Exploring ‘Black Boxes’: Methodological approaches to uncovering the culture of formative assessment in mathematics classrooms

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Introduction

In terms of systems engineering, present policy seems to treat the classroom as a black box. Certain inputs from the outside are fed in or make demands – pupils, teachers, other resources, management rules and requirements, parental anxieties, tests with pressures to score highly, and so on. Some outputs follow, hopefully pupils who are more knowledgeable and competent, better test results, teachers who are more or less satisfied and more or less exhausted. But what is happening inside? How can anyone be sure that a particular set of new inputs will produce better outputs if we don’t at least study what happens inside? (Black and Wiliam, 1998b, p.1).

In both policy and research literature, much attention falls on classroom inputs (curriculum, teacher preparation, pedagogical strategies) and outputs (evidence of student achievement), while the most pivotal learning processes occur within the activities of the classroom—a space thus referred to by Black and Wiliam as “the black box.” In response to their work surrounding the widely praised teaching strategies classified as “formative assessment” (Sadler, 1989; Taylor, 1994; Fuchs et al., 1997; Black and Wiliam, 1998a; Crooks, 1988; Biggs, 1998; Clarke et al., 2002; Chudowsky and Pellegrino, 2003; Herman et al., 2006; CCEA, 2007; Shute, 2008; Shepard, 2009), they asked, “how can anyone be sure that a particular set of new inputs will produce better outputs if we don’t at least study what happens inside?” (Black and Wiliam, 1998b, p.1). Moreover, the 1999 TIMSS study suggests that “the more educators and researchers can learn about teaching as it is actually practised, the more effectively educators can identify factors that might enhance student learning opportunities and, by extension, achievement” (Hiebert et al., 1999, p. 2). Yet globally, much discourse on education remains heavily laden with prescriptions for best practice as well as reports of test-based achievement (Moss and Schutz, 2001; Ryan, 2005; Giles and Hargreaves, 2006; Koretz, 2007; Darling-Hammond, 2008; Panizzon and Pegg, 2008).
The PhD research described in this paper enters these ‘black boxes’ (Black and Wiliam, 1998b, p.1), or classrooms – which I argue are plural and diverse – with the aim of investigating some of the attitudes to and practices of formative assessment amongst both teachers and students. Literature reports a lack of consensus on what constitutes formative assessment as well as varied manifestations in practice (Stiggins, 2005; Crossouard and Pryor, 2008; Taras, 2008; Bennett, 2009). This research draws from multiple existing perspectives, considering a working definition to include all activities in the classroom through which teachers and/or students gain information about classroom learning and thus the ability to modify actions in response (Sadler, 1989; ARG, 2002; Stiggins and Chappuis, 2005). Set in Belfast, Northern Ireland and Los Angeles, California, this research explores eight mathematics teachers’ practices of formative assessment in light of sociocultural contexts. The former provides an environment where recent policies, including a new curriculum, evidence a shift in focus from summative assessments to the integration of ‘Assessment for Learning,’ strategies (CCEA, 2007). The latter, however, represents an educational context where policies are still highly focused on high-stakes, standardized tests (Shepard 2009). In addition to providing background and a description of this PhD research, specific attention will be paid throughout the paper to illustrating the importance of the researcher’s chosen flexible and responsive disposition to the methodology. While tailored to the researcher’s questions, methodological decisions may require modifications due to the ambiguous nature of the classroom context and to the varied possibilities for the foci within sociocultural research.

