



Classroom Talk – A Significant Consideration in Developing an Analytical Framework

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ABSTRACT

This paper is part of a larger study in which two frameworks were developed in order to analyse data sets gathered in a Malaysian undergraduate setting. The broader aim of the research is to study the degree of transferability of an interactive pedagogy developed by Western researchers in a Malaysian classroom setting. The first paper discussed how a framework was developed from Project Zero research findings. The subsequent paper will show how an analytical framework derived from the first and second (present) papers can be used to analyse data sets and provide answers to the research questions raised in the study. The focus of this second paper, however, is to develop one framework, for which literature by prominent researchers in classroom discourse is considered. This paper specifically deals with various aspects of classroom discourse ranging from the importance of language and the use of right language to stimulate student thinking to improving teaching and learning by employing suitable classroom discourse. This is followed by a table listing episodes of classroom interaction that research shows is relevant to enhance classroom learning.

Keywords: Classroom discourse, pedagogical content knowledge, Project Zero, higher order thinking, pedagogical talk

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INTRODUCTION

The broader aim of this research is to study the degree of transferability of an interactive pedagogy developed in the West in a Malaysian classroom setting. As this study is based on the social constructivist theory, data are analysed using a social constructivist framework developed from classroom discourse literature by prominent

researchers in this area. Key researchers in classroom discourse include Cazden (2001), Mercer (2000; 2009), Alexander (2006; 2012b), Wegerif and Dawes (2004), Barnes (1992), Wells (1992) and Norman (1992), among others. Literature by these key researchers was looked at to develop an analytical framework, which then served as a comprehensive lens for viewing the kinds of interactions that took place within a data set. This framework (Table 1) combined with that built from Project Zero (PZ) research findings provided a comprehensive lens through which data sets gathered in a Malaysian undergraduate setting could be analysed. The data consist of a video of classes in session, an interview with student and teacher participants as well as researcher observation. The final analytical framework derived was then utilised to provide answers to research questions raised in the study. A sample of a section of the framework built from PZ research (reported in the first paper) is included (Appendix 1) to aid in understanding the processes involved in this study. A sample of how the final analytical framework will look like, as will be discussed in the third paper, is also included (Appendix 2). Apart from serving to further highlight the significance of the present paper in this trilogy, the appendices mentioned above also depict the extent of the study undertaken, which in turn explains the need for this three-part analysis.

PZ research is considered briefly in this paper as an understanding of it is pivotal in making sense of classroom discourse. PZ research initiatives are carried out by the

Harvard Graduate School of Education; it is particularly employed as a reference point because it is a well-established classroom research model with interaction as a key element. As the focus of this paper is framework development, research questions will only be discussed in the next paper.

This paper is focused on discussing in depth the literature on classroom discourse and is divided into several sub-sections that deal with various aspects of classroom discourse.

IMPORTANCE OF CLASSROOM DISCOURSE

As corroborated by Project Zero research findings, Cazden (2001) recommends various ways in which changes can be made to improve teaching and learning. She opines that changes in the nature of the workplace and civil society have affected the way knowledge and learning are conceived. This has led to education today placing greater importance on the intellectual processes rather than the product. As such, teachers are urged to switch to classroom discussion in order to inspire and develop higher order thinking. This is a move away from the traditional classroom that practises the three-part pattern (Initiation/Response/Evaluation-IRE). The importance of language has been spoken about by many a researcher for a long time. Vygotsky simply puts it this way, “Children solve practical tasks with the help of their speech as well as with their eyes and hands” (1978, p.26). Conversations with people in similar

settings have been observed by Bruner and other developmental psychologists to help form young children's personal growth (1990). Halliday (1993) establishes that for children, language learning lays the very foundation for all kinds of learning to occur. In his words, "When children learn language...they are learning the foundations of learning itself" (pp. 93–116). Echoing this, Alexander (2006, 2012b), argues that the case for pedagogical talk, which he terms as "pedagogical dialogue" is based on both research evidence and logic. According to him, learning that involves learners' attention and captures their interest and has two-way interactions rather than just one, is more likely to bring greater benefits to learners. He asserts that:

...dialogic pedagogy works better than a monologic one...for it touches on the nature of brain and mind, on the relationship between language and thought and on the complex interweaving of the cognitive, social and cultural in human development and learning. (2006, p. 4)

