
Looking Back to Move Forward: Lived Experiences of Chemistry Teachers on Early Career Teaching

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ABSTRACT

Beginning chemistry teachers often struggle to balance abstract content, diverse learners, and classroom management demands, yet little is known about how veteran chemistry teachers make sense of these early-career challenges over time. This study investigated how veteran chemistry teachers in Bukidnon interpreted their initial teaching experiences, the difficulties they encountered, and the ways these experiences shaped their current practices. Fifteen veteran chemistry teachers teaching at the senior high school and college levels in different schools in Bukidnon were selected through criterion-based purposive sampling and participated in in-depth, semi-structured interviews using an Interpretative Phenomenological Analysis (IPA) design. Analysis revealed that early-career teaching brought excitement, anxiety, and “reality shock,” as participants realized that content knowledge alone was insufficient for effective chemistry teaching. They described difficulties in aligning lessons with the curriculum, simplifying complex chemical concepts, managing student behavior, addressing diverse learning needs, and coping with limited laboratory and instructional resources. Over time, they shifted from teacher-centered approaches to more student-centered, active-learning strategies, supported by mentoring, collegial guidance, reflection, and professional development. The findings underscore the importance of structured mentoring, practical preparation in classroom and laboratory management, and discipline-specific professional development for beginning chemistry teachers.

Keywords: chemistry teachers, early-career teaching, classroom management, interpretative phenomenological analysis, lived experiences, mentoring

INTRODUCTION

The shift from new teacher to experienced educator is especially complex in chemistry. Novices must handle abstract content and manage varying student needs and classroom dynamics. Studies show new teachers often face “reality shock” when their pre-service training fails to prepare them for real classroom settings, leading to stress, uncertainty, and trial-and-error in instruction and management (Comon, et al., 2025). Classroom management is one of the toughest challenges, especially when quick responses to misbehavior are needed, but support such as mentoring and induction is lacking (Lacy, 2024; Bird, 2023). These early difficulties can impact confidence, teaching quality, and retention. Teaching chemistry carries distinctive demands compared with many other subjects because it combines abstract conceptual understanding with practical laboratory work, safety responsibilities, and equipment management (Gorospe, 2022). Beginning teachers must not only explain invisible particles, symbols, and reactions but also design safe, meaningful experiments within the constraints of available materials and facilities, often in environments where laboratory safety infrastructure and resources are limited (Gorospe, 2022). These discipline-specific pressures can intensify early-career “reality shock,” as novices discover that strong content knowledge alone is insufficient to handle laboratory logistics, risk management, and students’ misconceptions about chemical phenomena (Dicke et al., 2015). For this reason, there is a need for chemistry-specific research on how teachers navigate their early years and how their insights can inform mentoring and professional development tailored to chemistry education (Gorospe, 2022).

This study specifically examines how veteran chemistry teachers retrospectively interpret their early teaching experiences and identify which techniques and classroom management strategies they now deem critical for beginning teachers. While previous studies have explored the challenges for novice teachers and suggested general improvements, and some literature on tacit knowledge and mentoring highlights the value of practice-based insights from experienced educators, such insights are rarely documented in a systematic or chemistry-specific manner (Xu et al., 2022). This gap in context-grounded evidence constrains the design of mentoring, induction, and professional development tailored to the needs of beginning chemistry teachers.

This study addressed that gap by using a qualitative phenomenological approach to explore how veteran chemistry teachers retrospectively make sense of their transition from novice to experienced educator. The research centers on which teaching techniques and classroom management strategies these teachers wish they had known at the start of their careers and how their insights can strengthen mentoring, induction, and professional development programs for beginner chemistry teachers. The study will be conducted among chemistry teachers from different schools in Bukidnon to generate contextually relevant evidence for designing support systems tailored to early-career needs in chemistry education.

