

A Study on Effective Teacher Questioning

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Abstract: Questioning is a teaching method most frequently used by teachers in the actual teaching process. Effective classroom questioning can not only help teachers understand the actual learning situation of students, but also promote the communication between students and teachers, and finally achieve a significant increase in the quality of classroom teaching. To better study how to ask questions effectively in the classroom, the author interviewed and observed the lectures of geography class in junior high school in China and gave conclusions based on the findings.

Keywords: Teacher Knowledge; Knowledge of Questioning

1. What is Teacher Knowledge?

In his highly influential paper on teacher knowledge, Shulman (1986) divided teacher knowledge into three discrete categories:

- (a) Subject Matter Knowledge (SMK)
- (b) Pedagogical Content Knowledge (PCK)
- (c) Curricular Knowledge (CK)

Shulman pointed out that SMK is knowledge of the subject itself, though SMK offers no direct application in the transfer of knowledge to students. In contrast to this, PCK, described by Shulman (1987) as the “missing paradigm”, is knowledge of teaching theory and is in effect the ability to transfer SMK, for example, being able to represent ideas in ways the students can digest and understand (Shulman, 1986, p.6). Shulman’s conceptualisation of PCK originated from his perspective that a framework that considered knowledge of pedagogy and content as separate to be inadequate in representing the multifaceted nature of teacher knowledge. Finally, CK refers to knowledge of the syllabus and is comprised of how the knowledge for teaching should be assimilated and arranged (Shulman, 1986, p.7).

Though resonating to some extent with the concept of PCK proposed by Shulman, Cochran et al. (1993) took issue with the inferred static nature of PCK that does not align with the ideals of constructivism. Cochran et al. argued that a teacher’s knowledge is fluid in nature and continually needs to adapt to the requirements of their students and context. Therefore, they proposed the idea of pedagogical content knowing (PCKg), which offers a more dynamic take on PCK and gives consideration to the environmental and student context of learning. Not dissimilar to that of Shulman, Barnett and Hodson (2001) attempted to elucidate the kinds of knowledge that teachers possess. However, they specifically focused on science teachers with their idea of pedagogical context knowledge and emphasised the contextualisation of teacher knowledge.

Unlike Barnett and Hodson (2001) who aimed to uncover the kinds of knowledge that are available for a teacher to employ in classroom applications rather than the knowledge they exhibit, Rowland et al. (2005), in a similar manner to Shulman (1986), sought to understand and categorise the knowledge of teachers; though their incentive was to formulate a framework that could be used to support teacher professional growth. The framework was formed through analysis of interviews and lesson recordings of pre-service primary school mathematics teachers that allowed for coding of their lessons with regard to knowledge exhibited. As such, Rowland et al. (2005), through inductive and deductive analysis grouped the types of knowledge into four ‘members’, which they dubbed the

knowledge quartet (KQ), with dimensions described as follows:

Although the KQ was originally designed with mathematics teaching in mind, in my professional opinion, the framework offers flexibility for utility in various disciplines. Moreover, as one of the key purposes of the KQ is teacher development, an underlying aim of this assignment, the KQ was used as both a tool to help with lesson observation and teacher critical reflection as well as to analyse Mia's exhibited knowledge to allow for the answering of RQ1 and RQ2 and facilitate my own professional growth as a teacher-educator.

