Collective instructional scaffolding in English as a Second Language classrooms

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ABSTRACT

This article proposes a contextual, multimodal model of instructional scaffolding as teacher-led, task-enabling activity. The model is developed from analysis of authentic classroom interaction from schools participating in the ESL (English as a Second Language) Scaffolding action research project (2001–2003), as well as drawing on sociocultural research literature relating to scaffolding. It is hoped that the model will contribute to an understanding of the nature and value of inclusive pedagogies that specifically address the language, literacy and cultural learning needs of ESL students in schools.

Introduction

Since its introduction by Woods, Bruner and Ross (1976), 'scaffolding' has been a promising metaphor for thinking about teaching. In the last 30 years, researchers have attempted to identify, define and operationalise scaffolding in a range of classroom contexts in order to provide a systematic way of describing the complexities and dynamics of effective teaching. Despite its promise, however, some studies of scaffolding have found that it is not easily defined or readily found in classrooms (Bliss et al 1996; Mercer 1998). As Mercer states, although 'an effective conceptual metaphor for the quality of teacher intervention in learning' (Mercer 1994: 96), the term scaffolding 'is being used without being operationally defined for the classroom, and so is used loosely and given a variety of covert interpretations' (Mercer and Fisher 1998: 114).

Indeed, use of the term 'scaffolding' has become so widely and variously used within literacy and general education that it risks becoming an inoperable concept, altogether indistinguishable from a generalised notion of 'supportive teaching'. It is only by articulating theoretically robust models of such teaching practices that educators can interrogate implicit 'folk pedagogies' (Bruner 1996) and develop inclusive professional knowledge practices for multilingual classrooms.

In this article, a model of scaffolding as a complex, collaborative, multi-modal, teacher-led task-enabling activity is proposed. The model is developed from analysis of authentic interaction data from classrooms participating in the ESL Scaffolding action research project, as well as drawing on sociocultural research literature relating to scaffolding. It is hoped that the model will contribute to understanding the nature and value of inclusive pedagogies that specifically address the language, literacy and cultural learning needs of ESL students in schools.

Conceptualising scaffolding

As a starting point for considering scaffolding in classroom interaction, two key perspectives about scaffolding are outlined from the sociocultural research literature. These perspectives are: scaffolding as task-enabling support and scaffolding as language-mediated co-regulatory activity. The first perspective focuses on the intellectual task basis of scaffolding. The second focuses on the nature of scaffolding as a social semiotic activity in which language is the key mediating tool.

SCAFFOLDING AS TASK-ENABLING SUPPORT WITHIN THE ZONE OF PROXIMAL DEVELOPMENT

In attempting to operationally define scaffolding for classrooms, many researchers (for example, Cazden 1985; 1988; Maybin, Mercer and Stierer 1992; Mercer 1994; Wells 1999; Mercer 2000; Hammond 2001; Gibbons 2002) have stressed that scaffolding is not simply any type of teacher support but is essentially concerned with the provision of *task-enabling support.*

> [Scaffolding] is not just any assistance which helps a learner accomplish a task. It is help which will enable a learner to accomplish a task which they would not have been quite able to manage on their own, and it is help which is intended to bring the learner close to a state of competence which will enable them eventually to complete such a task on their own.
>
> (Maybin, Mercer and Stierer 1992: 188)

Scaffolding, then, can be understood as *assisted accomplishment* of 'new or difficult tasks' (Applebee 2002). One way teachers often assist learners' accomplishment of new or difficult tasks is by managing task complexity to maximise student task control. Instructional scaffolding may involve modifying '… the steps taken to *reduce the degrees of freedom* in carrying out some task so that the child can concentrate on the difficult skill she is in the process of acquiring' (Bruner 1978: 19, italics in original).

This conception of scaffolding as task-enabling support realises at a micro level Vygotsky's 'cultural apprenticeship' notion of learning in which

novices are assisted to grow into the intellectual life of their community by co-constructing knowledge in joint activity within the zone of proximal development (ZPD) with the help of more knowledgeable mentors. This notion also relates to Tharp and Gallimore's (1990; 1998) understanding of teaching in the ZPD as 'assisted performance' of school literate discourse.

The dynamic, task-enabling function of assisted performance and its developmental effects on participants' ZPD is also emphasised in Wei's description of scaffolding as a pedagogic activity within an apprenticeship model of education.

> Scaffolding is the 'infrastructure' or support the master gives to the apprentice, or the teacher plans for the student, for tackling the task at hand. Scaffolding adapted to the level of the learner in both cases ensures success at a task the child cannot do on his or her own. The amount of scaffolding needed and provided decreases as the skill level of the learner increases. The teacher thus follows a moving ZPD. Ultimately, the scaffolding structure becomes internalized, enabling independent accomplishment of the skill by the learner. For a learner at a given level of skill, a greater scaffold is provided as a task difficulty increases. Scaffolding is integrated with shaping the technique in which task difficulty is also varied as a function of a learner skill.   (Wei 1999: 197–198)

Another way of understanding scaffolding as task-enabling support in teaching-learning environments is shown in Figure 1 below, drawn from Mariani (1997). (See also Hammond and Gibbons, this volume). The model shows how classroom teaching practices and routines structure students' experience of their learning environment by creating different degrees of challenge and support. Students experience classrooms as zones of anxiety/frustration (high challenge without commensurate support), comfort/cruising (support exceeds challenge), boredom/apathy (low challenge and low support) and, given the stimulus of high challenge with high support, engagement/development.

