CHAPTER FOUR

Kikan-Shido: Between Desks Instruction

INTRODUCTION

Of all the lesson events that might be observed in mathematics classrooms around the world, one of the most immediately familiar is that moment when the teacher, having set the students independent or group work, moves around the classroom. This chapter reports a fine-grained analysis of this lesson event in a selection of well-taught mathematics classrooms located in six different cities around the world. The Lesson Event is conceived as an event type sharing certain features common across the different classrooms studied. Each individual Lesson Event had a fundamentally emergent character, suggested by the classroom data as having a form sufficiently common to be identifiable within the classroom data from each of the countries studied. In each classroom, both within a culture and between cultures, there were idiosyncratic features that distinguished each teacher's enactment of each Lesson Event, particularly with regard to the function of the particular event. At the same time, common features could be identified in the enactment of Lesson Events across the entire international data set and across the data set specific to a country. This chapter details the differences and commonalities of ‘Kikan-Shido’ (Between Desks Instruction) in eighteen classrooms located in Berlin, Hong Kong, Melbourne, San Diego, Shanghai and Tokyo.

Methods of Instruction and Patterns of Participation

Greeno observed that “Methods of instruction are not only instruments for acquiring skills; they also are practices in which students learn to participate” (Greeno, 1997, p. 9). With regard to the learning of mathematics, some classroom practices will resemble those of other communities who habitually employ skills specific to mathematics (the mathematical activities of accountants or surveyors, for example) and some practices will be classroom-specific in the sense of relating to the process of learning (providing particular forms of explanation, asking particular types of questions when in doubt, seeking and offering assistance, and so on). Greeno also made reference to “patterns of participation” developed by students (Greeno, 1997, p. 9). This is a particularly apt phrase, combining the
fluctuity of participation in a social setting with the implicit regularity of a pattern. If we are to understand what occurs in social settings, it is the patterns of participation that are likely to offer insight. As will be argued, in considering social interactions in the classroom, the teacher must be considered co-participant with the students in any practices of the classroom community. Like Wenger (1998), this analysis of patterns of participation in classroom settings stresses the multiplicity and overlapping character of communities of practice and the role of the individual in contributing to the practices of a community (the class). Clarke (2001) has discussed the acts of interpretive affiliation, whereby learners align themselves with various communities of practice and construct their participation and ultimately their practice through a customising process in which their inclinations and capabilities are expressed within the constraints and affordances of the social situation and the overlapping communities that compete for the learner's allegiance and participation. By examining classroom practice over sequences of ten lessons, the Learner's Perspective Study (LPS) provides data on the participation of teachers and learners in the co-construction of the possible forms of participation through which classroom practice is constituted (cf. Brousseau, 1986). But co-construction of practice and joint participation in practice do not denote commonality of purpose among the participants in that (classroom) practice. To some extent both teacher and student share a common interest in advancing the student's learning, but they are not positioned identically within that purpose (cf. Davies & Harré, 1991), and their classroom participation will both confirm these positionings and co-construct them. In this chapter, we examine the proposition that not only can the lesson event 'Kikan-Shido' (Between Desks Instruction) serve as the basis for useful comparison of classroom practice across several countries, but it also provides evidence for the co-constructed nature of a particular pattern of participation. This suggests that such Lesson Events, while deriving from the teacher's instructional intentions and reflecting structural characteristics of the teaching of that classroom, also represent the consequence of a co-constructive process by which particular patterns of participation are established in the classroom.

Classroom Practice is a form of communal collaborative activity as it is constructed through the participation of both teachers and learners and only understood (and optimised) through research that accords value and voice to all participants. It is for this reason that the Learner's Perspective Study supplements the multi-camera documentation of classroom activity with post-lesson reconstructive interviews of the participants. Teaching and Learning are not simply distinct but interdependent activities that share a common setting, rather they should be conceived as aspects of a common body of situated practice and studied as such. It is ironic that recognition of this fundamental unity is enshrined in several languages other than English and that the dichotomisation of Teaching and Learning may be, in part, an artefact of our use of English as the lingua franca of the international education community. This chapter provides evidence of the mutuality of teaching and learning and supports their interpretation as components of a single body of communally constituted practice. We are assisted in this argument by Harré's work on social positioning (Davies & Harré, 1991) as this gives recognition to the mutuality of social practice, where the positioning of an individual carries both rights and responsibilities and is only sustained by mutual compliance. Of course, a position can be contested, and negotiation is a constitutive element of classroom practice (see Clarke, 2001).

The Data

This chapter reports the results of the Learner's Perspective Study based on analyses of sequences of ten lessons, documented using three video cameras, and supplemented by the reconstructive accounts of classroom participants obtained in post-lesson video-stimulated interviews, and by test and questionnaire data, and copies of student written material (Clarke, 1998, 2001, 2003). In each participating country, the focus of data collection was the classrooms of three teachers, identified by the local mathematics education community as competent, and situated in demographically different school communities within the one major city. This gave a data set of 30 'well-taught' lessons per school system (Berlin, Hong Kong, Melbourne, San Diego, Shanghai, and Tokyo). And, for the purposes of the analyses reported here, a total of over 180 videotaped lessons, supplemented by over 50 teacher interviews, and almost 400 student interviews. The teacher and student interviews offer insight into both the teacher's intentions in the enactment of the particular Lesson Event and the significance and the meaning that the students associated with that event.