Background

Assessment Context in the US

The US government first introduced national assessments in the 1960s with the Elementary and Secondary Education Act (ESEA) of 1965 (Epstein, 2005). In 1983, the US National Commission on Excellence in Education published A Nation at Risk, which described the inferior performance of American education as compared to other nations and eventually inspired the reauthorization of ESEA as the No Child Left Behind Act (NCLB) of 2001. Ultimately, NCLB aims to close the “achievement gap”—the “persistent economic and educational achievement gaps between low-income, racial, ethnic, and linguistic minority students and their peers” (Ryan, 2005, p. 534). NCLB defines procedures for monitoring school progress throughout the country with a heavy
reliance on standardised assessments (Wiliam, 2006; Mabry, 2008). Such assessments were already widely practiced, yet the act inflated the consequences of poor results, thereby inspiring schools and districts to prioritise test preparation. Assessment policies inevitably influence practises of formative assessment (or lack thereof) in schools. Many argue for the role that formative assessment should play given pressures on schools to raise test scores, but little evidence exists that policy makers will lighten the focus on summative tests (Wiliam, 2006). In fact, the requirements of NCLB have not lessened since its implementation, nor does it appear that accountability systems will disappear anytime soon (Koretz, 2007; Shepard, 2009). Despite the accountability culture, many teachers in the US have practiced assessment techniques aligned to the principles of formative assessment. (Frye, 1991; Ruiz-Primo and Furtak, 2006; Heritage, 2008). Still, the US has yet to see government-issued directives regarding assessment other than those focused on standardised tests for accountability purposes.

According to the US Department of Education, however, change is imminent. Following the election of Barack Obama, new leaders in educational policy resolved to review the policies instituted under the George Bush administration. In March of 2010, they published A Blueprint for Reform: The Reauthorization of the Elementary and Secondary Education Act. Stated improvements to No Child Left Behind include a shift in accountability from specified AYP scores (target scores indicating Adequate Yearly Progress) to growth of students and schools, a decreased focus on punishing failure and an increase in rewards for progress, and a broadened focus on the well-rounded curriculum rather than a narrowed one resulting from ‘teaching to the test’. In addition, the Department states its intent to invest more in professional development of teachers as well as in the improvement of conditions for learning.

Assessment Context in the UK
Like NCLB, the UK’s Education Reform Act of 1988 centralised control over education in the UK through the creation of a national curriculum (Daugherty and Ecclestone, 2006). This sparked a move away from the 1944 Education Act, which had given control to Localised Education Authorities (LEAs). Instead, the Secretary of State gained power over school curriculum through the direction of curriculum bodies, later the Qualifications and Curriculum Authority (QCA). In 1992, the government introduced statutory publication of scores by schools for accountability purposes. Furthermore, the Labour Party’s 1997 victory established
national, test-based ‘benchmarking’ or minimal targets (Daugherty and Ecclestone, 2006; Fisher, 2008; Job, 2008). Results of national tests at certain ‘Key Stages’ of the national curriculum are published each year. On these tests, the government expects schools to reach specified, minimum targets, including 90 percent of 11-year-olds achieving at or above level 5 in English and Maths. Similarly, government-issued targets state that by 2020, 90 percent of students will earn five or more General Certificates of Secondary Education (GCSEs) and at least two A-levels at grades A* to C. (DCSF, 2008a, 2008b). Teachers’ unions critique such aims as unreasonable and thus discouraging (Eason, 2009).

Recent reforms, however, indicate a decreasing focus on high-stakes, standardized testing. This study focuses on Northern Ireland, which although for decades simply mirrored the policies of England (Daugherty and Ecclestone, 2006), has lately been described as progressive (Fisher, 2008; House of Commons, 2009; Job, 2008). Evidence of Northern Ireland’s uniquely traditional social context exists in its primarily faith-based, single-sex schooling and the retention of a summative selection exam taken at age 11. One might not expect sensitivity to AfL from this testing-focused culture, but the Council for the Curriculum, Examinations and Assessment (CCEA, 2007a) drew from current research and brought the movement into its curriculum documentation (Daugherty and Ecclestone, 2006). Subsequently, Education Order 2007 initiated phasing in a revised curriculum as well as requirements that teachers assess students annually in subject areas, cross-curricular learning and other skills. Schools now must provide families with annual, ongoing formative progress data (DENI, 2007). Moreover, CCEA now recommends incorporating Assessment for Learning (AfL) ‘as best practise’ into daily instruction (2007a, p. 1).