This 'engagement zone' provides another way of understanding Vygotsky's (1978; 1987) ZPD, where 'learning leads development' and 'minds are roused to life', and is described as:

> the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers.   (Vygotsky 1978: 88–89)

The value of the model lies in its ability to highlight how recurring classroom activity, at both micro level within tasks and at macro level across tasks, fosters differing cognitive/affective engagements of students, and in turn their differential academic development and agency. The model draws attention to

the learning dispositions and trajectories of each of the teaching–learning zones over which teachers have a strong locus of control and responsibility. At the micro level of pedagogic activity, scaffolding is located in high challenge/ high support task environments, confirming its function as task-enabling pedagogic action in the 'development zone'.
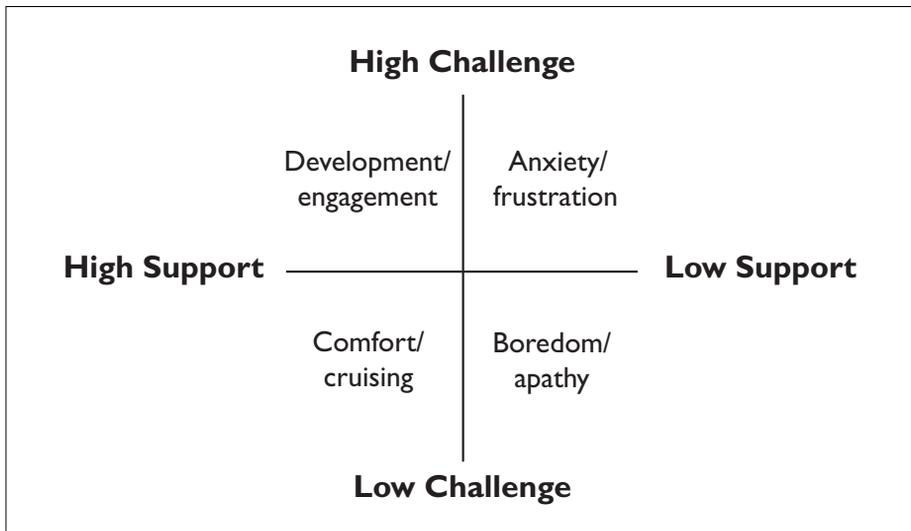
Figure 1: Teaching-learning zones based on Mariani's (1997) teaching style framework

Scaffolding as language-mediated co-regulation

Vygotsky (1978; 1987) argued that language has a privileged place in the development of higher human consciousness because, as the 'tool of tools' (Leont'ev 1981), it is used by humans to act on, control and transform their physical, social and semiotic worlds. In the classroom, in particular, language is the 'cultural toolkit for joint intellectual activity' (Mercer 2002: 10) that acculturates students into the ways of thinking and speaking of the discourse community to which they aspire to belong.

In any classroom, teacher–student dialogue is the most important mediating tool used to guide individual and collective understanding related to curricula goals and teacher intentions (Wells 1999; 2000; 2002a). Participation in such dialogue affords students opportunities to appropriate new ways of doing, speaking and thinking. In this context, instructional scaffolding can be seen as a particular type of mediating, task-based dialogue which, 'built into tasks, provides students with the knowledge and strategies

necessary to complete a new task, all embedded within "a natural sequence of thought and language" (Langer and Applebee 1986) that helps the learner internalise the new knowledge and skills for eventual use in other tasks.' (Applebee 2002).

Meyer and Turner (2002) outline a model of instructional scaffolding in which dialogue is central. Their analysis of teacher whole-class instructional discourse in high-achieving mathematics classrooms describes instructional scaffolding as collaborative teacher/student, co-regulatory dialogue in the service of shared mastery goals. A key feature of instructional scaffolding is the socio-cognitive and socio-affective supports teachers give to encourage student participation and perseverance in unfamiliar mathematical talking and thinking. Such teacher/student dialogue establishes within collaborative activity a supportive interpersonal climate needed to maintain a focus on conceptual learning, to 'push' student competence, and to promote increasing student autonomy and accountability.

The notion of scaffolding as language-mediated, collaborative activity is implicit in discussions about use of scaffolding as a pedagogical tool to foster the language and literacy skills that ESL students need to acquire the academic registers of schooling. Sharpe (2001), Hammond (2001) and Gibbons (2002) have used the terms *contingent* and *designed-in* scaffolding to encompass micro and macro level provision of language and literacy support in linguistically diverse classrooms. This distinction is a useful one as it supports comprehensive implementation of a language-based approach to teaching via both systematic curriculum planning and responsive instruction, as outlined by Hammond (1995; 1996), Macken-Horarik (1996; 1998) and Hammond and Macken-Horarik (1999). More recently Hammond and Gibbons (this volume) have used the term *interactional scaffolding* to highlight that this form of language-mediated activity, whether designed-in or not, is always realised as contingent, just-in-time task-relevant assistance.

This notion of scaffolding as language-mediated, co-regulatory activity is also evident in the work of Rose, Gray and Cowey (1999). Their model of instructional scaffolding has been specifically developed to enable Aboriginal students with limited literacy skills to accomplish high-order reading and writing tasks with ever-diminishing degrees of teacher control (and ever-increasing degrees of student freedom). The model represents a carefully designed-in form of interactional scaffolding that systematically exploits the mediational and regulatory resources of language for ensuring higher levels of successful student participation and performance in challenging literacy activity.

Instructional scaffolding in action

This section examines the verbal transcripts of teacher–student interaction arising from whole-class learning activity in lessons from two Year 7 classrooms. Data from the two classrooms, one Maths, the other English, are analysed to identify and compare the key features of collective instructional scaffolding as they play out within the activity and across the two classroom contexts.

INSTRUCTIONAL SCAFFOLDING IN YEAR 7 MATHS

Text 1 relates to a Year 7 (12- and 13-year-old) class consisting of 25 students. Half of the class have been learning English for between three and five years. In this lesson a student is at the front of the class, reporting on a group task in which the students had to solve a mathematical word problem using appropriate mathematical reasoning. The students were given a reflection sheet, which required them to record separately the problem, the key words in the problem, the mathematical operations required and the solution steps taken. While William is reporting, the teacher is recording on the board what the student is saying using mathematical numbers and symbols.

Text 1: Teacher-assisted reporting back to class – Year 7 Maths

Turn	William	Teacher
1		Now the really meaty part. Steps we used. Step 1.
2	*We just guessed. 9 plus 10.*	
3		Okay, so you *just guessed*. What was it? *9 plus 10.* So you're looking for pairs of numbers that add up to 19.
4	But when *we multiplied*, it didn't equal 48.	
5		So when you *tried multiplying* 9 times 10 you get 90, nowhere near what you want. So you *tried* one. So that was step 1. So, second step?
6	*Second, we tried 15 times 4.*	
7		So you've gone down. You *tried 15 plus 4.* Again 15 plus 4 add to 19 but the problem is you've got to get both, **you've got to satisfy both conditions**, don't we? Got to get them to add to 19 and times to 48.
8	We tried 15 times 4.	
9		What do we get for that? What do you reckon?
10	*60*	

Text 1 continued

Text 1 continued

Turn	William	Teacher
11		*60*, also no good. So what are you going to try now?
12	Step 3, we tried *16 plus 3*.	
13		*16 plus 3*. So you just moved up a bit from 15, haven't you? 19.
14	When we multiplied, it was 48.	
15		Looking good, isn't it?
16	But we have to minus 16 to 3.	
17		So that's step 4 now. So you've found the numbers *16 and 3*. So what are you finding now?
18	**The difference**.	
19		**The difference**. That's what the question's saying, isn't it? The last sentence of the question, you've got to find **the difference**. What about step 5. Just put in, answer equals *13*.
20	*13*.	
21		That's the **method** we talked about, we *tried* before, isn't it? … when you start with a guess and from each guess you work your way closer and closer to the answer. Each one we *tried*, it gives you a clue as to where the answer is going to be. You're slowly moving up, slowly homing in on the answer until you come to the answer you're looking for.