DEVELOPMENTS IN CLASSROOM DISCOURSE STUDIES

There have been groups lobbying for an increase in the amount of talk time in the classroom since the 1990s; among them is The National Oracy Project 1992 which favours using talk during classroom activities as a means of improving learners' language. Barnes (1992) spells out the need for teachers to know that the way

they listen and respond to students' talk is used by learners as strong indicators of the manner in which they should react in the classroom. This he says has, in turn, substantial influence on the way learners talk in the lessons that follow apart from other factors such as the context and the requirement of the lesson. As such, Barnes (1992) recommends that teachers explain clearly the reasons why learners should be involved in various types of conversation as well as the usefulness of conversation and that language is taught within context. Alexander (2012a) states that over the last 40 years, teachers have been aware of the unique and monumental role played by talk in learners' development. He further adds there is robust proof from over 20 major studies conducted worldwide that high level classroom talk enhances standards in subjects like English, Mathematics and Science. Now there is a great amount of evidence pointing to the measurable impact that high-quality classroom talk has on the standards of student achievement in core subjects (Alexander, 2012; Mercer & Littleton, 2007).

IMPORTANCE OF RELEVANT CLASSROOM DISCOURSE

Many education systems around the world give high priority to the achievement of literacy and numeracy in their schools and very often the success of an education system is judged by the rate of accomplishment of students in these skills. Surprising as it may be, talk, which comprises the very medium necessary to access education

itself, is devoted the least attention in schools. Wegerif and Dawes (2004) reason that perhaps the rationale for this omission is that children arrive in school displaying an impressive capacity to talk; however, according to Wegerif and Dawes, this is still insufficient as there is much to learn in terms of talking appropriately and effectively in a wide range of social and academic contexts. As important as the realisation that talk is a necessary part of classroom teaching, the importance of learners acquiring the discourse relevant within the discipline cannot be downplayed, as Cazden (2001) discusses. She differentiates classroom discourse from the informal talk students engage in outside of school; the greater the difference between the two, the greater the effort that is needed to enable students to learn the new role of talk. Educators from different countries, such as Douglas Barnes from Britain and Lisa Delpit, an African American, express the importance of explaining the “ground rules” (Sheeran & Barnes, 1991) to achieving the spoken and written skills of these “discourses of power” (Delpit, 1995).

Cazden (2001) urges that the new curriculum has to include not only the cognitive process of learning but also the social processes of discourse and that the new role of teachers is to become teacher researchers in their own classrooms. The task of learning to talk effectively is a difficult and lengthy process which requires teachers to help learners realise the kind of talk that is relevant to benefit most from the classroom (Wegerif, 2004). In his words, “The teacher

has a crucial role in making the thinking aims of activities explicit, modelling good thinking strategies and designing learning activities so that skills learnt in one context are applied in new contexts” (p.59). This is substantially different from the focus of the Visible Thinking project, which is devoted to making thinking explicit in the classroom. However, the language appropriate for use in the classroom is not discussed by the authors of the VT project mentioned above.

NEW CONTEXTS FOR STUDENTS’ LANGUAGE DEVELOPMENT

Cazden (2001) and Wake (2006) argue that adjustments to the language use in classrooms are important to strengthen the context in which students’ language progresses. Cazden puts forth that oral and written communication skills are increasingly gaining prominence in the world today both for purposes of work and social needs. Wegerif and Dawes (2004) say the benefits of talking effectively surpasses the classroom to the community, such as respect and empathy for others, awareness of the need for fairness and tolerance for differences and, most importantly, ability to discard the use of force and embrace the softer persuasive approach. Cazden (2001) strongly views that schools hold the task of establishing environments that allow students to use words of their choice that they are comfortable with to express their ideas. For many decades, the prime issues in education have been the consideration of dialect variations in the teaching of language skills of standard English. The National

Research Council of America reports suggestions made by linguist, William Labov, to alleviate reading problems in young children (Snow, Burns & Griffin, 1998). According to Labov, the principles that need to be employed are to “distinguish between mistakes in reading and mistakes in pronunciation” and to “give more attention to the ends of words”, where variation in pronunciation is more apparent (Snow *et al.*, 1998, p. 241- 242).