Debates Surrounding Assessment

It is argued that most summative assessments demand primarily that students regurgitate information from previous instruction (Chudowsky and Pellegrino, 2003; Darling-Hammond, 2007). The emphasis on testing and test preparation seen in classrooms, therefore, does not prepare students for future demands. This does not mean, however, that summative assessments should become extinct, nor that they are universally detrimental (Biggs, 1998). Absolute judgments about any assessment practise become problematic when variables such as

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1 Beginning with the 2010/2011 academic year, the Department of Education in Northern Ireland ceased to provide a transfer test for use by post-primary schools.
culture and context are taken into account (Moss and Schutz, 2001; Elwood, 2006; Darling-Hammond, 2007). Therefore, research can only theorize and recommend; it cannot predict universal success with accuracy. Furthermore, the purpose for assessing sometimes demands a summative tool. Thus, many argue that teachers should choose assessment types according to the purposes of the learning, while also incorporating formative assessment tools that aim to support learning. This approach, it is argued, will in turn improve performance on summative measures (CCEA, 2007a; Clarke et al., 2002; Newton, 2007; Gardner, H. 2006).

Many studies do show that formative assessment practices support learning (Taylor, 1994; Black and Wiliam, 1998a; Elwood and Klenowski, 2002; Herman et al., 2006; CCEA, 2007b). However, similar to some emphatic claims about universally negative consequences of summative assessments, many argue for the practice of formative assessment without sufficient support. In their review of research on formative assessment, Black and Wiliam (1998a) did not find a single study reporting negative effects as a result of formative assessment. Similarly, several claim that formative assessment strategies are particularly successful with low-performing students (Fuchs et al., 1997; Black and Wiliam, 1998a; Herman et al., 2006). As previously stated, and perhaps most enticing to policy makers, researchers also argue for the potential of formative assessment to contribute positively to improved performance on summative assessments (CCEA, 2007a; Clarke et al., 2002;). For example, it is argued that assessing more frequently throughout a unit, as prescribed by formative assessment, increases learning (Crooks, 1988, Gardner, H. 2006). Many also claim that formative assessment requires students to take responsibility for their own learning through knowledge of learning intentions, engagement, self and peer-assessment and collaborative learning activities. Such strategies, research claims, will increase students’ confidence and help them become self-guided learners (Black and Wiliam, 1998b). Evidence also supports providing quality feedback through the tools of formative assessment to help teachers and students modify their practices toward the learning intentions (Crooks, 1988; Sadler, 1989; Biggs, 1998; Chudowsky and Pellegrino, 2003; Shute, 2008).

Stemming primarily from quantitative studies, the above claims would seem to rest on unstable ground, since without considering context and process, formative assessment itself cannot be handed full credit for measured gains. Black and Wiliam, for example, admit that their 1998 meta-analysis highlighted quantitative studies and thus lacked comprehensive consideration of
the ‘normal’ classroom (1998a, p. 16). They also acknowledge the inclusion of laboratory studies as problematic and inferior to studying formative assessment in its natural context, but their defence rests in the challenge of reaching an “adequately complex and complete understanding of formative assessment,” (p. 9). The question is whether this can be reached at all. The variations between each context and thus the functions of assessment practises within, limit the possibility of a universally applicable conception of any educational practise. Researchers simply cannot prescribe best practice for every classroom; however, we can focus on equipping the players themselves—the teachers and the students—to work more effectively within their own unique contexts.

Despite documented benefits of formative assessment, tensions between promoting learning through classroom assessments and fulfilling accountability requirements remain. Elwood (2006) notes both the logistics of large-scale formative assessment implementation and its tensions with summative measures for accountability as reasons for delayed growth. Educational authorities hesitate to trust measures other than standardized, summative tests and also prefer them for their efficiency. As a result, teachers are reluctant to drastically shift their practices due to the structural differences between summative and formative assessments and pressures to prepare students for the former. Research over the past several decades shows many teachers using classroom assessments that resemble the year-end tests (Crooks, 1988), and several UK studies found that teachers rarely reviewed or discussed assessment results critically with students (Crooks, 1988; Black, 1998b; Black, 1998a).