METHODOLOGY

Objectives:

This study aims to explore the lived experiences of chemistry teachers regarding the evolution of their teaching techniques and classroom management, with a particular emphasis on the pedagogical strategies they wish they had known at the start of their careers. Specifically, the study seeks to address the following research Questions:

1. How do veteran chemistry teachers describe their early-career teaching experiences?
2. What classroom management and instructional challenges did they encounter as beginning teachers?
3. What teaching techniques and classroom management practices do they wish they had known at the start of their careers?
4. In what ways have their early-career experiences shaped their teaching practices over time?

Research Design

This study used Interpretative Phenomenological Analysis (IPA) to explore how veteran chemistry teachers interpret and make sense of their early-career teaching and classroom management experiences (Smith et al., 2009). IPA involves a “double hermeneutic,” where participants interpret their own experiences, and the researcher interprets these interpretations, which is appropriate for examining how early challenges are integrated into current professional identities (Smith et al., 2009). Using retrospective accounts is consistent with IPA’s concern for present meaning-making rather than reconstructing a strictly chronological record. To manage my own assumptions about chemistry teaching, I kept reflexive notes and regularly discussed emerging interpretations with my adviser.

Data were analyzed following IPA’s main stages: repeated reading of each transcript, detailed exploratory noting on content, language, emotions, and initial interpretations, development of emergent themes for each participant, clustering of these themes into broader patterns within cases, and finally cross-case analysis to identify convergences and divergences among the fifteen teachers, which led to the superordinate themes reported in the Results and Discussion (Smith et al., 2009). Rigor was enhanced by peer debriefing and limited member checking to support credibility, an audit trail of analytic decisions to support dependability, and reflexive journaling plus systematic organization of transcripts, notes, and codes to support confirmability (Lincoln, 1985).

Participants of the Study

The study was conducted among veteran chemistry teachers from different schools in Bukidnon that offer chemistry instruction at the senior high school or college level. Fifteen participants were selected through

criterion-based purposive sampling. To be included, participants had to be: (1) currently teaching chemistry at the senior high school or college level, and (2) have at least five years of teaching experience, allowing them to reflect meaningfully on their early years of teaching and the development of their classroom management and instructional practices.

Data Gathering Procedure

Data were collected through in-depth, semi-structured interviews conducted either face-to-face or via online video conferencing platforms, depending on participant availability and contextual constraints. Participants were purposively sampled through social media, professional and academic networks, referrals, and direct contact with chemistry teachers who met the inclusion criteria. Eligible individuals were informed of the study's purpose, their role, and that participation was voluntary. Interviews were scheduled at the participants' convenience, and before each interview, informed consent was obtained and participants were reminded that they could withdraw at any time without penalty. With permission, interviews were audio-recorded to ensure accurate and detailed capture of their narratives.

Data collection continued until thematic sufficiency was reached, that is, when additional interviews no longer generated substantively new themes relevant to the research questions and instead deepened or confirmed the existing analytic structure. In keeping with IPA's idiographic orientation, saturation was considered in terms of the depth and recurrence of meaning across cases rather than statistical repetition alone (Smith et al., 2009). By the later interviews, the central patterns concerning reality shock, layered instructional challenges, shifts toward student-centered pedagogy, the role of mentoring, and the long-term influence of early experiences had become conceptually consistent across participants, indicating that the dataset was sufficiently rich for interpretative analysis.

To strengthen credibility, limited member checking was conducted by sharing thematic summaries with selected participants after the initial analysis. These participants confirmed that the interpretations reflected the general meaning of their experiences and offered minor clarifications in wording, but no major thematic revisions were required. Credibility was further supported through peer debriefing with colleagues and advisers familiar with qualitative research and chemistry education, while dependability and confirmability were reinforced through an audit trail, reflexive journaling, and systematic organization of transcripts, notes, and coding outputs, consistent with established criteria for trustworthiness in qualitative research (Lincoln & Guba, 1985).

Ethical Considerations in the Data Collection

Ethical guidelines were followed throughout. Participation was voluntary, with informed consent obtained before data collection. Participants were informed about the purpose, procedures, possible risks and benefits, their right to withdraw, and measures to protect their data.