Chapter Structure

In the sections that follow, Kikan-Shido is defined and then discussed from several perspectives: its form as observed on the video record of class activity; its meaning as reconstructed by teacher and students in post-lesson video-stimulated interviews; and its function (intention, action, and interpretation). Our main purpose in this chapter is to use Kikan-Shido to establish the legitimacy and utility of Lesson Events as one basis for international comparison of classroom practice. A secondary purpose is to examine the legitimacy of the characterisation of Kikan-Shido as a whole-class pattern of participation, and to situate the actions of teacher and learners in relation to this pattern of participation. It will be argued that while engaging in Kikan-Shido, the teacher and the students participate in actions that are mutually constraining and affording, and that the resultant pattern of participation can only be understood through consideration of the actions of all participants. Comparison of the enactment of Kikan-Shido across 180 videotaped lessons in the data set provides significant insight into the pedagogical principles underlying the practices of different classrooms internationally. In making this argument, we are posing Lesson Events as a category (and Kikan-Shido as a particular instance) with the capacity to sustain useful international comparisons of classroom practice.
KIKAN-SHIDO: BETWEEN DESKS INSTRUCTION

Japanese teachers possess an extensive vocabulary with which to describe their practice. Among the large number of terms available to them is the term 'Kikan-Shido,' which means 'between desks instruction,' in which the teacher walks around the classroom, predominantly monitoring or guiding student activity, and may or may not speak or otherwise interact with the students. Our use of 'Kikan-Shido' honours the existence in one language of an established term that succinctly encapsulates an activity that could only be described in English by an extended phrase or lengthy definition. The utilisation of such terms conforms to a tradition that has seen ‘déjà vu’ and ‘Schadenfreude’ assimilated into English usage for precisely the same reasons. Whenever a particular activity (in this case, a lesson event) is succinctly and accurately designated by a local term, and no equivalent label exists in English, it is entirely appropriate for an international study such as this to acknowledge that culture’s recognition of the activity by appropriating the local term for international use. So, for the purposes of this discussion, we will use the Japanese term, ‘Kikan-Shido,’ as a signifier or cipher for a general conception of the particular activity – one that takes into account the patterns of participation of both teacher and students in the activity designated by 'Kikan-Shido'.

Kikan-Shido was clearly recognisable in a variety of mathematics classrooms internationally, both to researchers and to classroom participants (teachers and students). For all classrooms in the data set, the activity of Kikan-Shido appeared to have four mutually exclusive principal functions: (i) Monitoring Student Activity, (ii) Guiding Student Activity, (iii) Organisation of on-task activity, and, sometimes, (iv) Social Talk. Each principal function is defined in Table 1.

Table 1. Definition of the Principal Functions within Kikan-Shido

<table>
<thead>
<tr>
<th>Function</th>
<th>Definition</th>
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<tr>
<td>Monitoring Student Activity</td>
<td>The process by which the teacher observes the progress of on-task activities and homework, ascertains student understanding, or selects student work, with intent to keep track of student progress, question student comprehension and record student achievement.</td>
</tr>
<tr>
<td>Guiding Student Activity</td>
<td>The process by which the teacher gives information, elicits student response in order to promote reflection, or facilitates engagement in classroom activity, with intent to actively scaffold the development of student participation and comprehension of subject matter.</td>
</tr>
<tr>
<td>Organisational</td>
<td>The process by which the teacher distributes and collects materials, or organises the physical setting in the classroom, with intent to support interactions among students and facilitate student engagement in learning activities.</td>
</tr>
<tr>
<td>Social Talk</td>
<td>The teacher engages with student(s) in conversations not related to the subject matter or current on-task activity.</td>
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Table 2. Activity Codes Defined

<table>
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<tr>
<th>Code</th>
<th>Description</th>
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<tr>
<td>S</td>
<td>Selecting Work: Students are chosen to share their work, methods or thinking with the whole class. This may occur immediately or later in the lesson.</td>
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<tr>
<td>M</td>
<td>Monitoring Progress: Teacher walks around the classroom observing student progress of on-task activity.</td>
</tr>
<tr>
<td>Q</td>
<td>Questioning Student: An expression of inquiry that invites or calls for a reply from a student that may or may not be related to the current on-task activity.</td>
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<tr>
<td>H</td>
<td>Monitoring Homework Completion: While students are engaged in on-task activity, the teacher observes the completion of homework and may note student achievement or understanding of subject matter.</td>
</tr>
<tr>
<td>E</td>
<td>Encouraging Student: Activity pursued by the teacher intended to motivate, provide support and feedback to individuals or groups of students.</td>
</tr>
<tr>
<td>G</td>
<td>Giving Instruction/Advice at Desk: Teacher scaffolds the development of students' understanding by providing information, instruction or advice, focusing on the development of a concept that addresses meaning, reasoning, relationships and connections among ideas or representations, or the demonstration of a procedure.</td>
</tr>
<tr>
<td>GQ</td>
<td>Guiding Through Questioning: A series of specific teacher questions intended to scaffold the development of student understanding of a procedure or concept during the on-task activity.</td>
</tr>
<tr>
<td>R</td>
<td>Re-directing Student: Activities pursued by the teacher to regulate the behaviour of student(s) who are perceived not to be paying attention to the current activity, and to support students' on-going engagement during the lesson.</td>
</tr>
<tr>
<td>A</td>
<td>Answering a Question: Information given by the teacher when requested by a student.</td>
</tr>
<tr>
<td>GAB</td>
<td>Giving Advice at Board: Instruction or advice given while an individual or group of students work at the board. The instruction or advice may be intended for those students working at the board or may be intended for the whole class.</td>
</tr>
<tr>
<td>GW</td>
<td>Guiding Whole Class: Teacher walks around the classroom and provides information, instruction or advice intended for the whole class.</td>
</tr>
<tr>
<td>HM</td>
<td>Handout Materials: Teacher walks around the classroom distributing materials related to on-task activity.</td>
</tr>
<tr>
<td>CM</td>
<td>Collect Materials: Teacher walks around the classroom and collects materials from students.</td>
</tr>
<tr>
<td>A</td>
<td>Arranging Room: Teacher repositions furniture to enable independent, paired, group or board work.</td>
</tr>
<tr>
<td>S</td>
<td>School Related: Teacher engages in conversation related to school activities or curriculum.</td>
</tr>
<tr>
<td>NS</td>
<td>Non-School Related: Teacher engages in conversations of a social nature not related to the subject matter or on-task activity.</td>
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</table>
Monitoring Student Activity is made up of four activity codes: (i) selecting work, (ii) monitoring progress, (iii) questioning student(s), and (iv) monitoring homework completion. Guiding Student Activity comprises seven activity codes: (i) encouraging student(s), (ii) giving instruction or advice at the student's desk, (iii) guiding through questioning, (iv) re-directing student(s), (v) answering a question, (vi) giving advice at board, and (vii) guiding whole-class. Organisational consists of three activity codes: (i) handout materials, (ii) collect materials, and (iii) Social Talk comprises two activity codes: (i) school-related talk, and (ii) non-school-related talk. Table 2 presents the definitions for each activity code. Where it occurs in Tables 1 and 2, the term ‘scaffold’ is used to designate teacher support for student construction of knowledge.

