

## Activity Based Learning (ABL)

# An evaluation of the pedagogy, impact on learning outcomes, political economy of adaptation and subsequent scale-up of the programme in Tamil Nadu, India

*Nidhi Singal, David Pedder, Malathy Duraisamy, Shakthi Manickavasagam, Shanmugam M and Govdinrajan M, ABL pedagogy in schools and classrooms in two districts in Tamil Nadu.*

*Monazza Aslam, Shenila Rawal, Anna Vignoles, Malathy Duraisamy & Shanmugam M, The trajectory of learning: the ABL story in Tamil Nadu, India.*

*Jaskiran Bedi & Geeta Kingdon, The political economy of the scale-up of the ABL programme in Tamil Nadu.*

*Shailaja Fennell, Malathy Duraisamy & Shanmugam M, Dissemination and scaling up of the Activity Based Learning Programme*



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## Report 1

# ABL pedagogy in schools and classrooms in two districts in Tamil Nadu

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## Executive summary

Activity Based Learning (ABL) is based on the pedagogical principle of learning through activities. It is an approach which took root in Tamil Nadu (India) and its defining characteristic is its promotion of student learning as self-initiated, independent and at an individual pace. ABL uses a range of interesting, innovative and clearly differentiated learning resources to assist each student develop as an independent learner according to his or her particular aptitude and skill. Through the use of self-learning cards, learning ladder and other associated materials, children learn to function independently and/or draw on peer knowledge to complete activities. In principle, such an approach enables teachers to support the learning and assessment needs of diverse groups of students in multi-grade and multi-age classrooms. ABL classrooms also look markedly different from the majority of classrooms in government schools across India in how they are physically organised. This research, using a multi-methods approach, examines the perceptions and practices of students, teachers and headteachers in ABL settings.

### Key findings:

- All headteachers articulated unequivocally supportive accounts of the effectiveness of ABL and its benefits for both students and teachers. A common barrier in some schools was the lack of adequate resources, such as task cards etc., which were essential to implementing ABL. Headteachers envisaged their role primarily in terms of monitoring and inspection of the reform agenda.
- The notion of children '**learning without fear**' was a dominant feature in teachers' accounts. This was regarded as significant in developing an open learning environment and in fostering what we term '**pedagogic bonding**'. For teachers, a key feature in successfully supporting student learning in ABL classrooms was teachers own reconfigured role and position.
- Observed lessons consisted of a great deal of task-related work undertaken by students working alone on individually chosen tasks and undistracted by others (54.2% of all students' time in class not interacting with their teacher or with their peers). In this respect classroom conditions conducive to independent learning appear to be well established. However over half the time teachers spent talking with students (54.4%) was not directly related to learning. The main focus of teachers' interactions with students tended to be concerned with class management and task supervision and not with advances in students' thinking and understanding through skilful questioning and responses to pupils' developing ideas.

### Conclusions:

Teachers' perceptions of the likely benefits to students and their own teaching practices are an important influence for behaviour change. Teachers and Headteachers held strong positive beliefs about the role of ABL in improving childrens' learning experiences, which were central to ensuring the successful uptake and implementation of ABL.

It has not been possible to assess whether teachers' positive perceptions of ABL are supported by evidence on improved learning outcomes from the accompanying paper in this series, due in large part to data limitations.

Headteachers were supportive of ABL but saw their role as restricted to monitoring of ABL practices rather than becoming more actively engaged with the uptake and roll out of the policy. Strengthening the role of headteachers could potentially increase the effectiveness of implementation and uptake.

Further research is needed to investigate these perceptions, to understand how ABL classroom processes impact on students' learning processes, relationships and achievements.

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## 1. Introduction

Quality has been an EFA goal since the 2000 Dakar framework declared it to be ‘at the heart of education’ and a fundamental determinant of student enrolment, retention and achievement. In this global context classroom pedagogy developed by teachers with their students is consistently seen as ‘the crucial variable for improving learning outcomes’ and is critical to any reform to improve educational quality and opportunity (UNESCO, 2005, p.152). While pedagogy itself is a contested term, broadly (and more commonly accepted) it involves teaching, learning and assessment activities and relationships that support learning. Watkins and Mortimore define pedagogy as “any conscious activity by one person designed to enhance learning in another” (1999, p.3). Alexander (2015) reiterates that “pedagogy is at the very heart of education and without pedagogy discussion of educational quality makes little sense” (p.251). Hence not surprisingly, over the last two decades, many developing countries have embarked on major pedagogical reforms to meet their commitment to Education for All.

The Activity Based Learning (ABL) approach - a child-centric and activity-based pedagogy - provides an example of one such approach that has been adopted in primary schools in certain parts of India. Adopted initially in 2003, across 13 schools in Chennai, Tamil Nadu, it was rolled out in a phased manner across the entire state for all children studying in grades 1-4 in all government and aided schools by 2007-2008. The ABL approach aims to provide engaging and challenging learning materials and flexible space for learning, teaching and assessment through carefully graded and planned sequences of activity.

This study forms part of a series of four, DFID funded, interrelated studies covering the following:

1. ABL pedagogy in schools and classrooms in two districts in Tamil Nadu
2. The Trajectory of Learning: the study of ABL in Tamil Nadu, India
3. The Political Economy of the Scale up of the ABL programme in Tamil Nadu
4. Dissemination and Scaling up of the Activity Based Learning Programme

### Research focus

In this study, our specific research focus was on

- exploring variations in how principles of ABL are interpreted, adapted, developed and implemented in different local ABL school and classroom settings in ways that teachers and students consider important and effective for optimising classroom learning opportunities and processes of both students and teachers;
- understanding how headteachers and teachers make sense of ABL and build it into their local school and classroom practice settings.

### Outline of the report

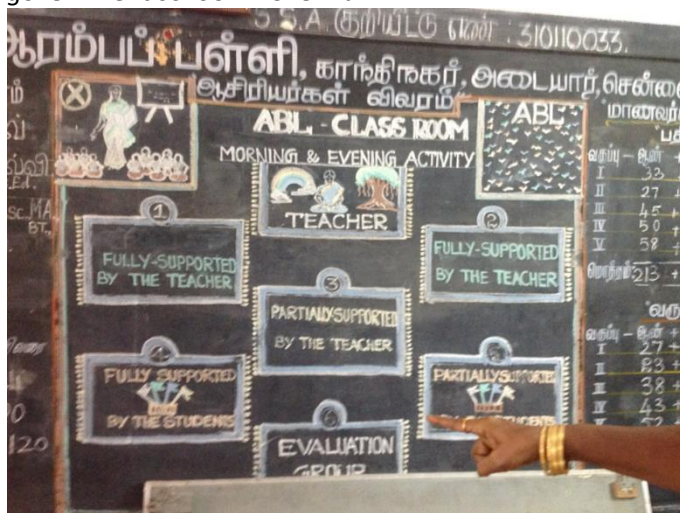
We begin this report by detailing and illustrating key components of the ABL approach- its classroom configuration, resourcing and other key factors. We then discuss existing research in this area and set out our key questions, before explaining our multi-methods approach to data collection. We conclude by discussing our findings and setting out key reflections and conclusions from this study.

## Brief overview of common features in ABL classrooms

### ABL classroom configuration

ABL classrooms look markedly different from the majority of classrooms in government schools across India, which are typically characterised by children sitting in rows, a teacher blackboard at the front of the room, where the teacher spends most of her time. In ABL classrooms, the teacher sits at the level of the students, either on the floor or a low stool. Children sit together according to their learning levels in 6 groups (or 'mats'). A child moves from one mat to another as and when he/she completes an activity (Picture 1).

**Picture 1:** A pictorial representation of ABL as drawn on a board in the headteacher's office of a government school in Chennai

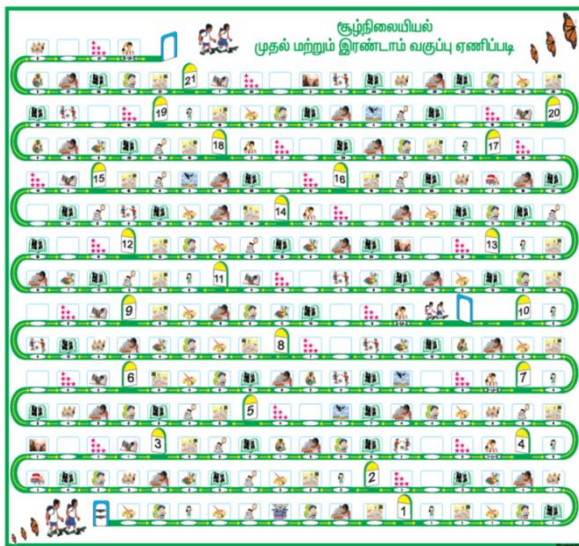


- Mats/Groups 1 and 2 are teacher supported, where every child learns the given concepts from the teacher on a one-to-one basis.
- Mat/Group 3 is a partially teacher-supported group. Children work with the relevant practice cards but seek teachers' help if needed. They also make use of the lower level blackboards that are allocated to every child. Later, this learning is reinforced by writing in their notebooks, which the teacher regularly checks.
- Mat/Group 4 presents reinforcement activities. This is a partially peer-supported group.
- Mat/Group 5 is fully peer-supported, where children are comfortable working at their own pace but with the help of others in the group. Activities are of the enrichment kind for this group.
- Mat/Group 6 is the final group and is self-supported, where self-assessment takes place through evaluation/test cards. The teacher marks the achievement of the child on the achievement chart displayed in the classroom, which the child also can check.

### Differentiated Learning and the Use of 'Learning ladders'



**Picture 2:** An example of the learning ladder



A key feature of the ABL methodology is enabling differentiated learning through the use of the 'learning ladder' (see Picture 2). The learning ladder consists of various steps that must be crossed as a student proceeds through the curriculum. For every subject, different ladders are displayed in the classroom and depict different numbered learning milestones in a pictorial manner. The sequential arrangement of activities that correspond to each step in the ladder also directs a child to a particular mat. Children learn to recognize their position on the ladder and learn to choose the appropriate 'self-learning card' that corresponds to the step they have reached on the ladder. The learning cards are stored in clearly marked trays at the back of the classroom. The self-learning cards have logos and other features which easily map onto the symbols on the learning ladder helping children see at which level they are working.

### **Classroom layout and learning resources**

Rather than one teacher blackboard dominating the classroom, each child has a dedicated blackboard, at the child's eye level, on which to write her work. Works of children are displayed prominently on binding wires across the room. Other locally sourced materials adapted for teaching and learning purposes are also seen in many ABL classroom settings. Whole group activities are conducted by the teacher for half an hour in the morning and another half an hour in the evening, and can range from songs, rhymes, arts and crafts etc.; other than that, children usually sit in small groups. These also include activities such as the health wheel chart and weather calendar.

A synthesis conducted by NCERT (2011) and an evaluation of ABL (Akila, 2009) identified five key aspects of the ABL model, namely: *classroom organization* as multi-grade and small groups on different mats carrying out independent learning activities with support from teachers and students as explained above; *curriculum structure* broken down into small learning units or milestones; *teaching and learning* through a series of activities and opportunities for independent and peer learning; *role of the teacher* as a facilitator rather than learning being solely teacher driven, and finally *assessment*, which is non-threatening and built into the activities the child completes, moving onto the next milestone only after they achieve a certain "mastery of skills".

### **Preconditions for successful implementation of ABL**

The shift from a teacher-centred to a child-centred pedagogy engendered by ABL entails a radical change in the classroom practices and dispositions of teachers and students. Building practices and

dispositions towards more independent, self-directed learning among students is not only a matter of implementing task-based learning, configuring the mat system and managing the learning ladder and corresponding sets of resources and task cards. Interpersonal as well as intrapersonal processes need to be cultivated in classrooms.

Reflected in this is a particular view of the learner. The learner is perceived as an individual making independent decisions and choices, as he/she engages with the learning ladder and task cards. ABL also explicitly challenges children to learn interdependently. For example, mats 4 and 5 encourage children not only to take responsibility for their own learning but also the learning of their peers. Developing an individual and social orientation to learning in relation to these challenges requires a very sophisticated set of learning strategies and dispositions among pupils. The teacher's role in the ABL setting is to facilitate pupils' development of individual and social engagement in their learning, and this is not a trivial challenge. It is in these terms that ABL involves a change in the culture of classroom teaching and learning.