Phenomenological Approach

This study used an interpretive phenomenological approach to explore chemistry teachers' early-career experiences. It focused on how they understood teaching and the classroom management strategies they later deemed essential but initially lacked during their early years. The approach emphasized detailed individual analysis before identifying broader themes (Smith et al., 2009) and aimed to generate practical insights to improve support for new chemistry teachers in Bukidnon and similar contexts.

Data Analysis

The qualitative data were analyzed using the Interpretive Phenomenological Analysis (IPA) framework. Consistent with its idiographic orientation, the analysis prioritized an in-depth examination of individual participants' experiences before moving to cross-case comparisons (Smith et al., 2009). The analytic process followed a systematic and iterative sequence.

First, each interview transcript was read and re-read to promote immersion and to develop a nuanced understanding of the participant's account. This was followed by exploratory noting, in which detailed comments were recorded to capture significant statements, linguistic features, emotional expressions, and preliminary interpretations related to early-career challenges and the development of teaching and classroom management practices.

Next, emergent themes were generated by synthesizing and clustering these notes into concise, conceptually meaningful units that reflected the essence of each participant's experience. These themes were then organized within each case to identify patterns and relationships. After completing the within-case analyses, a cross-case analysis was conducted to examine convergences and divergences among participants, leading to the development of superordinate themes that represented shared meanings while preserving individual nuances.

To enhance the rigor and trustworthiness of the study, the criteria of credibility, dependability, and confirmability were systematically addressed. An audit trail documenting analytic decisions, coding procedures, and theme development was maintained throughout the research process. Credibility was strengthened through peer debriefing with colleagues and advisers familiar with qualitative research and chemistry education and, where feasible, through member checking by sharing selected interpretations with participants to ensure alignment with their intended meanings.

RESULTS AND DISCUSSION

This section presents the superordinate themes that emerged from the interpretative phenomenological analysis of the interviews with fifteen veteran chemistry teachers that teaches senior high schools and colleges in Bukidnon. The themes are organized around the research questions and highlight how participants made sense of their early-career teaching experiences, the challenges they faced, the classroom management and instructional practices they developed over time, and the ways these experiences have shaped their current teaching.

Theme 1: Stepping into the Classroom – From Excitement to Reality Shock

This theme captures how veteran chemistry teachers reinterpreted their initial “reality shock” as a turning point in constructing a more realistic and resilient professional identity. Rather than viewing early fear, anxiety, and mismatch between expectations and classroom realities as failure, they later framed these feelings as necessary disruptions that pushed them beyond a narrow focus on content knowledge. Participants consistently recalled a mixture of excitement and anxiety in their first years of teaching chemistry. One teacher described early teaching as “quite challenging since I’m new to this field,” but also “the most memorable year in my teaching career since it’s my stepping stone,” capturing both difficulty and significance. Another shared that teaching was “not easy, but it is fun and fulfilling since you’re able to impart your knowledge to your students,” emphasizing the role's simultaneous weight and reward.

Emotional experiences were often ambivalent: participants felt “so nervous and excited at the same time” and “overwhelmed and nervous” as they adjusted to lesson planning, classroom management, and simplifying complex concepts. Several expected that a strong science background would be enough, one teacher said, “Before I started teaching, I expected that having a strong background in science would be enough to teach effectively,” only to find that “teaching requires more than just subject knowledge” and demands “patience, adaptability, and understanding students’ different learning styles.” These accounts reflect the “reality shock” described in the literature, where new teachers discover that pre-service preparation does not fully match classroom realities (Comon et al., 2025).

Despite this shock, participants framed their early years as formative rather than purely negative. One veteran noted that those experiences “help me build who I am today as a teacher” and taught that “we as teachers are not perfect... we should make it a challenge to be a better teacher.” This sense-making aligns with research showing that early disillusionment, when supported, can contribute to resilience and deeper professional commitment (Dicke et al., 2015). Overall, this theme suggests that early emotional turbulence functions as a catalyst for

identity work, prompting chemistry teachers to shift from seeing themselves mainly as subject experts to seeing themselves as adaptive professionals who learn from struggle.