**The Study**

As Black and Wiliam (1998) noted, the lack of attention to teachers’ day-to-day activities has created a gap in our understanding of how assessment trends manifest in the varying sociocultural contexts found within each classroom. Influenced by this literature as well as my own teaching background, this PhD research explores assessment practises in early secondary mathematics classrooms (Key stage three/middle school). Given the charged debates surrounding assessment policies and practice, I have chosen to examine the actual dispositions and practises of teachers in two varied policy and cultural contexts. These contextual differences between policies and practises in my current residence of Belfast and my former residence of Los Angeles invite cross-cultural comparison aimed to further understand the
influence of these factors on teachers' assessment practice. The universality of assessment debates also increases the relevance of comparative research, since highlighting findings from varied contexts can enrich our understanding of contextual influences. In fact, a 1993 article in the *Phi Delta Kappan* by Madaus and Kellaghan urged Americans to consider the lessons to be learned from the failures of the British standardized testing system and to focus on performance-based assessments instead. Comparative study enables researchers to view classroom activities from a fresh perspective, thus often leading to the discovery of alternatives for their own native contexts (Hiebert *et al*., 1999, p. 2).

**Theoretical Framework**

The very nature of the insufficiently understood “black boxes” (Herman, 2006; Taras, 2008) necessitates theoretical and methodological choices, which allow for flexibility. Each classroom is composed of a unique and dynamic set of learners, each who “cannot be separated from [the] social and cultural-historical context” (Rogoff, 2003, p.50). Similarly, assessment itself is a social process engaged with by social beings, each enacted on by culture (Moss, 1996; Gardner, 2006). Therefore, exploration of classroom assessment demands a theoretical approach that considers all factors that may interact with teachers' beliefs about and practices of assessment. I have chosen a sociocultural approach, as it allows for unpredicted themes to emerge from the investigation of these multiple components. Although a variety of perspectives exist within this family of theories, they share a belief in the social nature of learning and a regard for multifaceted factors of influence on learning (Haertel *et al*., 2008). A sociocultural lens, for example, considers the effects of teachers' own social and cultural backgrounds on their views of learning, which then in turn impact upon their classroom teaching and assessment practices (Murphy, 1999; Greeno and Gresalfi, 2008; Moss, 2008). Specifically, Rogoff's “three planes of analysis", will help balance the focus of the research on the individual, interpersonal and institutional planes (Rogoff, 2008). Rogoff argues that understanding the learning process requires analysis of how each of these realms impacts an individual or a community of learners.

The Theoretical approach is also influenced by the work of Sfard, chosen for her focus on learning within the mathematics context. Any study of assessment must consider theories of learning (Black & Wiliam, 1998a; 1998b; Crooks, 1988; Elwood, 2006) – especially formative assessment for its aim to enhance the learning process. Sfard delineates two metaphors for
learning, participation and acquisition, and argues that evidences of our own beliefs about learning in relation to these are embedded within our discourse (2008a). The concept of discourses within particular communities of practice provides a means for illuminating ways of thought and practice present in classroom activities. Specified discourses can be found in certain arenas of practice (Lave and Wenger, 1991; Sfard, 2008b) For example, discourses can be associated with formative assessment, teaching, particular cultural contexts, policies and mathematics itself. Participants’ discourse, therefore, could provide insight into their own ways of thinking about learning and assessment. Analysing discourse, therefore, may shed light on how members of a classroom community believe learning takes place. Since the principles of formative assessment align more closely with the participation metaphor, this research sets out to explore the extent to which teachers who practice formative assessment have also aligned their beliefs about learning with those on which formative assessment is founded. This theoretical lens is not fixed but rather is dynamic and open to modification.

