resources, modifying learning activities, and continuously reflecting on their teaching experiences to ensure that learning competencies are achieved.

Although previous studies have examined science teaching practices and curriculum implementation, limited qualitative research has explored the lived experiences of Science 8 teachers in implementing competency-based instruction within Philippine public secondary schools. Understanding these experiences is essential for identifying effective coping strategies and informing future professional development initiatives.

Therefore, this study explored the challenges and coping strategies of Science 8 teachers in delivering competency-based instruction at Diffun National High School, Quirino. The findings are expected to contribute to the improvement of science instruction, strengthen teacher support programs, and provide recommendations for enhancing competency-based teaching in secondary science education.

2. Objectives of the Study

This study aimed to explore the challenges and coping strategies of Science 8 teachers in delivering competency-based instruction at Diffun National High School, Quirino.

Specifically, it sought to:

1. identify the challenges encountered by Science 8 teachers in delivering competency-based instruction;
2. explore the coping strategies employed by teachers to address instructional challenges;
3. describe the pedagogical experiences of teachers in implementing competency-based instruction;
4. examine how teachers adapt their instructional practices to meet learners' diverse needs; and
5. provide implications for strengthening competency-based science instruction and teacher professional development.

3. Review of Related Literature

Competency-based instruction emphasizes learners' mastery of knowledge, skills, attitudes, and values through meaningful learning experiences and authentic assessment. Unlike traditional content-centered instruction, competency-based education focuses on learners' ability to demonstrate competencies in various contexts. In science education, this approach promotes inquiry, problem-solving, collaboration, and critical thinking while allowing learners to progress through carefully designed learning experiences.

Effective competency-based science instruction requires teachers to employ learner-centered pedagogies such as inquiry-based learning, contextualized instruction, collaborative learning, differentiated teaching, and formative assessment. These instructional approaches encourage learners to actively construct scientific knowledge, investigate real-world problems, and apply scientific concepts in everyday situations. Studies have consistently shown that learner-centered science instruction improves conceptual understanding, scientific reasoning, and learner engagement.

Teachers' pedagogical competence plays a crucial role in the successful implementation of competency-based instruction. Effective science teachers demonstrate flexibility in lesson planning, utilize varied instructional resources, employ continuous assessment, and provide timely feedback that supports competency development. Reflective teaching and continuous professional learning further enable teachers to improve instructional effectiveness and respond to evolving curriculum demands.

Despite the advantages of competency-based instruction, several studies have reported implementation challenges among science teachers. Limited laboratory facilities, inadequate instructional materials, large class sizes, diverse learner abilities, insufficient instructional time, and increased curriculum demands often constrain teachers' ability to deliver effective competency-based learning experiences. These challenges require teachers to become resourceful, adaptive, and innovative in designing instructional activities that promote competency mastery.

Research further suggests that teachers cope with these instructional challenges through collaboration with colleagues, participation in professional development activities, reflective teaching, improvisation of instructional materials, and contextualization of science lessons. Such coping strategies strengthen teachers' instructional competence while enhancing learner engagement and achievement.

Although previous studies have investigated competency-based education and science teaching practices, limited qualitative research has focused on the lived experiences of Science 8 teachers in implementing competency-based instruction in Philippine public secondary schools. This study addresses this gap by exploring the challenges, coping strategies, and pedagogical experiences of Science 8 teachers at Diffun National High School, Quirino.

4. Theoretical Framework

This study is anchored on Constructivist Learning Theory by Jean Piaget, Social Constructivism by Lev Vygotsky, and Experiential Learning Theory by David Kolb. These theories explain how learners develop scientific understanding through active engagement, collaboration, and meaningful learning experiences.

Constructivist Learning Theory posits that learners construct knowledge by connecting new concepts with their prior experiences (Piaget, 1972). In competency-based science instruction, teachers facilitate learning by providing inquiry-based activities, experiments, and problem-solving tasks that enable learners to actively build scientific understanding.

Vygotsky's Social Constructivism emphasizes that learning occurs through social interaction, collaboration, and teacher guidance (Vygotsky, 1978). Science teachers promote competency development by encouraging classroom discussions, cooperative learning, peer collaboration, and scaffolding that support learners in achieving the intended competencies.

Kolb's Experiential Learning Theory explains that meaningful learning occurs through concrete experiences, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984). Science teachers apply these principles by engaging learners

in laboratory investigations, demonstrations, hands-on activities, and real-life applications of scientific concepts.