Theme 2: Negotiating Multiple Challenges in Early-Career Teaching

This theme shows how beginning chemistry teachers experienced multiple, overlapping demands, curriculum, abstract content, student behavior, and limited laboratory resources, not as isolated problems but as an interconnected web they had to manage simultaneously. Their accounts reveal that early-career challenge in chemistry is less about a single deficit and more about navigating constant trade-offs between coverage, comprehension, safety, and engagement. Participants encountered layered challenges involving content, curriculum, students, and context. In terms of content and curriculum, one teacher explained that it was difficult to “simplify complex chemistry concepts into terms that students could easily understand,” especially while “adjusting to the curriculum guidelines” and trying to “align my lesson plans with the required standards.” Managing pacing was also demanding: they struggled to “balance content coverage with student comprehension” and to follow the curriculum while attending to “students’ different learning abilities.”

Student-related challenges centered on behavior, attention, and varied learning needs. Teachers highlighted “students with disruptive behavior, short attention spans, and those who were slow learners,” noting that “it was challenging to keep the class focused while also making sure that all students were able to follow and understand the lesson.” One described moment when “some students would lose focus easily, talk during discussions, or become disengaged,” while others “struggled to keep up with the pace of the class.” These experiences echo findings that novices frequently feel unprepared for classroom management and behavioral issues (Bird, 2023; Lacy, 2021).

Contextual constraints further complicated their work. Teachers in remote or resource-limited schools mentioned “limited materials and equipment in our laboratories” and that “students didn’t bring materials for their experiments” despite clear instructions. In response, they adapted by organizing “group activity, so they can collaborate with their classmates” and by “trying another learning approach so that all of them can participate and to make the activity more engaging.”

Instead of portraying themselves as helpless, participants emphasized perseverance and purpose: they “manage all these challenges through perseverance to teach and to touch the lives of others” and by being “flexible and resourceful,” using “simple explanations, real-life examples, and visual aids” to bridge gaps. In analytic terms, this theme highlights early-career teaching as a process of negotiating constraints, where novice chemistry teachers learn to prioritize, improvise, and make situated decisions rather than simply implementing pre-service training “by the book.”

Theme 3: Evolving Classroom Management and Pedagogy

This theme traces a developmental movement from control-oriented, teacher-centered practices toward more student-centered and active pedagogies, showing that changes in classroom management and instruction are tightly linked. Participants’ narratives indicate that behavior problems often declined when they redesigned lessons to make students actively work with chemistry ideas instead of passively listening.

Participants’ narratives revealed a clear shift from teacher-centered control to more student-centered and active pedagogies. Early on, many relied on rules and direct instruction: “I manage my classroom... by setting up rules and regulations for the student to follow” and “set clear expectations and classroom rules from the beginning and consistently enforced them.” This structure helped maintain order but did not always foster deep engagement.

Over time, teachers experimented with and increasingly adopted active learning strategies. One described moving to “student-centered, based teaching since I believe that students will not learn just by listening but more by experiencing or doing it on their own,” highlighting a shift from lecture to participation. Another explained that they “gradually shifted from a teacher-centered approach to a more student-centered one,” using

“discussions, group work, and problem-solving activities related to Chemistry concepts” and “acting as a facilitator of learning by guiding students, asking questions, and helping them discover answers on their own.”

Participants also articulated what they wished they had known earlier. One reflected, “I wish I had known earlier how effective active learning strategies could be in improving both student understanding and classroom management,” including “collaborative learning, inquiry-based activities, and differentiated instruction.” Another shared that they would have benefited from understanding “differentiated instruction and student-centered learning approaches” sooner, so they could better adapt lessons to “students’ learning styles.”

These accounts support the idea that classroom management and instruction are deeply intertwined: as teachers moved toward engaging, student-centered strategies, they found that behavior issues lessened and learning improved (Bird, 2023). The transition from controlling behavior to designing engaging learning experiences is a key developmental trajectory evident in participants’ stories. Analytically, this theme suggests that effective classroom management for chemistry teachers emerges not only from rules and sanctions but from creating learning environments where students are cognitively and physically engaged with meaningful tasks.