Key: *Italicised text* = repeated/appropriated speech. **Bold text** = conceptual discourse of the subject area.

Task conditions

From this interaction it can be seen that certain social conditions make this collaborative activity possible. As the student with assigned responsibility for reporting to the whole class about his group's work, William has *ownership* of the task. William's *struggle* to communicate his group's solution steps to the class reflected that this reporting activity was a new and unfamiliar one for all students. As William and the teacher work together to report the group's problem-solving, the unequal nature of their collaboration is determined by the differing levels of mathematical and other expertise between the two participants. At the same time, however, the teacher's *commitment* to ensuring that William achieves a successful reporting outcome is critical in sustaining the interaction to its conclusion.

Task engagement

In accomplishing the reporting task, William experiences a set of social/intellectual *challenges* and *supports*. On the challenge side, the task requires William to communicate to his class peers by:

- recounting a number of solution steps
- explaining his group's reasoning for these steps
- expressing mathematical ideas using both arithmetic and language systems, and
- using appropriate mathematical language.

    These challenges, however, are balanced by multiple supports, specifically:

- William's prior participation in the group task
- William's completed reflection sheet, to which he refers
- the teacher's guiding prompts and comments, and
- the teacher's concurrent recording of the student's oral recounting on the board.

William's engagement, participation and perseverance in the reporting task is sustained so long as a rough equilibrium between these challenges and supports is maintained throughout the task.

Task trajectory

The potential developmental trajectory of the reporting activity can be seen in the interaction and turn-taking patterns. Initially lacking in confidence, William assumes increasing initiative (turns 4, 14, 16) in the joint reporting as the teacher 'leads from behind' by prompting and elaborating on William's contributions. Throughout the task, the teacher plays a strong guiding role as he judges that William, by himself, is not yet able to articulate the mathematical reasoning required by the activity. At the same time, William's continuing dependence on the teacher's assistance prevents him from taking a leading role in the interaction. Nevertheless, it could reasonably be expected that, with repeated practice and diminishing support in future similar activities, William would develop increased control over the task, along with mastery of its component skills.

Task context

The activity takes place 'publicly' in front of the class. The activity therefore occurs for the benefit not only of William, but for the whole class collectively. Because the task occurs within a shared public context, all students in the class have the opportunity to observe and compare concrete, visible models of peer

and teacher mathematical reasoning needed to successfully complete these kinds of problem-solving tasks.

Semiotic resources for the task

A host of meaning-making signs and symbols accompanies, underpins and augments this collaborative activity. These *semiotic resources* extend the mathematical thinking of the class members in activity and can be broadly grouped under three headings.

William's mathematical reasoning is extended by the teacher's *interactional discourse* through strategies such as *repetitions*, linking William's responses to teacher elaborations (turns 3, 5, 11, 13); *affirmation*, confirming William's efforts so far (turn 16); and *elaborating strategies* that make explicit the reasoning process through such strategies as *reformulations* marked by 'so' (turns 5, 13), *recontextualisations* of student's language into more mathematical discourse (marked in bold) (turns 7, 21), recaps (turns 5, 21) and *extending strategies* such as 'high demand' questions (turns 11, 19) that 'press' William to communicate his thinking. Such *interactional scaffolding* involves an intertwining of both cognitive and affective supports for the student as he wrestles with the task.

At the same time, William's mathematical reasoning is being supported through use of *inscriptions* throughout the activity. As William is reporting to the class, the teacher records his words on the blackboard in mathematical notation. As well, the reflection sheet used to sequence and structure the earlier group problem-solving activity also sequences and structures the individual report-back activity. In this task, *inscriptional scaffolding* is being used to 'make visible' (Collins, Brown and Holum 1991) and extend students' mathematical reasoning as they 'think with and through' (Saljo 1998) the mediating text.

At the same time, *indexical* support is at work in the interaction through the teacher's pointing at and underlining of his cumulative mathematical blackboard notations. In this situation, *indexical scaffolding* is being used to augment the teacher's inscriptional and interactional scaffolding. Within the one activity, all three types of scaffolding are at work simultaneously.

Instructional scaffolding in Year 7 English

Text 2a relates to a Year 7 (12- and 13-year-old) class consisting of 25 students. Almost all of the students have been learning English for between two to six years. In this lesson, one student is sitting in the 'hot seat' and being interviewed by a group of five students sitting in front on the floor, with the rest of the class looking on. The 'hot seat' student is required to be Mota, a fictitious minor character from a story they have been studying.

The interviewers must try to elicit elaborated responses from the 'hot seat' character through their questions so they can draw out Mota's motivations for her actions.

