Preservice teachers' classroom questioning practices: An analysis using Bloom's revised taxonomy

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Classroom questioning plays a central role in shaping students' cognitive engagement and opportunities for higher-order thinking. However, preservice teachers often rely on lower-level questions during classroom instruction, particularly during teaching practicum. This qualitative descriptive study examined the cognitive levels of classroom questions posed by 18 final-year preservice teachers teaching in upper primary classrooms across urban, peri-urban, and rural school settings in Fiji, using Bloom's revised taxonomy as an analytical framework. Non-participant classroom observations were conducted during practicum lessons, and teacher questions were recorded verbatim and categorised according to the six cognitive levels of Bloom's revised taxonomy. The findings indicate an overwhelming reliance on remembering and understanding questions, which accounted for over 90% of all observed questions, with very limited use of higher-order questions such as analysing, evaluating, and creating across subject areas. While some variation was observed between curriculum areas, higher-order questioning remained consistently limited. The study highlights the need for more explicit and systematic development of questioning strategies within preservice teacher education programs, particularly through targeted training, explicit modelling by mentors, and structured feedback during practicum, to better support the development of students' critical and analytical thinking skills.

Introduction

Classroom questioning is widely recognised as a central pedagogical practice that supports student engagement, checks understanding, and promotes meaningful learning. Through well-structured questions, teachers can stimulate thinking, encourage participation, and guide learners from surface-level recall to deeper conceptual understanding. In contemporary classrooms, effective questioning is increasingly viewed not merely as a technique for eliciting responses but as a deliberate instructional strategy that scaffolds learning and fosters higher-order cognitive skills (Rahmaeni, 2025; Shaughnessy & Boerst, 2017; Wang et al., 2024). Consequently, the development of effective questioning practices is considered a fundamental component of teacher preparation programs.

Research examining classroom questioning across educational contexts has consistently shown that teachers tend to rely heavily on lower-order questions, particularly those requiring recall and basic understanding. Studies grounded in Bloom's taxonomy indicate that questions at the remembering and understanding levels dominate classroom discourse, while higher-order questions involving application, analysis, evaluation, and creation are comparatively rare (Assaly & Jabarin, 2021; Muhayimana et al., 2022; Zaidi et al., 2018). This pattern is especially evident among novice and preservice teachers, who often depend on factual recall questions that demand minimal cognitive engagement from

students (Alvi, 2024; Forster et al., 2019). Such findings suggest persistent challenges in teacher education, particularly in preparing preservice teachers to confidently and effectively employ cognitively demanding questions during instruction.

Although teacher education programs frequently emphasise the importance of higher-order thinking and questioning strategies, research indicates that these principles are not consistently translated into classroom practice during practicum placements. Joseph and Thomas (2020) observed that while higher-order questioning is often discussed in coursework, it is not always modelled or reinforced in school-based teaching experiences. As a result, preservice teachers may struggle to integrate higher levels of Bloom's taxonomy into their questioning practices, particularly in authentic classroom settings where time constraints, classroom management concerns, and performance pressures are present. In small islands and developing education systems, including those in the Pacific, these challenges may be further intensified by examination-driven curricula, limited instructional resources, multi-grade teaching contexts, and restricted access to sustained professional mentoring (Ghaleb, 2024; Singh & Chand, 2022).

Despite the growing international literature on teacher questioning, there remains a notable lack of empirical studies from the Pacific region, particularly from Fiji, that examine the cognitive level of questions posed by preservice teachers in real classroom contexts. This gap is significant, given that Fiji's national curriculum and policy documents emphasise learner-centred approaches, inquiry-based learning, and the development of higher-order thinking skills. The Ministry of Education (2013), for example, expects teachers to design learning activities and questions that encourage students to interpret, apply, and synthesise knowledge. At the same time, Fijian classrooms are characterised by diverse linguistic backgrounds, varying school resourcing, and ongoing curriculum reforms, making the enactment of cognitively demanding pedagogy both essential and challenging. Understanding how preservice teachers enact these expectations during their practicum is therefore critical for informing teacher education and improving classroom practice.

Our study seeks to address this gap by examining the types and cognitive levels of questions used by preservice teachers in upper primary classrooms in Fiji during their teaching practicum. Using Bloom's revised taxonomy as an analytical framework, the study provides a systematic analysis of questioning practices across multiple subject areas. By focusing on observed classroom interactions rather than self-reported practices, our study offers contextually grounded insights into the extent to which preservice teachers engage learners in higher-order thinking within authentic instructional settings.

The study was guided by the following research questions:

1. What levels of questioning, according to Bloom's revised taxonomy, are practised by preservice teachers during classroom instruction?
2. What is the most common level of questioning used by preservice teachers in Fijian upper primary classrooms?

Literature review

The role of questioning in teaching and learning

Questioning is widely recognised as a foundational instructional strategy that plays a critical role in shaping classroom interaction and student learning. Effective questioning facilitates dialogue, activates prior knowledge, guides learning, and promotes deeper cognitive engagement (Obidovna, 2023). The types of questions teachers ask influence not only the level of student participation but also the depth and quality of learning that occurs. When questions are carefully planned and purposefully sequenced, they can help learners move beyond a surface understanding toward analysis, reasoning, and reflection (Alsaleh, 2020).

Research indicates that high-quality questioning supports students in progressing from rote memorisation to deeper conceptual understanding. Nold (2017) emphasised that questioning functions as a bridge between instruction and formative assessment, enabling teachers to identify misconceptions and adjust instruction accordingly. In this sense, questioning is not merely a means of verifying knowledge, but a tool for scaffolding learning and fostering metacognitive awareness. Approaches such as Socratic questioning further highlight the pedagogical value of enquiry-based dialogue in promoting analysis, synthesis, and evaluation (Abdullah et al., 2022). However, some scholars caution that higher-order questioning alone does not automatically lead to deeper learning unless students are adequately prepared to engage with open-ended tasks and supported through appropriate scaffolding (Li et al., 2022; Loyens et al., 2023). This suggests that the effectiveness of questioning is shaped not only by cognitive level but also by instructional context and learner readiness.