Theme 4: Support, Coping, and Professional Growth

This theme explains how support systems and coping strategies transformed early-career difficulties from private struggle into shared, professional learning. Teachers’ reliance on mentors, colleagues, and continuous learning shows that resilience was not purely individual but was cultivated within relationships and professional communities.

Support networks and coping strategies emerged as crucial in helping participants navigate early-career challenges. Many explicitly mentioned turning to colleagues: “I coped... by asking for help from my co-science teacher,” acknowledging that “they have a lot of experience and their expertise could lead me to change my teaching pedagogy.” Another sought support from “my mentors and colleagues,” noting that their encouragement helped them “believe that I can do it myself with the help of my mentors.” These relationships provided both practical strategies and emotional reassurance.

Participants also invested in continuous learning. One teacher emphasized that “continuous learning could help me to improve my teaching,” making an effort to attend trainings, read educational materials, and explore new teaching strategies.” Another described attending “seminars and workshops to enhance my knowledge and skills in teaching,” which were particularly helpful in understanding “effective classroom management and instructional strategies.” They consistently framed professional development and reflection as key to becoming “more confident and effective in delivering my lessons.”

Teachers additionally relied on intrapersonal coping strategies such as perseverance and self-belief. One participant summarized this stance with advice to novices: “Believe in yourself,” while another stressed the importance of “facing difficult situations willingly” and treating them as “opportunities for growth rather than obstacles.”

These patterns resonate with research on mentoring and tacit knowledge transfer, in which experienced colleagues provide access to practice-based knowledge that is difficult to learn from formal training alone (Wang et al., 2022; Xu et al., 2022). In this study, formal and informal supports, combined with individual commitment to reflection and learning, contributed to participants’ sense of growth and professional identity development.

Thus, the theme points to professional growth as a social and reflective process in which tacit knowledge about chemistry teaching is gradually built through dialogue, feedback, and deliberate self-improvement.

Theme 5: Looking Back – Identity, Influence, and Advice for Novices

This final theme illuminates how veteran chemistry teachers use their recollected early experiences as a lens for making sense of who they are now and for advocating specific supports for novices. Looking back, they

reinterpret past challenges as resources that guide their current priorities, such as student-centered learning, mentoring, and affirmation for beginning teachers.

When reflecting on how early experiences influenced their teaching today, participants described profound shifts in their identity and practice. One teacher said, “My early teaching experiences have greatly influenced how I teach today,” explaining that challenges made them “more resilient, patient, and focused on my goals as a teacher.” Another shared that they now “focus on student learning experience,” creating “a classroom where they can have fun, be engaged, and explore while learning.”

Teachers highlighted concrete changes in their approach: “I shifted from teacher-centered to student-centered strategies, used more interactive and inquiry-based activities, and applied consistent but flexible classroom management,” reflecting a more facilitative role. They emphasized that “effective teaching requires patience, adaptability, and strong relationships with students” and that “content knowledge alone is not enough; engagement, clear communication, and understanding students’ needs are equally important.”

When asked for advice to beginning chemistry teachers, participants frequently encouraged patience, flexibility, and continuous learning. One advised, “Be patient, flexible, and open to continuous learning... use active learning strategies and act as a facilitator of learning to make Chemistry more engaging and understandable for students.” Another stressed the need to “stay focused on your goals as a teacher and be willing to face difficulties as opportunities for growth,” and to “seek guidance from experienced colleagues and participate in seminars and workshops to improve your skills.”

Participants also identified the kinds of support they believe new teachers need most: “strong mentorship and guidance from experienced teachers,” “practical training in classroom management and lesson planning,” and “encouragement and word of affirmation that everything will be okay and they have someone they can rely on if they need guidance.” These recommendations reinforce the study’s conclusion that systematic mentoring and context-sensitive professional development are essential to supporting novice chemistry teachers in their early careers.

Analytically, this theme shows that memory of early-career struggle becomes a moral and professional compass: it shapes how veteran chemistry teachers position themselves as mentors, what advice they offer, and how they envision more humane induction for future chemistry teachers.