The theoretical difference between Monitoring Student Activity and Guiding Student Activity is similar to the difference between elicitation and initiation as these are theorised and discussed by Lobato, Clarke and Ellis (2005).

Initiating eliciting is not a simplistic dichotomy like “tell/not tell”—it’s not an either/or. Both categories of action are necessary and their use is interrelated. . . . Elicitation occurs when the teacher wants to learn more about students’ images, ideas, strategies, conjectures, conceptions, and ways of viewing mathematical situations. When the teacher’s communicative act functions to facilitate the expression of the student’s mathematics, then this constitutes “eliciting.” . . . Initiating is often preceded by eliciting, so that the teacher can gather information about students’ thinking before making a judgment whether to work with and structure the students’ ideas or to introduce new information. Initiating involves the insertion of new ideas into the conversation, ideas that the teacher assumes will be interpreted in many different ways rather than passively received. Once the teacher engages in initiation, she then steps back and elicits to see what the students did with that information. Both actions have their function within the teacher’s promotion of student conceptual development (Clarke, 2005, pp. 13, 14).

The distinctions between each principal function and each activity code are substantive. Each principal function and corresponding activity code are empirically grounded and the application of all principal function codes and activity codes listed in Tables 1 and 2 were subjected to inter-rater reliability checks and a level of greater than 80%. Coverage codes, since they are mutually exclusive and, in combination, account for all documented activities. Using StudioCode video analysis software, it was possible to code for Kikan-Shido, and its various functions, as they occurred in the video record (Figure 1).

Using the coding system as shown in Figure 1, we can map the various activity codes to a timeline of a single lesson (see Figure 3). For the purpose of statistical analyses, the individual timelines from each lesson were combined to identify the frequency of each activity code.

While the participants in many classrooms may conspire in the enactment of Kikan-Shido, the actual functions served by Kikan-Shido help us to distinguish one classroom from another. The ways in which different teachers initiate Kikan-Shido are diverse and distinctive. This can be seen graphically in the comparison of 180 lessons across six countries in the LPS data set (see Figure 2).

An essential point must be made here: we have analysed sequences of ten or more lessons taught by eighteen teachers designated as competent in six different countries. We do not presume to characterise the teaching of a country or a culture on the basis of such a selective sample. Nor do we intend to compare teaching in one country with teaching in another. Most importantly, we commenced our analysis intending to compare and contrast teachers and their classrooms, not cultures. As will be shown in the results that follow, a particular practice documented in one American classroom might also be a distinctive feature of a classroom in Japan. Where such classroom practices are found in such culturally-disparate circumstances, the particular practice assumes heightened significance. That fact that teachers situated very differently have developed similar solutions to a particular classroom challenge suggests not only the generality of the pedagogical strategy but also its cultural transferability. The occurrence of such culturally-distributed practices problematises simplistic East-West comparative cultural analyses.

Figure 2 graphically illustrates both the similarities and the significant differences in the way that 18 competent, experienced teachers enacted the lesson event that we have called Kikan-Shido. For example, A-T3 and US-T3 both devoted about 45% of their class time to Kikan-Shido, but Figure 2 makes it clear that the relative weightings of monitoring versus guiding activity were completely different. If we compare G-T3 with HK-T3, we find similarity not only in the time devoted to Kikan-Shido, but even in the relative proportions of monitoring and guiding.
However, at the next level of analysis, we find significant differences in the manner in which the monitoring and guiding activities were carried out.

The teacher from US School 3 made extensive use of Kikan-Shido in every lesson and for extended periods of time. Generally, the teacher engaged in Kikan-Shido during Warm Up or after setting a learning task. One-third of the teacher's extensive Kikan-Shido activity was committed to monitoring homework completion. Interestingly, if this component (monitoring homework completion) were removed from US-T3's Kikan-Shido record, her use of Kikan-Shido would closely resemble that of A-T1, even to the relative proportions of the activity codes. Monitoring homework completion was an administrative responsibility that clearly influenced the classroom practice of US-T3. Real understanding of the decisions and pedagogical principles underlying each teacher's classroom practice.

During Kikan-Shido, Australian Teacher A-T1 monitored student progress with the task activity (11.2% of total lesson time over all sampled lessons coded as Monitoring Progress). Drawing on the insights gained from observations of students at work, the teacher appeared to adopt different strategies for individual students with the intention of facilitating student understanding. This is illustrated in the following quote.

A-T1: I have a different intention for each student that I approach. I think.

A-T1: For example, Earl. These boys, um -- really want to be right and want to solve it and they will. Earl will appreciate when I come around and they want me to check their work. They wait patiently until I come around. So that's what they do. Kamahl sits there and has a lot of trouble, but doesn't take many steps to help himself at all unfortunately. Because he doesn't want to appear that way. Sometimes, there are a couple of people I need to hint and ask them what they're thinking because they're not comfortable. Sometimes, um, you know, they don't want to show their work. They want to be right and want to solve it and they will. Earl will appreciate it. Mel asks questions, that's the first thing she does. She doesn't think...
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INDIVIDUAL TEACHER USE OF KIKAN-SHIDO

Differentiated Instruction for Individual Students

During Kikan-Shido, Australian Teacher 1 monitored student progress with the on-task activity (11.2% of total lesson time over all sampled lessons coded as Monitoring Progress). Drawing on the insights gained from observations of students at work, the teacher appeared to adopt different strategies for individual students with the intention of facilitating student understanding. This is illustrated in the following quote.

A-TI: I have a different intention for each student that I approach, I think.

Int: Can you tell me a little bit more about that?