Despite the recognised importance of questioning, classroom practice remains dominated by low-level questions. Numerous studies report that a large proportion of classroom questions require only factual recall or simple comprehension (Joseph, 2018). This trend reflects a broader pedagogical challenge, where teachers, often constrained by curriculum demands, assessment pressures, or limited training, struggle to incorporate cognitively demanding questions into everyday teaching. Beginning teachers, in particular, tend to rely on recall-based questions due to limited pedagogical experience, insufficient confidence, or uncertainty in managing open-ended classroom discussions (Jiang, 2020; Salmon & Barrera, 2021). While a small number of studies have reported more balanced questioning patterns in inquiry-oriented classrooms, these contexts are typically characterised by strong institutional support and sustained professional development, conditions not universally available across schooling systems (Sarwanto et al., 2021).

Bloom's revised taxonomy and cognitive questioning

Bloom's taxonomy has long been used as a framework for classifying educational objectives and cognitive processes. The revised taxonomy proposed by Anderson and Krathwohl (2001) reconceptualised the original framework by emphasising action-oriented cognitive processes, remembering, understanding, applying, analysing, evaluating,

and creating. This revision highlights learning as an active process and emphasises higher-order thinking skills.

Within classroom questioning, Bloom's revised taxonomy provides a useful analytical lens for evaluating the cognitive demand of teacher questions. Lower-level questions typically focus on recalling information or demonstrating basic understanding, while higher-level questions require learners to apply knowledge, analyse relationships, evaluate ideas, or generate original responses (Kouicem & Boulakhal, 2025; Loyens et al., 2023; Özcan & Gültekin, 2024; SoodmandAfshar et al., 2024). In subjects such as social science, where enquiry, argumentation, and interpretation are central, the taxonomy is particularly relevant for promoting higher-order questioning (Aashamar et al., 2024).

Research consistently shows that classrooms dominated by lower-order questioning limit opportunities for cognitive development. Sarwanto et al. (2021) found that excessive reliance on recall questions restricts students' ability to develop critical and independent thinking skills. In contrast, classrooms where teachers deliberately incorporate higher-order questions are more likely to foster deep learning and active knowledge construction (Li et al., 2022; Niyazi & Wu, 2024). Nevertheless, some researchers argue that Bloom's taxonomy should be used flexibly rather than prescriptively, cautioning against viewing higher-order questioning as inherently superior in all instructional situations (West, 2023). This perspective emphasises the importance of aligning question types with lesson objectives, learner needs, and subject-specific requirements.

Preservice teachers and questioning practices

A substantial body of research has examined the questioning practices of preservice and novice teachers, revealing a strong tendency toward low-level questioning. Studies consistently report that preservice teachers predominantly ask closed, convergent questions that invite brief or factual responses (Hiltunen et al., 2021). This tendency is often attributed to anxiety, inexperience, and limited opportunities to practise higher-order questioning in authentic classroom settings. Dos et al. (2016) and Karaman and Büyükkıdık (2023) further noted that novice teachers frequently prioritise classroom control and student participation, leading them to favour safer, predictable questioning strategies.

Although Bloom's taxonomy is commonly introduced in teacher education programs, its practical application during teaching practicum remains inconsistent. West (2023) reported that while preservice teachers may demonstrate theoretical understanding of cognitive levels, they often struggle to apply this knowledge during live classroom instruction. When confronted with real classroom dynamics, preservice teachers tend to revert to factual questioning, particularly during early teaching experiences (Purnomo et al., 2024; Suphasri & Chinokul, 2021; Wang et al., 2017). Some studies, however, suggest that preservice teachers who receive sustained mentoring and explicit feedback during practicum are more likely to experiment with higher-order questioning, indicating that practice conditions play a critical mediating role (Coe et al., 2020).

This gap between theory and practice highlights a key challenge in teacher education. Understanding a theoretical framework does not automatically translate into effective classroom use unless preservice teachers receive guided practice, modelling, and feedback (Lee et al., 2019). Tour and Barnes (2021) emphasised that without structured mentoring, novice teachers often perceive higher-order questioning as risky or difficult to manage, particularly within time-constrained lessons.

Contextual and cultural factors further shape questioning practices. In many developing and small island contexts, including Pacific Island nations such as Fiji, teaching is often influenced by exam-oriented curricula, teacher-centred traditions, and limited access to professional learning opportunities (Chand, 2021; Singh & Chand, 2022). Notably, there is a scarcity of empirical research examining classroom questioning practices in the Pacific region, and virtually no published studies focusing specifically on preservice teachers' questioning in Fiji. This absence limits the extent to which international findings can be applied uncritically to the Fijian context, where linguistic diversity, curriculum reform, and resource variability may shape classroom interactions in distinctive ways.

Improving questioning in teacher education

Efforts to improve preservice teachers' questioning practices have increasingly focused on explicit instruction, modelling, and reflective practice. Bloom's revised taxonomy has been widely recommended as a planning tool to help preservice teachers align questions with intended learning outcomes (West, 2023). When used systematically, the taxonomy can support teachers in designing lessons that incorporate a range of cognitive demands.

Professional development approaches that include microteaching, peer observation, and collaborative lesson planning have shown promise in enhancing questioning skills (Breiman, 2019; Lotter et al., 2018). Mentor teachers' modelling plays a particularly important role, as preservice teachers are more likely to adopt higher-order questioning when they observe it used effectively in real classrooms. Additionally, video-based reflection has been found to increase preservice teachers' awareness of their questioning patterns and encourage a more deliberate use of higher-order questions (Prilop et al., 2020).

Despite these interventions, research continues to report limited use of higher-order questioning in early teaching careers (Bibi et al., 2020; Moyo et al., 2022). This persistence suggests that questioning skills require sustained and systematic development rather than isolated training sessions. Embedding questioning strategies into assessment criteria, practicum supervision, and reflective practice may therefore be essential in ensuring that preservice teachers develop the confidence and competence to engage learners in deeper thinking. These insights further underscore the need for context-specific research, such as the present study, to examine how preservice teachers enact questioning strategies within authentic classroom environments.