Limitation

This study has several limitations. First, it involved a relatively small, purposively selected sample of fifteen veteran chemistry teachers from one province in Northern Mindanao, which limits the transferability of the findings to other regions, school systems, or subject areas (Lincoln & Guba, 1985). Nevertheless, the findings may be most applicable to settings with similar conditions, such as public or private schools serving diverse learners, contexts with varying access to laboratory materials, and institutions where novice chemistry teachers must balance abstract content, classroom management, and resource constraints. Second, the study relied on retrospective self-reports, so participants’ accounts may have been shaped by memory bias and by their present professional identities. While this is consistent with IPA’s interest in present meaning-making, future studies may complement retrospective interviews with longitudinal designs, reflective journals, or contemporaneous records of novice teachers’ experiences. Third, the study drew data only from interviews and did not include classroom observations, instructional documents, or student perspectives, which limited opportunities for triangulation. Finally, because the study focused specifically on chemistry teachers, some discipline-specific issues such as laboratory work, safety demands, and the teaching of abstract concepts may not transfer directly to other subject areas.

CONCLUSION

This study explored the lived experiences of veteran chemistry teachers regarding their early-career teaching and classroom management, the challenges they encountered, the practices they wish they had known at the start of their careers, and how these experiences shaped their teaching over time. Using an interpretative

phenomenological analysis approach, the research illuminated how participants moved from initial excitement and idealistic expectations to confronting the complex realities of curriculum demands, student diversity, and contextual constraints.

The findings show that early-career chemistry teachers navigate multiple, intersecting challenges related to curriculum alignment, content simplification, classroom management, and resource limitations. In response, they gradually shift from primarily teacher-centered, control-oriented strategies to more student-centered, active-learning approaches that integrate classroom management with meaningful engagement in chemistry learning. Support from mentors, colleagues, and professional development opportunities plays a critical role in helping them cope with and learn from these challenges, fostering resilience, adaptability, and ongoing growth (Wang et al., 2022; Xu et al., 2022).

Looking back, veteran teachers see their early experiences as foundational in shaping their professional identity and current practice. They emphasize the importance of patience, flexibility, and relationship-building, as well as the need to view challenges as opportunities for learning rather than as signs of failure. Their advice to beginning chemistry teachers centers on believing in oneself, embracing continuous learning, using student-centered strategies, and seeking support from experienced colleagues.

Overall, the study underscores the need for more intentional mentoring, induction, and professional development programs that address the specific realities of early-career chemistry teaching, including classroom management, curriculum implementation, and resource constraints. By listening carefully to the voices of veteran teachers who have “looked back to move forward,” teacher education institutions and schools can design more responsive supports that help beginning chemistry teachers navigate their own early-career journeys with greater confidence, effectiveness, and sustainability.

RECOMMENDATION

Based on the findings, the following recommendations are proposed to enhance support for beginning chemistry teachers in senior high schools and colleges.

For School Heads and Administrators, School heads and administrators should institutionalize structured mentoring and induction programs for novice chemistry teachers. Veteran teachers may be formally designated as mentors to guide lesson planning, classroom and laboratory management, and coping with early-career “reality shock.” Regular mentoring conferences, classroom observations, and feedback sessions should be scheduled within the school calendar to ensure sustained support rather than relying on informal, voluntary help.

For Beginning and Veteran Chemistry Teachers, beginning chemistry teachers are encouraged to cultivate habits of reflection and help-seeking, such as keeping reflective journals, consulting colleagues, and treating early challenges as opportunities for professional growth rather than signs of failure. Veteran teachers, in turn, are encouraged to make their tacit knowledge explicit by sharing concrete strategies, narratives of their own early-career struggles, and affirming feedback through mentoring, peer coaching, and professional learning communities.

For Future Researchers, Future researchers may replicate or extend this study in other provinces, grade levels, or subject areas to compare whether early-career challenges and support needs are similar or different across contexts. Mixed-method or multi-source designs that include classroom observations, student perspectives, and school leaders’ views are also recommended to triangulate and deepen understanding of early-career chemistry teaching.

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