ABL therefore holds a number of important implications for practices and relationships, for schools, teachers and students:

1. Teachers receive ongoing professional development support in the context of the classrooms in which they teach. Regional and school structures and opportunities encourage and support teachers develop and adapt ABL practices for their local contexts.
2. Students are supported (by teachers and peers) in developing norms of participation and cooperation consistent with taking increased responsibility for their own learning and developing skills and practices of independent learning.
3. Teachers and students develop close interactive partnerships as the basis for building a child-centered pedagogy and culture in the classroom together.
4. The expertise and knowledge of peers as well as teachers are recognized as important sources of learning and support for a student in the child-centered ABL classroom.
5. Teachers display responsiveness to the learning needs, interests and personalities of their students.
6. Support from teachers and peer group is available to help each student make appropriate choices not only in what to learn but how to learn.
7. Teachers' help students develop understandings of what they know and can do as well as what they find difficult.
8. Students are encouraged and supported to engage in self and peer-assessment as important ways of building independence and interdependence in their learning.

These practical implications undergird the ABL approach to classroom teaching and learning and require sophisticated teaching skills and organisational strategies for their successful realization as practice in the ABL classroom. Although these implications apply to many other types of teaching we list them here in order to emphasize the essentially interactive and therefore social nature of ABL. What is distinctive to ABL is the resource infrastructure and mat configuration of ABL classrooms. The mats (see above) signify the importance of specific and deliberately planned patterns of interaction between teacher and students (mats 1-3) and among peers (mats 4 and 5). The ABL model was designed to promote individualization and self-direction in student learning, especially in contexts of teacher absence or shortages (e.g., Anandalakshmy, 2007). Nevertheless, the task-based learning approach of ABL is designed (i.e. through the mat structure) to be mediated by pedagogic interactions among students and between students and teachers. It is through social interaction as well as disciplined individual activity that the full learning potential of the ABL model can be achieved for both teachers and students. In other words, making the most of learning in ABL settings challenges students to strike an optimal balance between an individual mode of learning and

engagement and a more social, interactive orientation in any given lesson. This balance will vary considerably among different students, and teachers need a sophisticated and well developed expertise if they are to support each pupil find their own particular optimal balance.

## 2. Summary review of previous research and evaluations of ABL

A common focus of existing studies on ABL has been on the impact of ABL on students' learning attainments. A review of this literature highlights various inconsistencies in current findings. In order to illustrate this point, it is useful to compare the findings of two detailed reports produced by Akila (2009) and Kumar et al. (2009).

Akila (2009, p. 21) in her research reports "a direct relationship between classroom processes and outcomes of children". However, she also reports a tailing off in the achievements of students in higher grades. Kumar et al. (2009, p. 64) report a similar trend in students' academic performance between grades I and IV; however, their analysis contains some ambiguities. On one hand, they report (2009, pp. 7 and 64) that the percentages of students who achieve at least satisfactory scores (50% or above) in Tamil, Maths and EVS respectively are as follows: Grade 1:13.6%, 14.61% and 21.66%; grade 2: 50%, 54% and 46%; Grade 3: 58%, 53% and 61%; Grade 4: 63%, 58% and 68%. On the other hand, Kumar et al. (2009, pp. 64-65) go on to report that as students' progress through the grades the percentage of students that achieve scores below par for their grade level increases, so much so that about 65 % of grade IV students are below par for their grade level. They also report that students' achievement levels in Mathematics and EVS follow a similar trends between grades I and IV.

The findings of Kumar et al. (2009) differ to those reported by Akila (2009) particularly in respect to gender and social status. Kumar et al. (2009) report gender and caste differences in the test performances in mathematics (boys outperform girls in grades 1 and 2; girls outperform boys in grades 3 and 4) and between students from different social groups, whereas Akila reported no significant gender or social group differences. Furthermore, Akila's report does not note any significant differences in achievement results according to the type (Government or Aided) or the size of school.

In trying to understand such inconsistencies as reported above we reviewed the literature to find evidence of classroom processes that might mediate ABL effects on students' learning attainments. Available papers/reports provide some useful descriptions of materials and resources used in ABL classrooms and some general indication of the kinds of practices that teachers and students develop; however the empirical basis on which representations of practice are reported tends to be poorly specified. Classroom observations appear to be the primary data source together with, to a lesser extent, interviews. Yet the methods used for collecting observational and interview data are not reported in sufficient detail and the insights tend to be of a general nature neither problematizing nor addressing questions related to variations in the practices and performance of different teachers and students in different ABL school and classroom contexts.

For example, Pillai and Ramaswamy (2009) draw on classroom descriptions, analysis of secondary literature and few interviews with teachers and policy makers, but their study falls some way short of a systematic exploration of processes through which ABL comes to influence classroom practices of teachers and experiences of students in different contexts. Another example is the study by Anandalakshmy (2007), even though the findings are derived almost entirely from classroom observations, the report fails to mention the number of classes observed or time spent on observation. It merely notes that fieldwork was conducted by 'an independent team of researchers,

who were also, experienced teachers'. Similarly in the study by Pillai and Ramaswamy (2010) a number of qualitative methods were used, including interviews with officials, teachers and parents, as well as observation of classrooms and Block Resource Teacher Educator (BRTE) training workshops, however in their analysis there is overreliance on inferences from secondary sources rather than engaging with the findings from their empirical explorations. Additionally, in cases where classroom-based data has been collected it is only used for contextualisation of the learning outcomes data, rather than for developing deeper understandings of the teaching and learning processes adopted in an ABL classroom. Finally, the NCERT (2011) study is a more comprehensive evaluation combining different methods, such as drawing on student and teacher interviews, observations, and cognitive and non-cognitive outcome data; nevertheless, the underpinning design principles are, like most of the other studies, underspecified, making it difficult to know how the different data (including the observation and interview data) were collected and analysed; hence the empirical basis for the findings they report remains unclear.

A notable exception is the study undertaken by Kumar et. al., (2009). This study adopted a more systematic approach which focused on observing and describing various group and individual tasks/activities undertaken by students during school hours. Kumar and his team used observation schedules to record teachers' behaviours, the range of activities typically undertaken by students and teachers during the school day, time spent by students on active learning and other activities in the classroom during school hours. Their research went beyond description to the identification of broad patterns of classroom practices and their impact on students' performance on tests in Tamil, Mathematics and EVS. A distinctive strength of their report is the inclusion of the qualitative research tools in the appendices, which were very useful in shaping development of the instruments for our own study.

The two evaluations conducted by Akila (2009) and Kumar et al, (2009) seemed to be more useful in understanding how ABL effects on students' learning are mediated. Both studies included important observational components in their research designs, thus widening scope for understanding more about the classroom processes that might mediate ABL effects on students' performance on tests. Each study developed a different category system and therefore had a different observational focus in their studies. However, neither provides clear operational definitions for their categories, nor do they clarify the basis on which the selected observable aspects of classroom processes were justified for detailed attention and recording – either in theoretical or empirical terms.

Notwithstanding these limitations, Akila (2009) and Kumar et al. (2009) both report interesting variations in patterns of classroom practice among different student groups and in patterns of impact of classroom practice on students' learning attainments. Kumar et al. (2009) identified three categories of learning behaviour: 'active learners', 'passive learners' and 'off task learners'. However patterns of association between different categories of learning behaviour and test performance were by no means consistent across grades. For example, they report (2009, p., 65) that in grades 3 and 4, 'active learners' outperform 'off task' and 'passive learners'. No significant or large differences in achievement are recorded for the three groups in grade 2. However, in grade 1 'off task' learners outperform 'active' and 'passive learners'. By contrast, Akila (2009) reports more stable links between classroom processes and student achievement. Classroom processes were classified under three headings: 'materials and use', 'learning styles in groups', and 'teacher-child relations'. Examples of the kinds of processes that Akila observed at higher levels of frequency in high performing classrooms include teachers' attention to slow learners, student satisfaction with the help provided by the teacher, and scope for children to interact freely with the teacher.

Finally, a common assumption made in most of the papers/reports reviewed for this study is that there is a shared understanding of ABL amongst heads and teachers, and therefore what remains to

be understood is how it is to be implemented in practice. We planned this research to address this assumption.

### 3. Research aims and questions

From the review of available research we conclude that an in-depth and nuanced exploration of classroom processes and their mediation of learning in ABL classrooms has been a rather neglected feature of the ABL research and evaluation literature. More research is needed that identifies commonalities and variations in practices and interactions developed by teachers and students to realise ABL principles effectively in different classroom contexts. Such research needs to attend to the perspectives and practical repertoires of students, teachers and school heads who are responsible for the promotion of ABL in their different school and classroom contexts.

In order to undertake such an exploration, there is a need, we felt, for more in-depth pedagogic research that can help us address the following specific research questions:

1. In what ways do teachers' and students' observable practices and patterns of interaction vary in different ABL classroom contexts?
2. What kinds of thinking and expertise underpin teachers' practices to optimise the quality of their students' learning and progression in different ABL classroom contexts?
3. How do teachers consider that ABL supports improvements in different students' learning?
4. What leadership perspectives and practices influence the development of practice related to the promotion of ABL in schools and classrooms?

We turn now to present the research design and methods of data collection we developed to help us address these research questions.

### 4. Research design and methods of data collection

A multi-methods approach was adopted in order to collect data at the levels of school and classroom in both rural and urban settings. Data were collected from 10 randomly selected schools and these were the same schools as those used for the non-cognitive survey component of the research. Five of these schools were selected from an urban sample (Chennai district) and 5 from a rural sample. Within these schools, our particular focus was on grades 1st to 4th, as these grades have been the main focus of the Government's ABL reform efforts and resourcing. An overview of our sample is summarised in Table 1.

*Table 1: Overview of the sample*

	<b>Chennai (urban)</b>	<b>Kanchipuram (rural)</b>
Type of schools (year in which ABL was started)	3 government(2002 and 2003); 2 aided (2006)	3 government (2004 and 2007); 2 aided (2006 and 2007)
Total number of teachers in the school	2 to 10	4 each in 4 schools, 11 in one
Total student population	40 to over 350	Between 80 to around 400

Number of children with special needs (CWSN)	In all schools, except one	All schools had at least one child with special needs
Physical Infrastructure	All schools had toilets and 'pucca' boundary wall	All schools had toilets and 'pucca' boundary wall
Watchman	Only in the 3 government schools	No watchman in any of the schools

Our sampling strategy was not designed to support systematic comparisons of pedagogy in ABL and non-ABL school and classroom contexts, as our research study was conducted only in ABL settings. Our focus, as reflected in our research questions, was on variations of practices and perspectives in our sample of ABL schools in rural and urban locations. Our points of reference for analysing and interpreting data from the 10 ABL schools in our study are the principles and preconditions of ABL presented earlier in the report. The purpose here is to engage with the different ways students, teachers and headteachers in different ABL contexts realise ABL principles in practice. In the absence of detailed accounts of variations in ABL pedagogy in different ABL settings in previous research, we feel it is necessary to map out such variations towards a fuller, detailed operationalisation of ABL pedagogy in practice. We see this task as an important preliminary step before large scale comparisons of pedagogic practice, perspectives and outcomes are undertaken between ABL and non-ABL schools.

Data were gathered through a mix of qualitative and quantitative methods which we summarise below.

#### 4.1 Interview strategy

**Semi-structured interviews** were conducted with the heads of all schools, and all the teachers in school who were involved in teaching grades 1st-4st. The semi-structured interview schedule was developed using a thematic approach, the schedule was piloted before and after translation into Tamil for accuracy of meaning and also to incorporate the specificities of ABL.

All the headteacher and teacher interviews were conducted by one researcher, based in Chennai and fluent in both Tamil and English. He was trained through a series of workshops on developing interviewing skills and was supported throughout the process by the local team of researchers. Using a single researcher to conduct all interviews was useful as it allowed greater familiarity with the schedules, gave him insights in how to developing useful probing questions based on greater understanding of informants' accounts. An overview of the number of interviews conducted and the focus of these interviews is given in Box 1 (overleaf).

All the interviews were audio-recorded, and hence were transcribed verbatim by an independent person who was fluent in Tamil and English. The translation was checked for reliability based on a random selection of excerpts in each interview by the researchers in the team who were fluent in both the languages.