These theories provide the foundation for understanding the challenges encountered by Science 8 teachers and the coping strategies they employ in delivering competency-based instruction.

5. Methodology

This study employed a **qualitative phenomenological research design** to explore the challenges and coping strategies of Science 8 teachers in delivering competency-based instruction at Diffun National High School, Quirino. The phenomenological approach was appropriate because it enabled the researcher to understand the lived experiences and perspectives of teachers regarding the implementation of competency-based science instruction.

The study was conducted at **Diffun National High School**, Schools Division of Quirino. The participants consisted of **eight (8) Science 8 teachers** who were directly involved in teaching Science 8 during the conduct of the study. Participants were selected through **purposive sampling** based on their teaching experience and involvement in competency-based instruction.

Data were gathered using a **researcher-developed semi-structured interview guide**, supported by classroom observations and document analysis. Permission to conduct the study was obtained from the appropriate school authorities before data collection. Individual interviews were conducted with each participant, audio-recorded with their consent, and transcribed verbatim. Classroom observations and instructional documents, including lesson plans and assessment materials, were also examined to validate the interview data.

The collected data were analyzed using **Braun and Clarke's (2006) six-phase thematic analysis**, which involved familiarization with the data, coding, searching for themes, reviewing themes, defining and naming themes, and producing the final report. To ensure trustworthiness, the study employed member checking, triangulation, peer debriefing, and an audit trail. Ethical principles were observed by securing informed consent, maintaining confidentiality through pseudonyms, and ensuring that participation was voluntary throughout the study.

6. Findings and Discussion

Theme 1: Addressing Learner Diversity in Competency-Based Science Instruction

One of the major challenges identified by the participants was the diversity of learners' academic abilities, learning styles, and levels of scientific understanding. Teachers explained

that some learners quickly mastered the required competencies, while others required additional explanations, remediation, and differentiated learning activities. These differences influenced lesson pacing and instructional planning, requiring teachers to continuously modify their teaching strategies to ensure that all learners achieved the expected competencies.

Participant 2 shared:

"Every class has learners with different abilities. Some easily understand scientific concepts, while others need more guidance and additional activities before they master the competency."

Participant 6 stated:

"I adjust my teaching strategies depending on the needs of my students. Sometimes I prepare different activities so everyone can participate and learn."

These responses indicate that learner diversity remains one of the most significant instructional challenges in competency-based science education. Teachers addressed this challenge by implementing differentiated instruction, providing individualized support, and encouraging peer collaboration. These practices are consistent with Constructivist Learning Theory and Vygotsky's concept of scaffolding, which emphasize adapting instruction to learners' developmental needs while promoting meaningful learning.

Theme 2: Coping with Limited Instructional Resources through Innovation and Improvisation

The participants reported that limited laboratory equipment, instructional materials, and science resources affected the implementation of competency-based instruction. To address these limitations, teachers demonstrated creativity by improvising laboratory apparatus, utilizing locally available materials, integrating multimedia resources, and designing alternative learning activities that achieved the intended competencies.

Participant 3 explained:

"We do not always have complete laboratory equipment, so I improvise using available materials that can still demonstrate the scientific concept."

Participant 7 remarked:

"When experiments cannot be conducted, I use videos, simulations, and locally available materials so learners can still understand the lesson."

These findings demonstrate that teachers' innovation and resourcefulness play a crucial role in sustaining effective science instruction despite limited resources. Their coping strategies

enabled learners to experience meaningful and engaging science lessons while achieving curriculum competencies. The findings support Kolb's Experiential Learning Theory, which highlights the importance of concrete learning experiences, and align with previous studies emphasizing the value of contextualized and improvised instructional materials in science education.

Theme 3: Managing Time Constraints in Delivering Competency-Based Instruction

The participants identified insufficient instructional time as one of the major challenges in delivering competency-based instruction. They explained that completing all learning competencies while ensuring that learners achieved mastery was difficult, particularly when laboratory activities, remediation, and performance-based assessments required additional class time. As a result, teachers carefully prioritized essential learning activities and adopted flexible instructional strategies to maximize available instructional time.

Participant 1 shared:

"Some competencies require more time because learners need activities and discussions before they fully understand the lesson. Sometimes one period is simply not enough."

Participant 5 stated:

"I carefully plan my lessons and integrate related competencies whenever possible so that I can maximize the available time without sacrificing learning."