‘Talk Lesson’, a programme developed by Mercer, Dawes, Wegeriff and Littleton for children aged 8 – 11, is designed to create an understanding among learners that certain ways of using language in joint activities could lead to better reasoning and problem solving (Mercer, 2000; 2009). Mercer adds that it is also a way of overcoming unsuccessful collaborative activities caused by ineffective communication. In support of the ability of talk lesson in bringing out the potential that lies within the students, Mercer (2000; 2009) says the talk lesson enables students to exchange views, make individual thinking and reasoning visible to others, debate over differing opinions while substantiating their own and build upon their knowledge using one another’s ideas. According to him, this participation in group problem-solving activities enables students’ individual reasoning skills to develop, which corresponds with Vygotsky’s assertion of a link between social activity and individual development. Wegeriff and Dawes (2004) deduce that if Vygotsky’s claim were true, that by taking part in logical arguments, children are learning to think rationally

while alone, then children should be taught the ground rules for effective dialogue with others in order to enable higher order reflection to take place internally.

DISCOURSE IN NON-TRADITIONAL VS. TRADITIONAL CLASSROOMS

This sub-section discusses the various facets of the role of the teacher that is expected to come into play to facilitate and move away from the transmission approach to teaching.

Teaching Methods

The initiation of a venture called The National Oracy Project (1992) was an indication of the growing realisation of the important role played by oracy in student learning alongside literacy and numeracy. The National Oracy Project believes in the potential of collaborative learning through talk by learners (Mercer, 1992). It emphasises the importance of giving learners autonomy over their own learning and urges teachers to value learners’ language ability. Mercer (1992; 2000; 2009) further argues that the teaching method employed by the teacher is important as it has a significant impact on what is learned and how it is learned. He views that a good teaching method takes into account the needs of learners, and teachers need to continuously observe and identify with learners’ understanding in order to expand their understanding.

Cazden (2001) says one of the major ways in which a non-traditional classroom differs from a more traditional one is the role of the teacher, which diverges in the

following aspects. To begin with, the teacher accepts alternative answers given by students but she also encourages comparisons and justification. This enables students to realise the importance of explaining their answers and the need to listen and make reference to peers' opinions. Next, the ratio of teacher talk to student talk is reversed: in the traditional classroom, the teacher talks for two thirds of the class time but this is now reduced while students' response time is extended. Yet another aspect is the need for the teacher to understand student understanding of the lesson. In order to achieve this, the "pedagogical content knowledge" (Hashweh, 2005; Hill, Ball & Schilling, 2008; Loughran, Berry & Mulhall, 2006; Loughran, Mulhall & Berry, 2008; Shulman, 1987) of the teacher is important. This will enable the teacher to see the value behind students' opinions even though they may not be well expressed. Finally, students should discuss and validate answers and justifications as a group instead of solely depending on evaluation by the teacher.

Alexander (2006) has devised a dialogic teaching pedagogy constructed upon psychological and pedagogical evidence that is made up of a three-part repertoire based on five underlying dialogic principles. The first part of the dialogic repertoire i.e. the teacher needs to encourage the different kinds of 'learning talk' that are important for students to master e.g. the skills to narrate, explain, question, answer, analyse, speculate, imagine, explore, evaluate, discuss, argue, justify and negotiate. The characteristics that need to be nurtured

alongside these are willingness to listen, open to new ideas, to think and to give others time to do the same. The second part of the dialogic repertoire i.e. teachers acquire the five types of 'teaching talk' e.g. rote, recitation, exposition, discussion and dialogue. The third part of the dialogic repertoire i.e. the five interactive strategies that can be carried out in a classroom e.g. whole class teaching, group work led by the teacher, group work on set collaborative tasks led by the students themselves, one-to-one discussion between students and one-to-one discussion between student and teacher.

Alexander (2006) further substantiates his stance by offering five principles in which interaction needs to be grounded to make classroom discourse truly dialogic. Firstly, teacher and students attempt learning tasks **collectively**; secondly, teacher and students listen to each other, share ideas and are open to new suggestions, **reciprocally**; thirdly, students are able to voice their opinions freely without the fear of being ridiculed as a **supportive** environment has been established in which team work prevails; Fourthly, teacher and students construct on individual as well as shared ideas and form logical lines of thought and ask questions **cumulatively**; and fifthly, teacher plans and directs classroom discourse towards set educational goals **purposefully**.