A-TI: For example, Earl. These boys they um… really get into it… and want to be right and want to solve it… and they will. Earl will appreciate… oh actually… oh most of them do if I come around and they want me to check their work… and so they will wait patiently until I come around- so that’s what they do. Kamahl sits there and has a lot of trouble… but doesn’t take many steps to help himself… at all unfortunately. Because he doesn’t want to appear that way. Sometimes… um… there are a couple of people I need to hint and ask them what they’re thinking… because they are not comfortable with the work.

Int: Mmh [softly]

A-TI: This is the sort of work that would apply to that… about half the class would really appreciate but the other part would just wish that I just… told them how to do it and they could just repeat it.

Int: Okay mmm [softly]

A-TI: So it doesn’t suit everyone at the moment… this sort of question.

Int: Right… who are the ones who would be enjoying it and who are the ones who wouldn’t?

A-TI: Sandy wouldn’t, Sandy wouldn’t enjoy this. … Mel’s a- Mel asks questions, that’s the first thing she does, she doesn’t think
she doesn't even take a moment to think about it. She, she's very verbal, she will say what she's thinking and ask immediately so she's not afraid to ask but I'm not going to answer her questions necessarily but she'll say no I don't know how to do this, she won't take a moment she's very immediate.

Motivational Support and Encouragement

Encouragement was coded and clustered within Guiding Student Activity. It is distinguished from social categories such as Non-school Related Social Talk as it was clear, both to researchers and to classrooms participants (teachers and students), that this strategy was an instructional act related to the on-task activity and intended to motivate and to provide support and feedback to individuals or groups of students.

On many occasions, Australian Teacher 1 would provide verbal encouragement to individual students (see Figure 3 for Teacher 1’s utilisation of Kikan-Shido across all ten lessons). In fact, the practices of all three teachers in Australia and those of US Teacher 3 appeared to prioritise the development of student confidence by providing motivational support and encouragement.

A-T3 She needs that encouragement — she's not particularly independent and she's not well skilled and she relies heavily on a lot of other students — on this day she was by herself doing the task — and that was really pleasing — mmm.

Such explicit encouragement was much less evident in the other classrooms studied. In fact, the teachers in the Asian data set (Shanghai, Hong Kong and Tokyo), with the exception of Shanghai Teacher 2 (0.4% of total class time devoted to Encouraging student), typically did not encourage students during Kikan-Shido. On the occasions when encouragement was given, it was directed at individual students or the whole class.
By providing motivational support and encouragement, the teacher aimed to keep students engaged and motivated. In the Australian classrooms, verbal encouragement was given to individual students (see Figure 3 for Teacher I’s utilisation of Kikan-Shido). This practice was less evident in the Asian data set (Shanghai, Hong Kong, and Tokyo), where teachers typically did not encourage students during Kikan-Shido.

On many occasions, Teacher I would provide verbal encouragement and support to students. The teacher believed that this approach was an effective method to enhance student confidence and to provide feedback on their performance. This strategy was used to motivate and support students in the classroom. It is important to note that the level of encouragement provided varied across different classrooms and teachers.
The only instance of Encouraging the Student coded in Shanghai School 1 illustrates a unique strategy that was employed by the teacher intended to encourage, motivate and provide feedback to individual students while addressing the whole class:

**SB-T1** Be quick — finish the other one. Eh, [to whole class] some of you drew it very well. [Points to student 4’s work] You drew it wrongly. [To student 5] You also were wrong. [To student 6] You sped up moving down the row. You did it right. [Pat student 7] You were wrong. [To student 8] [Taking up the paper of student 9]. Eh, he did it right. [to whole class] student 9 also did it right.

In this example, the teacher draws the attention of the class to the student’s error. While the teacher’s intentions appear to be motivational, there is no example of the strategy (public announcement of student error) in the Australian, American, Shanghai School 2 and HK1. Such statements were recorded in SH1, SH2, HK1 and HK2. This suggests that encouragement and motivation in these four classrooms were predicated on a value system different from that operating in non-Chinese classrooms.

**The Distribution of Responsibility for Knowledge Generation**

Another characteristic of Kikan-Shido, as it is practiced in US School 3 and in Shanghai School 2, is the implicit devolution of the responsibility for knowledge generation from the teacher to the student, while still institutionalizing the teacher’s agency orchestrated and mediated by the teacher. The practices of SH-T2 provided some powerful supporting evidence for the contention by Huang (2002) and Mok and Ko (2000) that the characterisation of Confucian-heritage mathematics classrooms as teacher-centred conceals important pedagogical characteristics related to the agency accorded to students; albeit an agency orchestrated and mediated by the teacher. The practices in both ‘Asian’ and ‘Western’ settings.

Kikan-Shido as a Class-Debugging Mechanism

Kikan-Shido could also serve a diagnostic role. The diagnosis could relate to particular student difficulties or to the relative effectiveness of a teacher’s explanation during a whole-class discussion. Upon identifying such difficulties or concerns during Kikan-Shido, the teacher could act in several different ways: either by giving individual students personal assistance, if the problem was not a general one, or through whole-class discussion of a misunderstanding or difficulty that appeared to be widespread. For example, German Teacher 2 provided instruction and advice intended to address and guide the whole class. One example taken from the video record is cited below:

**G-T2** Right, then let’s stop at this point immediately now ... the teacher help usually came in the form of instruction or advice at a student’s desk, advice at the board or answering a question.
This is echoed by one student:

S Then if we're working on a problem and everybody has a different answer and we don't know why, then we ask Mister I -

Int What would you do if you couldn't ask Mister I here?

S All right, then I would ask the whole class.

One of the Australian teachers (A-T1) used Kikan-Shido as an opportunity to gauge the success of her whole-class introduction of new content. In one instance, her use of Kikan-Shido revealed widespread student difficulties.

A-T1 Oh - this was terrible - as soon as I started going around oh I felt bad about this but it didn't matter too much - that I hadn't talked about - I assumed - that they knew what the base and height of a triangle was - and how to recognise it - and I might have gone to Kamahl first or to someone and it just - I was made very obvious that I hadn't - but that sort of - was made very obvious that I hadn't - but that's another thing that I do, I do go to see them that's another thing that I do, I do go to see them that gives me a much better understanding of whether - what I have done up the front is of any value at all. And then you give them an opportunity to ask.