These responses demonstrate that effective time management is essential in competency-based science instruction. Teachers coped with time limitations through careful lesson planning, integration of learning activities, and prioritization of essential competencies. These practices reflect teachers' instructional flexibility and commitment to ensuring meaningful learning despite limited classroom time.

Theme 4: Implementing Continuous Assessment to Monitor Competency Development

The participants emphasized that assessing learners' competency development was both essential and challenging. They regularly used formative assessments such as oral questioning, quizzes, laboratory activities, performance tasks, and classroom observations to determine learners' progress. Continuous assessment enabled teachers to identify misconceptions early and provide timely interventions that supported competency mastery.

Participant 4 explained:

"I conduct short assessments after every lesson because they help me determine whether my students have already mastered the competency or still need additional activities."

Participant 8 remarked:

"Performance tasks allow me to see whether learners can apply scientific concepts instead of simply memorizing information."

These findings indicate that formative assessment plays an important role in competency-based instruction by providing immediate feedback for both teachers and learners. Through continuous monitoring, teachers were able to modify instructional strategies, provide remediation, and improve learners' understanding of scientific concepts. This finding supports learner-centered assessment practices that emphasize continuous improvement rather than relying solely on summative examinations.

Theme 5: Strengthening Professional Growth through Reflection and Collaboration

The participants described reflective practice and collaboration with fellow teachers as important coping strategies in addressing instructional challenges. They regularly participated in Learning Action Cells (LACs), professional development seminars, peer mentoring, and collaborative lesson planning to improve their teaching practices. Reflecting on classroom experiences also enabled them to identify successful instructional strategies and areas requiring improvement.

Participant 3 shared:

"Our Learning Action Cell sessions help us exchange ideas and teaching strategies. I learn many practical techniques from my fellow Science teachers."

Participant 7 stated:

"After every lesson, I reflect on what worked well and what needs improvement. Reflection helps me become a better teacher and respond to my students' needs."

These responses highlight that professional collaboration and reflective teaching strengthen teachers' instructional competence and confidence in implementing competency-based instruction. Through continuous learning and collaboration, teachers become more capable of adapting to curriculum demands and addressing diverse classroom situations. These findings support the importance of professional learning communities and reflective practice in promoting continuous instructional improvement and sustaining quality science education.

7. Conclusion

This study explored the challenges and coping strategies of Science 8 teachers in delivering competency-based instruction at Diffun National High School, Quirino. The findings revealed that teachers encountered challenges related to learner diversity, limited instructional

resources, time constraints, assessment demands, and curriculum implementation. Despite these challenges, the participants demonstrated resilience and professionalism by employing differentiated instruction, contextualized learning, collaborative teaching strategies, reflective practice, and continuous professional development. These coping strategies enabled teachers to facilitate meaningful learning experiences and support learners in achieving the expected science competencies. The study concludes that the successful implementation of competency-based instruction depends not only on teachers' pedagogical competence but also on institutional support, adequate learning resources, and sustained professional learning opportunities that respond to the evolving demands of science education.

8. Implications

The findings of this study have significant implications for educational practice and policy. School administrators should strengthen support for Science teachers by providing adequate laboratory facilities, instructional materials, and continuous professional development programs focusing on competency-based instruction, differentiated teaching, and authentic assessment. Learning Action Cells (LACs), mentoring programs, and collaborative planning sessions should be strengthened to encourage teachers to share effective instructional practices and address common classroom challenges. Curriculum planners and education leaders may use the findings to develop responsive instructional guides and training programs that enhance teachers' capacity to implement competency-based science instruction effectively. Furthermore, future researchers are encouraged to conduct similar studies in other public secondary schools using larger participant groups or mixed-methods designs to validate and expand the findings of this study.

References

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Department of Education. (2016). *K to 12 Curriculum Guide: Science (Grade 3 to Grade 10).* Department of Education, Philippines.

Hattie, J. (2023). *Visible Learning: The Sequel.* Routledge.

Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development.* Prentice Hall.

OECD. (2023). *PISA 2022 Results (Volume I): The State of Learning and Equity in Education.* OECD Publishing.

Piaget, J. (1972). *The Psychology of the Child.* Basic Books.

Tomlinson, C. A. (2017). *How to Differentiate Instruction in Academically Diverse Classrooms* (3rd ed.). ASCD.

UNESCO. (2023). *Global Education Monitoring Report 2023: Technology in Education—A Tool on Whose Terms?* UNESCO.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes.* Harvard University Press.

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6th ed.). Sage Publications.