Organisation of Classroom Talk and Peer Listening

In discussing elements of classroom discourse that can be altered in order to

make classroom talk more effective, Cazden (2001) believes that the idea behind the change is both educational and equitable opportunities to learn. This, she adds, requires teachers and researchers to observe who participates in classroom discussion, how they do it, who does not and why this is so. Unlike in the traditional classroom, where the teacher holds absolute control of the right to speak, though not all teachers would choose to exercise those rights all the time, here Cazden (2001) talks about the *speaking rights* (p.82) of students i.e. that students should be given opportunities to speak during classroom activities.

Cazden (2001), in adding more to a point already made, mentions that there are many ways to organise opportunities to speak, some of which are as follows. Firstly, teacher nomination according to seating positions addresses the issue of inequality as a result of “deregulating” classroom discourse. Next, encouraging “handing off” allows students to select the next speaker. Another would be the use of the ‘talking stick’; the student who receives the stick gets the opportunity to speak but can choose to utilise the opportunity or to pass it on. Lastly, the activity opening up an issue to the whole class requires all the students to take a stance on an issue. The author concludes by saying that teachers have the responsibility to make peer listening happen besides being careful listeners themselves because learning takes place while students are discussing problems in groups compared to while they are working individually. The recognition of the benefits of organising

good classroom talk by the teacher is not new, as shown by the literature. Deborah Schifter (1997), an applied mathematician and staff developer, reflects on how her former listening habits changed:-

I'm [becoming] able to see how individual kids are thinking and see what concepts are troublesome for kids to make sense of...I feel like I'm getting more skilled at finding out what kids do 'get' rather than just thinking 'they don't get it'. (p.16)

Teacher's Revoicing, Questioning and Waiting Time

Apart from organising opportunities for learners to speak and listen, teachers' revoicing, questioning and wait time serve many important roles in teaching and learning. O'Connor and Michaels (1996) mention that teachers' revoicing has many purposes. He points out that by repeating students' ideas to the class, the teacher actually summarises and reformulates the points uttered by students. In the second place, reconceptualisation allows for “a fusing of the teacher's words, register or knowledge with the original intent of the student” (O'Connor & Michaels, 1996, p. 81). Thirdly, revoicing, which is gaining in popularity, is essential for constructing common knowledge and building a community of learners.

According to Piagetian Eleanor Duckworth (1981), teacher questioning for the purposes of assisting and assessing student learning is important. She cites an

example where a conversation with a child that focuses on trying to make sense of the child's understanding is in itself a process which boosts the child's understanding. These types of questions are also known as metacognitive questions in which learners' attention is drawn to their own thinking and awareness. For example, 'What do you mean?'; 'How did you do that?'; 'Why do you say that?'; 'How does that fit in with what was just said?'; 'I don't really get that; could you explain it another way?'; 'Could you give me an example?'; 'How did you figure that out?'.

The Initiation/Response/Evaluation or Initiation/Response/Feedback (IRE/IRF) method of learning in the traditional classroom is often called to question for the inauthenticity of its questions. The value of any question lies in its contribution towards student learning; in a non-traditional classroom, teachers are often urged to ask authentic questions or natural questions i.e. questions to which they do not already know the answers (Cazden, 2001). Equality in a dialogic classroom is seen when not only learners hear out the teacher but the teacher too asks authentic questions and is genuinely interested in what the students are saying and thinking (Alexander, 2006; 2012b). Nystrand showed through his large pretest-posttest study that by asking authentic questions, teachers supported students' thinking, and this led to successful and real learning (Nystrand *et al.*, 1997; Cazden, 2001).

However, Alexander (2006; 2012b) cautions that while good questioning skills

have a place in education, employing even the most well refined questioning techniques will not yield learning benefits if the answers provided are not taken to a higher level to provoke further thinking or questioning. As Bakhtin (1986, p.168) puts it, "If an answer does not give rise to a new question from itself, it falls out of the dialogue."