Text 2a: Teacher-assisted 'hot seat' – first group – Year 7 English

	Teacher	Interviewers	'Hot seat' character
1	Alright? Follow what we're trying to do? Mota has a character, the fire has a character, mother has a character, <u>now let's see if we can get this man from the village a bit of a character</u>. Okay. First question. *So, what did you think when you saw Mota's mother leaving her by the fire and coming to the river?*		
2			Ah, something was really wrong. And she was really scared.
3	*Mota's mother did?*		
4			Yeah.
5	Okay. *How do you know Mota's mother, what's the connection?*		
6			Friend.
7		*[laughter and talking]*	
8	<u>Now, take it further</u>. Now, one of you, at this point, you come in and take it over there, *so how do you know*, <u>you say she's your friend</u>. *Is she your **neighbour**, is she just a [inaudible one word]*, <u>so try to feed him information</u> …		
9		*[some laughter and talking]*	
10	<u>No, no, that's not in [inaudible one or two words], he's already said 'friend'. So keep questioning</u>, somebody else ask him a question. <u>What you want to find is another character to write about and a bit more detail about the plot [name]</u>.		
11		Did she <u>trust</u> Mota?	
12			Yes.
13	That's – okay, <u>can we take that a little bit further? We already know that Mota's nearly burnt down the whole village, so we ask a very central question</u>, *would you trust Mota? Can you give us **a bit** **more information**?*		

Text 2a continued

Text 2a continued

	Teacher	Interviewers	'Hot seat' character
14			Oh, me? Probably not, because she's a <u>bit</u> young and she [inaudible several words].
16	*How well do you know Mota?* <u>Now, what you need to do when you get a question like that, is to give yourself some kind of relationship with her.</u> You know, how *I'm the schoolteacher, I'm the* **next-door neighbour**, *I know this, that and the other about her.* <u>So all we're trying to get is as much information as we can out of this.</u> Yeah?		
17			Oh, <u>I'm her</u> **next-door neighbour** and she … and I don't <u>trust</u> her at anything cause she …
18	*What was one of the things you might know of a situation where* **she was a bit silly**?		
19			Ah … she [inaudible several words]
20		*[laughter]*	
21	*And what, what was her reason?*		
22			Ah, because **she's just foolish**.
23		*[laughter]*	

Key: <u>Underlined text</u> = teacher coaching discourse. *Italicised text* = teacher modelling.
     Bold text = appropriated speech.

The same activity is then repeated with a second group of students.

Text 2b: Unassisted 'hot seat' – second group – Year 7 English

	Teacher	Interviewers	'Hot seat' character
24	Okay. Alright. And – thank you. Now, we're moving back here. You have a go. Now, what we didn't do there – and you've got to be, I'm not going to do anything more here – <u>you've got to think of a smart way of getting his name out of him, it could be a she, doesn't have to be a he – and you can get, and the relationship and a little bit more about Mota, about her mother, about the</u> **village** in general. That's your brief. Okay. Shush. Excuse me. We've got all the people here that we need. [name], go.		

Text 2b continued

Text 2b continued

Teacher	Interviewers	'Hot seat' character
25	Have you got an important job in the **village**?	
26		Oh, yeah. <u>I have to look after the animals</u>. What happens is, <u>we have lots of animals</u> and I have to <u>look after them</u> and prepare them for the slaughter.
27	*[laughter]*	
28	[inaudible question]	
29		Well, see, the **village** never got burnt, the grass fire was around the **village**. But it was a beautiful **village**, it was made of sticks.
30	*[laughter]*	
31	Do you have any relationship with Mota's mother?	
32	*[laughter]*	
33		No, we went to school together when we were learning how to hunt kangaroos and she was learning how to get fruit and everything. We got lost and that's how I knew her.
34	What do you think happened?	
35		Well, I'm not sure, really. All I saw was Mota's mother running, going 'oh, Mota'.
36	*[laughter]*	
37		And then I saw smoke everywhere. Well, at first, I thought, well, it looks like Mota's done it again. But, then, her mother told me about the fire demon.
38	How well do you know Mota?	
39		Well, I don't know her very well, except I do order her around a bit.
40	What were you doing when the fire was on?	
41		Oh, I was wrestling with my friend Dujon.

Text 2b continued

Text 2b continued

	Teacher	Interviewers	'Hot seat' character
42	*[laughter]*		
43	Okay, alright, thank you. Okay. Richard. [inaudible two or three words]. <u>Find out a bit more about the situation</u>.		
44	*[Dujon] [laughter]*		
45	What we have there is very good because there was, in drama terms, no negative blocking, whatever they threw him, he took it and he led on with it, he developed it, took it further.		

Key: <u>Underlined text</u> = teacher coaching discourse. **Bold text** = appropriated speech.

Task conditions

From this transcription, it can be seen that this drama-based activity is underpinned by a familiar set of social conditions. Each 'hot seat' student '*owns*' the task because they have been assigned the role of responding 'in character' to the group's questions. The first group, in particular, found this task a *challenging* one, as suggested by the intensity of the teacher's modelling of 'in character' questions and responses. The *expertise gap* between the teacher and 'hot seat' participants is reflected in the teacher's expectations of character authenticity in students' role play, her discursive pressure and her discourse modelling strategies. The teacher's overriding *concern* for optimal task participation of her novice students is seen in the flexible calibration of support she provides as she moves from the coaching, modelling and task meta-instruction with the first group to 'peripheral participation' and complete 'fade-out' with the second group.

Task engagement

As with the mathematical reporting task described earlier, maintaining successful student participation in the 'hot seat' activity involves *coordinating* the challenge and support elements of the task. On the challenge side, the 'hot seat' students must:

• imagine a character and his/her relationships with other characters within the story

• infer the motivation of a major character, Mota, from her behaviour, and

- express these perspectives through unscripted but 'authentic' character/ group dialogue.

  In addition, the teacher *further raises* the challenge level of the task by:

- nominating 'hot seat' participants rather than asking for volunteers, and

- pressing students to ask probing questions and give extended responses relating to the relationship between the 'hot seat' character and Mota.

  To meet these challenges, the teacher supports students, especially the first group by:

- clarifying task goals

- modelling and exemplifying a range of probing questions and character responses

- suggesting performance strategies

- providing re-enforcement and encouragement, and

- communicating key drama concepts and principles.

  The effectiveness of these counter-balancing supports is evident in the second group's take up of ideas, probing questions and extended responses from the 'hot seat' character.

Task trajectory

The developmental progression of this activity is characterised by a task *agency* that passes from teacher to students and is marked by disappearing levels of teacher support and instruction. Initially, with the first group, the teacher controls the dialogue, employing multiple *instructional roles* that alternate between modelling question and response exchanges *as if a task participant*, and explaining, advising and reinforcing *as a task coach* (turns 1, 8, 13, 16). The rapid alternation of these roles reflects the teacher's goal of apprenticing students into the discursive strategies and practices necessary for successful participation in 'hot seat' activity. With the second group, by contrast, teacher scaffolding disappears as she stands back from the task and allows students to take full responsibility for the dialogue, only re-emerging at the end of the activity to provide closing meta-commentary.

