

Classroom Interaction: Investigating the Forms and Functions of Teacher Questions in Moroccan Primary School

My Essaid Chafi and Elmostapha Elkhouzai

Laboratory IDDS, University Hassan I, FSTS, 26000 Settat, Morocco

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ABSTRACT: This study investigates to what extent Moroccan primary school teachers utilize questions as a powerful pedagogical implement to stimulate thinking and construct knowledge. The intent is to highlight the forms and functions of questions posed and how effective they are in consolidating understanding and scaffolding thinking. The theoretical framework underpinning this study is embedded within the sociocultural perspective that conceptualizes the classroom as a cultural location of meaning in which relationships, functions, regulations, values, and norms are socially constructed. The study draws on observation data in large-class settings. Twenty teachers from five different schools took part in the study. Fifty lessons covering a range of subjects and topics were observed. Some of the lessons were audiotaped following teachers' consent. Verbal manuscripts of classroom questions were analyzed qualitatively and quantitatively. The focus was on questioning exchanges and how they aided or obstructed knowledge construction and cognitive engagement of learners. The findings of this study illustrate how whole-class questioning is dominated by factual questions requiring prescribed responses. Few questions were of speculative nature, which invites opinions, hypotheses and imaginings. Teachers employ questioning to retain control and to support their teaching, rather than pupil learning. . From the results it can then be recommended that in-service workshops should be supplied for teachers, and courses on how to use effective classroom questions to advance attainment/ learning outcomes of students. The concern for good use of teachers' classroom questions for effectual learning outcomes should also be integrated in the training programs at different teacher training centers in Morocco.

KEYWORDS: Teacher Questioning, Classroom Observation, Higher Order Thinking, Transmission Teaching, Cognitive Engagement.

1 INTRODUCTION

Questioning is one of the most familiar forms of teacher talk in classrooms. It is acknowledged as a fundamental part of the staple diet of classroom interaction through which a variety of pedagogical and social actions are carried out. In fact, it is difficult to visualize teachers teaching without posing questions [1]. How teachers bring into play questions during whole-class instruction has spawned multitudinous discussions on the nature and role of this basic discursive implement for engaging learners in instructional interactions, checking comprehension, and building understandings of complex concepts ([2], [3], [4], [5]. Preceding classroom-based studies have identified a range of question types, for example, closed and open-ended questions [6] display and referential questions ([7], forced-choice questions [8], assisting and assessing questions [4], and clarification requests [9], [10], [11]. If, as Postman (1979) stated, "all our knowledge results from questions, . . . [and] question-asking is our most important intellectual tool" [12], then sustained research into this tool can potentially advance instruction.

Croom and Stair (2005) state that classroom questions are best used "as diagnostic tools to help indicate students' academic progress or to assess students' critical thinking" [13]. This view was upheld by Vogler (2005): "questions can monitor comprehension, help make connections to prior learning and stimulate cognitive growth" [14]. Unskilled classroom questions from teachers are characterized as low-level that mainly check whether knowledge has been transmitted. These

types of questions termed “recitation questions” rather than “in-depth questions” [15]. The act of posing questions has the potential to enormously facilitate or influence learning process; however, it may also have the capacity to hinder pupil’s learning if not conducted properly. As Chin (2006) indicates, flexibility in questioning is needed, the teacher adjusts questioning to accommodate students’ contributions and respond to students’ thinking in a neutral rather than evaluative manner [16]. By the same token, Hunkins (1995) observes that there is a shift from conceptualizing questions as devices by which students are evaluated about the specifics of learning to viewing question as instrument for active processing, thinking about, and using information productively [17]. Questions have been employed as key vehicles that “elicit awareness of the diversity, complexity, and richness of knowledge” [17].

Classroom teachers are expected to foster thought and inspire inquiry in pupils, and one effective instrument at teachers’ disposal for fulfilling that is proper questioning. When teachers’ questions are utilized appropriately [18], they can improve learning by enhancing critical thinking skills, reinforce pupil understanding, correct their misunderstanding, provide feedback for students and stimulate classroom discussion. Danielson (1996) confirms that “good and skilled questions, when they are carefully crafted and framed engage students in a true exploration of the content and allow the students to exhibit their understanding of the concept” [15].