Theoretical framework

This study is grounded in Bloom's revised taxonomy of cognitive processes (Anderson & Krathwohl, 2001), which provides a hierarchical framework for classifying cognitive processes involved in learning and instruction. The taxonomy organises cognitive skills into six levels: remembering, understanding, applying, analysing, evaluating, and creating, progressing from lower-order to higher-order thinking. It has been widely adopted in educational research to examine the cognitive demand embedded in instructional practices, assessments, and classroom discourse, including teacher questioning.

Bloom's revised taxonomy is particularly relevant to the analysis of classroom questioning because it offers a systematic way to evaluate the intellectual complexity of questions posed by teachers. Questions at the lower levels of the taxonomy typically require recall or basic comprehension, while higher-level questions demand deeper cognitive engagement, such as applying knowledge to new situations, analysing relationships, evaluating ideas, or generating original responses. By focusing on the intended cognitive process elicited by each question, the framework enables more consistent and transparent categorisation than approaches based solely on question form (e.g., open or closed questions).

The use of Bloom's revised taxonomy in this study aligns with the broader educational emphasis on promoting higher-order thinking skills, which are essential for contemporary learning contexts. Krathwohl (2002) argued that effective teaching should engage learners across all cognitive levels, encouraging not only the acquisition of knowledge but also critical analysis, judgement, and creativity. From this perspective, classroom questioning plays a crucial role in shaping the quality of learning experiences and determining the extent to which students are cognitively challenged. This emphasis is particularly relevant in curriculum reform contexts, where learner-centred and inquiry-oriented pedagogies are strongly promoted.

In our study, Bloom's revised taxonomy functions as an analytical lens rather than a prescriptive teaching model. The taxonomy is not used to evaluate the quality of teaching in normative terms, but to systematically describe and analyse observable questioning practices as they occur during classroom instruction. It is used to categorise and analyse the questions preservice teachers ask during classroom instruction, enabling a systematic examination of patterns in questioning practices across subjects.

By mapping observed questions onto the six cognitive levels, the framework supports an evidence-based evaluation of the extent to which preservice teachers provide opportunities for higher-order thinking. This approach enables meaningful comparison across subject areas and lessons while remaining sensitive to contextual variations in instructional practice.

The framework is therefore suitable for addressing the research questions, as it enables the clear identification of dominant questioning levels and highlights gaps between intended pedagogical goals and actual classroom practice. Its use provides a coherent theoretical

basis for interpreting findings and drawing implications for preservice teacher education and practicum support.

Method

Research design

Our study adopted a qualitative descriptive research design to examine the cognitive levels of the questions preservice teachers posed during classroom instruction. A qualitative descriptive approach is appropriate when the aim is to provide a low-inference, systematic account of observed practices in natural settings without extensive theoretical interpretation (Hatch, 2023). This design enabled direct examination of classroom questioning practices as enacted during practicum teaching.

Sampling and participants

Purposive sampling was employed to select information-rich cases relevant to the research questions (Shamsudin et al., 2024). The participants comprised 18 final-year preservice teachers selected from a cohort of approximately 70 students enrolled in a three-year Bachelor of Education (Primary) program at a university in Fiji who were undertaking a compulsory teaching practicum. All participants were in their final year of study during the data collection period.

Selection criteria included (a) active placement in an upper primary classroom during the data collection period; (b) consent to classroom observation; and (c) representation across key curriculum subject areas. While availability and geographic accessibility influenced participation, the sample was intentionally structured to ensure subject-area representation rather than being based solely on convenience. All preservice teachers who met the selection criteria and were available during the practicum window were invited to participate, and 18 consented.

Research context and setting

Data were collected in upper primary classrooms across urban, peri-urban, and rural schools in Fiji. Each classroom served as a practicum placement for a participating preservice teacher. Observations focused specifically on how preservice teachers formulated and used questions during instruction. Researchers acted as non-participant observers to minimise disruption to normal classroom routines. Data collection was conducted over a six-week period from October to November, coinciding with the final practicum placement for preservice teachers.

Each of the 18 preservice teachers was observed teaching one 30-minute lesson. These 18 lessons were distributed evenly across six subject areas: English, mathematics, iTaukei language, social science, basic science, and health science, with three different preservice teachers observed per subject. This structure ensured balanced representation across curriculum areas while maintaining a manageable scope of observation.

The observed classrooms were single-grade classes only (Years 5–8). Class sizes ranged from approximately 25 to 38 students, reflecting typical upper primary classroom conditions in Fiji. Instruction during the practicum was conducted primarily in English, the official medium of instruction in Fijian schools, with iTaukei and Fiji Hindi used flexibly for clarification and classroom interaction as needed.

Data collection

Data were gathered through non-participant classroom observations conducted during regular school hours. Each preservice teacher was observed teaching one 30-minute lesson. A structured observation protocol was used to record all teacher questions verbatim.

The observation protocol included: (a) a running transcript section for recording teacher questions verbatim; (b) a contextual notes column used to briefly document lesson phase (e.g., introduction, guided practice); student responses (choral, individual, silence), and teacher follow-up; and (c) lesson metadata (subject, class level, observation number). The "contextual notes" component was designed to capture immediate instructional context rather than comprehensive classroom profiling. As a result, certain structural variables, such as exact student numbers and detailed class composition (e.g., gender balance or full demographic breakdown), were not systematically recorded in all observations. This decision was made to prioritise the accurate capture of questioning sequences and minimise observer intrusion during live lessons. However, general classroom characteristics (e.g., approximate class size and single-grade) were noted retrospectively where possible to support the interpretation of findings. Contextual notes were intentionally brief and descriptive to support accurate interpretation of questions during analysis rather than to evaluate teaching quality.

Data analysis

Data analysis followed a deductive content analysis approach, guided by the six cognitive categories of Bloom's revised taxonomy: remembering, understanding, applying, analysing, evaluating, and creating (Anderson & Krathwohl, 2001). Deductive analysis was appropriate because the study sought to apply an established theoretical framework to categorise observed classroom questions (Kleinheksel et al., 2020).

All teacher questions recorded during classroom observations were transcribed verbatim. Each question was then coded according to its dominant cognitive demand, as defined by Bloom's revised taxonomy. To support consistency and analytical rigour, a coding guide was developed that included operational definitions, decision rules, and illustrative examples for each cognitive level.