Assigning Students Intellectual Roles

In theory, when an idea comes from a less authoritative figure such as a peer, students will be quick in trying to reason it out conceptually and verbally or argue with the peer, which they may not be so ready to do if it comes from a more authoritative figure such as a parent or teacher (Cazden, 2001). Her finding indicates the different intellectual roles students can assume in pair or small-group activities. Spontaneous helping of each other is illustrated by Cazden (2001) with an example: when a fifth grader in a central Los Angeles school was required to record words and illustrations that depicted the desert (after a class trip), she asked peers for help in remembering a word. The "socially shared cognition" with peers helped the students as they used one another's memories as word search resources. This in turn enabled the student to succeed in her word search.

Another intellectual role students can assume in the classroom according to Cazden (2001) is tutoring another student when assigned to by the teacher. The initial awareness of the responsibility of having to teach others later leads students to take their own learning seriously. This helps 'tutors'

find a new dignity in seeing themselves as experts and resource persons even as their teachers observe an increase in their keenness to participate in the class as well as to assume lead roles. It is a good opportunity for students to give directions instead of receiving them and to ask questions instead of having to answer them. Teachers also could rely on these observations to pitch their expectations of their students. A third function refers to reciprocally providing a 'critique' of one another's work (as in peer writing conferences). Critique differs from criticism in that it is about work still in progress given by a colleague to another and is reciprocal, while criticism is given by professionals on completed work and is one way. The fourth and final role is collaborating as presumed equal-status learners on assigned tasks. Webb and Palincsar (1996) sum it up as, "The long list of group and classroom features provides a menu of possible ways to enhance the quality of collaboration in the classroom" (p. 867).

Cazden (2001) summarises some of the features of a non-traditional classroom either taken from her own studies or those done by others as follows. In non-traditional classrooms, the line between teacher-directed lessons and learning through peer group interactions are becoming blurred because the teacher is less authoritarian and there is an increase in student-student interaction. Examples cited are Gallas' non-traditional sharing time and Lampert's non-traditional lessons in which students are required to respond to both peers and

teacher; teachers intentionally 'revoice' students' ideas during a discussion to help them direct their ideas to the class; reciprocal teaching (RT), where the teacher initially leads the discussion but gradually intends for students to take over the task; and Brown's Community of Learners (COL) classrooms that have various frameworks that exemplify the many innovations in classroom organisation and patterns of participation.

There are some suggestions of ways around overcoming issues that arise concerning variation in language. Janet Maybin (1992), in her article 'Children's Language Practices at Home and School' mentions that bilingual children are at an advantage as they have a greater awareness of the need to make adjustments in school discourse compared to monolingual children, who may have no such awareness. While Mary Morrison and Perminder Sandhu in 'Towards a Multilingual Pedagogy' show that schools that support bilingual children's use of their mother tongue together with the mainstream language (English) tend to have children who are able to engage in complex thought. Cazden (2001, p. 56) concludes that

...the new importance of discourse in school-improvement efforts comes not from any anticipated substitution of non-traditional for traditional lessons, but from the need for teachers to have a repertoire of lesson structures and teaching styles, and the understanding of when one or another will be most appropriate

for an increasingly complex set of educational objectives.

Differential Treatment

Differential treatment is another area in which contemporary classrooms differ from the traditional classroom. According to Cazden (1992, 2001), given the potential classroom discourse has for students whereby it is significant for students to speak more and participate in a variety of contexts, teachers need to pay careful attention to who gets more opportunity to talk in class and who gets proper feedback. She provides several examples of research done on differential treatment and cultural differences, and how these together have an impact on learning.

Firstly, Cazden (2001) mentions James Collins, a linguist who analysed fragments of lessons where low-group and high-group children read stories of equal level of difficulty. He found that the teacher helped the two groups of students in contrasting ways: the high-group was assisted for meaning or understanding while the low-group was helped with word-calling or pronunciation. Secondly, Cazden (2001) describes classroom discourse, "... as the drama of teaching and learning with speaking parts for all" (p. 164). She talks about equality for speech and the important role of teachers of engaging all students in classroom interaction.

Other studies in the area of differential treatment include Fischer and Rose (2001), Juel and Cupp (2000), Mulroy and Eddinger (2003) and Tomlinson (2005).