Teacher questioning serves a number of functions in the classroom [19], [20], [21]:

- asking questions fosters students’ interest and maintain their active involvement;
- questions help students voice out their minds;
- questions are tools to follow-up and elaborate on students’ contributions;
- asking questions enables teachers to control disciplinary and behavioral issues;
- questions are an indispensable evaluative tool; to diagnose specific difficulties inhibiting pupil learning;
- to provide opportunity for students to assimilate and reflect upon information;
- to develop an active approach to learning .

2 THEORETICAL BACKGROUND

The theoretical framework underpinning this study is embedded within the sociocultural perspective that conceptualizes the classroom as a cultural site of meaning in which relationships, roles, rules , values and norms are socially constructed [22], [23] into being the local interactions of the community. Researchers within this tradition treat education and cognitive development as cultural processes whereby knowledge is not possessed individually but also shared amongst members of communities; and understandings are jointly constructed through their involvement in events which are shaped by cultural and historical factors. Education is viewed as occurring through dialogue whereby “the interactions between students and teachers” echo “the historical development, cultural values and social practices of the societies and communities in which educational institutions exist” [24]. The socially established cultural practices of the classroom become evident and repeatedly reconstructed in the pedagogical and social life of the classroom, mirrored in the customary ways of participation and communication [25], [26]. The interaction patterns in the classroom community can be seen as both fostering and also impeding opportunities for learning to classroom members [27], [23]. Sociocultural views of learning hinge on theories that underscore the social nature of development. Human activities in the sociocultural tradition are socially mediated and thus learning is seen as a matter of participation in a social process of knowledge construction rather than an individual endeavor [28]. Knowledge emerges through the network of interaction and is distributed among interactants. Learning is a process that, as stated by [29], takes place in a participation framework, not in an individual mind.

McCormick and Donato (2000), working within a sociocultural theoretical standpoint, suggest that teacher questions should not take on the position of an elicitation tool where teachers elicit pupils’ knowledge about the content of the discussion. Rather, they put forward that teacher questions need to be conceptualized as dynamic discursive tools that are meant to establish collaboration and scaffold understanding [30]. Operating within the same theoretical paradigm, Hall and Verplaetse (2000) propose that teachers’ questions need to be implanted within a context that permits students to engage in oral interactions that facilitates language production that will eventually aid learning [31]. According to Vygotsky (1978), questions are one case in point of symbolic linguistic tools that semiotically mediate, assist, and scaffold mental activity during both formal and informal instructional activity [28].

In this study, we believe that a framework to study classroom questions must reflect their mediational quality; that is, their ability to assist learning [32]. To attain this, we investigate the forms and functions of teacher questions and their link to knowledge construction and cognitive engagement of pupils. Three concepts of sociocultural theory specifically shored up this investigation of teacher questions. At the outset, learning transpires in well contextualized activities that often occur during collaboration [33]. Subsequently, collaboration with a more knowledgeable individual during problem solving often

gives rise to cognitive development in the learner [34], [35], [36]. As a final point, speaking is the principal semiotic tool used to lead learners to carry out what they cannot act upon unassisted [28], [37].

3 METHODOLOGY

Although questioning is a fundamental facet of any classroom interaction, it is still an under-researched area in the Moroccan classroom context. There is a scarcity of data into how teachers actually teach in Moroccan primary classrooms. There is a need for field data on which to base decisions and formulate policies so as to bridge the gap between the rhetoric and reality of educational development. The design of this research was observational. Service teachers were observed in classes and recordings were made following specified aspects of classroom interaction. Applying “focused whole-class observation” [38] enabled the researcher to be ‘covert’: not to reveal exactly what he was looking for in the observation to reduce ‘participants bias’ when they try to accommodate to what they assume the researcher was looking for. Additionally, having a checklist of entire criteria to observe helped the researcher to stay focused on aspects he wanted to investigate in the study.