Task context

Again, the context for the lesson is the 'public' space in which the whole class views the 'hot seat' as a 'goldfish bowl' activity. All the students are able to participate in the *collective* activity, while nominated individual students 'represent' the others in the learning activity (Bourne 2004). This

activity setting affords all students opportunities to observe the role play dynamics and discourse as proximal models for their own anticipated task performance at a future time.

Semiotic resources for the task

A range of meaning-making resources is available for use by participants in this collaborative drama activity. *Interactional* resources, in the form of fading teacher-led dialogue, are the dominant feature of this activity. Use of the *indexical* resources of the classroom also underpins the activity, in the form of the spatial positioning of the class into a 'goldfish bowl' arrangement.

Interactional resources are used through a range of teacher discourse strategies aimed at assisting the first group to interrogate a character and elicit narrative relationships and motivations. As indicated by the coding of the transcript, the teacher's talk is marked by alternations between coaching discourse alongside the task and modelling discourse for the task. The teacher employs *modelling* of different types of probe questions the group should be asking (turns 1, 5, 8, 13, 16, 21) and *recapping* (turns 1, 10, 24, 45). In group two, a student appropriates the teacher's question: *How do you know Mota's mother? What's the connection?* (turn 5) and recontextualises it as: *Do you have any relationship with Mota's mother?* (turn 31). Similarly, teacher discourse: *Is she your neighbour* (turn 8) and *I'm the next-door neighbour* (turn 16) is taken up by the student: *I'm her next-door neighbour* (turn 17); and *she was a bit silly* (turn 18) is appropriated by the student as: *she's just foolish* (turn 22).

In Text 2b, it can be seen that the teacher/student word appropriation extends to the interaction between interviewers and the 'hot seat' character, for example, *village* (teacher, turn 24 – interviewer, turn 25 – 'hot seat' character, turn 29). The group's questions are all challenging questions (turns 25, 28, 31, 34, 38), which press the 'hot seat' student to respond evaluatively and credibly in role. At the end of the activity the teacher positively evaluates the students' efforts and recontextualises the nature of their participation using the drama performance concept of 'negative blocking' (turn 45).

Meaning is also created through the physical positioning of students as they engage in the 'goldfish bowl' activity. A small group of students is seated on the floor in front of a student seated on a chair at the front of the room. They provide a model, for those who are watching, about how to ask challenging questions and respond in ways that will develop the minor character, his/her relationship to Mota and her mother, and credibility for attributing motivation to Mota for her actions. The teacher's use of a 'goldfish bowl' strategy to orchestrate the activity constitutes use of *indexical* resources.

Instructional scaffolding in the two classrooms

Each example of scaffolded activity in the two classrooms discussed has shown common aspects of the social-semiotic environment in which scaffolding arises. These common aspects may be identified as:

• situational task conditions

• task challenge/support equilibria

• developmentally significant teacher/student role shifts, and

• shared public/private contexts.

The summary in Table 1 below shows the underlying similarities between the two instances of instructional scaffolding, despite the obvious differences in the nature of the activity, content and participants.

Table 1: Instructional scaffolding in two classrooms

Features	Class reporting Year 7 Maths	'Hot seat' Year 7 English
CONDITIONS	• student owns assigned task role • challenging activity • teacher/student expertise gap • teacher commitment to successful task completion	• student owns assigned task role • challenging activity • teacher/student expertise gap • teacher commitment to successful task completion
CONDITIONS	*challenges* • communicating to whole class • recounting solution steps • juggling two meaning systems • explaining reasoning • maths language *supports* • group work experience • reflection sheet • teacher guides steps • online recording on blackboard • elaborating explanations • teacher metalanguage	*challenges* • teacher nomination • questioning • pressure for character perspective • pressure for elaborated responses • signalled withdrawal/handover *supports* • repetition • modelled questions/answers • goal clarification, task strategy • reinforcement, exemplification • encouragement • principles, key concepts
COURSE	• co-regulated activity maintained • no teacher 'fade out'	• shift to student-regulated activity • teacher 'fade out'
CONTEXT	collective scaffolding in front of the class	collective scaffolding in front of the class

Table 1 continued

Table 1 continued

Features	Class reporting Year 7 Maths	'Hot seat' Year 7 English
MEANING- MAKING RESOURCES	• interactional resources • indexical resources • inscriptional resources	• interactional resources • indexical resources

A MODEL OF INSTRUCTIONAL SCAFFOLDING

We now describe a model of instructional scaffolding relevant to whole-class settings, based on analysis of the scaffolded tasks in the preceding section. The model expands the one described by Hammond and Gibbons (this volume) and encompasses two broad areas of action essential to scaffolding: a contextual framework, describing the knowledge task basis of scaffolding, and a classification framework, describing the knowledge resource basis of scaffolding. The contextual framework describes the situated, dynamic nature of scaffolding and reflects a focus on the developmental effects of joint intellectual activity while in the 'process of flight' (Vygotsky 1978). The classification framework describes the kind of mediational resources available to participants in such scaffolded activity. Together, the model reflects diachronic ('through time') and synchronic ('point in time') perspectives on emergent literacy and social practice described by Gutierrez and Stone (2000). The two parts of the framework can be used to identify, respectively, the 'process' and 'content' of teacher-led scaffolding in classrooms.

A   Contextual framework for scaffolding

The situated and dynamic nature of scaffolded activity can be understood in terms of four basic contextual 'drivers' outlined in the contextual framework described below. Without an understanding of these drivers, understandings about scaffolding are reduced to a focus on surface features of verbal, interactive behaviour to the neglect of fundamental, underlying social purposes of the interaction. The contextual framework highlights essential dynamic functions of scaffolding as joint teacher/student activity and helps identify how scaffolding functions in classroom settings.

1   Conditions for scaffolding

Scaffolding occurs when four activity conditions are met. These conditions are identified as follows.

1   *The novice task participant has prime responsibility for the task.*
    Under this condition, the locus of responsibility for 'doing the task' must rest with the novice participant. That is, the novice participant must have

or develop an interest, desire, duty or commitment to undertake the task and achieve its goal. Without having or developing *ownership* of the task, the novice participant is not motivated to seek, attend to, or accept any assistance needed for its successful completion.

2   *The task engages participants in challenging problem-solving activity.*
    Under this condition, consistent with the concept of the ZPD, the level of difficulty posed by the task must be *beyond* the ability of the participant to accomplish independently, but not beyond their ability to accomplish with assistance. If not *challenged* to solve problems posed by the task, the novice participant has no need to make use of any available assistance, nor will the novice be 'pushed' to develop task-relevant skills and knowledge that they do not already have.