Methodology

While many assessment studies have focused on outcomes of practice (e.g. Black and Wiliam 1998, Wiliam et al. 2003; Webb, 2004), this research seeks a more holistic picture of daily incidences of assessment in classrooms in light of various sociocultural influences. Sociocultural theory dictates a methodological approach, which allows for the exploration of all potential influences on the focus of the study (Croussard and Pryor, 2008), in this case, beliefs about and practices of classroom assessment. For the purpose of this study, it was important to enter the classroom and to remain there for some time in order to allow for elements of the sociocultural context to surface as significant themes. Use of a variety of qualitative research instruments – such as teacher interviews, observations, student focus groups and the collection of student work – allowed for the investigation of a multitude of influential factors acting upon teachers’ beliefs and practices (Troman and Jeffrey, 2007). The methods chosen placed the researcher in the centre of classroom activity and also engaged the teachers in the reflection process. The following description of the research instruments illustrates the cyclical process of design, research, reflection and adaptation, which is essential for quality research in any qualitative comparative study. Reference?

Sample
The research included a total of eight Key Stage Three/post-primary mathematics teachers and was conducted in two schools in each city. Belfast schools included an all-girls grammar school drawing from a primarily middle class population as well as a secondary school with lower achievement rates on standardized tests. In 2009, 93.9% of the grammar students achieved five or more GCSEs with grades A* - C, compared with 59% in the secondary school. Los Angeles schools were also selected for their differing levels of achievement. Students in the first school come primarily from lower class, immigrant families, and the school is struggling to meet government targets on achievement tests. The second school serves an upper class community and students’ regularly achieve high scores on end-of-year standardized assessments.

**Pilot Study**

After drafting instruments and a research design that were based on literature reviews, I conducted a pilot study. Focus groups of teachers in both Northern Ireland and Los Angeles were asked potential interview questions and also asked to comment on the’s topic and design. This process helped me to respond to cultural characteristics in each educational context in order to determine whether the wording of the questions would obtain coveted information from participants—an essential step for any researcher wishing to tailor measures to a culture other than her own. Several changes were made to the questions, as a result of this pilot study, such as rewording or the addition of exemplars to ascertain participants’ understanding of interview questions.

**Strand 1: Questionnaires**

Paper surveys were distributed to all teachers in each school with the aim of gaining insight into the sociocultural context of each participating teacher’s community of practice. Questions covered teachers’ beliefs about learning and dispositions to assessment policies and practises. Teachers were also asked to report on their day-to-day uses of assessment strategies.

**Strand 2: Pre-observation Interviews**

Prior to observing teachers’, I sought their own interpretations of how they viewed the learning process and the roles played within this by the teacher, the student and assessment tools. These semi-structured interviews explored teachers’ beliefs about influences on learning and also asked them to report on how they viewed and used assessments.
Strand 3: Observations
A sociocultural approach considers classroom interactions and relationships as key influences on learning and modes through which learning occurs. I observed each teacher for one full day per week for four weeks. Observations were audio recorded, and detailed field notes also documented the activities of the classroom. The audio files were later transcribed for the purpose of discourse analysis. Data from these observations of what teachers do will be compared to teachers’ stated beliefs about learning and their interpretations of their own practices as described in the pre-observation interviews. Data from observations will also be used to compare teachers’ implementations of classroom assessments to the ideal as described in much of the literature on formative assessment.

Strand 4: Post-observation interviews
In an effort to uncover not only how teachers use assessments as well as the relationship of their practice to beliefs about learning and assessment, the researcher involved the teachers in the post-observation reflection process. This particular strand helped to qualify and clarify any initial impressions as a result of the data and was particularly helpful for cross-cultural comparison. Following several weeks of observation, I reviewed the content of the pre-observation interview and summarized the content of the observations in one-to-one meetings with each teacher. Kersting (2008) found this strategy effective for engaging teachers in self-reflective dialogue in relation to their teaching practises. I asked teachers whether they would change any of the statements in the first interview, and I also asked them to reflect upon examples of classroom assessment strategies represented in the data.