Following initial coding, approximately 10% of the total dataset was independently coded by a second educational researcher, who was familiar with Bloom's revised taxonomy. An initial inter-rater agreement of approximately 85% was achieved prior to discussion.

Discrepancies were reviewed and resolved through consensus, strengthening the reliability and transparency of the coding process (Miles et al., 2019; Saldaña, 2021).

Following final coding, the frequency of questions within each cognitive category was calculated. These data were entered into Microsoft *Excel* to generate descriptive statistics, including frequencies and percentages. This quantification of qualitative data enabled comparisons across subjects and classrooms, supporting the identification of overall trends in questioning practices.

Trustworthiness of the study

Trustworthiness in this qualitative study was established through the criteria of credibility, dependability, confirmability, and transferability (Korstjens & Moser, 2018; Lincoln & Guba, 1985). Credibility was enhanced through direct, non-participant classroom observations conducted in authentic teaching contexts. Observations took place during regular lessons, allowing questioning practices to be captured as they naturally occurred (Creswell & Poth, 2018). The use of a structured observation protocol and verbatim recording of teacher questions strengthened data accuracy. Observations across multiple subjects further supported a more comprehensive and credible representation of questioning practices (Shenton, 2004).

Dependability was supported by consistent data collection and analysis procedures across all observations. A uniform observation protocol and a standardised deductive coding process guided by Bloom's revised taxonomy were applied to all data (Anderson & Krathwohl, 2001). Detailed documentation of observation procedures, coding decisions, and reliability checks provided a clear audit trail, enhancing methodological transparency (Nowell et al., 2017).

Confirmability was addressed by grounding the analysis in an established theoretical framework and by employing systematic coding procedures to minimise researcher bias. The inclusion of inter-rater agreement prior to consensus further strengthened the neutrality of the analytical process (Miles et al., 2019).

Transferability was supported through a thick description of the research context, participants, subject areas, and data collection procedures. The Fijian context shares characteristics common to many small island and developing education systems, including diverse linguistic classrooms, examination-oriented curricula, resource constraints, and colonial legacies in schooling. Such contextual detail enables readers to assess the applicability of the findings to comparable educational settings (Lincoln & Guba, 1985; Tracy, 2010).

Ethical considerations

Ethical approval for the study was obtained from the relevant university ethics committee prior to data collection. Participants received written information outlining the purpose and procedures of the study and were informed that participation was voluntary and that

they had the right to withdraw at any time without consequences (Creswell & Creswell, 2018). Informed consent was obtained prior to the commencement of classroom observations. All identifying information was anonymised, and data were securely stored in password-protected files accessible only to the researchers. The study adhered to established ethical guidelines for educational research, ensuring respect, confidentiality, and integrity throughout the research process (Bryman, 2016).

Results

This section presents the findings of the study on the cognitive levels of classroom questions posed by preservice teachers during their practicum. Results are organised by subject area to reflect variations in questioning practices across instructional contexts. For each subject, the distribution of questions across Bloom's revised taxonomy is reported using both figures and supporting descriptions. A summary table is included to present the overall distribution of questioning across all observed lessons.

English language

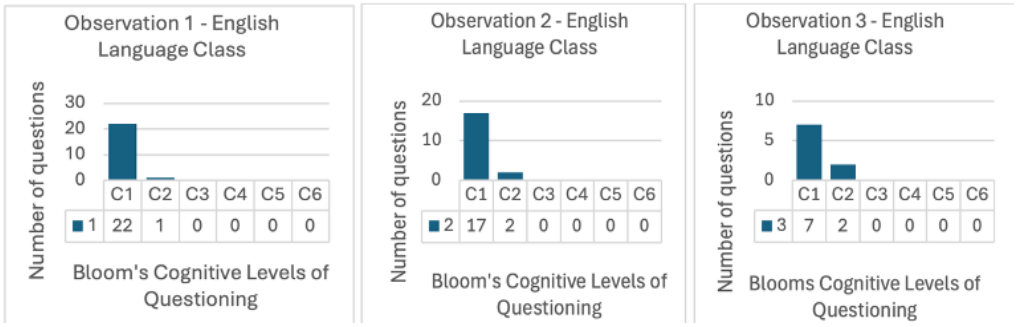

Figure 1: Cognitive levels of classroom questioning in English language lessons

Note. Figure 1 represents the aggregate distribution of questions across three observed English language lessons taught by three different preservice teachers.

Analysis of questioning practices in English Language lessons revealed an overwhelming dominance of remembering-level questions, which accounted for almost all questions posed during the three observed lessons. These questions primarily required students to recall factual information, identify textual details, or reproduce previously taught content. Understanding-level questions accounted for only a very small proportion of total questions, typically prompting brief explanations of word meanings or simple ideas from the texts. No questions were observed at the applying, analysing, evaluating, or creating levels. Overall, English language instruction relied almost entirely on recall-based questioning, indicating limited use of questioning to promote interpretation, inference, or critical engagement with texts.

Mathematics

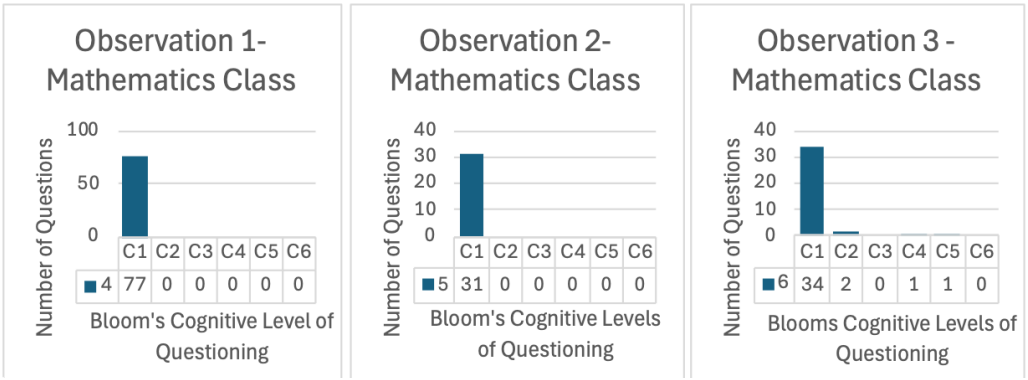

Figure 2: Cognitive levels of classroom questioning in mathematics lessons
Note. Figure 2 represents the aggregate distribution of questions across three observed Mathematics lessons taught by three different preservice teachers.