3   *A knowledge/skill differential exists among task participants.*
    Under this condition, different degrees of expertise must be readily available to task participants to afford them opportunities for sharing and acquiring task-relevant knowledge and skill. Without *asymmetries* |of task expertise ranging from 'master' to 'near peers', there can be no reciprocity of help and assistance necessary to drive the circulation, dissemination and appropriation of task-relevant knowledge and skills among participants.

4   *Expert task participants are concerned about the task participation of novices.*
    Under this condition, task experts, such as teachers and peer mentors, must have an interest, desire, duty or commitment to help novices participate in and complete the task at hand. Without a sense of *care* or responsibility for the task participation and performance of less capable others, experts are not motivated to provide and sustain the relevant assistance that task novices require to accomplish challenging activity.

2   Coordination of scaffolding

This contextual driver refers to the critical *balancing* of challenge and support needed to sustain novices' ongoing task participation and performance. As suggested in Mariani's (1997) teaching/learning framework, students can |easily become overwhelmed by the difficulty of the task when there are insufficient matching supports. Conversely, students easily become bored by a task with insufficient challenge. To provide optimum development and motivation for students, tasks should not only be sufficiently challenging to 'stretch' students beyond their 'comfort zones', but should also supply specific supports needed to meet the particular challenges at hand. Scaffolding is

most effective when students engage in tasks where challenges and supports are 'in balance'. The balancing of challenges and supports within class tasks is one of the most important ways teachers create zones of proximal development for their students.

Task supports encompass social, cognitive, linguistic, paralinguistic and affective strategies. *Social strategies* include task-enabling interactions such as questioning and turn-taking; *cognitive strategies* include providing conceptual supports such as analogies and prior knowledge cues; *linguistic strategies* include supply of task relevant lexical, grammatical and textual resources; *paralinguistic strategies* include task-supportive non-verbal communication such as gesturing and pointing; and *affective strategies* include provision of socio-emotional supports such as encouragement and frustration control needed for task perseverance.

Instructional scaffolding can therefore be seen as a 'balancing act' involving monitoring and coordination of the interplay of challenge and support dynamics of a particular task for particular students. Effective scaffolding of students' task participation and performance involves teachers in creating and managing an equilibrium of challenge and support throughout the operation of the task.
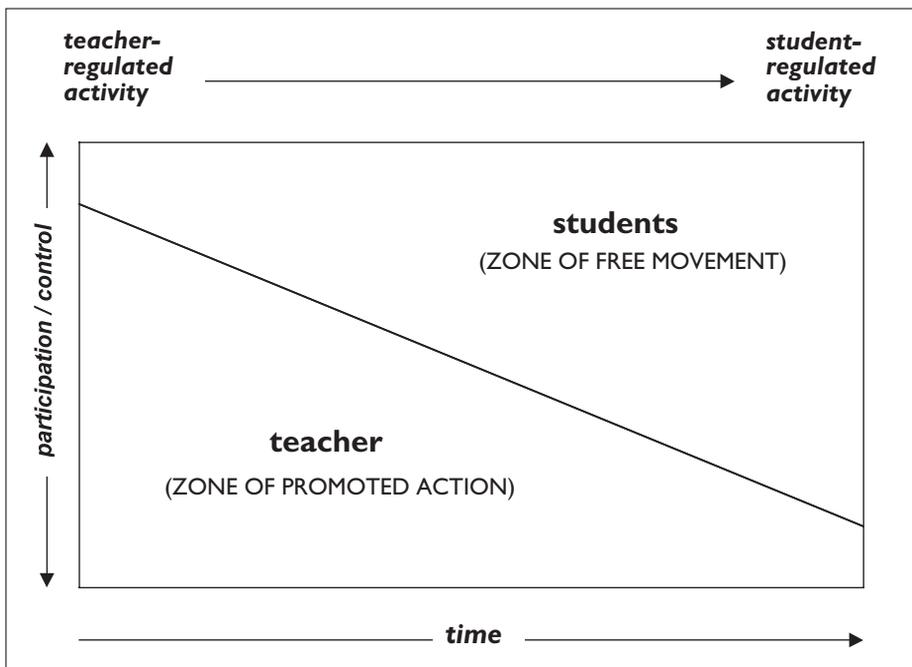
3   Course of scaffolding

Scaffolding is 'played out' over the course of a task in identifiable progressions. The course of scaffolding reflects the teacher's primary goal and intention that students develop independent functioning and control of valued activity. By aiming to affect a shift in participation/control from teacher to student in the course of the activity, this *instructional telos* establishes the basic pedagogical direction and purpose of scaffolding. Such imagined instructional end-points reflect, as well as enact, fundamental teacher beliefs and expectations about the capabilities of the particular students they are teaching.

The progression of scaffolding is characterised by a transfer of task role, responsibility and authority *from* the teacher *towards* the student. As the task unfolds, this shift is typically evidenced by diminishing teacher participation and increasing student involvement. This teacher '*fade-out*' (Brown and Ferrara 1985) or '*handover*' (Bruner 1978) is accompanied by increasing student mastery, '*uptake*' or '*take over*' of the task. There is, moreover, a fundamental interdependence between these two movements. Students cannot begin to take over an activity until the teacher first moves to relinquish his or her control over it. At the same time, teacher fade-out provides the 'press' students need in order to take over and control the task. In this way, teacher fade-out sustains challenge and a 'moving ZPD' for novice participants as they grow more agentive and accomplished in the task. The

'handover/takeover' transition is the 'chrysalis' in which novice participants appropriate the knowledge and skills of task experts and themselves become 'task masters'.

The emergent, unfolding process, whereby task agency, knowledge and skills transfer from the teacher to students throughout the course of a task, is schematically illustrated in Figure 2 below. It illustrates how the initial stage of task scaffolding is typically teacher-controlled, a middle stage allows shared teacher/student control and, in the later stage, full student control emerges. It is through this 'pivot' movement from teacher-regulated to student-regulated activity at the micro level of classroom tasks that scaffolding fosters learner agency, autonomy and self-directed learning.