### *Box 1: Interviews at the school level*

#### **Head teacher interviews: 10**

*Themes:* Understanding of ABL; Development of ABL; Leadership; Community and Parents; Reflections on ABL

#### **Teacher interviews: 45**

*Themes:* Experience and understanding of ABL; Teaching-learning practices; Use of classroom space/ design; Assessment; Support; Effectiveness of ABL; Reflections

In addition to these interviews, we also conducted post-lesson interviews with teachers (a total of 60 of these), to allow for teachers to develop more contextualised accounts of the thinking and decisions that shaped their practice during particular observed classroom sessions.

## **4.2 Classroom observation strategy**

Additionally, data were collected through **systematic classroom observation** procedures which supported detailed recording of what teachers and students observably were doing and saying in different ABL classroom contexts. Systematic observation procedures enabled us to quantify the occurrence of different facets of teachers' and students' observable practices at regular time interval during observed lessons. This formed the basis for identifying patterns of similarity and difference in the observable practices and interactions of teachers and students across the range of observed ABL classroom contexts. We set out to develop observation procedures that enabled detailed recording of classroom interactions and behaviours of both teachers and students. This entailed the use of two different observation schedules, the Teacher and Student Records, in each observed lesson. One research assistant focused on students and used the Student Record. The other research assistant focused on the teacher and used the Teacher Record.

Sixty lessons were observed in total: thirty lessons at five schools in Chennai district (urban location) and thirty lessons at five schools in Kanchipuram district (rural location). A total of 8,614 twenty-five second time intervals were observed from the Student Record involving almost 360 target students and amounting to almost 60 hours detailed observation of students. The Teacher Record was used to observe 41 teachers over 11,273 twenty five second time intervals, amounting to a little over 78 hours detailed observation of teachers. Observers also recorded additional class details including the grade level, observed class size and number of students in the register, the number of boys and girls present during the observed lesson, and the age range of students in the class. The names, ages and standards of each target student were also recorded.

We now provide a summary of the thinking behind our observation focus, while the categories we developed for each schedule together with their definitions are listed in Appendices 1 and 2.

### ***Rationale for the observation focus***

A key assumption in planning this research has been that the ABL system of task cards, learning ladders and mat configurations are unlikely to influence students' learning achievements and attainments except through the mediating effects of what teachers and students think and do in classrooms. We argued earlier that existing ABL research has proved largely unhelpful in providing the kind of theoretical and empirical frameworks that might help us better understand the contexts



in which ABL influences students' learning achievements through the mediation of teachers' and students' classroom practices and perspectives. Therefore we set out to explore empirically what processes characterise teachers' and students' practices in different ABL classrooms on the understanding that any impact of ABL on students' learning attainments would depend on the ideas, practices and perspectives of teachers and students in ABL classrooms.

We needed to find out whether there are recognisable patterns of practice common across different ABL classroom contexts. We also needed to find out whether some of these patterns of classroom activity are related to the quantity and quality of students' learning. To establish any relationships between ABL and students' learning attainments, there is ultimately a need for experimental research to identify what these classroom process variables are, and then to relate them to students' attainments. In so far as we still do not know what classroom process variables are the key mediators of ABL effects on student attainments, this study is best viewed as preparatory to the experimental project.

Disappointingly, the under-theorised nature of ABL research is evident in the widespread absence of an explicit justification for selecting variables (Dunkin and Biddle, 1974; McIntyre, 1980; Rosenshine and Furst, 1973). This, together with a shortage of detailed, well contextualised qualitative research into effective teaching and learning practices in ABL contexts left us without a strong rationale that might help decide what classroom processes are likely to mediate ABL effects on student learning and so worth attending to in the development of our observation instruments.

### *Provisional assumptions about teaching and learning practices that might mediate ABL effects on students' learning attainments*

Effective teaching and learning processes can be understood to be transactional in nature (e.g., Cooper and McIntyre, 1996). From this perspective, the social relations between teachers and students and among students are at the centre of understanding and promoting effective classroom practice in different contexts. Consistent with Vygotsky's (1978) notion of cognitive development, teacher-student and student-student social relations are key to any model of effective teaching and learning which seeks to address the cognitive and affective concerns of students actively engaged in classroom learning. From teachers' and students' perspectives, cognitive development is inseparable from the social and affective domain of classroom relationships. In similar vein, the model of learning proposed by Bruner and Haste (1987) emphasises the importance of sharing and testing inter-subjective meanings, negotiating interpretations through interaction, and exercising empathy. It is as teachers and students adapt and adjust how they talk and relate together in class that they make one another's knowledge and experiences intelligible and therefore accessible to one another as partners and collaborators in the teaching and learning process.

This transactional model of effective teaching and learning would appear to resonate with the precepts of ABL we listed above in so far as those precepts express a major concern with promoting child-centred learning as an individualised process supported by mutual, close, interactive partnerships between teacher and students and among students. It is in the development of social relations that different sources of knowledge and experience are made mutually intelligible for the learning of self and others.

Our assumptions about the transactional social nature of effective teaching and learning processes and their central role in mediating ABL effects on students' learning attainments shaped development of our observation strategy. Our observation schedules focus attention on teacher-student and student-student interactions that reflect observable dimensions of the social relations under discussion here. However we had no basis for predicting in advance of the study whether the



ABL method would reduce or increase the quantity or quality of students' learning opportunities. We are confident in assuming that teachers and students differ in their repertoires and skills and so take advantage of classroom contexts in different ways. We are also persuaded by the important conclusions of Rosenshine and Berliner (1978) and Brophy and Good (1986) that academic learning is influenced by the amount of time students spend engaged in academic or curricular learning activities.

However we could not know before our study whether the mat configuration and the individualised nature of the learning promoted in ABL classroom settings would bring into play or not a set of constraints which would limit the quantity of learning opportunities possible. We could expect perhaps that students on mats 1 and 2, and to a lesser extent, mat 3, would have most opportunities for direct academic interactions with their teacher because the teacher, in theory, should spend more time working interactively with students on mats 1-3. We could also expect that students on mats 4-5 might have more opportunities for working collaboratively and engaging in different kinds of academic-related interactions with each other. We did not know whether students on mats 4-5, not directly supervised by the teacher, would use their time for academic or non-academic activities; and if the latter how much time the teacher would need to spend on management and control of discipline at the expense of time devoted to academic activities and interactions. Neither did we know at the outset how teachers distributed their time on different tasks, such as supervision and monitoring of the ABL learning resource infrastructure to support students on various learning activities.

We assumed that the quality of learning opportunities is closely linked to the breadth and depth of curriculum coverage. This has been shown to be related in important ways to the optimisation of student attainment but not in any simple way. On the one hand Dunkin and Biddle (1974) draw attention to evidence that breadth of coverage gives students the opportunity at least to learn all the constituent elements of the curriculum. On the other hand Bloom (1976) argues that it is more effective to facilitate progression at a rate at which students can achieve mastery of the subject matter, even if this means a slower pace of coverage or incomplete coverage. The ABL method reflects Bloom's argument with its emphasis on student determination of the pace at which they progress from one milestone to another.

We were also persuaded by previous observational research that the quality of learning opportunities is enhanced when teachers 'structure new information' clearly and 'provide corrective feedback' (Brophy and Good, 1986:366). Bellack et al (1966), Wright and Nuthall (1970) and Hughes (1973) all reported positive associations between student attainments and teachers' reactions to student contributions and ideas in lessons such as probing incomplete, incorrect or no responses, providing adequate time for students to consider or formulate their responses to teachers' questions, and providing clear explanations why a student idea has been accepted or not. Such strategies encourage students to extend their responses and support students' thinking at levels they would otherwise be incapable of achieving. Striking an optimal balance between high and low-order questions also enhances the quality of student learning opportunity.

What we could not predict at the outset was how much time there would be in different ABL classrooms for such interactions and whether or not and to what extent such interactions might prove vulnerable to time constraints caused by the need to engage in non-academic interactions of a supervisory or disciplinary nature.

### *Observation procedures*

Design of the **Teacher Record** was influenced by Galton et al. (1980, 2001) and Pedder (2006). Observation data generated by the Teacher Record focused entirely on what the teacher was saying or doing. The teacher's behaviour was coded at regular twenty-five second intervals signalled by a bleep recorded on a MP3 player connected to an earpiece worn by the observer. Codings on the Teacher Record followed a method of 'instantaneous time sampling' which allows coding of multiple categories of each observed activity at the bleep.

The total number of codings made from the Teacher Record at any given signal depended on the teacher's situation and activity at that particular moment. The teacher's *audience* and *location* were always coded along with appropriate categories from the remaining list which distinguish between different *functions* of the teacher's academic and managerial interactions. Categories and their definitions used to operationalise each facet of the teacher's interactions are listed in Appendix 1.

Design of the **Student Record** was influenced by Galton et al (1980, 2001). Observations developed from the Student Record were used to record the nature and frequency of students' classroom activities when working alone or interacting with adults or with other students. One student at a time was the focus of observation. To distinguish her/him from the rest of the class she/he is described as the target student. 6 target students from each observed class – three girls and three boys – were identified for observation purposes. The target student's behaviour was coded at regular twenty-five second intervals. A signal was provided by a bleep that sounded every twenty five seconds on a MP3 player connected to an earpiece worn by the observer. Each target student was observed by rotation for 24 twenty five second time intervals (equivalent to 10 minutes elapsed time) using the 'instantaneous time sampling' system which allows coding of multiple categories of each observed activity at each signal.

The total number of codings at a given signal depended on the target's situation at that particular moment. Observations of each target student focused on particular aspects of adult-student and student-student curriculum-related interactions. Aspects of adult-student interactions of interest to us were the target student's role, who the interacting adult was, and the focus of interaction between adult and student. Aspects of student-student interactions of interest to us were the target student's role, the mode of interaction, the task context of the interaction, the gender and number of other student(s), and the base of other student(s). When target students were not involved in curriculum-related interactions with an adult or with their peers, we recorded other aspects of their classroom activity and engagement. For all behaviours or interactions the location of the target student was recorded. Observation categories and their definitions are listed in Appendix 2. Table 2 provides an overview of the district, classroom and curricular contexts in which observations were made from the Teacher and Student Records

Lastly, the data collection team of three core researchers kept **daily field notes** which captured unplanned conversations, spontaneous observations, and additional reflections and notes. The researchers also took more than 500 **photographs** (with due permission) to capture features of ABL settings that they considered salient in some way.

Table 2 below summarises the district, classroom and curricular contexts in which observations were made for this study from the Teacher and Student Records.

Table 2: Distribution of classroom observations by district, subject, class size, standard, mono/multigrade classes (percentage of all observations)

		Teacher Record (TR) <sup>2</sup>	Student Record (PR) <sup>3</sup>
District	Chennai	50.9%	49.8%
	Kanchipuram	49.1%	50.2%
Subjects	English	16.8%	16.2%
	Maths	26.9%	27.0%
	Science	20.1%	19.5%
	Tamil	29.9%	30.3%
	Social Science <sup>4</sup>	6.3%	7.0%
Class size	<15	28.1%	30.1%
	16-30	54.9%	53.2%
	31-50	15.3%	15.0%
	51+	1.7%	1.7%
Class standard (TR) Standard of target students (PR) <sup>5</sup>	1 <sup>st</sup>	6.7%	20.3%
	2 <sup>st</sup>	8.1%	29.5%
	3 <sup>st</sup>	21.2%	23.7%
	4 <sup>st</sup>	20.3%	26.7%
	1 <sup>st</sup> +2 <sup>st</sup>	33.4%	
	3 <sup>st</sup> +4 <sup>st</sup>	10.4%	
Monograde/multigrade classes (TR)	Monograde	56.2%	
	Multigrade	43.8%	

### 4.3 Implications and limitations of the research design

Given limitations of research resource and time we needed to place limits on the scope and sample for this study. Furthermore, given limitations in the existing body of research literature about how school and classroom processes might come to mediate effects of ABL on learning, we decided to focus our research resource exclusively on variations in the perspectives of leaders and teachers and in the observable practices of pupils and teachers in ABL settings that we considered important mediators of ABL effects on students' learning. This enabled us to examine in detail whether or not there are quite different understandings of ABL amongst headteachers and teachers and whether or not patterns of teachers' and students' classroom practice in ABL settings vary in different contexts.