Int And then you give them an opportunity to ask.

A-T1 I didn't give them a chance yes - and then I went around and checked with - with some key students whom I know struggle and I was feeling quite confident about it after that although - my explanation here isn't all that crash hot I've - probably probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I probably I 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Students would routinely reply, “She explained things really well.” It is now clear, from comparison of students’ descriptions of teachers’ instructional acts with the video record of those acts, that such student accounts are constrained by the students’ lack of a technical pedagogical vocabulary and their difficulty in recognising many of the subtle and sophisticated techniques employed by their teachers to elicit the students’ mathematics and to initiate into the classroom conversation elements of the teacher’s mathematics (Clarke & Lobato, 2002; Lobato, Clarke & Ellis, 2005). The research methods employed in this study allow the students’ account to be juxtaposed with the researcher’s inferences from the video record, resulting in the constructive elaboration of both accounts.

Code Switching

In Hong Kong School 3, while the instructional language is English, the teacher found himself faced with students’ constant demands for Chinese explanations, which were clearly conveyed in one student’s request: 請中文喲! (“Chinese please!”) (HK3-L04). This type of teacher-student interaction was especially evident when it came to introducing a new mathematical term:

HK-T3: Now, I want you to meet with the word. Now I want you to meet with the word ‘simultaneous equations’.

HK-T3: Now, what do we mean by the word “simultaneous” – huh?

S: Chinese meaning.

HK-T2: 聯立方程 – literal translation: Simultaneous Equations


Code switching in this classroom appeared to be a normative practice that was co-constructed by both the teacher and students, and which was predominantly enacted during Kikan-Shido. The co-constructed nature of this practice was evident in the teacher’s statement quoted below, in which he clearly conveyed the challenges of choosing the instructional language to address students’ needs, while still maintaining the institutional agenda.

HK-T3: This one, when he cannot follow he asks his neighbour. In this way you will see that when I teach I use English. But if they have questions, when they have questions, I will use Chinese. When they individually ask me questions we have to use Chinese. Because umm, the students from my observation, I mean from my observation in the past, their standard of English has not reached that level – this student, the first one, um, he always tell me that he can’t do it, he can’t understand people speaking in English. He says I have to speak in Chinese. Therefore, you’ll see that he’s either expressionless or asking the two classmates sitting behind how to do it.

Selecting Work

Another distinctive feature of Kikan-Shido, as enacted in Shanghai School 2, Japan School 3, and I/S Schools 2 and 3, is the Selecting of Student Work to be shared with the whole class, either immediately or at some later time in the lesson. The teacher in Shanghai School 2 made use of selecting work in almost every lesson, and usually more than one student was selected to present their solutions on the board.

In this example, the class was attempting to solve the following systems of equations using the method of elimination by adding/subtracting.

\[
\begin{align*}
2x - y &= 5 \quad &\text{(Eq. 1)} \\
3x + 4y &= 2 \quad &\text{(Eq. 2)} \\
5x + 4y &= 16 \quad &\text{(Eq. 1)} \\
5x - 6y &= 33 \quad &\text{(Eq. 2)} \\
8x - 4y &= 20 \quad &\text{(Eq. 3)} \\
9x + 12y &= 48 \quad &\text{(Eq. 2)} \\
10x - 12y &= 66 \quad &\text{(Eq. 4)} \\
19x &= 144
\end{align*}
\]

\[x = 6\]

SH-T2: [I walks around. Picks up S1’s sheet. Problem A] Revise this one plus equation three, oh no three plus two. Write down...

SH-T2: [to S4. Problem B] This became equation number three, en write Equation three plus equation four. Um, is it six? Can they be divided?

S4: Six.

SH-T2: Yeah, very good, keep working. Write it on the blackboard, you did it well today, come on and write it on the blackboard.


In solving these two systems of equations, this teacher deliberately selected Work from students to represent a variety of solution methods (in this example, the second problem was solved differently by S4 and S6), and these solution methods Selecting Work was an instructional strategy that was purposefully employed by methods with the whole class. The teacher’s deliberate use of this strategy to lesson interview, where he emphasised the importance of allowing student misunderstandings to be made visible to the whole class.

SH-T2: I think it is no big deal even if they are wrong. Just let students and the interactions between the teacher and many years of teaching, I have many ways of solving a problem, supplementary remarks.
The students in this classroom appeared to share the same valuing, as was explicitly acknowledged by one student in this example:

2 Just then the teacher was listening to their discussions and corrected them, and then he invited a classmate to do it on the blackboard. The teacher always lets us, he listens to our opinions, and then chooses a correct one or a few and a wrong one, to make a comparison, to find out which is correct, which is wrong - to let us compare and find out where the mistake is, mainly to make it clear which one is which, which one is made incorrect more often, and so we have to correct such a habit.

The student identifies two important teacher practices: (i) The involvement of the students in identifying errors and misconceptions and (ii) the highlighting of those misconceptions that are most common. The student's repeated reference to "our," "us," and "we" confirms the success of the teacher's devolution of responsibility to the students.

Orchestrating Whole-class Activity

Although most of the teacher support during Guiding Student Activity was directed to individual students, teachers (particularly in A2, G1, G2, HK1, HK2 and I1) repeatedly provided information, instruction or advice intended to inform the whole class. This type of activity was coded as Guiding Whole Class within the code Guiding Student Activity.

The exercise of Guiding Whole Class during Kikan-Shido suggests that the teachers attached sufficient importance to the class learning as a whole group, such that they would give guidance to the whole class, when this was judged to be appropriate, while also continuing to give assistance to individual students (Hino, 2006). Guiding Whole Class was enacted differently according to the teacher's judgment of the situation: either upon perceiving the difficulties among students to be general, the teacher would interrupt students' work by making clarifications to the whole class; or the teacher would provide information, instruction or advice to the whole class during Kikan-Shido as a way of orchestrating whole-class activity.