Questioning practices in mathematics lessons were similarly dominated by remembering-level questions, accounting for the vast majority of all observed questions. These questions focused on recalling number facts, formulas, or procedural steps. A very small number of questions were coded at the understanding level, typically requiring students to explain a procedure or identify a correct method. Only isolated instances of higher-order questioning (applying or analysing) were observed, together representing a negligible proportion of total questions. This pattern suggests that mathematics instruction during practicum was largely procedural and teacher-directed, with limited emphasis on reasoning, problem-solving, or evaluative thinking.

iTaukei (Fijian language)

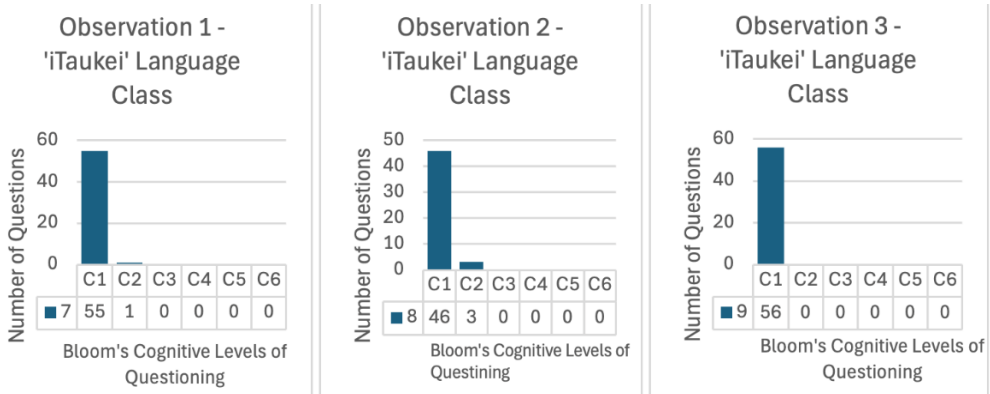

Figure 3: Cognitive levels of classroom questioning in iTaukei language lessons
Note. Figure 3 represents the aggregate distribution of questions across three observed iTaukei language lessons taught by three different preservice teachers.

In the iTaukei language lessons, questioning was almost exclusively concentrated at the remembering level, which accounted for nearly all observed questions across the three lessons. These questions typically required students to recall vocabulary, grammatical forms, or factual language content. A small number of understanding-level questions were observed, generally asking students to explain meanings or identify simple relationships. No questions were recorded at the applying, analysing, evaluating, or creating levels. This pattern suggests that language instruction was primarily focused on recall and recognition, with minimal use of questioning to support the development of interpretive, analytical, or expressive language skills.

Social science

Figure 4 represents the aggregate distribution of questions across three observed social science lessons taught by three different preservice teachers.

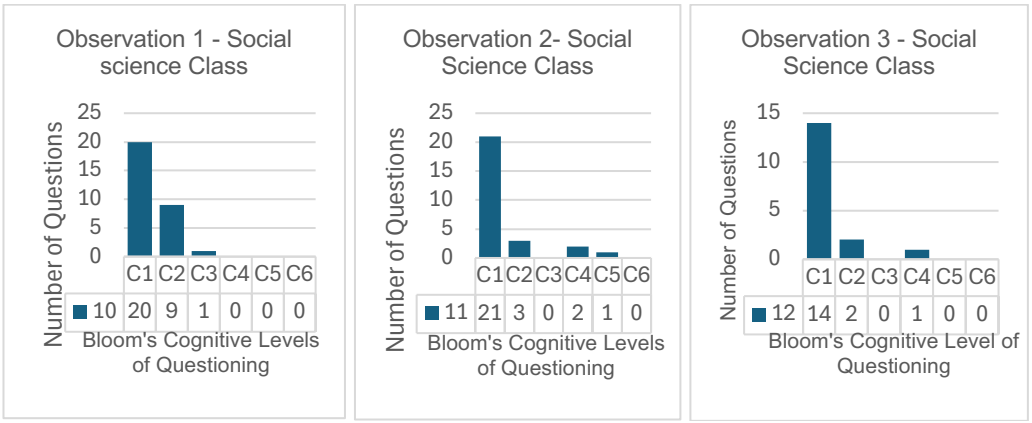

Figure 4: Cognitive levels of classroom questioning in social science lessons

Social science lessons demonstrated greater cognitive diversity compared to other subjects, although lower-order questioning still predominated. Remembering-level questions accounted for the largest proportion of observed questions, followed by a noticeable increase in understanding-level questions that prompted explanations, descriptions, or interpretations of social concepts. A small number of questions reached the applying, analysing, and evaluating levels, requiring students to interpret information, justify their responses, or express their judgments.

This comparatively broader cognitive range may reflect the discussion-oriented nature of social science content, which lends itself more readily to interpretation, reasoning, and evaluative judgment. Nevertheless, higher-order questions remained limited overall, and recall-based questioning continued to dominate instructional interactions.

Basic science

Figure 5 represents the aggregate distribution of questions across three observed basic science lessons taught by three different preservice teachers.