Data were collected in four primary schools in Marrakech, including rural, urban, and suburban sites. All of them were public schools. They were selected to be as representative as possible –geographically, economically, and culturally. The schools operate from grade 1 to 6. The language of instruction is Standard Arabic and French. In practice the language of instruction turned out to be a blending of Standard Arabic and Moroccan Arabic. Even the teaching of French is heavily punctuated by the use of Moroccan Arabic. The numbers of pupils in classrooms ranged from 30 to 45. The main teaching aids in most classrooms were the chalkboard and textbooks.

Data collection took five weeks. Methods included eight to ten hours per week of classroom observation and around three to four hours of audio-taping. The focus was on the forms and functions of questions, and how effective they are in scaffolding thinking and consolidating understanding in the narrow context of classrooms. During classroom observation, I participated most through listening to what was going on in the classroom. In order to identify forms and functions of questions in classroom talk, based on Myhill’s classification [39], the researcher tracked the questions posed, the answers that they generated and how the teacher followed up on these answers. In deciding which utterances were to be considered as questions, I settled on that any question or statement that provoked a response would be characterized as a question. This would capture all those authentic endeavors on the part of the teacher to engage pupils in the talk. The unit of analysis was ‘IRF’ structure: Initiation–Response–Feedback [40]. Teachers’ initiating questions and the corresponding students’ answers that they elicited were analyzed, with a particular attention to the kind of questions asked, how they were posed, and the relationships between the cognitive level of questions and students’ responses, and the types of follow-up given in response to answers. I specifically focused on the effect of preceding utterances on subsequent ones, and to what extent teachers’ questions influenced what pupils contributed and whether they triggered further thinking.

To accomplish the purpose of this study, the subsequent questions were raised:

1. What is the frequency of the occurrence of different types of questions in the discourse of Moroccan primary school talk?
2. What functions do the questions fulfill?
3. How effective are these questions in engaging pupils cognitively?

4 FRAMEWORK FOR ANALYSIS OF TEACHER QUESTIONS

4.1 CLASSIFICATION OF QUESTIONS BY FORM

The researcher analyzed the observations and tape recordings and sought to categorize the questions used by the teachers. The outcome of data analysis was a classification of the questions used by the teachers both in terms of forms and functions in the context of Teaching. The classification of teacher questions was conducted through adopting Myhill’s taxonomy [39]. She suggested four types of questions namely; factual, speculative, process and procedural. The description of question types is described in Table 1.

Table 1.

Form	Definition	Example
Factual Questions	inviting a predetermined answer	What was in her pocket? Why did he wake up early?
Speculative Questions	Questions inviting a response with no predetermined answer, often opinions, hypotheses, imaginings, ideas	What do you think his next move might be? How would you behave in a similar situation?
Process	Questions inviting children to articulate their understanding of learning processes/explain their thinking	How did you come to that conclusion? Can you account for that choice?
Procedural	Questions relating to the organization and management of the lesson	Is that clear enough for everyone to see? Can you start with the one on your left?

4.2 CLASSIFICATION OF QUESTIONS BY FUNCTIONS

In terms of functions, the outcome of data analysis was a classification of the questions used by the teachers in the context of observed classrooms. The classification of teachers' questions by functions was conducted by adopting Myhill's taxonomy [39]. She suggested eleven functions of questions, namely; class management, practicing skills, checking prior knowledge, cued elicitation, developing vocabulary, recapping, checking understanding, building on content, building on thinking, and developing reflection. The description of question functions is described in Table 2.

Table 2.

Functions of question	Definition
Factual elicitation	meant to recall information/fact
Class management	linked to management of tasks/behavior
Practicing skills	pupils are expected to rehearse, repeat or practice a strategy or understand something
Checking prior knowledge	related to checking knowledge and experience relevant to lesson
Cued elicitation	cueing answers
Developing vocabulary	questions posed to assess or clarify understanding of vocabulary
Recapping	recalling prior lessons and work done in this lesson
Checking understanding	checking grasp of ideas and concepts already covered
Building on content	putting together information about the topic
Building on thinking	moving forward with pupils' ideas and concepts
Developing reflection	querying how pupils are learning and the strategies they are using.