On identifying the common mistakes among the students, Hong Kong Teacher 2 would give instructions to the whole class while walking around in order to remind the class of the errors they made or tended to make. In the example below, instructions to the whole class were interspersed with comments to individual students.

HK-T2 [to VENESSA] Young lady, you've copied down the question wrongly. You are really overtaken by the twins!
HK-T2 [to B:] What's wrong? Okay.
HK-T2 [to whole class] Hey, be careful with one thing. You've got one thing, your fatal mistake is mis-copying questions. Very often you copy from your book wrongly, or you've copied the first thing correctly, but you get it wrong in the second step. Is this illusion or what? Is this a kind of 'sense dis-coordination'?

On many occasions, German Teacher 3 would Guide the Whole-Class Activity through a series of specific teacher questions and explicit instruction intended to scaffold the students' understanding. For example, during an on-task activity where the students were asked to determine the surface area and volume of a rectangular prism they had made (see Figure 4), the teacher walked around the classroom questioning and instructing the whole class.
Catherine O'Keefe, Li Hua Xu and David Clarke

**VARIATION ACROSS THE TEN-LESSON SEQUENCE**

While Kikan-Shido has a recognisable structural form evident across all classrooms, the variation in the amount of time devoted to Kikan-Shido suggests that it is employed purposefully in distinctive ways in each lesson. For example, in US1 there was significant variation in the amount of time the Teacher devoted to Kikan-Shido in each lesson (see Figure 7). While Kikan-Shido represented only 8.8% of total class time across the ten-lesson sequence, the Teacher made extensive use of Kikan-Shido in Lesson 7 (35.2% of total class time). Similarly, the amount of time allocated to Kikan-Shido in HK3 also varied across the ten-lesson sequence (see Figure 5). It is clear that this Teacher devoted significantly more time to Kikan-Shido during the last five lessons, especially in lessons 6 and 9.

The variation in the use of Kikan-Shido across the ten lessons taught by HK-T3 (see Figure 5) confirms the point made in Chapter 2 of this book, that any attempt to characterise a Teacher's practice by a single lesson pattern ignores the Teacher's purposeful selection of structural elements according to the location of the lesson in the ten-lesson sequence. The same purposeful variation is evident in Figure 7, which documents US-T1's selective use of Kikan-Shido across the ten-lesson sequence.

![Figure 5. Variation in the utilisation of Kikan-Shido across a ten-lesson sequence](image)

This teacher's observation that "they didn't have questions in the previous lesson" suggests that the variation in the amount of time devoted to Kikan-Shido was influenced by two important factors: the degree of difficulty of lesson content and the students' willingness to learn. HK-T3 observed that "Actually, today there was one problem. I didn't expect that there would be so many hands up. So that you see that the situation was relatively messy. And I couldn't answer them all." HK-T3 also explained that today's lesson was different because it was about integers and was easy. The calculation was easy, and the students thought they could do it.

**WHOLE-CLASS COMPLICITY IN PATTERNS OF PARTICIPATION**

Of major interest for the purpose of this chapter is the evidence that Kikan-Shido is a co-constructed pattern of participation to which members of the classroom community subscribe. In an attempt to situate the participatory status of both the teacher and students during Kikan-Shido, each lesson was further analysed to identify whether each coded instance was initiated by the teacher or student. For this purpose, Monitoring Progress (where this was non-verbal and non-interactive) and all activity codes within Organisational were not coded for initiated activity. Table 3 defines each interaction code.
Table 3. Student and Teacher Initiated Interaction

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<th>Student Initiated Interaction</th>
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<td></td>
<td>The process through which the student calls for the teacher's attention, through verbal and non-verbal acts, with the intention to confirm progress, confirm solutions to a problem or request guidance. Verbal acts by students included calling out, asking a question, or making a statement. Non-verbal student acts included hand up, approaching the teacher and showing work.</td>
<td>The process through which the teacher instigates verbal and non-verbal communicative acts with the student(s) with the intention to Monitor or Guide Student Activity, or engage student(s) in conversations of a social nature.</td>
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Figure 6 graphically illustrates both the similarities and the significant differences in the way that both teachers and students subscribe to the pattern of participation within Kikan-Shido. For example, if we compare HK3 with A2 we find similarities in the relatively high proportions of Student-Initiated Interaction. If we compare, G3 with J3 we find similarities in the weighting of Student-Initiated Interaction and Teacher-Initiated Interaction. However, real understanding of the pattern of participation enacted within each classroom is only evident from a combined analysis of Figure 2 and Figure 6.

Figure 6 suggests one particular commonality that was shared by all three Japanese classrooms: that is, the teacher initiated a large proportion of Student-Teacher Interactions. However, Figure 2 shows that the classroom practice of Japanese Teacher 3 was quite different from the other two Japanese teachers with respect to the high proportion of time devoted to Guiding Whole-class activity. This interweaving of similarity and difference was highlighted by Clarke (2003) as characteristic of international comparisons of classroom practice. The Japanese example shows that this is true of within-country comparisons as well. A phenomenon as complex as classroom practice can be characterised in many different ways. Similarity in one aspect does not mean similarity in all aspects.

In fact, teachers within one culture may differ in many respects. For example, if we compare the three Hong Kong classrooms as represented in Figure 6, it is clear that HK2 evidenced more Teacher Initiated interaction, while HK1 and HK3 had a much higher frequency of Student Initiated Interactions. With respect to Guiding and Monitoring (Figure 2): HK1 had a higher proportion of Guiding Student Activity, with an emphasis on Guiding Whole Class; HK2 gave equal weight to Guiding and Monitoring Student Activity; while HK3 was similar to HK1 in the frequency of Guiding Student Activity, but very different in that the guidance took the form of Giving Instruction/Advice at Desk.
Table 3. Student and Teacher Initiated Interaction

Student Initiated Interaction

- The process through which the teacher initiates feedback and suggestions

Teacher Initiated Interaction

- The process through which the student initiates feedback and suggestions

A comparison of Student and Teacher Initiated Interaction shows that the Japanese example is characterized by a high proportion of Student Initiated Interaction, while the Hong Kong example is characterized by a high proportion of Teacher Initiated Interaction. However, real time interactions in a Japanese classroom, as indicated by the figure, show that the pattern of interaction is more complex than the figure suggests. For example, while Teacher Initiated Interaction is predominant in the Japanese classroom, Student Initiated Interaction is also present and may be more frequent than indicated by the figure. Additionally, the figure does not account for the role of the student in initiating interaction, which can vary significantly across different classrooms.