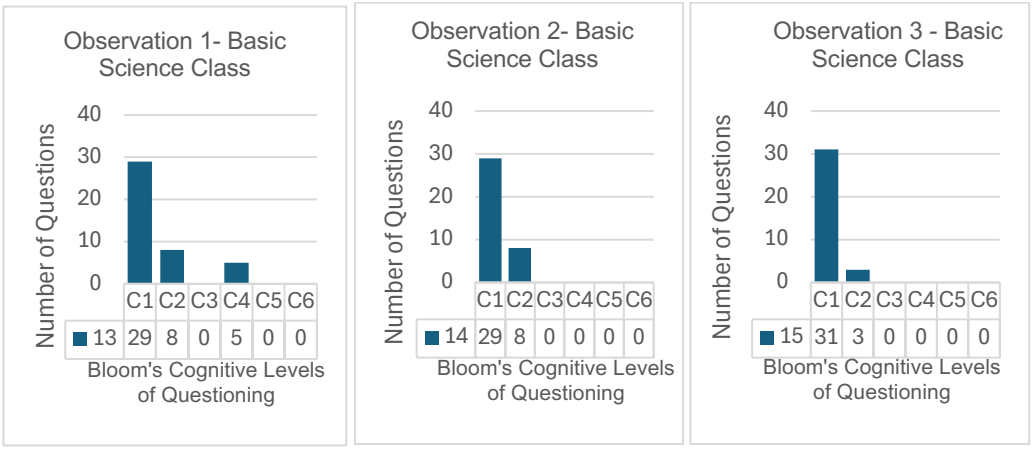

Figure 5: Cognitive levels of classroom questioning in basic science lessons

Questioning in basic science lessons was largely focused on the remembering level, accounting for the majority of questions posed. These questions focused on recalling scientific facts, terminology, and basic concepts. A modest proportion of questions were coded at the understanding and analysis levels, indicating occasional opportunities for students to explain scientific ideas or identify simple relationships. No questions were observed at the applying, evaluating, or creating levels. Although some cognitive variation was evident, basic science instruction remained predominantly recall-oriented, with limited use of questioning to promote scientific reasoning or inquiry.

Health science

Figure 6 represents the aggregate distribution of questions across three observed health science lessons taught by three different preservice teachers. Health science lessons exhibited a pattern similar to most other subjects, with remembering-level questions constituting the overwhelming majority of observed questioning. These questions primarily required recall of health-related facts and concepts. A small number of understanding-level questions were observed, typically asking students to explain basic ideas. No questions were recorded at the applying, analysing, evaluating, or creating levels. This suggests limited use of questioning to encourage students to apply health knowledge to real-life situations or engage in critical health-related decision-making.

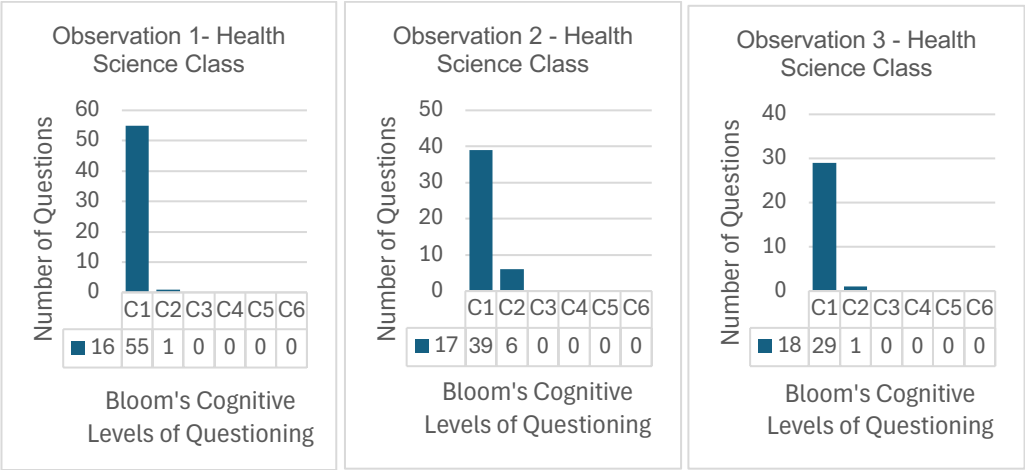

Figure 6: Cognitive levels of classroom questioning in health science lessons

Overall distribution of questioning across subjects

Table 1 summarises the overall distribution of questions across all 18 observed lessons. The data show that over 9 out of every 10 questions (90.6%) were at the remembering level, followed by a small proportion at the understanding level. Questions at the applying, analysing, and evaluating levels were extremely rare, and no creating-level questions were observed across any subject. This pattern was consistent across subjects, despite minor variation in social science and basic science.

Table 1: Distribution of preservice teachers' questions by cognitive level (Bloom's revised taxonomy)

Bloom's category	No. of questions	Percentage (%)
Remembering (C1)	612	90.6
Understanding (C2)	52	7.7
Applying (C3)	1	0.1
Analysing (C4)	9	1.3
Evaluating (C5)	2	0.3
Creating (C6)	0	0
Total	676	100

Summary of key results

Across all subject areas, preservice teachers relied predominantly on lower-order questioning strategies during classroom instruction. While questioning was frequently used to manage lesson flow and encourage participation, the cognitive demand of questions was generally low. Higher-order questions were rare, inconsistently distributed, and largely absent in several subjects. As a result, opportunities for students to engage in deeper thinking, reasoning, and creativity were limited during the practicum lessons observed.

Discussion of results

This study examined the cognitive levels of classroom questions posed by preservice teachers during practicum teaching, using Bloom's revised taxonomy as an explicit analytical lens. The discussion interprets the findings in relation to the overall distribution of questioning, the dominance of lower-order questions, subject-based variations, and the limited use of higher-order questioning, particularly at the creating level. By mapping observed questioning practices onto the hierarchical structure of Bloom's taxonomy, the discussion highlights the extent to which classroom questioning aligned with, or failed to align with, the taxonomy's emphasis on progressive cognitive engagement.

Overall patterns of questioning

The results indicate that questioning was a frequent instructional practice across all observed lessons; however, the cognitive demand of these questions was heavily concentrated at the lowest levels of Bloom's revised taxonomy. As illustrated in Figures 1 and 2 and summarised in Table 1, most questions were categorised at the remembering and understanding levels, suggesting that preservice teachers primarily used questioning to check recall and basic comprehension rather than to promote deeper cognitive engagement. From a Bloom's taxonomy perspective, this pattern reflects a limited application of the taxonomy, with little movement beyond foundational cognitive processes toward higher-order thinking.