2. What is Effective Teacher Questioning?

The highly revered research of Mercer et al. (1999), which constituted lesson observations of UK primary school teachers and their students correlated the construction of students' understanding and learning with the quality of student-teacher interactions taking place within classroom discourse through both teacher talk and student talk. Furthermore, Mortimer and Scott (2003), in their ground-breaking research into meaning-making in the context of UK and Brazilian secondary science classrooms drew attention to the crucial role teacher questioning plays in the shaping and guiding of classroom discourse which can directly impact the cognitive processes and meaning-making of students. To quote Manson (1973) on his development of a framework of thirteen types of cognitive questions for geography teachers, "A teacher should be able to phrase insightful questions which promote thinking and expedite problem-solving" (Manson, 1973, p.24), which highlights the importance that teacher educationalists have placed on teacher questioning as a tool for fostering student learning. Manson proposed that there are six types of questions, remembering questions, understanding questions, solving questions, analysing questions, synthesising questions, and judging questions. In a similar fashion, Chin (2007), in her research on the use of constructivist forms of teacher questioning within science classrooms aimed to develop a framework to understand teachers' use of questioning in an effort to support teachers' use of more effective questioning through cognisance of such types. Chin's study comprised lesson observations of six secondary science teachers in Singapore in an English medium instruction (EMI) context. Through deductive and inductive analysis of the classroom talk, Chin crafted a framework that detailed four questioning strategies, Socratic questioning, verbal jigsaw, semantic tapestry and framing. In contrast to Manson (1973), Chin sought to facilitate teachers' greater insight into their own use of questioning to enhance students' cognitive engagement with a strong emphasis on guiding the students to create their own understanding, while Manson more so appears to describe a framework that confines student learning to the restrictions of the teachers' own ideas, rather than that of the students'. That being said, there is some alignment of Manson's framework with that of Chin's (2007) wherein Manson criticises the overutilisation of 'remembering questions' as this kind of question is inconsistent with teachers' goals of "teaching students how to think" (Manson, 1973, p.25).

In line with the work of Chin (2007), Oliveira (2010) sought to construct a framework to gain insight into science teacher questioning. In slight divergence from the research focus of Chin, however, Oliveira focused on the sociolinguistic element of teacher questioning as opposed to the student cognitive processes elicited through constructivist questioning approaches. Chin's underlying belief that the role of teacher questioning is to cultivate student thinking and enable students to create their own understanding through negotiating meaning via a dialogic approach to classroom discourse aligns with the view of Konfetta-Menicou and Scaife (2000) who support the idea that teacher questioning should create opportunities for students to engage in high-level thinking that develops logical understanding and critical thinking. This drive to foster higher-order student cognitive engagement also resonates with the recent research of Pun and Macaro (2019) who sought to understand the role teachers' first language (Chinese) usage plays in student engagement with high-order and low-order questions in EMI high schools in China. It is clear that Oliveira (2010) agrees with the need to encourage students' cognitive engagement; however, her approach appears indirect, with a stance that fosters an improved contribution of student output to classroom talk through emphasising the sociolinguistic aspect.

While several noteworthy scholars have put forward frameworks to enhance teachers' use of effective questioning approaches, it may superficially seem that Manson's (1973) framework, specifically designed with geography teachers in

mind, would be most suitable for this study. However, the constructivist questioning strategies proposed by Chin (2007) more strongly resonate with addressing the issues that have been highlighted in Mia's teaching and offer a promising way forward to cultivate her growth as a learner-teacher and my growth as a teacher-educator, and thus, Manson's framework was used to first categorise questions and Chin's framework was applied to analyse how the discourse could be improved to promote students' thinking and learning.

3. Developing Teachers' use of Questioning

In a context similar to my own, Kang and Que (2020) sought to develop beginning teachers' use of questioning in middle school geography lessons in China. Kang and Que analysed lesson recordings of the teachers in an effort to pinpoint areas for development. What appeared to be the main findings was the predominance of teacher talk and minimal teacher questioning beyond low cognitive engagement questions, with a lack of dialogic follow-up questions to explore students' espoused ideas.

The key research of Burn (1997) highlights that teacher questioning is not exclusively developed through critical reflection and that question planning with the guidance of an experienced educator can be invaluable. This research led Burn to propose the idea of collaborative teaching and collaborative planning which encourages the sharing of knowledge between teachers of varying levels of expertise and can allow for support in preparing effective questions. That being said, on reflection of contingent knowledge described by Rowland (2013), collaborative planning may do little to enable teachers to advantageously react to the contingency introduced through students' responses to questioning (Mutton et al., 2011).

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