5 RESULTS AND DISCUSSION

5.1 CLASSIFICATION OF THE FREQUENCY OF THE OCCURRENCE OF DIFFERENT TYPES OF QUESTIONS IN TERMS OF FORM

The researcher counted the questions in each type and calculated their relative frequency. Figure 1 shows the comparative distribution of the questions by type.

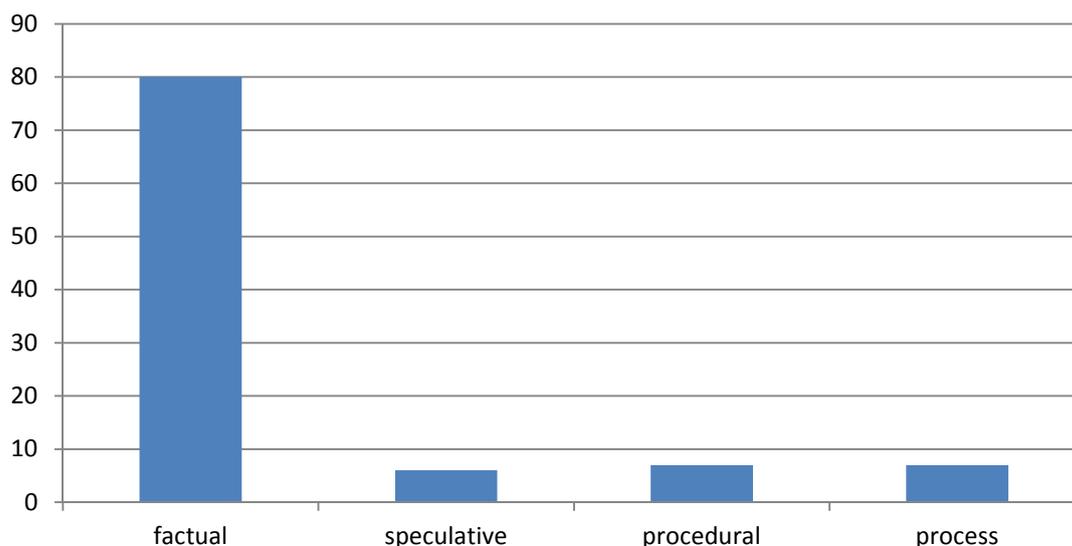


Fig. 1.

The analysis shows that a significant percentage of questions was factual. Over 80 % of questions posed were factual; that is, those that require a predetermined response. The analysis clearly indicates the relatively low percentage of questions aiming at triggering high order thinking. Speculative questions, which target opinion forming, hypothesis making and articulation of understanding, take a minority position in classroom talk patterns. Speculative questions constituted no more than 6 %. Pupils seemed hesitant to raise hands when speculative questions were posed. Many students often respond at a lower cognitive level than the questions demand. The fact that pupils hesitate or mutter to higher order questions might suggest that they are more used to, and therefore more at ease with, low level questioning requiring short and predetermined answers. Moreover, teachers seem to allot the same amount of time to both factual and speculative questions which puts students under pressure and therefore impacts on the length and quality of their responses. The interactive pace is sometimes fast. There are few pauses, answers come hard on the heels of questions, and transmission time is minimal [41].

Teachers paraphrase questions and strongly cue them to get the answer they have in mind. They just gloss over or ignore answers not leading to prescribed directions. The process of questioning serves to side pupils' thinking with the teacher: it is less a process of educational inquiry more of a process of "following the teacher's script" [42]. Teachers manipulate classroom interaction so that it revolves around their "frame of reference" [43]. Teachers use questions in a manner that narrows and limits thinking to factual recall, rather than use questions to develop learning and understanding. The dependence upon factual or closed questions emerges as a prevalent feature of teachers' talk repertoire in the observed classrooms. Alexander (2001) argues that open questions coupled with heavy prompts, clues and cues that close the door to cognitive engagement seriously impede students' cognitive engagement [41]. The paucity of speculative and process questions and dominance of factual questions might indicate that the teachers are not aware enough of the value of higher order questions to foster thinking, reasoning and problem solving skills. The teachers have always complained about the teaching load and felt under pressure to cover the curriculum which may have created the tendency towards factual questioning. This may be ascribed to the prioritizing of teaching (delivery and content) over learning (understanding). Black and William consider this pattern of questioning as wholly counter-productive to the enterprise of learning:

"So the teacher, by lowering the level of questions and by accepting answers from a few, can keep the lesson going but is actually out of touch with the understanding of most of the class – the question-answer dialogue becomes a ritual, one in which all connive and thoughtful involvement suffers" [44] .