This pattern aligns with previous research showing that novice teachers tend to prioritise factual and procedural questioning, particularly during early teaching experiences (Hiltunen et al., 2021; Suphasri & Chinokul, 2021). The predominance of lower-level questioning may reflect preservice teachers' focus on lesson flow, classroom management, and curriculum coverage during practicum. Under these conditions, questioning primarily functions as a confirmation or control mechanism rather than as a deliberate strategy to scaffold learners through increasingly complex cognitive processes, as envisaged by Bloom's taxonomy. As a result, opportunities for learners to engage in analytical, evaluative, or generative thinking remain constrained.

Importantly, this pattern should not be interpreted solely as a pedagogical limitation. It may also reflect adaptive and context-responsive teaching decisions within the realities of primary classroom environments. Preservice teachers, particularly during practicum, are required to balance multiple competing demands, including maintaining classroom order, ensuring participation, and completing planned lesson content within short instructional periods (typically 30-40 minutes). In such contexts, lower-order questions may serve practical and pedagogically appropriate purposes, such as checking readiness, reinforcing foundational knowledge, and sustaining lesson momentum.

Dominance of lower-order questioning

The imbalance between lower and higher-order questioning is clearly demonstrated in Table 1, which shows that lower-order questions (remembering and understanding)

accounted for over 98% of all observed classroom questions. Within the taxonomy's hierarchical structure, this imbalance indicates a heavy reliance on the foundational levels, with minimal progression toward the upper levels that support critical thinking, judgment, and knowledge construction. Higher-order questions were comparatively rare, suggesting that preservice teachers did not consistently challenge students to analyse information, evaluate ideas, or construct new understandings.

This finding supports earlier studies indicating that although preservice teachers are often introduced to Bloom's taxonomy during teacher education programs, they experience difficulty translating theoretical knowledge of cognitive levels into classroom questioning practice (Coe et al., 2020; West, 2023). The practicum context may further discourage pedagogical risk-taking, as preservice teachers operate under the scrutiny of observation and assessment. Such risks may include losing control of classroom discourse, being unable to manage diverse or unexpected student responses, deviating from a carefully planned lesson sequence, or exposing gaps in their own subject knowledge when responding to open-ended questions. Consequently, preservice teachers may default to closed, recall-based questions that offer predictability and perceived instructional safety.

However, a more contextually grounded interpretation suggests that such questioning patterns may also reflect prudent, professionally responsible decision-making rather than simple reliance on lower-level pedagogy. In classrooms characterised by relatively large class sizes, diverse learner abilities, and, in some cases, multigrade structures, preservice teachers may deliberately use simpler questions to maintain inclusivity and ensure that all learners can participate. Lower-order questions may also serve as cognitive scaffolding, helping students build confidence before engaging with more demanding tasks. In this sense, recall-based questioning can play a legitimate role in supporting learner motivation, particularly for students who may struggle with more complex cognitive demands.

Subject-based variations in questioning

Although lower-order questioning dominated across all subject areas, some variation was evident in the distribution of higher-order questions. As shown in Figures 4 and 5, subjects such as social science and basic science showed slightly greater representation of analysing and evaluating questions than other subjects. These subjects often involve interpretive content, social issues, or causal explanations, which may create more natural openings for higher-level questioning within Bloom's taxonomy.

However, even in these subjects, higher-order questioning remained limited overall. This suggests that subject matter alone is insufficient to ensure cognitive progression across the taxonomy. Instead, questioning practices appear to be shaped more strongly by preservice teachers' pedagogical confidence, instructional planning, and familiarity with questioning strategies, than by curriculum content. This observation aligns with previous research suggesting that, without explicit modelling, scaffolding, and guided practice, preservice teachers tend to replicate similar questioning patterns across different curriculum areas (Tour & Barnes, 2021).

It is also important to recognise that subject-specific pedagogical expectations in primary education may influence the choices made in questioning. For example, in language and foundational subjects, emphasis is often placed on vocabulary development, comprehension, and procedural fluency, which naturally lend themselves to lower-order questioning. Preservice teachers may therefore be aligning their questioning strategies with perceived curriculum priorities and learner readiness, particularly when working with younger learners who are still developing foundational knowledge and skills.

Limited use of higher-order questioning

A closer examination of higher-order questioning revealed that analysing questions occurred more frequently than evaluating or creating questions, though still in very small numbers. Notably, no creating-level questions were observed across any subject. Within Bloom's revised taxonomy, the creating level represents the highest form of cognitive engagement, requiring learners to generate original ideas, design solutions, or produce new knowledge (Anderson & Krathwohl, 2001). The absence of creating questions therefore directly undermines the taxonomy's emphasis on active, learner-centred knowledge construction.

This finding suggests that preservice teachers may lack the confidence, pedagogical strategies, or classroom support needed to facilitate open-ended, inquiry-based interactions. Similar patterns have been reported in other studies, which noted that novice teachers often avoid generative questioning due to concerns about time constraints, classroom management, and the unpredictability of student responses (Karaman & Büyükkıdık, 2023). As a result, questioning remains focused on confirming existing knowledge rather than extending or transforming it.

At the same time, the absence of creating-level questions should be interpreted cautiously. In short lesson periods and tightly structured practicum lessons, opportunities for extended inquiry, project-based tasks, or creative knowledge construction may be limited. Preservice teachers may prioritise lesson completion and clarity of instruction over exploratory dialogue, particularly when they are still developing confidence in managing classroom interactions. From this perspective, the limited use of higher-order questioning may reflect structural and contextual constraints rather than a lack of pedagogical intent.

Contextual considerations

The findings must also be understood within Fiji's broader educational context. Teaching practices in many developing and post-colonial education systems have historically been shaped by exam-oriented curricula and teacher-centred pedagogies (Chand, 2021; Singh & Chand, 2022). These systemic influences may reinforce recall-based questioning practices, particularly during practicum, where preservice teachers are socialised into established school norms and expectations.

Despite curriculum reforms and policy directives in Fiji that emphasise critical thinking, learner-centred instruction, and 21st-century skills, the results indicate a persistent gap

between policy intentions and enacted classroom practice. This gap has significant implications for Fiji's educational development goals, as limited exposure to higher-order questioning may hinder students' ability to develop problem-solving, reasoning, and creative skills essential for participation in a knowledge-based economy. Addressing this disconnect requires stronger alignment between teacher education programs, practicum supervision, and classroom expectations, with explicit attention to developing preservice teachers' competence and confidence in higher-order questioning.