Figure 2: Course of scaffolding

This diagram recalls Wei's (1999) description previously cited, which emphasises the developmental trajectory of scaffolding and brings together many of its attributes identified in earlier research as being of pedagogical significance; in particular, controlling for task complexity in order to maintain and increase student participation and control over activity, building and exploiting inter-subjectivity throughout the activity, and 'fading out' teacher support as student control over the activity develops.

4 Contexts for scaffolding

Scaffolding may be linked to any curricula task and embedded within any classroom activity. Scaffolded tasks may be incorporated within a range of classroom activity formats such as individual work, small group work and whole-class interaction. In classrooms, scaffolding often occurs 'privately' in interactions between the teacher and individual students or small groups of students who are experiencing difficulty with a task.

Scaffolding can also occur 'publicly', enabling participation in challenging whole-class activity. In public scaffolding, the whole class participates in the collective, while individual students 'represent' the others in the learning activity (Bourne 2004). Representative participation in publicly scaffolded tasks is communicated by participant selection processes, which signal that any student could be nominated and that all students will eventually be called upon. Examples include situations where individuals or groups may be reporting back to the class, are involved in a 'demonstration' activity in front of the class, or are participating in teacher-facilitated class discussion.

When a scaffolded task occurs as 'public' classroom activity, it makes the reasoning, problem-solving and discourse processes of cognitive tasks visible to students and contributes to the broader learning apprenticeship of the class-as-learning-community (Collins, Brown and Holum 1991). As a shared, collective endeavour, scaffolded tasks model participation and mastery on desired pedagogical tasks and build inter-subjectivity and situated knowledge and skill for the benefit of all students. Such teacher-led whole-class scaffolding, termed *collective instructional scaffolding*, has been the focus of this article.

B Classification framework for scaffolding

After considering the underlying social dynamics of scaffolding, we now turn to the meaning-making resources available to teachers when leading scaffolded activity in the classroom. The classification framework outlined below highlights the different mediational forms that scaffolding may take in activity and helps identify what scaffolding 'looks like' when realised in joint teacher/student activity.

The semiotic dimensions of scaffolding can be considered in terms of its *mode*, or the particular symbolic form used to mediate action; its *manner*, or the orientation in which this symbolic mediation is channelled; and its *means* or resources – the specific task-enabling tools and strategies – by which directed symbolic assistance is realised.

The *modes* of scaffolding – *interactional*, *inscriptional* or *indexical* – direct teachers' attention to three distinct mediating sign systems through which task-enabling support may be provided. *Interactional scaffolding* refers to task enablement through inquiry-oriented contingent dialogue

(Palincsar 1986; Wells 1999; 2000; 2002a; 2002b). *Inscriptional scaffolding* refers to task enablement through normative use of texts and inscriptions to talk, think and reason with (Roth and McGinn 1998; Cobb 2002). *Indexical scaffolding* refers to task enablement through situated use of physical signs to sustain, orchestrate and enhance meanings (Erickson 1996).

The *manner* of scaffolding highlights how task-enabling support may have either a representational (Toth 2000) or procedural orientation, that is a knowledge-structuring or task-guiding emphasis, respectively. These two orientations may be compared to the concepts of declarative and procedural knowledge described in information processing theory and applied to second language acquisition research (McLaughlin, Rossman and Mcleod 1983; McLaughlin 1987). Scaffolding *means* refers to the range of 'mediational means' (Wertsch 1985; 1991) or semiotic resources such as discourse and multimodal tools and strategies that can be used to provide task-enabling support.

The applicability of the framework is shown in the following example of everyday teaching practice. In new and difficult classroom activities, teachers often draw on multiple modes of scaffolding to provide the support they believe their students need. for example, a teacher elicits student responses about concepts from a diagram, clarifies and builds on those responses, while pointing out salient parts of the diagram and recalling prior shared knowledge on the topic. In this particular joint activity, students' developing knowledge is simultaneously being given schematic support through mediating diagram-matic text (*inscriptional scaffolding*); discursive support through mediating teacher dialogue (*interactional scaffolding*); and spatial/locational support through mediating physical signs (*indexical scaffolding*).

Conclusion

Analysis and comparison of whole-class teacher–student interaction from the two classrooms has enabled identification of an important pedagogic activity, *collective instructional scaffolding*. This analysis has also supported the development of a model of instructional scaffolding that is able to identify essential common features of activity as they play out in different classroom contexts. Consideration of classroom interaction with the assistance of the model highlights how varied instructional scaffolding can be in terms of its semiotic modes, means and resources. Further analysis of the discourse of instructional scaffolding also suggests that scaffolded activity is an identifiable pedagogical activity sub-system well suited to improving the social, linguistic and academic participation and performance of second language learners as well as their English-only speaking peers.
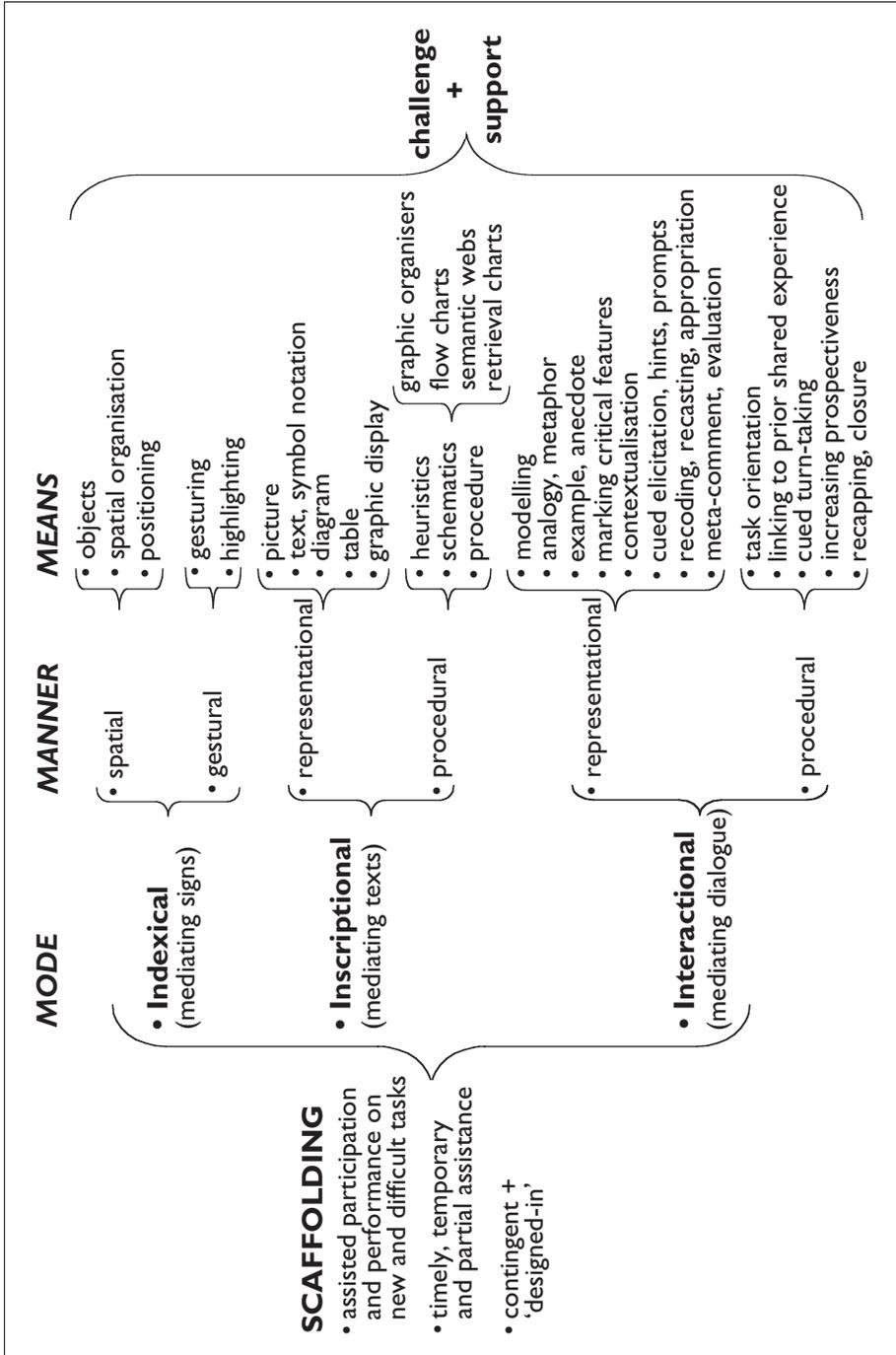
SCAFFOLDING
- assisted participation and performance on new and difficult tasks
- timely, temporary and partial assistance
- contingent + 'designed-in'