<sup>2</sup> The Teacher Record was used to observe 41 teachers over 11,273 twenty five second time intervals, amounting to a little over 78 hours detailed observation of teachers.

<sup>3</sup> A total of 8,614 twenty-five second time intervals were observed from the Student Record involving almost 360 target students and amounting to almost 60 hours detailed observation of students.

<sup>4</sup> Taught in 3<sup>st</sup> and 4<sup>st</sup> only

<sup>5</sup> These were the standards or grades of the target students observed irrespective of whether they were in a monograde class (ie all other students in the class were of the same standard or grade) or in a multigrade class (in which case some other students in the observed lesson were from a different standard or grade).

A particular feature of our research design was the combination of interview and observation methods of data collection. This combination enabled us to understand variations in the perspectives and observable practices of teachers directly involved in the promotion of ABL in a range of district, classroom and curricular contexts (see table 2). Our observation strategy also allowed us to focus in detail on the classroom practices and behaviours of students. We also interviewed headteachers which enabled us to understand more about school leaders' perspectives and their perception of their role in relation to the ABL reform. Lacking from our design are data that enable us to report the perspectives of students, their thoughts about ABL, and their accounts of the strategies they developed in order to participate and learn in ABL classrooms.

Absent from our sample are schools and classrooms in which a non-ABL teaching and learning policy is implemented. This means that we were unable to make comparisons between the observable practices and perspectives of teachers and pupils in ABL and non-ABL settings, or between the leadership perspectives of headteachers of ABL and non-ABL schools.

A final limitation of the design relates to the small school and teacher sample sizes. These do not provide an adequate basis on which to demonstrate that the patterns of perspective and practice we report here are representative of school and classroom practice in other ABL settings in Tamil Nadu. Nevertheless, our design allows for the detailed examination of strategies for promoting ABL in different contexts together with a consideration of opportunities and constraints considered influential for its optimal implementation and further development by those directly involved in its local adaptation.

## 5. Findings

In presenting our findings we begin with a focus on headteachers, their leadership perspectives in relation to ABL, and their role in promoting ABL at their respective schools. Our focus then moves to teachers and how they make sense of ABL, their classroom role and practices in promoting ABL in the classroom, the kinds of relationships they seek to develop with their students in supporting their students' learning in ABL classroom settings, and factors which they consider important in supporting or hindering teaching and learning in ABL settings. The second part of the findings then focuses on a detailed examination of the observation data, drawing on both the Student and Teacher Record to compare patterns of classroom interactions in ABL classrooms. Together, the findings presented here provide a holistic illustration of ABL in our sample schools.

### 5.1 Headteachers: their role and perceptions in ABL settings

In the existing literature on ABL there is little examination of the role of headteachers<sup>6</sup>. And yet, headteachers can be expected to play a central role in supporting local implementation of the ABL reform in the local and particular contexts of their schools. How headteachers interpret the reform and the kinds of leadership strategies they use to support implementation of ABL in the classroom were therefore of interest to us. We believed that their accounts would help us to understand critical features of ABL from their perspective as school leaders. It would also be interesting to identify points of similarity and difference between headteachers' leadership perspectives and the perspectives expressed by teachers in their accounts.

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<sup>6</sup> Akila (2009) mentions that head-teachers were interviewed, but their perspectives are not examined in any great detail in the findings of the report.

Of the 10 headteachers who were interviewed, all (similar to the gender distribution amongst teachers), except one, were male. Each had over 20 years (the highest being 33 years) of teaching experience and they had been headteachers for a shorter period, ranging between four-nine years. Not surprisingly, all of them had taught in non-ABL settings and in eight cases they had been HTs when their school transitioned from a non-ABL to an ABL setting. The purpose of the interviews was to support headteachers develop accounts of their theories, principles and beliefs about ABL and their leadership role in promoting and embedding ABL at their different schools. Headteachers across the 10 schools articulated unequivocally supportive accounts of the effectiveness of ABL and its many benefits. Interestingly their accounts not only highlighted perceived benefits for students, but also for teachers.

*Perceived benefits for students:*

HTs noted that ABL promotes effective learning for students through a number of processes and mechanisms, paramount among these were the following:

- ABL provides students with clear direction for task progression through well-labelled cards and the learning ladder. This enables students to move at their own pace, be independent and take ownership of their learning, fosters motivation (i.e. reach the next milestone) and raises interest and confidence.
- The variety of learning activities in ABL classrooms promotes interest and encourages students to share their thoughts.
- Learning is experiential, experimental and independent in ABL classrooms – the most commonly noted statement being that ABL supports students' learning by enabling them to *'understand it by doing it themselves'*.
- ABL connects classroom learning with real life contexts of students' lives and knowledge.
- Students are free of the burden of book learning.

It was common for headteachers to use descriptions such as, *'there is flexibility in pace'*; *'gradual learning through the ladder steps'*; *'children no longer fear learning and move at their pace'*; *'it is a child based system'*; *'children are now learning with interest'*, *'learning with interest in itself is beneficial'* in describing the ABL approach. One of the headteachers stated that ABL is about *'learning through experiments'*, while another highlighted (RS7) that *'when children are taught with colourful pictures and models (as is the case in ABL) it is more interesting and facilitates greater understanding and desire to learn'* (US4).

HT at RS6 clearly noted that she had seen a positive impact on students' confidence as a result of the ABL approach:

When the student learns by himself through ABL, his confidence is increased. When the child can read, write and say all by himself he wants to achieve more and is motivated to reach the milestones...they just want to know what needs to be done and they are confident of doing it by themselves. The student is interested to move on to the next level. (RS6\_HT)

Some also drew contrasts with the traditional book-based method:

Only tiny cards are there which can be easily completed... no more burden of books (RS7)

Our students are performing well... since it is self-learned, they learn it with interest. Because they do not have to memorise what is given in the book, they come with interest.... Earlier the teacher will keep teaching and students just kept listening. Like a slave, whatever the teachers says, the student had to listen to it.

There were no options to share student's thoughts whereas in ABL, there is so much scope to share his thoughts (US2\_HT)

Finally, as noted earlier, the connection between classroom learning and real life was valued by all HTs. In all interviews, at some point in the discussions, HTs promptly pointed to the many benefits of using the health wheel and weather chart which are an integral part of ABL classrooms.

Students make a note of the weather forecast for each day... When the students themselves are made to note these, for example when they note the weather in Chennai, they know which months had heavy rainfall or cloudy... ABL promotes applying their knowledge through education in their lives. That is a very positive aspect. Students also mark their attendance themselves. It helps them to know the importance of coming to school and provides them motivation for regularly attending school. (US4\_HT).

#### *Perceived impact on quality of teaching:*

When asked about the kind of impact ABL practices have on teachers in school, HT RS6 noted an actively engaged teacher as being central in ABL:

Guiding the children and clarifying their doubts needs a lot of preparation. Teachers are also involved in making the learning interesting and looking for various methods to help the children improve their studies.

Five of the 10 HTs raised these specific factors in their interviews:

- Teachers' knowledge is enhanced in ABL contexts because teachers themselves learn the concepts to be taught in each lesson.
- ABL helps teachers make their teaching more interesting.
- ABL challenges and supports teachers to promote individualised learning and move away from whole class teaching.

In these interviews, the following quotes were common: , *'teachers act as a bridge to the path of knowledge and show them the right direction'*; *'teachers involved in making the learning interesting'*; *'they learn the concepts of each lesson'*.

Thus, HTs seemed to strongly believe that ABL had a significant positive impact on students, and half of them also discussed how they felt it was beneficial for teachers too. Given the very positive perceptions towards ABL, it is useful to examine the kind of challenges and barriers that HTs noted they faced in implanting ABL in their school settings.

#### *Challenges and barriers faced:*

When asked to reflect on the challenges and barriers that they faced in implementing ABL, only six HTs were willing to discuss any concerns. The other headteachers simply noted that they did not face any challenges. Amongst the six who raised some challenges, HTs at RS7 and US1 were most concerned about the lack of parental support. HTUS1 acknowledged,

There is nothing difficult in ABL to be implemented. The only problem is that we do not have parental support for this...there is zero level of support from parents. There may be hardly a couple of parents who realise the value of education.

What is interesting to note here is that the headteacher at US1 was making a general point in relation to parents not valuing education, which she argued manifested in high rates of student absenteeism in her school. However, the headteachers at RS7 made a specific point about initial parental reluctance towards the ABL approach, which was also noted by the head at RS9:

When the ABL was introduced, parents told me that their child is always drawing and not reading the books. I told them that when the child draws, it is equivalent to reading one full page of book, and the child understands it.... Gradually even they will understand.

While both the above examples are from schools in Kanchipuram, the rural site, it is important to flag that headteachers in Chennai also highlighted lack of parental support as an important barrier, but when doing so they noted that this was the case only in the initial phases of the programme. In both instances, the headteachers reflected that they overcame parental resistance through community meetings with parents and also by giving them a chance to come and view on-goings in the classroom.

Two headteachers also noted that for teachers in their school classroom control was a big concern, as children did not work independently in small groups and regularly caused disruptions. RS7 observed, *'Teachers keep telling me that when they make them sit in groups and learn, teacher will attend to one group and the remaining groups will be having fun. They find it difficult to manage'*. He also spoke about how ABL was better for children with high abilities, a point that resonated in many of the teacher interviews, and in discussions with HT\_US4.

One HT (RS9) reflected on the nature of teacher training, especially the duration being too short.

It will be good if they are provided more training. In two day training, they provide too much information which makes the teachers to grasp everything in two days. Teachers find this difficult and they are not able to implement all their learning's completely. If they provide more training with excitement, they will be able to understand better and implement it.

Finally, a common theme which emerged across four (1 rural and 3 urban) of the ten schools, was the lack of adequate resources, such as replacement of cards and learning ladders which get damaged through wear and tear (RS7). Getting new cards in English medium rather than Tamil medium, as HT at US1 queried:

We do not receive enough cards. Cards are not sufficient...we have English medium in our school. But we do not have cards for English medium. We have cards only for 1<sup>st</sup> and 2<sup>nd</sup> standard. It's been so many years, still we have not received cards. On what basis can we teach children?

In another urban school, due to high student numbers, the HT noted not only the challenges his teachers faced with large class sizes of 45-58 students, but also resource shortages related to large class sizes such as insufficient quantities of cards for all students, *'...ABL cards should be supplied every year on time. Sometimes the supply gets delayed...and enough quantity of cards should be provided'*. In US4 the HT noted the need for a TV and computer in his school. It is useful to note here that even though such resources are clearly marked on the learning ladder, they were not in use or evidence in any of the classrooms we observed or visited.

*Leadership approaches of headteachers in ABL schools:*

Given the important strategic role of headteachers, we invited them to reflect on their leadership approach to promoting and embedding ABL in their schools. In these accounts a consistent picture of their leadership dispositions and strategies are reflected.

All headteachers understood their primary role in terms of monitoring and inspection. They understood their responsibility in terms of ensuring teachers 'follow' ABL. Some reported checking with students if teachers had taught certain elements of the syllabus or, through random checks, whether they (the students) had learnt and understood certain aspects of the curriculum. HTs in most cases perceived their responsibility as procedural in nature- ensuring that teachers are following ABL and have the resources to implement it. This was highlighted in various narratives:

RS6\_HT: ...I keep telling teachers that higher officials are very interested in the education of these rural children... My role is to ensure that all the classes follow it (the ABL methods). I ask teachers if they have instructed students on certain things and also check with the students if the teacher has told them these... I instruct all the classes to follow the same. That's my role.

US4\_HT: I go on rounds to check whether students come to school regularly and whether the class divisions are mentioned, how do they observe and get into their groups. ...I also check whether the children go to classes properly and whether the classes follow the ABL method.

Only in one school, did the HT (US5\_HT) also teach, in this case class 2st. However, when describing her role she too noted that, *'I monitor all the classes. I will randomly call a student and ask him about which card is he learning, and ask him to read and write the card...Each day, I visit one class'*. Thus, what emerged in these accounts was the dominant perception of HTs that their main responsibility was with monitoring of the reform agenda.