The figure also highlights the importance of considering the context in which these interactions occur. For instance, in a Japanese classroom, the teacher may initiate interaction in the form of questions, while the student may respond with answers or requests for clarification. Conversely, in a Hong Kong classroom, the teacher may provide feedback and suggestions, while the student may initiate interaction by seeking clarification or asking for help.

In summary, the figure provides a useful representation of the interaction patterns in different classrooms, but it is important to remember that these patterns may vary significantly across different contexts and cultures.
Both similarity and difference can provide insights. Variation in one aspect of classroom practice suggests tolerances within the socio-cultural norms of practice affecting both teacher and student behaviour. Tolerance of such variations suggests that no highly-valued principle is being challenged by the variations. Similarity suggests that practice may be predicated on a shared pedagogical principle. Where the similarity is specific to the classrooms in one country (or one cultural grouping), then the principle may reflect a socio-cultural norm specific to that country (or cultural grouping). Any such similarities identified within the LPS data may be researchable through analysis of the TIMSS video data, if a case for national or cultural typification was to be made. Our interest, where similarities occur, is in the identification of commonalities in the practices of competent teachers. One of these characteristics is clearly the purposeful selection of instructional strategies in response to topic, lesson location, class capabilities and individual student need, within the affordances and constraints of school system and culture.

Relating Teacher and Student Perspectives

The post-lesson interviews from both teachers and students revealed that Kikan-Shido has a recurrent form, recognisable to those participating in it. This is not to say that the participating teachers and students attributed corresponding meanings to the activity. The point has already been made (Clarke, 2001, p. 296, and elsewhere) that individuals can participate in a practice whilst being positioned differently within it, and whilst attributing different characteristics to the activity. That is, without being identical, the participants’ descriptions of the activity make it clear that they are talking about essentially the same form, but they may attribute quite different functions to that form. For example, in Australia school 3, the Teacher’s intention appears to be predicated on the devolution of the responsibility for knowledge generation from teacher to student(s):

A-T3 Often I just enjoy sitting down with ... a student and saying - “mmm well ... let’s think about this because I don’t know the answer” - let’s try and see if we can find a way [sigh] and I - will make suggestions ... But, ah yeah, I think sometimes it’s good that- and they can see that I don’t know - as well, and I am happy to call in somebody - and ... ask other students if they’ve done it and if they have _ ideas._

This can be contrasted with one student’s description of Kikan-Shido that suggests this same Teacher’s activity was typically quite directive:

Int Alright- okay I - I am just interested in- when Mrs. Greeno comes - and goes - what sort of feelings you have - then?
Rhys Probably makes - um sometimes it helps you to focus a bit more ... 

Int Aha.
Rhys most of the time probably it makes us focus a bit more – and - yeah I mean you won’t know - how ... how well you are doing unless she comes and ... has a look and see if you are doing alright on not _ so _...

While each participant is talking about the same form, i.e. Kikan-Shido, it is clear that each participant attributes quite different functions to that form. Evidence that students contribute to the form taken by a pattern of participation such as Kikan-Shido can be found in the following statement from A1-L09:

S She’s a big help - it’s such a change from last year um I had - a pretty bad teacher - and I spent most of the lesson with my hand up wanting to get help but she didn’t- and she didn’t help me - and - I failed - every maths test - I can’t remember if I passed - even one - but Mrs M - this year she explains - everything to everyone before - you do the test -

S Can you describe what it is like being in Mrs Milano’s lesson in terms of how you sort of ... feel - before you even come in to a lesson?

S Well after- Maths isn’t my favourite _ subject _
Int [laugh]
S ah ... but it is good to know you have got a good teacher who can - help you - and - if you don’t know anything - she’s there.

In general, many students in this class attached a high level of significance to the co-construction of Kikan-Shido. Indeed, many students’ participation in classroom practice in general seemed to be predicated significantly on the belief that Kikan-Shido would provide them with valued support should they need it. From the post-lesson interviews, students predominantly valued individual assistance, explanation and advice and the opportunity to ask questions (see Table 4 for a breakdown of student references to Kikan-Shido). One example from A1 is cited below.

S Oh ... ah it’s really good when Mrs Milano comes around to everyone individually - it’s like so if you are not sure about anything - you just like - she’ll come around.
Int Oh I see.
S Yeah.
I Is Alright - it’s pretty good you say, can you tell me more? Yeah, like, say if you um don’t know something when she’s talking, when she’s up the front and, yeah, of the class and she comes around to everyone to see like how you’ve been doing so you can see like, if you are doing well or not and understanding you can just ask her individually.
Based on our analysis of the Teacher Interviews, the Lesson Event we have called Kikan-Shido was explicitly valued by all three Australian teachers, in particular Teachers 1 and 3 (A-T1 made 7 references to Kikan-Shido; A-T3 made 10). Interestingly, the number of times each teacher referred to their Kikan-Shido practice was in proportion to the time these teachers committed to Kikan-Shido. This was also the case for US Teachers 2 and 3, Hong Kong Teacher 1 and all Shanghai teachers. For example, Shanghai Teacher 1 did not commit a large proportion of the class time to Kikan-Shido (8.4%). It is not surprising that this teacher did not refer to Kikan-Shido in the post-lesson interviews. In an exception to this pattern, if we compare SH1 with US1, we find similarity in the time devoted to Kikan-Shido, but difference in each teacher’s reference to Kikan-Shido. The teacher in US School 1 referred to Kikan-Shido three times during the post-lesson interviews. However, two of these three references corresponded to the one lesson (L07), when the teacher devoted a large proportion of class time to Kikan-Shido. That is, this exception is the sort of anomaly caused when an atypical situation affects a low occurrence count. As a general pattern, teachers made reference to Kikan-Shido with a frequency largely consistent with their use of it.