Juel and Cupp (2000), mention that there is research evidence that temporary and partial differential treatment can improve the learning and relative achievement status of initially low-achieving children. Clay (2000) states, "Consequently, teachers plan for all children to have the same amount of exposure to each activity though actually individual learners need differential exposure" (p. 22).

CONCLUSION

This paper has outlined and critiqued key theorists and research that has informed and positioned part of the study reported within this paper. The various sections within this paper have served to stress not only the importance of classroom discourse but also the manner in which classroom talk could be made relevant to maximise learning benefits. There is sufficient literature to prove that making changes to aspects of classroom discourse such as making classroom talk more dialogic, organising time for talk and peer listening, teacher's revoicing, questioning techniques, waiting time, assigning intellectual roles and employing differential treatment is beneficial for learning. These are the features that differentiate a non-traditional classroom from a traditional one.

The entire discussion in this paper revolves around how classroom discourse can be turned into a relevant learning tool and is summarised into episodes. A summary of these episodes that promote learning within the classroom as identified by key researchers in classroom discourse

is given in the table below (Table 1). These episodes, if replicated in the classroom, have the potential to elicit learning benefits as depicted in many research studies. These will next be used to create a framework of analysis to act as a lens with which to view data gathered in a Malaysian undergraduate classroom; the data will be shared in the next and final paper in this series.

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TABLE 1
Summary of Episodes in the Classroom that Help Enhance Learning as Recommended by Research

Summary of episodes in the classroom that help enhance learning as recommended by research		Comments	Source
1.	Teacher explains the ground rules of oral and written communication in which formal language is used		Cazden, 2001
2.	Teacher is welcoming, respectful of all students and upholds equal status for all		Cazden, 2001; Barnes, 1992
3.	Teacher is open to unconventional methods of sharing		Cazden, 2001
4.	Teacher accepts alternative answers by students but encourages comparisons and justification		Cazden, 2001
5.	Teacher talk is reduced while students' response time is extended	In the traditional classroom, the teacher normally talks for two thirds of the class time but this is now reduced	Cazden, 2001
6.	Teacher needs to have good "pedagogical content knowledge"	This is important for teachers to understand student understanding of the lesson	Cazden, 2001; Mercer, 1992
7.	Scaffolds - examples of episodes for a writing class		
	1. <i>Initial writing samples.</i> Write about an experience that is important to you for some reason...		
	2. <i>Examples of personal narrative.</i> Students read and talk about examples by professionals and other students...		
	3. <i>Idea sheets.</i> After receiving a sample from the teacher, students work individually, writing a few sentences about their own experiences [that they might write about]...		
	4. <i>Introduction to using specific detail.</i> Describing shells in teacher-led lesson, small groups and individually with feedback episodes [and revision demonstrated and tried]		
	5. <i>Details about people and places.</i> Teacher-led talk about an interesting drawing or photograph, followed by small-group work which is then read aloud and a workshop with individuals working on idea sheets, reading aloud, then feedback and revision		
	6. <i>Describing sounds.</i> Teacher-led talk about recording of various sounds		
	7. <i>Writing about bodily sensations.</i> Various in-class exercises followed by writing about a strenuous activity from one's own experience		
	8. <i>Writing about the "dumpster scenario."</i> Students asked to make an imaginative leap into a teacher-given scenario, then to write individually, with teacher coaching followed by reading in small groups, feedback and revision.		

Adapted from
Hillocks, 1995,
178-179

TABLE 1 (continue)