Overall, headteachers expressed significant faith in the benefits derived from the ABL reform, as noted in their accounts of student engagement and quality of teaching. It was also interesting that their accounts also expressed a degree of passive compliance and not a nuanced engagement with policy. In cases where they were struggling with high student numbers and lack of adequate resources, headteachers exhibited an understandably pragmatic acceptance of these realities over which they felt they had little control.

## 5.2 Teachers understanding of ABL principles and their role in ABL classrooms

According to ABL principles, the teachers' role is that of a facilitator of students' learning processes. Importance is placed on teachers interacting with their students in a friendly and democratic manner. During interviews, teachers' reflections on the principles of ABL highlighted the following features, which were voiced across the sample group:

- ABL is about promoting...
  - self-directed learning
  - learning at an individualised pace
  - learning for all
- In ABL learning is...
  - more than subject based knowledge
  - encouraged through different methods
  - experienced by students without fear



[Report 4](#), investigating the dissemination and scale up of ABL, looking at interviews with teachers highlighted similar confidence among teachers about the value of ABL in supporting the learning of students.

ABL was described by teachers as encouraging children to learn on their own. This perception is best exemplified in the excerpt below:

Self-learning is the main principle. ABL makes students use all their 5 senses to learn. The student identifies his logo from the ladder and picks up his card from the tray and gets to his group....ABL is student-centered approach and that has enabled students to be engaged in active learning. RS6\_4st<sup>7</sup>

As suggested in the quote above, the notion of active learning and learning practically and/or in a range of different ways was also regarded as important. In few instances, teachers elaborated on how they used different materials and approaches to help children learn.

If we are teaching maths numbers, we bring in some small stones and start counting with students. Then we ask them to pick up one or two stones. This is how we teach in ABL. It is mostly practical learning. RS6\_1st&2st

All students should learn the concepts – even if it is in a slow pace, they should learn. Some children will learn by games, some students learn through stories, some students learn by role-playing. There is a card for drawing and painting – that card brings children’s creativity. US2\_4st

While self-learning and supporting learning through hands-on activities was important, it was also felt that learning was essential for all students and as one teacher stressed it should be carried out in a manner that is responsive to students’ particular interests.

The central principle (of ABL) is (to) help students bring out their innate skills and talents. In book based method it was always about one lesson and there were possibilities for students to hide their talents. But ABL method enables us to provide individual attentions to students. For example one student might be very good in drawing, the other one might be good in project work, some student will be very good in studies. ABL helps us to identify each student’s skills. Some students are very skilled in stories, puppets. US4\_1st&2st

In majority of cases, it was noted that learning is important for all, but in parallel teachers commonly made distinctions between children’s differing abilities. Teachers in both rural and urban settings very often used words such as, ‘*dull child*’, ‘*gifted*’, ‘*not bright*’, ‘*low IQ*’, ‘*less learning ability*’, ‘*slow learners*’ etc. Additionally, when making such ability distinctions teachers reflected on how ABL was more suited to some children than others.

(In ABL) Students are able to learn by themselves. Most students require help from teachers. Students with low IQ need attention from teacher, students with high IQ does not require teacher’s attention they are able to learn by themselves. So we have to provide special attention for students with low IQ (RS8\_4st)

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<sup>7</sup> In order to protect the identify of our sample schools and the participants we have used various identifiers, - R stands for rural, and U for Urban, which is in most cases accompanied by the class (or classes) which the interviewed teacher was in-charge of.

Bright students benefit more than students who have less learning ability. Bright students are able to read the cards and follow instructions and do the activity. But slow students require more support and so we sit with them after school. (US2\_1<sup>st</sup>)

### **ABL and Children with disabilities**

Here it is also useful to examine how teachers perceived the participation of children with disabilities in ABL settings, which is particularly relevant here given that 9 of the 10 sample schools did have at least one child with disabilities (the highest being 6 in one school). It is important to note that when using words like 'slow learners', 'dull', 'not bright', teachers were not referring to children with disabilities, rather they were talking about children who they perceived as below average. When referring to children with disabilities, the teachers were referring in most cases to children with some type of sensory or physical impairment and in one case a child who was identified as 'mentally retarded'. An interesting observation which emerged during the analysis of teachers interview data is that when asked about the presence of children with disabilities in their classrooms, all, except one teacher, did not raise any concerns or questioned their presence. Rather most of them provided accounts of how they were making accommodations for including these children in the classroom.

This method is helpful for specially challenged students also. In my class I have a girl, she can't speak and hear properly. She will be sitting in my class, and when I am teaching, she too will make sounds with tunes that I am teaching, and slowly she has picked up to make sounds similar to the words though she cannot pronounce correctly. This is because of ABL. When she came in 1st std, she could not speak even one word, but now she can produce rhyming sounds. (RS8\_1st and 2<sup>nd</sup>)

Other ways in which teachers noted that they supported children with disabilities was through peer involvement, '*...Also we will ask the high intelligent students to teach the low intelligence students*' (RS10\_3st). Another teacher similarly stated, '*When a disabled student pairs up with a regular student to learn it is useful for him*' (US2\_2st). Few teachers spoke in terms of making small curriculum adaptations, such as '*We give them the tasks based on their individual capacity. We give them the tasks which can be performed by them*' (RS10\_4st). Another teacher noted rather broadly, '*we work based on their ability to learn*' (RS7\_1st). Three teachers spoke at length, describing how the use of pictures, cards and other teaching aids in the ABL classroom facilitated learning for children with disabilities, as highlighted in the excerpts below:

Differently abled students are motivated by game cards, drawing and painting cards. I have a girl student last year, she would draw beautiful shapes, but we cannot say what shape that is. When we give her crayons, she will be very interested. It is useful for differently abled students. There is no difficulty (US2\_4st)

For mentally retarded child, when they take the card, they know that it is something to read and at least look at the pictures. Even though they may not be able to understand anything on it, they will at least look at it. (RS8\_3st)

It is important to acknowledge that these responses around peer support, small multi-sensory pedagogical adaptations are no different from how teachers in non-ABL classrooms describe their practices in other parts of India. However, teacher for class 1&2 in RS9 was very categorical in her rejection of ABL for children with disabilities and rationalised that:

Disabled children will have difficulties in getting cards, to write, to get up from the place and move to another place. ABL requires students to be moving around – like they have to walk to check the ladder, take their cards, which is difficult for them.

Another teacher, who previously had described in great detail how important it was to work at the level of each student, acknowledged that there were certain barriers when it came to working with children who were 'mentally challenged'. She felt that, *'They do not understand. I had a student earlier, who mentally challenged. I could work with him on oral level, but written was not possible; I could not get anything in written from him. During training, they can easily say that we can do it, but practically it is not possible'* (RS9\_3st).

Thus, while teachers were largely positive in their interviews about children with disabilities, this did not necessarily capture the reality of classroom practices. Rather it is useful to note that teachers were getting a range of messages from the training they were attending and the state's own policy on inclusion, some of these were helping influence perceptions and practices in small ways, such as the following excerpt suggests:

This October we went for training in MGR university about dyslexia....(it) helped me understand that even I am dyslexic in certain areas. I have thought some students who do not write were doing it on purpose, but this training helped me understand that they are not able to do it. For example if a student reverses number 9, I scold them and sometimes hit them. But this training helped me understand that that is disability. All students will not be able to produce similar work. They become dyslexic because of stress at home. Now I can identify dyslexic children. There are 2-3 children in my class who are dyslexic. ...All these days I had been thinking that he is useless and he does not want to work. After this training I can understand the disability of the child. He is not doing in on purpose. I should help him to improve. There is not hatred. I also work hard to help him (US2\_3st).

While one might question the attribution of dyslexia to stress at home in the reflection above, what it highlights is how training was sensitising teachers to the needs of a growing diversity of children in their classrooms. Questionably, teachers in these interviews were also likely to be recounting the official position which they were being familiarised with in training programmes, for instance teacher of class 3st in US2 rather plainly stated, *'As per state policy inclusive education is a must. Even today we have training on it. It is a very good policy. ... I would say that Inclusive Education is a must'*. Nonetheless, one could argue that this awareness was an important, though not sufficient, first step. Across the board, teachers noted the importance of all students' learning, and they also stated that it was more than just book based knowledge. As teacher for Class 3st shared, *'when I teach I want to give my students some general knowledge information also. Teaching should not be just about the lesson'* (RS6\_3st).

In US4, the class 3st teacher noted that not only should all children learn well, but they should also know *'how to implement their learning in their lives, health and hygiene, environmental knowledge'*. When asked to give an example of how she promoted this, the teacher elaborated:

(We teach students) how to live a civilized life. Every morning we do health wheel, we look in to their health and hygiene, like nails, hair. If we find any students who are not hygienic, we talk to them. We do it in private; our intention is not to insult students. We talk about health and hygiene - nails can spread germs. Then students do self-attendance register. Then we do weather chart. Then there is time for meditation to strengthen their involvement. Then they get into groups (US4\_3st)

During school visits, the use of health chart, weather chart and filling in the self-attendance register was a regularly observed practice across schools. This idea of learning about things that are relevant to their lives was also supported by the teacher in RS10\_class 2st, *'they should learn everything that's happening around them, not just restricted to the syllabus. They should also learn all the physics and extra-curricular activities necessary for their life'*. Interestingly, the class 4st teacher in RS10 made a direct association between ABL and non-cognitive outcomes for students, when she reflected that, *'(ABL) helps in nurturing self-reliance and self-confidence among the students'*. While this statement was not elaborated upon by the teacher, it raises interesting issues around the assumptions teachers were making about the nature of the classrooms and how children perceived their place in it.

A theme which was common across all teacher interviews is the notion of classrooms as spaces where learning is not a burden, and the relationship between teacher and students is friendly and nurturing. As the teacher of class 3st\_RS10 simply stated, *'(ABL) is about learning without any fear, and their (student) own involvement is the main principle of ABL'*. The absence of stress and learning without burden was important for another 3st class teacher in RS9, who described that learning in her ABL classroom is *'taking place in a happy environment, there is no punishment'*.

The notion of learning without fear was a dominant feature in teachers' accounts and became even more significant when teachers were asked to compare their experiences of non ABL classrooms (which most had, given their own schooling, and 42 of the 45 teachers interviewed had also previously taught in non ABL settings) and ABL schools in which they were currently working. It is in the contrasts between ABL and non-ABL settings that there is a clear indication of the vilification or demonization of 'traditional/non-ABL' classrooms as spaces where the distance between teachers and students was seen as dominating. This was seen both in terms of the physical space ('teacher stands in the front') and also the relationship between students and teachers ('teachers are unapproachable', 'there is not much interaction', 'teacher relies solely on the textbook'). Non-ABL classes were regarded as monotonous and not capable of support individualised learning, and the overwhelming emphasis was on memorisation and completing the curriculum. Thus, non-ABL classrooms were seen as distant, unfriendly places, where teachers *'relied on using textbooks and asking standard questions and answers and do not promote much interaction'* (RS10).

In contrast when describing ABL settings, teachers were very focused on positive relationships with their students.

I think studies should not be a burden for students. Students should enjoy and learn. We should not give them a lot of homework or a lot of writing to do. Through ABL they learn according to their interest. They either finish one or two cards or a milestone. There is no compulsion that they have to finish so much work in a day. I think they enjoy learning. (RS10\_2st)

Additionally, teachers argued that ABL supported closer forms of bonding with their students, through things such as teachers sitting on the floor/or on low stools at the level of students, *'we sit with them...earlier, we used to sit up and students sit down. Now, we sit with them together and teach them'* (RS10\_3st); *'...in ABL we get more close to the children, sit along with them in-between their groups and mingle with them'* (RS7\_1st). This reconfiguration of physical space where the teacher was no longer standing in front of a blackboard or sitting at a desk in front of the children, but was sitting *with* the children, according to all teachers, had resulted in the fostering of much more positive relations between teachers and students. As teacher of class 4st in US3 stated, *'in non-ABL schools students will have fear towards teachers. Sometimes students get beaten by their*

*teachers. In this (ABL) method teachers sit on the mat along with students, they, they talk etc. there are more opportunities for students and teachers to get involved well'.*

According to teachers, in their ABL classrooms, students were more willing to engage on a personal basis, such as sharing personal problems or enquiring about their teacher's health, if the teacher has been absent from school. As a teacher noted, '*...We are able to show love and affection to the children and they feel better this way. We are considered next to their mother*' (RS7\_4st).