This suggests a pattern of teaching which is transmissive, with the teachers imparting factual information, and asking factual questions. The pupils appear to be the depositories and the teacher is the depositor. This is "the 'banking' concept of education, in which the scope of action allowed to the students extends only as far as receiving, filing, and storing the deposits" [45]. Triggering and extending pupils thinking entails sensitive shaping of classroom talk and listening attentively to pupils' contributions. There is an urgent need to develop pedagogic confidence in framing classroom talk which permits children to be 'active in creating their own understandings' [46].

5.2 CLASSIFICATION OF THE FREQUENCY OF THE OCCURRENCE OF DIFFERENT TYPES OF QUESTIONS IN TERMS OF FUNCTIONS

The researcher counted the questions in each category and calculated the relative frequency of each function. Figure 2 shows the comparative distribution of the questions by functions.

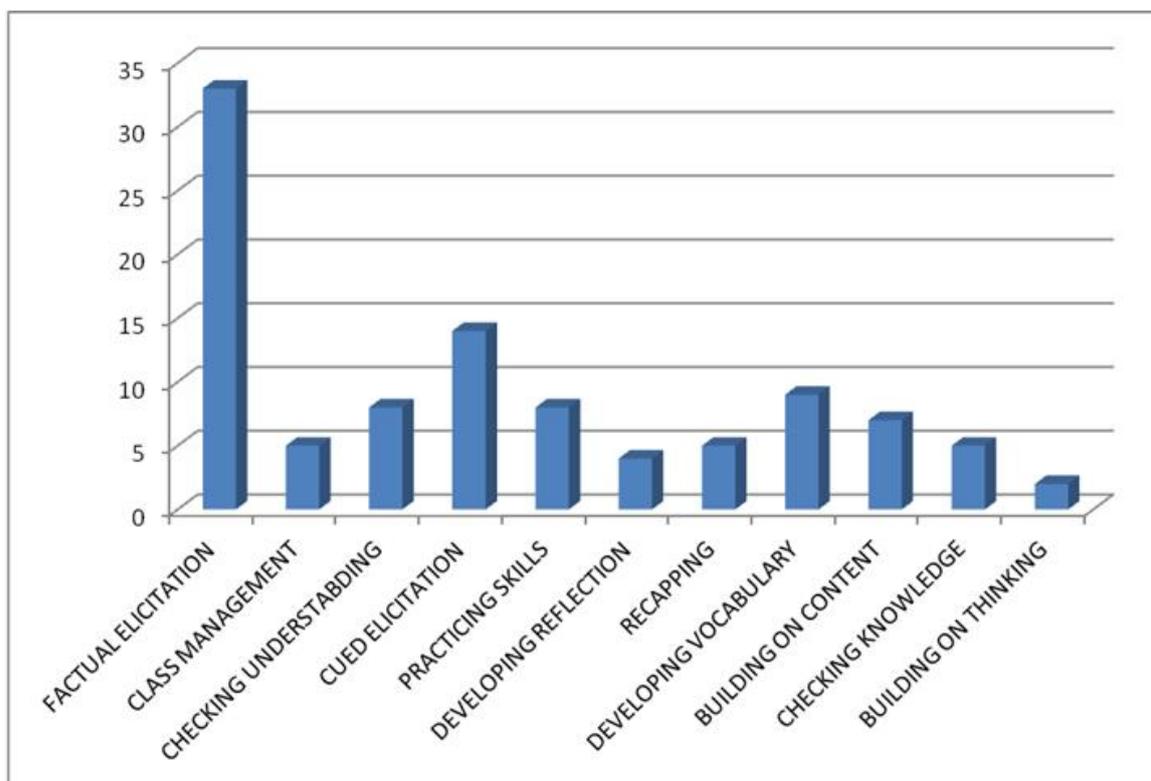


Fig. 2.