MODE

- **Indexical** (mediating signs)
- **Inscriptional** (mediating texts)
- **Interactional** (mediating dialogue)

MANNER

- spatial
- gestural
- representational
- procedural
- representational
- procedural

MEANS

- objects
- spatial organisation
- positioning

- gesturing
- highlighting

- picture
- text, symbol notation
- diagram
- table
- graphic display

- heuristics
- schematics
- procedure
  - graphic organisers
  - flow charts
  - semantic webs
  - retrieval charts

- modelling
- analogy, metaphor
- example, anecdote
- marking critical features
- contextualisation
- cued elicitation, hints, prompts
- recoding, recasting, appropriation
- meta-comment, evaluation

- task orientation
- linking to prior shared experience
- cued turn-taking
- increasing prospectiveness
- recapping, closure

challenge + support

Figure 3: Classification framework for scaffolding

Instructional scaffolding draws attention to the nature of the intellectual task being tackled and how novice participants are being assisted to accomplish it. Instructional scaffolding only has existence and value in the context of a task-oriented curriculum, where tasks are used as a means of, and context for, new learning. Task-based curriculum design has long been promoted as providing meaningful and inclusive contexts for developing the second language and literacy learning of ESL students (Allen 2000; Brown 2000; Bygate, Skehan and Swain 2001; Willis and Willis 2001). For ESL students in particular, instructional scaffolding is a key pedagogical tool for enabling successful participation in, and mastery of, communication-based curriculum tasks. In this context, instructional scaffolding can also be seen as one among a number of teaching practices essential to an inclusive curriculum that responds to the linguistic and cultural needs of its diverse students. An example of the key role that scaffolding can play in such a curriculum is found in the distributed 'system of scaffolding' developed by Kolodner and associates (Puntambekar and Kolodner 1998) to enable second language learners to participate successfully in all areas of a task-based, 'learning by design' science curriculum.

The activity settings in which scaffolding occurs also highlight the dynamic, semiotic nature of the learning environment. It is through the exploitation of multiple, interacting resources made available in the classroom that a 'semiotic ecology' is created, that is a semiotically rich environment emerges from the 'social ecology' (Erickson 1996) of the classroom. These environments are characterised by 'message abundancy' (Gibbons 2003), whereby skills and understandings are made available for learners through multiple tools, modes and activities. Such recycling and 'proliferation' of key curricula concepts multiplies the meaning afforded by the classroom learning environment, while also amplifying support for learners, such as ESL learners, as they participate in challenging activities.

The development of such rich semiotic ecologies in classrooms is an important feature of a learning apprenticeship whereby students are inducted into the intellectual life of the 'class community' through 'guided participation' (Rogoff 1990, 1995). Participation in scaffolded activities is an important element in mediating new learning as well as building a classroom 'community of practice' (Lave and Wenger 1991). The experience of collaborative accomplishment in negotiating challenging but supported tasks creates a shared classroom culture in which learners use various semiotic tools to achieve common intellectual task goals.

Finally, scaffolded activity should be seen as a key site of situated professional knowledge practice and learning. Instructional scaffolding involves teachers in making conscious and subconscious decisions about

the support they think learners require to accomplish classroom tasks. When teachers are immersed in providing contingent scaffolding, that is task-enabling support provided *at the point of need*, the thinking which underpins their support is rarely accessible to reflection, critique or refinement. Breakdowns in contingent scaffolding, however, encourage teachers, as they repair the situation, to reconsider their own assumptions about task difficulty, students' capabilities and the pedagogic support needed. Such breakdowns therefore provide valuable opportunities for teacher imagining and thinking about designed-in scaffolding, that is what specific task support should be available *in anticipation* of student need. In this context, scaffolded activity provides an important opportunity for situated professional learning about effective teaching practices for diverse students. Through these opportunities teachers can engage in meta-reflection on their decision-making processes about task-based teaching and learning. It is this interrelationship between successful designed-in and contingent scaffolding that creates a continuous cycle of professional action learning for teachers in their classrooms. Indeed, it is the growing knowledge practice arising from such situated professional learning cycles that lies at the heart of ESL teaching.

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