Such emotional bonding and the absence of fear was perceived by teachers as having powerful implications for learning in ABL settings. Teachers reported that students felt less inhibited to take initiative and ask teachers if they had difficulty in understanding something. All teachers reported that students are more ready to clarify their doubts when struggling with a task during a lesson. As a teacher for class 4st (RS7) noted, '*...they do not fear the teachers; they come to us to clear their doubts*'. Another teacher voiced similar thoughts when she stated, '*...students feel free to come and talk to the teacher and clear their doubts*' (US2\_class 1). The class 2 teacher in the same school also observed that '*students get closer (in relationship) with teacher...they are able to approach teachers to clear their doubts...*'

This change in teacher-student relationship and the perceived impact on student learning was mentioned by all, and is well illustrated in the views of the class 3st teacher in RS8:

Now there is no distance among teachers and students. When we sit along with student teach them, there is no fear in them. There is good relationship with students...they get all their doubts clarified.

..in non-ABL teacher-student relationship was not easy. In ABL it is not like that, students relate to us like friends, they do not fear us. They approach us for doubts, they are open about their feelings. There is no fear of the teacher now, which is good (US2\_2st)

Teachers argued that the lack of fear of teachers in ABL classrooms was significant in developing an open learning environment and fostered 'pedagogic bonding'. For teachers in this study, a key feature in successfully supporting student learning in ABL classrooms was their own reconfigured role and position. Two teachers, for example, positioned themselves as, '*just another student sitting with them*'. Nine other teachers spoke of their relationships with their students in familial terms, such '*mother*', '*like their sister*'.

This pedagogic bonding was fostered through a reconfiguration of physical space (discussed earlier) supported by personal disclosures, wherein students felt able to communicate personal issues to their teacher, and these in turn enabled students to disclose instances where they were not learning, and were willing to '*clarify their doubts*'. Teachers unequivocally expressed a view that this dismantling of traditional boundaries of power and space between teachers and students was central to ABL.

### **Challenges faced in ABL classrooms**

Similar to the scenario in interviews with headteachers, most teachers were initially not very forthcoming in discussing the challenges they were faced with in ABL classrooms. However, a few did articulate concerns which were clustered around the following issues: respect and discipline, teacher-student ratio, physical infrastructure, ABL related resources, student attendance and grouping in ABL.

Despite the clear value that teachers placed on reconfigured space and the scope for developing personal relationships in the ABL classroom, a number of teachers also reported that the cultivation of less formal, more personal relationships with students was a source of tension. While advocating the building of trust and norms of pedagogical bonding, two teachers were acutely aware that their traditional authority base had been significantly weakened in the new more fluid spatial configurations introduced by the ABL reform. As one of them reported, this led to loss of classroom control:

Teacher-students relationship is very easy. They do not fear. But then they do not have respect for teacher either, but then that is a different story (RS7\_1st)

For many teachers, the issue of **poor physical infrastructure- in terms of physical space** in classrooms, and the lack of ABL resources were resounding. RSc9, a government aided school was occupying the premises of a community building, which had no permanent walls and at the start of the school day teachers pulled out make-shift dividers to demarcate boundaries for temporary classrooms. These dividers were not sound proof and the noise levels in the hall were extremely high. All 6 teachers interviewed in this school raised this issue of limited and inappropriate space. Teacher of class 3st stated, *'ABL should have separate classrooms and there should be silence in the room. The classrooms are too noisy'*. Similarly, teacher for class4st noted that *'the class was very noisy all the time'*. This impeded significantly on what teachers were able to do.

**Class size** was a particular concern for some teachers and in few cases for all teachers in a given school, such as RS8. Teacher for class1&2 RS8 noted:

The class strength is high to teach in this method and the cards given are not sufficient, there is a shortage of cards and the students fight among themselves that some of them do not received their cards. Cards should be sufficient and the number of children in the class should be less.

In class 4st in RS6, there were 40 students and just one teacher; this teacher clearly noted that *'something should be changed to improve student learning outcomes'*. The minimum number of students in each class in this school was around 40 and all three teachers complained about the level of noise in the classroom during lesson, their inability to provide individual attention and high workload. Issues of class size were not limited to rural schools, but also raised in US5 and US2. Teacher for class 4st in US2 stated, *'I have 50 students in my class. We are in high school building. If we had a building for our own we would have more facilities to teach our students'*. Interestingly, these teachers tended to argue that the ideal ratio for ABL classrooms was 1:20, and advocated that smaller student numbers would enable them to achieve greater progress.

**Poor quality resources** was another barrier to learning mentioned by some teachers in both rural and urban settings (RS10, RS9, US2, US3) who pointed to the insufficient availability of cards for all children, torn and old cards which needed to be either updated or replaced. Others spoke in terms of needing *'We need low level boards'* (US2\_3st). Another teacher in this school spoke about shortage of cards, and the fact that they were not enough to go around. It is interesting to note that in a small survey of teachers reported in the political economy component, 76% teachers, the highest number, felt that the ABL materials provided, such as cards and logos, were insufficient.

Teachers in four schools- RS6, RS7, US2 and US4 also mentioned **irregular student attendance**. These teachers felt that these issues arose because children lacked parental support in terms of their learning, and in many cases these parents had misgivings about the ABL method, wanting instead a

more prominent focus on textbooks and traditional methods of learning. However, none of these issues were raised by the Headteachers of these schools.

In reviewing the perceived challenges expressed by teachers, what emerged most strongly are concerns regarding the learning configuration of 'grouping' that teachers were being asked to adopt in ABL settings. On one hand, some teachers felt that grouping students to work on their own was problematic for the smooth and quiet functioning of the classroom and raised issues of classroom control and in some cases children's inability to understand which group they belonged to, or to complete their tasks independently was also a concern. The excerpts below are examples of teachers' concerns in relation to these issues:

During group activities they keep talking among themselves. We have to control that. I don't know if they are discussing about cards or talking something else. I have to keep rotating between groups. It would be good if the noise level is reduced in group activities.... Because they keep talking. RS8\_4st

Teacher: When I am with one group, the other group students get left out... It is difficult (US3\_4st)

Another teacher expressed her concerns about students not working on their task and copying from others, *"While sharing a card in a group of 4, below average students tend to copy the works of the high scoring students. I want to bring a change in this behaviour"* (RS10\_4st).

Inability of children to understand the system and know which group they are in or the activity they are on was particularly highlighted by teachers teaching grade 1&2.

Group system is a confusion. We use card system in teaching and when we ask the students to group the cards, they find it difficult to do the grouping. Students always come to us for everything. Only smart children can complete it other students will come to us for help. Until group 6 it is the same. (RS7\_2st)

For 1st standard students I am still helping them with picking their cards, there is not much practice for them. (RS8\_1st)

To help them understand the ladder system is challenging...for example, if we ask them to take a card and go to their ladder, they don't understand. By the time they are in 3rd or 4th grade, they understand the concept and it becomes easy for them. Grades 1 and 2 will need my help throughout. (RS6\_1st&2st)

On the other hand, the complete absence of whole class teaching was also seen as unhelpful, especially in classrooms with high student numbers. In these settings teachers noted that teaching some key concepts to all students as a whole class would be better than the teacher having to devote very little time to all children on the same concept.

ABL is very good, cards are very good, the content and the ideas are very useful. But the concepts are split up. So the subject seems to be dragged. So if the content of the lesson is taught in a collective method it will reach the children at the same time.... the only drawback that I feel is that if we can teach the lessons in one shot and complete the exercises in one sitting, we can travel to the next lesson together. Otherwise some children have to lag behind. If there is any option like we can write the answers in the black board or instruct to them together it will be perfect. It

would be good if there were a good balance between ABL and non ABL method.  
(RS7\_3st)

Her voice was not a lone one, as a number of other teachers alluded to similar concerns. Teacher for Class1&2 in RS9 raised issues related to group work and proposed the need to explore alternatives.

Sitting in groups is a challenge. Some groups are overcrowded. Some groups will have only two students. We have to always keep moving for cards. If we were teaching one card for all students, it would reach every one. Now when I attend to one student the other students' learning is interrupted. ....I suggest first if we take one card and teach the card to all students and then divide them in groups. When a student goes into a group with a new card it is difficult for him. Students from each group will be out "teacher what is this..', 'teacher how to do this', and I will be sitting down on the floor and each time I have to get up and reach to the student which is difficult. Otherwise it is a very good method. (RS9\_1&2).

The dilemmas teachers faced in their perceptions of the benefits of ABL and their struggles in implementing it are best exemplified in the interview with teacher RS7\_class1. The teacher began the interview by highlighting the principles of ABL as supporting learner independence and creativity, and how ABL is very good as '*students do not fear teachers, they come to us to clear their doubts*'. When invited to reflect on things that she would like to change in an ABL classroom, she noted:

Grouping students is a barrier...there is no class control...they do not have fear of teachers...It would be good if we do not group students...we are satisfied to teach students. But there is no control in class... Whatever is there in the book is what is in the cards also. We can teach them by sitting them in semi-circles. I do not sit down because my health condition (leg) does not permit. But other teachers have to sit down, and be with first two groups. Those teachers while sitting on the floor will not be able to know what is happening to other groups. Cards are good; they are colourful, easy to read. But group system is very tough for teachers to manage and keep their activity on track. When I am with one group, students from other groups will be trying to talk to me. Bright students finish their work fast. There are some students who wait for their friends to finish before they come to the teacher. Whatever content is there in the book is what is there in cards, might as well we can follow the book. It will be easier if there are no groups. Most teachers struggle to sit on the floor. This generation is full of sick people, and teachers do not feel healthy enough to sit on the floor.

Even though tensions such as the ones articulated above were evident in teacher accounts, the overwhelmingly positive nature of their narratives, can give rise to questions regarding their authenticity. Were teachers primarily saying things that they believed the researchers wished to hear? While there might be an element of this, what is clear is that there were no major differences in teachers' accounts based on the grades they taught, the school they worked in, or differences arising from rural or urban differences. It must however be recognised that all teachers were attending training sessions on a regular basis and in many cases would have picked up the current discourse from these settings. This is well captured in one of the interviews. When the teacher was asked, '*what do you think are the central principles of ABL?*' she began her response by talking about what she had been told in training:

In training we were told that this will be useful for the students for effective learning, a child can continue in a set pattern of studies. When a child gets absent unfortunately



he need not miss out on the portions because even when he returns after 10 days, he will continue from the same level in the ladder in which he had stopped. In this way the students are highly benefitted. Their studies do not get affected (RS7\_3st)

Thus it is possible teacher (and head teacher) narratives were over laden with ‘official talk’, things that they had been told in training programmes and hence were easily reproduced for the benefit of others. However, it is also possible that these teachers and headteachers did believe in what they were saying – they did truly think that their ABL settings were better places for supporting the learning and nurturing children with different abilities. This was truly the case when they contrasted these settings with the traditional non-ABL classroom settings which they had participated in previously.

### **5.3 Observable student and teacher behaviours and interactions in ABL classrooms**

The presentation of observation findings is organised in two main sections. In section 1 we provide an overview of classroom behaviours and interactions in ABL classrooms. In section 2 we report patterns of variation in teachers’ and students’ observable practices in ABL classrooms, highlighting differences by district, curriculum subject, class size, class standard and monograde/multigrade organisation.