The analysis of questions according to their functions, once again, reveals that factual elicitation is by large the prevalent occurrence (33%). Cued elicitation takes second position (14%). Other remaining functions are tempted intermittently. For instance, questions developing reflection and building on thinking assumed a minority position; (4%) and (2%) respectively. This suggests a pattern of teaching which is transmissive, with teachers imparting factual information, and asking closed questions. The overuse of test questions is contrasted with 'authentic' questions that urge students to think for themselves. Most questions posed by the teacher use recurrently closed questions meant to accumulate knowledge and 'understanding' through testing or stimulating recall of what was previously taught, or to strongly cue pupils to figure out answers from clues embedded in questions. Teachers often map their questions in terms of the lesson's content, they seem to put less weight on considering questions in terms of the cognitive and linguistic demands made on their pupils. The results disclose that most favored type of questions are factual and short answer-retrieval style questions both of which situate pupils into an inactive, information seeker-receiver situation in the class.

The types of questions posed are typical of teacher-fronted lessons in which transmission of knowledge from teacher to student is the expected form of interaction. Learning involves listening to the teacher, reading, and studying in order to recollect information on demand. Teachers employ classroom questions principally to assess students' aptitude to retain information. Posed questions were almost entirely confined to low cognitive levels. This portrayed superficial teaching and superficial learning which placed a ceiling on the learners' linguistic and conceptual development.

The whole pattern of classroom questions in the observed classrooms has a tendency towards coverage of curriculum and elicitation of facts rather than the formation of thinking strategies, articulation of learning and construction of interconnected learning. Teacher questioning lacks flexibility as the teacher rarely regulates questioning based on pupil answers to engage students in higher-order thinking. Students are not encouraged to self-evaluate their answers and justify their claims. By missing the opportunity of readdressing the evaluative function back to the pupils, the teacher falls short of fostering a climate that values reasoning, speculation, and the co-construction of knowledge.

Alexander (2008) characterizes the type of classroom interaction observed in Moroccan primary classrooms as monologic because there is no true exchange of meaning and the teacher largely dominates and controls interaction content and direction, thus squelching autonomous thinking on which the fostering of talk for learning and understanding hinges [47]. When teachers' questions and comments are probing and open-ended, and students are offered the chance to pose questions and expand on the talk along with responding to the teacher; participation in classroom is expected to be conducive to 'genuine' learning. As noted By Nystrand "what ultimately counts is the extent to which instruction requires students to think, not just to report someone else's thinking" [48]. Classrooms need to be a platform where the importance of teaching as discussion and dialogue is emphasized and where there is an exchange with a view to sharing information and solving problems as well as achieving common understanding through structured and cumulative questioning, guided discussion and understanding [49]. Students can learn higher mental processes if the processes hold a central position in the teaching-learning practice.

Quality talk in classrooms is contingent upon the types of questions posed. Pedagogical interaction can have greater power to provoke cognitive engagement and understanding if teachers ask challenging and high order questions that equip pupils with skill and habits of mind that permit pupils to participate effectively in the wider communicative practices to which they have increasing access. Although questioning forms only one part of good teaching, it is also the most used instructional strategy in the classroom. Therefore, for students to reap the maximum benefit from their teachers' questioning, teachers are required to develop awareness of ways of enhancing their current techniques of posing questions to meet the needs of their students and the curriculum. Teaching should rely, to a certain extent, on questions that are "fundamentally open or divergent...in terms of allowing a broader degree of uncertainty in what would constitute an adequate answer" [50]. Speculative questions are not meant to test learners nor lead them to a narrow range of answers considered acceptable by the teacher. Rather, these questions target new understandings through meaningful inquiry. Accordingly, teachers are expected to work strategically with learner answer, prompting for justification, challenging assumptions and broadening pupil horizon. Teachers should realize that a good lesson should have a balance incorporation of both low and high level questions and select questions that emphasize major points and stimulate cognitive engagement. Chin (2006) depicts the concept of a "cognitive ladder" to scaffold student understanding by making progress from lower order to higher-order questioning and "enabling students to gradually ascend to higher levels of knowledge and understanding" [51]. As students start to engage with new content, teachers may utilize lower-level questioning focused on recall and application. As students are set to progress through the inquiry process, teachers can then employ higher-order questioning focused on reasoning, clarification, and generalizing to alternate contexts. This scaffolding helps to sustain students learning and narrow the gap between student knowledge and conceptual understanding of concepts [51].