Summary of episodes in the classroom that help enhance learning as recommended by research	Comments	Source
9. <i>Pantomime of characters in emotional states</i> . Volunteer acts out teacher-given pantomime, then students work in small groups with one student acting and others writing details for an audience who did not see the actor.		
10. <i>Invention of dialogue</i> . Read and discuss examples as in #2: teacher-led development of dialogue (in play form) based on one scenario, followed by small-group work on another scenario; students present and then receive feedback.		
11. <i>Individual work on dialogue from idea sheet scenario</i> . Read aloud, feedback and revision		
12. <i>Punctuation of dialogue</i> . Teacher demonstrates; groups punctuate dialogue already written out – if successful, individuals convert dialogue from #11 to prose form and edit each other's punctuation		
13. <i>Workshop</i> . Students select an incident from idea sheets – drafting, periodic reading in small groups for feedback, revision, using a check-list, prompt ideas for revision		
14. <i>Class publication</i> . Students choose which to include, with all students represented if possible		
15. <i>Final writing sample</i> comparable to #1.		
8. Types of discourse emphasised by the discourse-intensive reform programme class		Adapted from Bruer, 1994, 286-289)
i. Social interaction...allows skilled thinkers to demonstrate expert strategies to the naive...[It] makes hidden thought processes public and shared...		
ii. Communal interactions allow students to share and distribute the cognitive burdens of thinking. A group provides a more information-rich context for learning...There are greater varieties of cues to trigger recall of information from individual memories...		
iii. Dialogue requires both language comprehension and language production. Because production is cognitively more demanding, dialogue might then result in deeper processing of information.		
iv. Social settings send message that thinking and intelligence are socially valued		
v. Thought, learning and knowledge are not just influenced by social factors, but are irreducibly social phenomena. Discourse does not make thought visible, rather thought is internalised discourse.		
9. Teacher and students establish mutual trust		Cazden, 2001
10. Teacher organises opportunities to talk		Cazden, 2001; Tharp & Gallimore, 1988
1. There are many ways to organise opportunities to speak:		
2. "Deregulating" classroom discourse – may result in inequality, this could be addressed by teacher nomination according to seating positions		
3. Encouraging "handing off" - allow students to select the next speaker		
4. Use of "Talking stick" – student who receives the stick gets the opportunity to speak which he/she can choose to utilise the opportunity or pass it on		
5. Requiring all students to take a stance on an issue		

TABLE 1 (*continue*)

Summary of episodes in the classroom that help enhance learning as recommended by research	Comments	Source
11. Teacher listens carefully and makes peer listening happen	Learning takes place while discussing problems in groups compared to working individually	Cazden, 2001 Alexander, 2006, 2012b
12. Teacher's revoicing By repeating students' ideas to the class, the teacher actually summarises and reformulates the points uttered by students Reconceptualisation – "a fusing of the teacher's words, register or knowledge with the original intent of the student." (pg 81) Revoicing is essential for constructing common knowledge and building a community of learners, and is gaining in popularity		O'Connor & Michaels 1996
13. Teacher asks questions for the purpose for assisting and assessing students		
14. Tea Teacher's wait time Teacher's responses – fewer mistakes in discourse and smoother building up of ideas Teacher's questions – fewer but higher level cognitively Teacher's use of students' opinions is enhanced More students, particularly those who were silent, participate in the discussion Less demand on the students to perform all the four moves – e.g. preparing to solicit ideas, airing those ideas and being answerable to the teacher for the idea given e.g. justify, defend etc.		Rowe, 1986
15. Enable students to assume various intellectual roles i. Spontaneously helping each other – e.g. when a fifth grader in a central Los Angeles school was required to record words and illustrations that depicted the desert (after a class trip), she asked peers for help in remembering a word. The "socially shared cognition" with peers helped them to use one another's memories as word search resources. This in turn enabled the student to succeed in her word search. ii. Tutoring another student when assigned to by the teacher – the initial awareness of the responsibility of having to teach others later leads students to take their own learning seriously. This helps 'tutors' find a new dignity in seeing themselves as experts and resource persons, even as their teachers observe an increase in their keenness to participate in the class as well as to assume lead roles. It is a good opportunity for students to give directions instead of receiving them and to ask questions instead of having to answer them. Teachers also could rely on these observations to pitch their expectations of their students. iii. Reciprocally providing "critique" of each other's work (as in peer writing conferences) – a critique differs from criticism in that it is about work still in progress given by a colleague to another and is reciprocal, while criticism is given by professionals on completed work and is one way. iv. Collaborating as presumed equal-status learners on assigned tasks – Webb and Palincsar (1996, pg. 867), " <i>The long list of group and classroom features provides a menu of possible ways to enhance the quality of collaboration in the classroom.</i> "		Alexander, 2006, 2012b

TABLE 1 (*continue*)