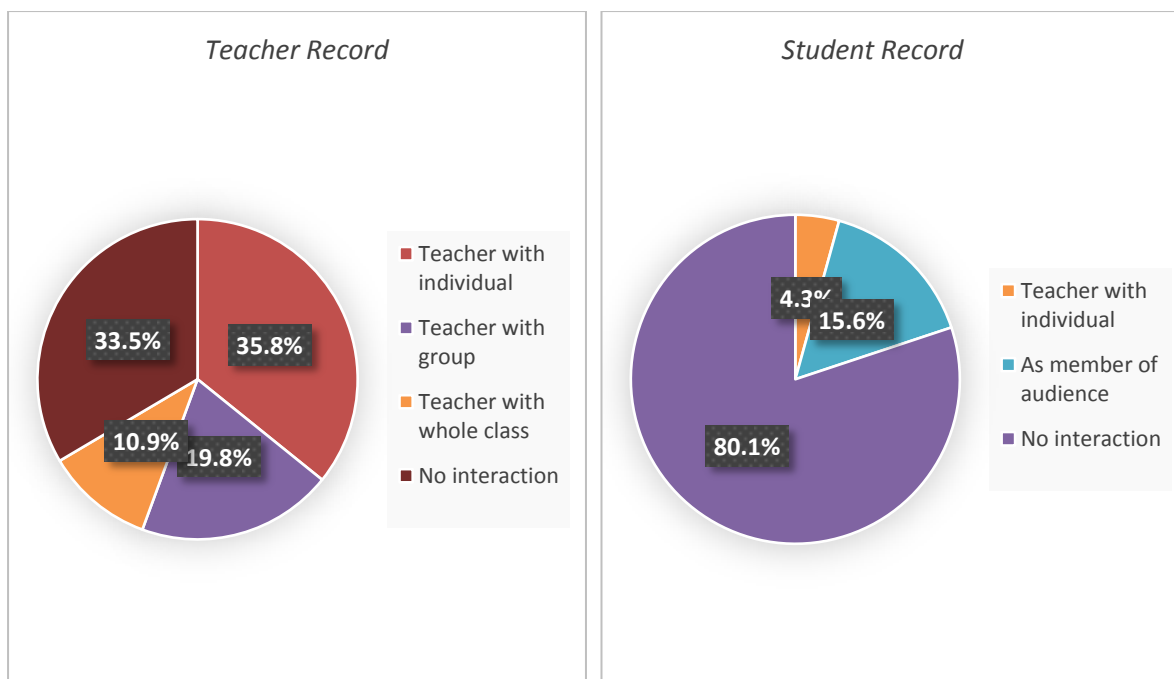
#### **1. Overview of ABL classrooms**

In section 1A we provide an overview of who was talking with whom, for how long, and where. In section 1B we focus on the nature of student activity and engagement when students were not interacting with their teacher or other students. In section 1C we summarise the nature of classroom interactions between teachers and students. In section 1D we present the role of the student in peer to peer interactions and the gender and number of interacting students. And in section 1E we look into the content and focus of teacher-student interactions.

#### **1A: Classroom interactions between teachers and students (Teacher and Student Record)**

The first main finding from the analysis of the observation data is the ‘asymmetry’ of teacher-student interaction, similar to the patterns of interaction that Galton and colleagues found in their study of primary classrooms in England (Galton et al.,1980; 1999). As the left hand chart (Teacher Record) in figure 1 shows, teachers tended to spend most of their lesson time interacting with students; and yet by contrast, the right hand chart (Student Record) shows that each individual student tended to interact with the teacher for only a small proportion of his or her time in class.

*Figure 1: Forms of student-teacher interaction (% of all observations)*



### The balance between individual, group and whole class interactions

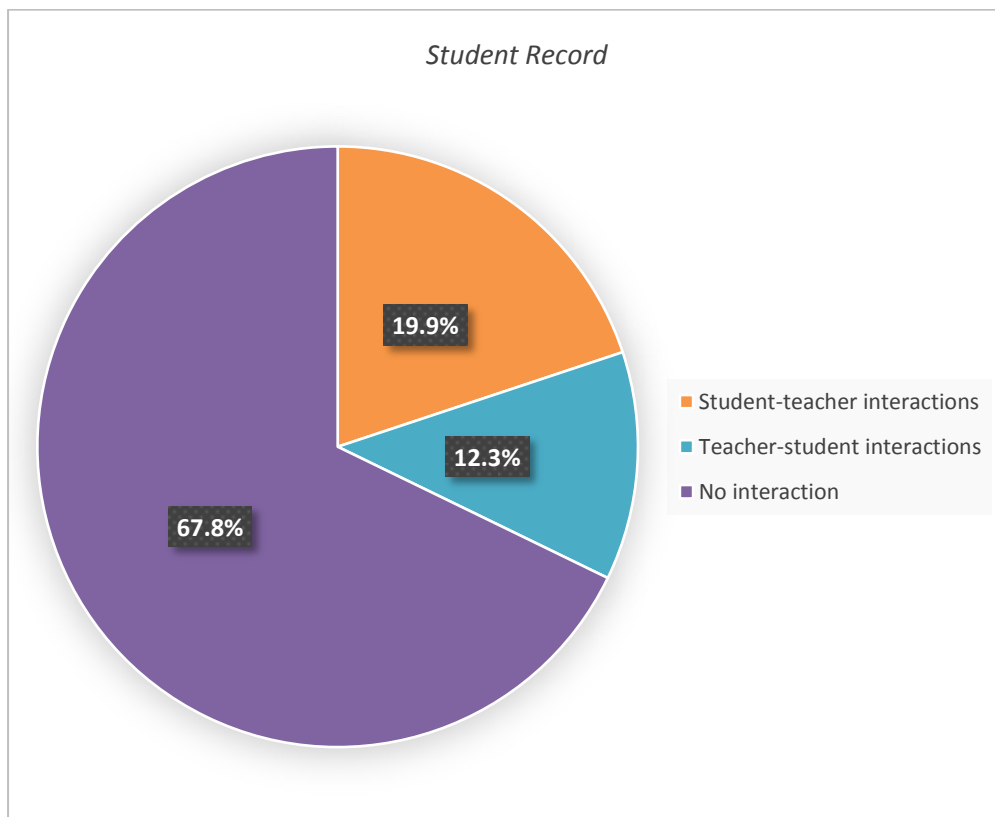
The Teacher Record on the left shows that teachers spent a substantial amount of their time in lessons interacting with students either as individuals, or as members of a group or of the whole class. They spent over a third of their time overall interacting with students individually (35.8%) and a further 19.8% interacting with students privately in a group. Teachers spent more than half their time (55.6%) interacting privately with their students either in a small group or on a one-to-one basis and this appears to be consistent with the need for close interactive partnerships, pedagogic bonding and relationships between teacher and students in order to build the child-centred pedagogy in the classroom discussed earlier in the report.

In contrast to the Teacher Record, our Student Record data shows that any given individual student in an ABL classroom spent less than a fifth (19.9%) of their time in class interacting with their teacher (either individually or as a member of the 'audience' of a teachers' interactions directed to a group or the whole class). Only 4.3% of a student's time in class overall was spent experiencing the individual attention of their teacher. This can be understood partly in terms of differences in the interactive purposes designated for each mat in the ABL classroom. Only mats 1 and 2, and to a lesser extent mat 3, emphasise teacher-student interaction. Mats 4 and 5 are designated for peer-peer interactions, and mat 6 for student assessment that requires no interaction between teacher and student. Furthermore, ABL pedagogy emphasises one-to-one interactions between teacher and students. This emphasis on one-to-one interactions reduces opportunities for other students to interact with their teacher.

By contrast, increasing time devoted to whole class interactions can engage more students in interaction with their teacher at any one time during a lesson. However, scope for teachers to devote more time to whole class teacher-student interactions is reduced in the ABL classroom. This is because at any one time, different students are working on different tasks, with a different curriculum focus, and at a different pace. These forms of differentiation, along with one-to-one teacher guidance and support are the bedrock of the ABL approach aimed at fostering an individualised, child-centred learning experience. However, the low proportion of classroom time

individual students typically experience with their teacher one-to-one might risk reductions in the quality of student learning opportunity. For example, students might spend more time queuing for their teacher's attention unable to proceed further with a task without the guidance of their teacher. To overcome this problem, teachers can adopt effective whole class interactive strategies that involve asking well-pitched questions and responding to students' ideas in ways that support their learning. Such whole class strategies can be incorporated within ABL general patterns of practice in ways that enhance rather than detract from child-centred learning and the ABL ethos.

Figure 2: The balance between teacher-student, student-student and not interacting (% of all observations)



### Low levels of interactions in ABL classrooms

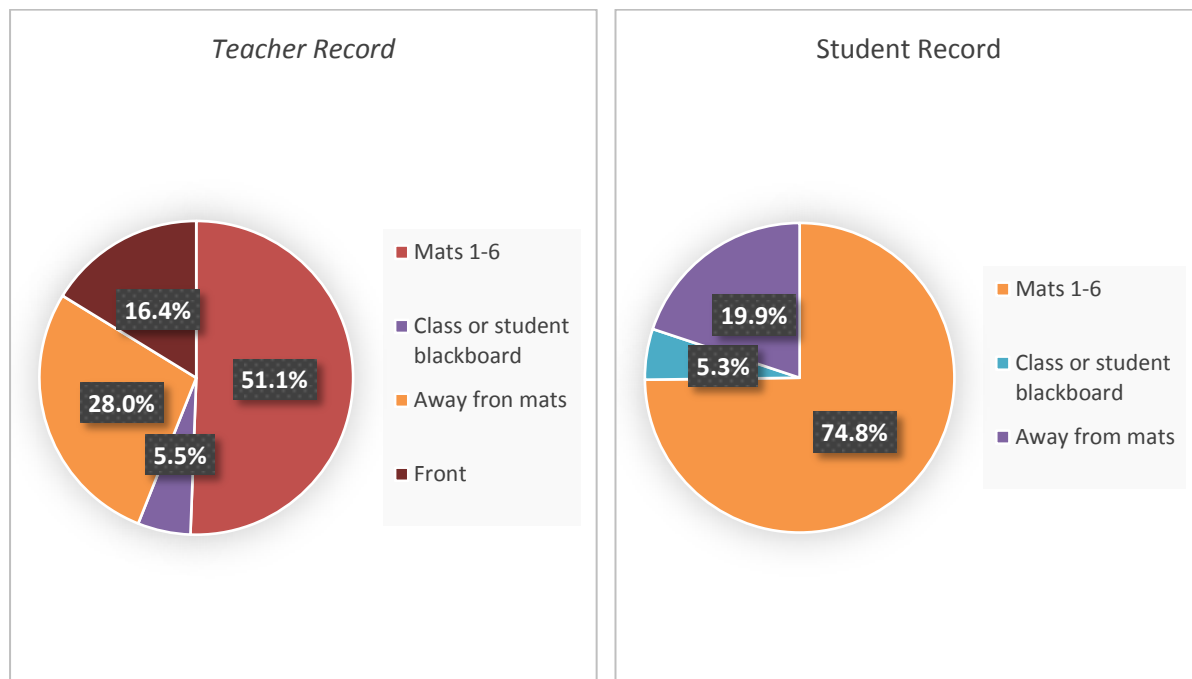
Our data shows that throughout a typical lesson, the majority of a student's time in an ABL classroom (67.8%) was spent not interacting with other students or their teacher. Of the remaining time in class, students tended to spend more time interacting with their teachers (19.9%) than with other students (12.3%). The low levels of student interactions with teacher or with other students might, in one sense, be consistent with the task-based approach to learning intrinsic to the ABL design. However, as we argued earlier in the report, the need to balance individual with social orientations to learning is important for optimising the quality of student learning experience in the ABL classroom. In light of this, we would want to argue that the small proportion of time spent interacting either with the teacher or peers jeopardize development of a genuinely transactional learning culture based on mutual support, collaboration and interdependence among students and with the teacher. Further refinement of the ABL model and accompanying professional development support are needed to increase patterns of teacher-student and student-student interactions so that students spend less time working in isolation.

### Location of classroom interactions

Given the distinctive importance of the mat configuration to the ABL classroom and the patterns of interactions planned for each mat, we turn now to consider the location of classroom interactions. Overall, teachers typically spent 51.1% of time in class on mats while students spent considerably longer periods (74.8%). Of the teachers' time spent on mats most of it was spent on mats 1 and 2 (29.4%). As figure 3 shows, teachers spent 16.4% of time in class away from the mats or at the front of the classroom (16.4%). Very little time was spent by teachers either by the class blackboard or with students at their blackboards. From the Student Record we can see that students spent much

longer periods of time in class on mats compared to their teacher. However, nearly one fifth of their time in class was spent away from the mats and little time at the blackboards, task card tray or learning ladder. These data indicate that in terms of where teachers and pupils spent most of their time in class, the ABL classrooms we observed tended to reflect the pattern and mat configuration of the intended ABL system.