The teacher in Japan School 1 stressed the importance of the monitoring function of Kikan-Shido.

J-T1: I was walking between desks and seeing how students were doing. I could see how most of the students were doing by looking from the front of the class. But I cannot see all the students, and it is hard to see how those who are more likely to be behind are doing. So I gave them the clear procedure of how to work on such problem, to make a table for a graph, and an equation from a table.

The above interview excerpt emphasises the importance attached by this teacher to monitoring students individually and at a level of detail not possible from the front of the classroom. It also establishes the teacher’s willingness to intervene or guide individual student activity during Kikan-Shido.

The Use of Physical Positioning

The ways in which teachers chose to position themselves physically during Kikan-Shido was often a teaching strategy intended to influence the nature of the interactions. In Australian School 1, the teacher’s deliberate physical positioning was utilised to minimise any intimidation of the students and, implicitly, to reduce the prominence of the inevitable power difference between the teacher and the student.

A-T1: I don’t want my presence to be overpowering. I don’t want them to think, “Oh she’s over me just telling me what to do.” I kneel down — and I try to get on their level.

In all three Australian schools, German Schools 1 and 3, Shanghai School 3 and Japan School 2, the positioning actions of each teacher were influenced by student behaviour and the level of student engagement in the on-task activity. Often the teacher would intentionally stand near a student, Giving Instruction or Advice at Desk or Ask a Question, in an attempt to regulate the students’ behaviour. The following example from SH3-L08 indicates that the teacher’s strategy was also evident to other participants in the class:

SH3: Our teacher is very humorous. Um, ... for example — there’s one student — there’s a student in our class, he is called Bear, moving around, but then the teacher didn’t scold him, just go over and watched him, and smiled to him, and then he stood very still.

This example illustrates one student’s sensitivity to the significance of teacher positioning.

Pattern of Participation During Assessment

It might be thought that there is less instructional teacher activity associated with a class test and, as such, the predominant teacher activity during Kikan-Shido in such lessons is likely to involve Monitoring Student Progress or Kikan-Junshi (Between
However, our analyses revealed that, during the only two class tests among the lessons analysed (US1 and A3), the teachers and students participated in Kikan-Shido specifically to Guide Student Activity. During the class test, both US Teacher 1 and Australian Teacher 3 devoted more time to Kikan-Shido than during any other lesson in the ten-lesson sequence. Figure 7 graphically illustrates US Teacher 1's utilisation of Kikan-Shido across the ten-lesson sequence, of which lesson 7 is the class test.

It was during the class test that US Teacher 1 devoted the greatest proportion of total lesson time to Kikan-Shido (35.2% of total lesson time). While Australian Teacher 3 devoted substantial lesson time to Kikan-Shido, the teacher also developed substantial lesson activity during the test (48.5%). In general, this guidance took two specific forms: Guiding Interaction (14.9%) and Guiding Whole-class Discussion (1.6%). The reconstructive account from the teacher's post-lesson interview illustrates the Teacher's use of these strategies.

The pattern of participation in US1-L07, as seen in Figure 8, clearly demonstrates that both students and the teacher contribute to the form of Kikan-Shido and that this pattern of participation supports some elements, which were student-initiated interaction (19% of total lesson time) compared with Teacher-Initiated Interaction (23.6% of total lesson time) but this did not involve any type of initiated interaction.

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demonstrated that this perspective provides a powerful explanatory framework for identifying similarities and differences of classroom practices in both ‘Asian’ and ‘Western’ settings. In particular, analysis from this perspective problematises the simplistic characterisation of ‘Asian’ or ‘Western’ pedagogy.

In this chapter, we have attempted to frame the argument that the pattern of participation designated by Kikan-Shido must be conceived as co-constructed by both teachers and students. Some examples given in this chapter have shown that Kikan-Shido can be thought of as a familiar dance done by teachers and students, where the steps are improvised according to need. The participants in the classroom, teacher and students, are complicit (co-conspirators) in this improvisation. Acceptance of this point has implications for the research designs by which we study the activities occurring in the classroom settings.

But co-construction of practice and joint participation in practice do not connote commonality of purpose among the participants in that (classroom) practice. Through juxtaposing individuals’ actual participation in Kikan-Shido with the reconstructive accounts from interviews, we were able to get insight into the meanings that were attributed to that form. Our analyses of whole-class patterns of participation show that even where all participants recognised and subscribed to the same pattern of participation (Kikan-Shido), they could attribute different characteristics to the activity.

If we conceive of institutionalised patterns of participation as taking on the status of bodies of practice, then their co-constructed nature has further significance. Rather than progressively increasing the competence of their participation in a culturally or socially pre-determined practice (e.g., Lave & Wenger, 1991), this conception of the origins of practice accords significant agency (however constrained by institutional or cultural norms) to the participants to shape their particular pattern of participation, and thereby to influence the nature of that practice. This approach to conceptualising classroom practice further challenges those simplistic East-West comparative cultural analyses that presume a generality of pedagogical strategy and its intact cultural transferability.

The similarities and differences documented in this chapter set out the degree of variation possible in the practices of eighteen competent teachers situated in very different school systems around the world. Among other things, our analyses suggest that the responsibility for knowledge generation can be purposefully distributed in the classrooms of competent teachers, with the students having agency to exploit and to shape.

While Kikan-Shido characterises a recurrent form evident across all the classrooms, its functions appear to be a consequence of the emerging patterns of participation in which the members of a particular classroom community engage. In order to accommodate both the fluidity of social interaction and its regularity, careful distinctions have been made to delineate the form and function that constitute each teacher’s enactment of Kikan-Shido in their classroom. Our analyses have identified the differences in teachers’ utilisation of Kikan-Shido as signature characteristics their practice. We suggest that these differences are predicated on the specific pedagogical principles that appear to underlie each teacher’s practice. Another issue central to this chapter is the distribution of the responsibility for knowledge generation. Our analyses of Kikan-Shido have
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