However, it is equally important to acknowledge that preservice teachers operate within institutional and structural constraints that shape their pedagogical choices. Factors such as class size, multigrade teaching contexts, limited instructional time, curriculum coverage expectations, and varying levels of student readiness all influence the types of questions that can be effectively used. Recognising these realities allows for a more balanced interpretation of the findings, in which preservice teachers' practices are seen not simply as deficiencies but as contextually situated responses to the complexities of real classroom environments.

Conclusions and implications

This study examined the cognitive levels of the questions preservice teachers asked during classroom instruction using Bloom's revised taxonomy. The findings indicate a strong reliance on lower-order questioning, with limited use of higher-order questions. While some subject-based variation was evident, higher-order questions, particularly at the evaluating and creating levels, remained under-represented across all observed lessons. This pattern suggests that classroom questioning during practicum largely supported knowledge recall and basic comprehension, rather than progressive cognitive engagement as envisioned in Bloom's taxonomy. At the same time, these findings should be interpreted as initial evidence-based, rather than a definitive evaluation of preservice teachers' pedagogical capability. The observed predominance of lower-order questioning represents a starting point for deeper investigation, rather than a final judgement. As discussed earlier, questioning practices are shaped by contextual realities such as class size, lesson duration, curriculum demands, and learner readiness, and these factors must be considered when interpreting the results.

These findings contribute to the growing body of evidence suggesting that preservice teachers often struggle to translate theoretical knowledge of questioning frameworks into classroom practice. In the context of Fiji's ongoing curriculum reforms, which emphasise learner-centred pedagogy, critical thinking, and problem-solving, the results highlight a persistent gap between policy intentions and enacted classroom practice. If left unaddressed, this gap may limit students' opportunities to develop higher-order thinking skills, which are central to national educational development goals and global competencies. Strengthening preservice teachers' questioning skills is therefore a key driver of improving instructional quality and student cognitive engagement, not only in Fiji but also in comparable developing and small-island education systems.

Implications for teacher education and practice

The findings suggest several implications for preservice teacher education programs. First, instruction on Bloom's revised taxonomy should move beyond conceptual understanding to explicitly model higher-order questioning in authentic classroom contexts. For example, teacher educators could demonstrate how a lesson on a local social science topic, such as community leadership or environmental sustainability in Fiji, can be scaffolded with progressively higher-order questions, moving from factual recall to analysis of causes and evaluation of solutions. The use of subject-specific lesson templates that explicitly map questions to Bloom's cognitive levels may further support preservice teachers in operationalising the taxonomy during lesson planning.

Second, mentor teachers and university supervisors play a critical role in shaping questioning practices. Providing targeted, formative feedback that explicitly identifies the cognitive level of questions asked, highlights missed opportunities for higher-order engagement, and offers alternative phrasing of questions may help preservice teachers develop greater pedagogical awareness and confidence. For instance, feedback might contrast a recall question with a rephrased analysing or evaluating question drawn from the same lesson content.

Third, embedding questioning analysis into practicum assessment criteria may reinforce the importance of cognitive demand in instructional practice. This could include specific assessment indicators, such as evidence of planned higher-order questions, use of follow-up prompts to extend student thinking, and alignment between lesson objectives and the cognitive levels of the questions. Such criteria would signal that questioning quality is a core component of effective teaching, rather than a peripheral skill.

More broadly, the findings underscore the relevance of this study for teacher education research in similar contexts beyond Fiji, particularly in systems undergoing curriculum reform while grappling with entrenched teacher-centred pedagogies and examination-oriented traditions.

Limitations of the study

Several limitations should be acknowledged. Our study focused on a specific cohort of preservice teachers within a particular teacher education context, which may limit the generalisability of the findings. Data were derived from classroom observations only and did not include interviews or reflective accounts that could have provided deeper insight into preservice teachers' decision-making processes. Additionally, the study examined questioning practices at a single point in time, rather than tracking their development over the duration of the practicum.

Recommendations for future research

Given that the present findings represent an initial exploration, there is a need for a more comprehensive and sustained programme of research to better understand the factors

shaping classroom questioning practices. Several priority areas for future research are proposed.

First, further research is needed to examine the influence of class size and classroom composition (including multigrade settings) on teachers' questioning strategies. Understanding how these structural conditions shape pedagogical decision-making would provide important insights into why lower-order questioning may be more prevalent in certain contexts.

Second, future studies should investigate the role of lesson duration and time constraints in shaping questioning practices. Short lesson periods may limit opportunities for extended dialogue, inquiry, and higher-order thinking, and research in this area could clarify how time structures influence cognitive engagement in classroom interaction.

Third, there is a need to explore preservice teachers' own perspectives on their practicum experiences, particularly their reasoning behind question selection and use. Qualitative approaches such as interviews, reflective journals, or stimulated recall could provide deeper insight into the intentions, constraints, and thought processes underlying observed practices.

Fourth, future research should examine the relationship between higher-order questioning and student learning outcomes, particularly the development of higher-order thinking skills. Establishing stronger empirical links between questioning practices and student cognitive outcomes would provide a more robust evidence base for pedagogical recommendations.

Finally, longitudinal and mixed-method studies are recommended to track the development of questioning practices over time, from initial teacher preparation through early career teaching. Such research would help determine whether observed patterns persist, evolve, or improve with experience and professional support.

Acknowledgements and declarations

We would like to thank all the participants who provided valuable information towards this study.

Funding

The authors state that no funding was involved.

Ethical approval

This research was approved by the author's institutional review board. The study was conducted in accordance with all required ethical protocols. Prior to signing the consent forms, all participants were informed that their participation was voluntary and that they would remain fully anonymous.

Conflict of interest

The authors declare no competing interests.

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Please cite as: Qabale, I. D., Chand, S. P. & Raiula, T. R. (2026). Preservice teachers' classroom questioning practices: An analysis using Bloom's revised taxonomy. *Issues in Educational Research*, 36(3), 1188-1212. http://www.iier.org.au/iier36/qabale.pdf