Strand 5: School Administrator Interviews
As previously mentioned, maintaining the link between methodology and the theoretical framework requires a cyclical process of evaluating and reevaluating these components of the research design and allowing one to influence the other in the form of modifications, if necessary. As my theoretical framework evolved from a focus on learning metaphors to include Rogoff’s planes of analysis, I was forced to question whether my data represented the multiple levels of influence acting upon teachers’ assessment practises. In order to represent the ‘institutional plane’, I added this strand of interviews.
Strand 6: Student focus groups

Similar to the addition of the school administrator interviews, my decision to augment the research design to include the student voice came from the theoretical framework that teachers’ practises reflect multiple spheres of influence, including the students they teach. A small group of students was selected at random in each school and met for a twenty-minute discussion outside of class. The teacher was not present for the focus group. Questions explored students’ accounts of how they best learn mathematics as well as how their teachers gain information about their academic progress.

Further Reflections on Methodology

The research process revealed the importance of a flexible disposition when adopting a sociocultural perspective, as there were a number of decisions, which needed to be modified in order to gather quality, multi-faceted data. Early data collection stages in this research, for example, revealed how additional instruments would help to make sense of the data. Some teachers described the school administrators as influential to their own instructional decisions. Therefore, a new measure was born of school administrator interviews in order to provide insight about the nature of this influence. Similarly, early interactions with teachers at the first school site implied their own responsiveness to the needs and preferences as a student. As a result, additional permission forms and questions were drafted to add student focus groups as an additional measure. Recall, the theoretical disposition required accounting for influences on teachers’ practices from all planes. Therefore, these methodological changes reflect the cyclical process of connecting the research design and process to the theoretical underpinnings and adjusting the research design accordingly.

Furthermore, the human-dependent nature of research within the social sciences threatens expectations that that the design can be implemented as planned. The researcher should prepare for possible adjustments according to time constraints and unpredictable factors such as school and classroom access or even cultural differences (Peshkin, 1993; Troman & Jeffrey, 2007; Walford, 2001). In this study, for example, the flexible approach enabled adjustments as a result of school and participant withdrawals. The original Belfast sample included a girls’ grammar school and a boys’ Catholic school, but when the boys’ school withdrew from the
study, the sample was changed to include the high-performing girls’ school and a mixed gender secondary school, thus changing the elements of variability between these two schools. The initial flexibility of the research design lessened the blow, if you will, of such unforeseen modifications. Responsiveness to the participants also goes hand in hand with a flexible disposition. The original design included video recordings of classrooms, but due to the apprehensions of teachers in the first school, the design was modified to include only audio recordings. When one of these first three teachers became ill, the design was changed from three teachers to two teachers per school. Similarly, adaptations had to be made to the ways in which questionnaires were distributed (online or paper), depending on the level of technological comfort of the teachers in each school. In order to obtain quality data that would answer my research questions and comply with my theoretical framework, I had to meet such methodological challenges openly and creatively.

To be sensitive to sociocultural factors, it was also important to periodically reflect upon the literature, the theoretical framework, and the cultural context throughout the data collection phase. Collecting quality data, particularly in comparative research, requires an awareness of one’s own cultural-historical lens as well as those of the participants (Moran-Ellis et al., 2006; Tayeb, 2001). A reflective journal accompanied daily field notes. This tool not only uncovered culturally mediated impressions but also provided insight into characteristics of participants. Continual self-assessment of cultural dispositions throughout classroom observations decreased the likelihood of biases, which would later influence the data analysis process. In addition to my own reflection, the built-in tool of participant reflection through post-observation interviews added great insight into the data, as this process revealed the teacher’s own interpretations of his or her reasoning for assessment choices observed. Allowing teachers to comment on or change the content of the pre-observation interviews and to respond to the data from classroom observations both increased the validity of the data (Walford, 2001) and also provided additional insight into the teachers’ interpretations of why certain assessment choices were made.

**Analysis**

The reflective cycle continues into the process of data analysis. As Walford (2001) warns, measures and conceptual hypotheses formulated before entering the field can quickly alter once
data collection begins. I have only recently completed collecting and transcribing the data for the study, and with around a thousand pages of transcription, it will be necessary to choose some foci for analysis. As stated previously, the sociocultural approach encourages the exploration of various potential influences on the focus of the study—in this case, beliefs about and practices of classroom assessment. I plan to begin with thematic codes linked to teachers practices and also to align these to the theoretical framework. The initial plan included the identification influences upon teachers’ practices from each of Rogoff’s (2008) three planes (individual, interpersonal and institution) as well as evidences of Sfard’s metaphors in the teachers’ language in the classroom. I am aware that analysis of the data may reveal additional themes, which hold potential for understanding teachers’ instructional choices. Therefore, I must continually reflect upon whether the analysis and theory adequately address the overarching question of how teachers practice assessment in light of varied sociocultural influences.