Knowledge reproduction seems to be the most preponderant form of interaction in Moroccan primary classroom. Analysis gives evidence of the ways in which learners' habituated patterns of practice generally replicate traditional school learning in which value is positioned on individual 'products' and 'achievement'. Classroom pedagogic practice needs to be geared towards effective interaction that situates learners in a favorable position to question, to argue, to reason, to listen to others, and to contribute to problem solving. These practices are likely to equip Moroccan young learners with the prerequisite tools conducive to transformative thinking and learning in the information society.

6 IMPLICATIONS

This study was a limited-scale inquiry and therefore it needs to be expanded and generalized to a superior number of teacher observation and classroom investigation so as to reach more primary school classes and disclose more findings to weigh against the ones exposed in this study.

The conclusions derived from this study have potential in translating research insights into practical guidance for teachers on the subject of strategic moves in classroom discourse. The analysis of classroom discourse data can inform instructional practice, raise awareness of the array of discursive strategies on hand, and function as constructive pointers for teachers during pre-service training and in-service professional development. The capability to handle and coordinate classroom discourse to sustain student learning is a significant feature of pedagogical content knowledge [52].

Pupils should be offered manifold and diverse opportunities to engage in meaningful interactions in class. One of primary school teachers' responsibilities, then, is to heedfully arrange the interactional environment in their classrooms to make such opportunities readily accessible. Teachers are called upon to balance 'authoritative' talk which governs classroom talk with 'dialogue' which does not normally occur often [53], [54].

Research findings specify that introduction to diverse learning tools will improve learning environment and stimulate students in engagement process. As an implement, a good questioning strategy can assist teachers to craft a learning context

paving the ground for genuine communication and negotiation of meaning in the class and provide a dialogic process, allowing pupils to gain understanding of real-life situations.

Teachers need to comprehend the inextricable linkage between classroom practice and pupil progress and, more specifically, the vital function they fulfill in generating conditions that define both the substance and direction of pupil intellectual growth. There should be a shift from regarding questions as devices by which one assesses the essentials of learning to conceptualizing questions as an instrument of actively processing, thinking about, and using information productively [55]. Teachers should decisively plan and pose questions that entail engagement in higher-level thinking. Pupils need to be familiarized with the diverse levels of thinking and helped to be conscious of the kind of thinking required by the question. In accentuating the interactive form of teaching, it is palpable enough that questioning is a central part in the process. That would prepare student teachers to progressively absorb questioning culture such that after graduation, the culture may possibly remain.

Teaching practice supervisors are encouraged to lay emphasis on questioning to student teachers for the duration of teaching practicum, more than ever before. Supervisors from the ministries are correspondingly encouraged to foster this culture among service teachers in the course of timely visits. Above and beyond, workshops, seminars and conferences may be held for them for this rationale.

7 CONCLUSION

The purpose of this article was to verify the extent to which class teachers inter-act with their pupils in the course of questioning. In order to investigate forms and functions of questions in classroom talk, the researcher tracked the types and functions of questions posed, the answers they generated and how the teacher followed up on these answers. Analysis of obtained data demonstrated that the teachers passed on mostly factual questions but performed inadequately on other types of questions. The questions that teachers asked hinged on facts and recall rather than on questions which required options (opinions, hypotheses, imaginings, and ideas). The teachers performed inadequately in questions meant to hone critical skills. Teachers prioritized teaching (delivery and content) over learning (understanding). Ultimately, the article exposed how the analysis of classroom discourse data can inform instructional practice, raise awareness of the range of discursive strategies on hand, and function as constructive pointers for teachers during pre-service training and in-service professional development.

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