	Summary of episodes in the classroom that help enhance learning as recommended by research	Comments	Source
16.	Teacher plans differential exposure for individual learners		Adapted from Clay, 2000, 22 Adapter from Mercer, 1992
17.	Teacher pays attention to the following to alleviate reading problems among young readers - “ <i>distinguish between mistakes in reading and mistakes in pronunciation</i> ” - “ <i>give more attention to the ends of words</i> ” (where variation in pronunciation is more apparent)		William Labov cited in Snow et al., 1998, 241-42
18.	Teacher explains reasons why learners should be involved in various types of conversation and the usefulness of conversation	Language taught within context is better learnt compared to language learnt out of context	Barnes, 1992; Mercer, 1992
19.	Effort to engage students’ minds and thinking to - question, listen, reflect, reason, explain, speculate and explore ideas - analyse problems, frame hypotheses and develop solutions - discuss, argue, examine evidence, defend, probe and assess arguments - see through the rhetorical games that people play in order to disguise their real intentions or deny access to the truth	Dialogic pedagogy is claimed to be an essential underlying infrastructure for successful learning as well as good society and future citizens	Adapted from Alexander, 2006, 2012b 2005 EPPI review cited in Deakin Crick et al., 2005
20.	Teacher asks authentic questions to encourage students to think for themselves and to ask questions	Promotes equality in the classroom and encourages students to ask genuine questions	Cazden, 2001 Alexander, 2006, 2012b Nystrand et al., 1997
21.	Teacher provides feedback/answers to students’ answers/questions that provokes further thinking and questioning		Alexander, 2006, 2012 Bakhtin, 1986

APPENDIX 1
FRAMEWORK DEVELOPED FROM PZ RESEARCH

No	Episodes to look out for in the classroom	Comments
1	Questions thrown out to class seeking interpretation and justification (<i>See/Think/Wonder – Core Routine, similar to What makes you say that- UR</i>) <ul style="list-style-type: none">- What do you see? What's going on?- What does it make you think/ feel?- What makes you say that?- What does it make you wonder?	This routine helps students describe what they see or know and build explanations, promotes evidential reasoning and encourages students to understand alternatives and multiple perspectives. Initially, teacher needs to scaffold students by continuously asking follow-up questions; over time they will automatically support their interpretations with evidence.
2	Effort to link students' prior knowledge to the lesson (<i>Connect extend challenge- UR/ 3-2-1 Bridge-UR</i>) <ul style="list-style-type: none">• How are the ideas and information presented connected to what you already know?• What new ideas did you get that extended or pushed your thinking in new directions?• What is still challenging or confusing for you to get your mind around?• What questions, wonderings or puzzles do you now have?• Students respond either in writing or verbally to '<i>I used to think ...</i>'• Students respond either in writing or verbally to '<i>Now I think ...</i>'	Works well with whole class, in small groups or individually; students share some of their thoughts and collect a list of ideas in each of the three categories, or write their individual responses to add to class chart – keep students' thinking alive over time, continue to add new ideas to the lists and revisit the ideas and questions on the chart as students' understanding around the topic develops.
3	Effort to enable students to capture essence of an issue and present it in verbal or non-verbal ways (<i>Headlines- UR</i>) If you were asked to give a headline for this topic or issue right now that captured the most important aspect that should be remembered, what would that headline be? <ul style="list-style-type: none">• How has your headline changed based on today's discussion?• How does it differ from what you would have said yesterday?	

APPENDIX 2
TEMPLATE FOR CATEGORIES/DESCRIPTORS DERIVED FROM ‘VISIBLE THINKING’ AND CLASSROOM INTERACTION RESEARCH

Categories/descriptors derived from ‘Visible thinking’ and classroom interaction research (My organisation)	What visible thinking researchers have observed as manifestations	Manifestations within Malaysian context outlined in this research
A. Classroom organisation/environment (incorporates VT routines/physical environment): <ul style="list-style-type: none">• Teacher characteristics - Teacher PCK• Routines - Procedures• Physical environment• Relationship dimensions• Trust/ Promotion of risk taking (ideas, questions)• Teacher-centred time/student-centred time		
B. Relationship/classroom climate (incorporates VT relationship):		
C. Curriculum linking, transparency of intentions and promotion of metacognitive dimensions (incorporates VT modelling, expectations): <ul style="list-style-type: none">• Clarity of task, priorities and intention• Personalising learning/differentiation• Exploring prior knowledge and understandings• Student involvement• Goal setting• Decision making• Reasoning		