The data may reveal critical incidences of which further investigation would help to address the research questions. In this case, discourse analysis will be employed. Similarly, Ninnes and Burnett (2003) report, “Foucault argues that if we recognize that language is tied to culture and to our own interpretation, labels (codes) should be flexible, reflexive” (p. 283). A rigid focus only on initial thematic inquiries, may overlook valuable insights. I anticipate, for example, that attention will be given to feedback. Heritage et al. (2008) found teachers in Los Angeles to be weakest not in deciphering feedback but rather in deciding how to respond. Research in this area is currently lacking, and additional study on how teachers in both contexts respond to feedback may inform recommendations for practise. Coding types, individuals involved and steps taken will provide a clearer picture of how the teachers integrate feedback (see Tunstall and Gipps, 1996; Shute, 2007; 2008; Chung et al., forthcoming). These studies categorised feedback by type and then interpreted these data to gain information about the teachers’ common practises. Furthermore, I will note the contexts in which interactions occur. Of interest will be the frequencies of teacher to whole class talk and one-on-one interactions between teacher and student.

Webb et al. (2004) used similar methods to study how teachers’ practises influenced collaborative learning amongst students. Video and audio recordings of both teacher and
student participation were transcribed and used as data. They then coded the discourse for all types of participation that occurred and performed quantitative analyses on these results. They also coded teachers' participation according to type of participation. Some sample categories included: ‘asks student to explain,’ ‘asks pairs to explain to one another,’ and ‘repeats or revoices student explanation.’ This helped them explore their specific interest in evidences of teacher’s shifting from teacher-directed to student-centred teaching styles. Since this shift is a characteristic of formative assessment implementation, analysis of this shift is another possible investigation for my study. While Webb et al. linked teacher participation to student outcomes, I would instead aim to represent types of teacher participation found in each setting and its interaction with the sociocultural influences. Similar analyses may also reveal degrees of congruence between teachers’ beliefs about how students learn and the activities facilitated in their classrooms. For example, if the teacher shares a belief in the power of collaborative learning, yet this type of discourse comprises a small percentage of classroom activity, I would postulate that factors other than the teacher’s stated beliefs may be influential upon practise; however, such hypotheses were further informed by discussions on these findings with the teachers in the post-observation interviews. However, these are merely initial thoughts, and the specific direction of the analysis is yet to be determined.

**Conclusion**

What has become clear thus far is the importance of viewing my own role as not only a researcher but also as a learner so that I can remain open to adapting the research design, if necessary, in order to maintain congruence with my own theoretical disposition while still catering to the research questions. In addition to modifying some of my strands of research, I found the involvement of the participants in the post-observation reflection process to provide further richness to the data, since I was not the only one to view, interact with and interpret the activities observed. Venturing into a foreign context as well as pulling the curtain back on one's own requires the courage to be flexible and responsive—particularly so in socioculturally rich environments such as classrooms where many factors impact upon the topic of study. If the researcher operates from a fixed paradigm, any new insights outside of this mold may be ignored, thus resulting in incomplete or skewed data (Ninnes & Burnett, 2003). While the initial design may yield rich information, the researcher must accept that at the same time, gaps or new discoveries or opportunities may emerge which require a reevaluation and perhaps
adaptation of the research design. Researchers should not ignore the influence of diverse contexts on their own perspectives - nor on those held by participants. Rather they should conduct research with an awareness of how these factors will affect methodology, findings and interpretations. Such sensitivity and flexibility is of particular importance in cross-cultural research, which explores educational concepts in light of varying political, cultural, social and economic arenas.

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