Figure 3: Location of teacher-student interactions (% of all observations)



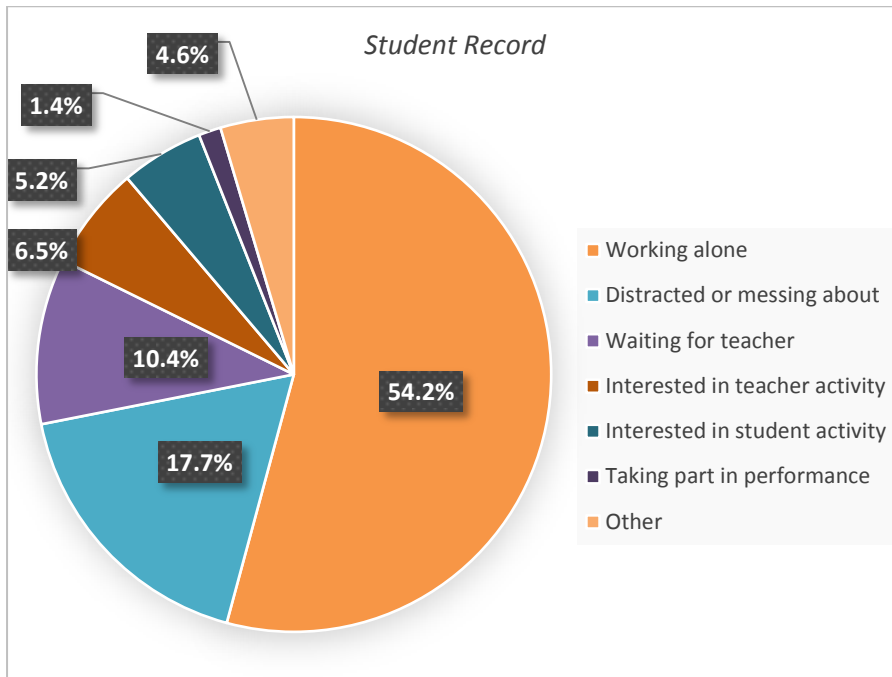
We turn in the next section to examine patterns of student activity and engagement in their lessons during the considerable time they spent not interacting with teachers or fellow students.

### 1B: Student activity and engagement (Student Record)

Figure 4 summarises the degree and kinds of engagement of a typical student in the classrooms we observed. As noted earlier, when not interacting with their teacher or fellow students, a typical student in the ABL classroom would spend over half their time (54.2%) working alone on a task. Their remaining time was spent distracted from their task by others or messing about (17.7%) or waiting to interact with their teacher (10.4%). These patterns of activity and engagement are reflective of the mainly well-ordered, task oriented classroom lessons we observed. Students appear to be well-attuned to working alone on task and mainly without distraction<sup>8</sup>.

<sup>8</sup> In discussing our findings we have deliberately not drawn any direct contrasts with other non-ABL/traditional settings. Our points of reference in this report are internal to the observation system we developed for this project. As noted in the research design, our study was conducted only in ABL classrooms thus making any direct comparisons with non-ABL classrooms impossible. Additionally, given that our observation schedule was specifically designed for this project; direct comparisons with other observational based studies would not be valid. For those readers interested in seeing patterns of engagement in teaching and learning activities among teachers and pupils in classrooms in different contexts, then studies such as Hardman et al., (2012) and Ackers and Hardman (2014) provide useful insights.

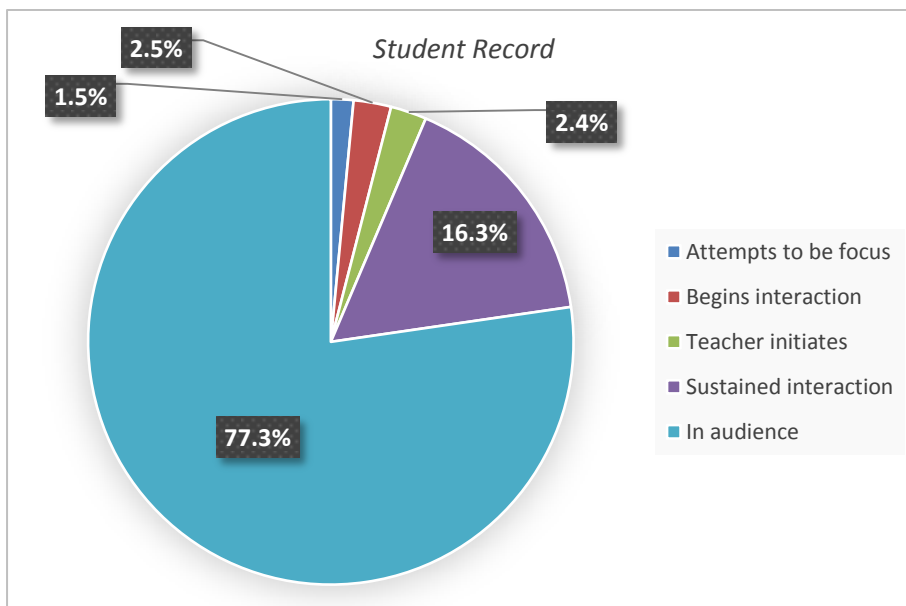
Figure 4: Student activity (% of all 'not interacting' observations)



### 1C: Classroom interactions between teachers and students (Student Record)

In section 1A we provided an overview of who was talking with whom, for how long, and where. In section 1B we focused on the nature of student activity and engagement. We turn now to focus attention on the nature of classroom interactions between teachers and students. We start by attending to the students' different roles when interacting with their teacher.

Figure 5: Students' role when interacting with the teacher (% of all student-teacher interactions)



## Patterns of passive student engagement with their teachers

As figure 5 shows, the general role of a student when interacting with the teacher is passive, as a member of the audience of a teacher's interaction (77.3%). Only a small percentage of time spent interacting with the teacher recorded students in more active, agentic roles with their teacher. In our scheme, agentic roles are not limited to instances when a target student successfully begins a new interaction with the teacher (2.5%). They also include instances when the teacher initiates an interaction with a student (2.4%). We can also report that 16.3% of teacher-student interactions were sustained across at least two time intervals. It is in these more sustained interactions that inter-subjective meanings can be tested and exchanged, interpretations negotiated and developing understandings and experiences explored between a teacher and a student. Nevertheless, the overall pattern was one of passive student engagement with their teacher and this suggests that the content of teacher-student interactions when they occur are more likely to be shaped by a teacher's agenda than a pupil's.

## Balance between task-related and class management interactions between students and their teacher

We turn now to report the focus of task-related teacher-student interactions. In section 1A (figure 2 above) we saw that teachers' interactions with students accounted for 19.9% of all lesson observations from the Student Record. Of these interactions, the Student Record enabled us to distinguish between teachers' interactions with students that were task-related, or focused on some aspect of class management, behaviour or organisation, or on whether a target was being ignored by the teacher.

Figure 6: Focus of teachers' interactions with students (% of all teacher-student interactions)

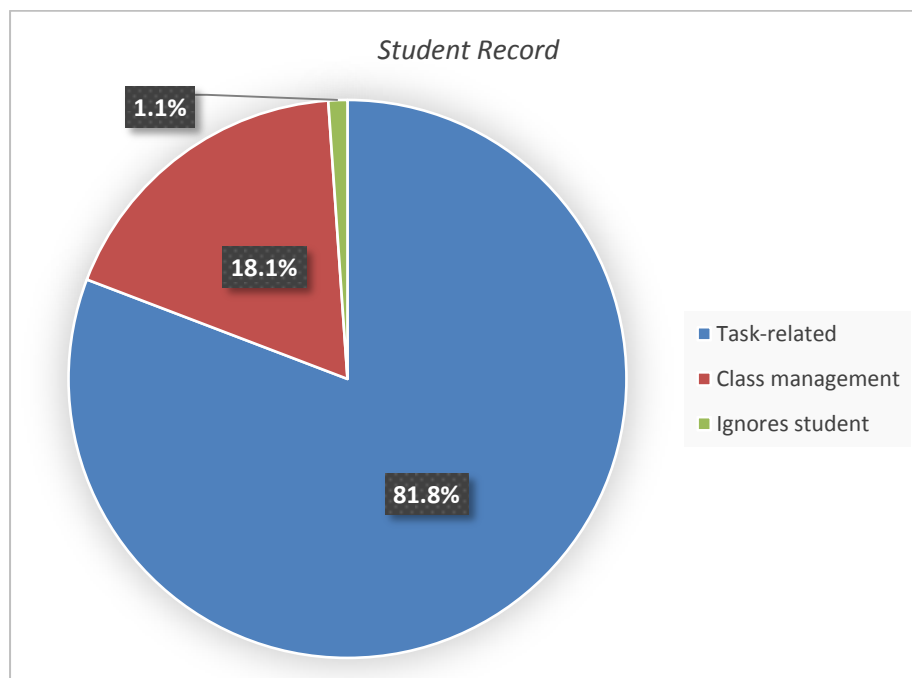


Figure 6 shows that the majority of teachers' interactions with a student tended to be task-related (81.8%) rather than concerned with other matters. In coding the 'task-related' category in the Student Record no distinction was made between interactions focused on curriculum content and task supervision. What we can conclude from this is that when teachers and students were

interacting in ABL lessons, the focus of interaction was overwhelmingly on some aspect of the tasks students were working on.

In the next section the focus shifts from teacher-student interactions to student-student interactions.

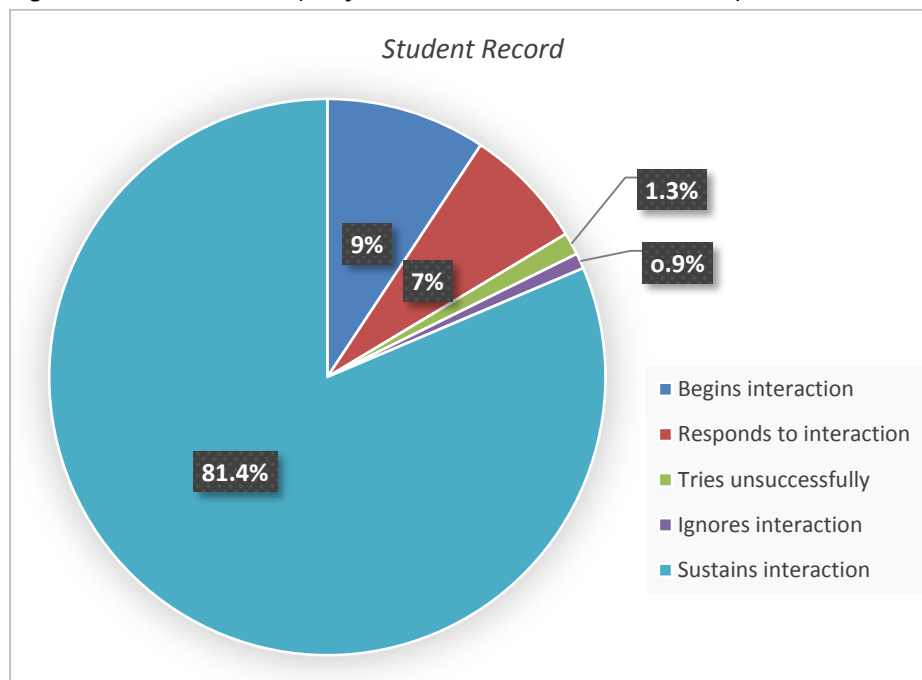
### 1D: Classroom interactions between students (Student Record)

Student-student academic interactions accounted for 12.3% of all lesson observations from the Student Record (see figure 2 above). Student-student interactions were observed and coded according to the role of the target student, whether the interaction was verbal or non-verbal, the task context of the interaction, the gender and number of interacting students, and the base location of the target student. We present findings from our analysis of each aspect of student-student interaction in turn.

#### The predominance of sustained student-student interactions

Figure 7 below shows that the overwhelming majority of student-student interactions were sustained from at least one time interval to the next.

Figure 7: Students' role (% of all student-student interactions)



As discussed above, this is an encouraging pattern in the data as it is through such sustained interactions that learning partnerships are established and a culture of mutual exploration through the sharing and testing out of ideas and understanding is fostered – the cultivation of interdependence discussed earlier. Remaining observations recorded target students initiating or responding to interactions with a fellow student(s). Small percentages are recorded for the other categories of student-student interaction in figure 7 because of the very high proportion indeed of sustained student-student interactions. We can also report that nearly all student-student interactions (95.5%) were verbal, 82.5% were with another student(s) engaged on the same task and 91.5% were with another student(s) on the same mat as the target student. **These observations taken together describe a common picture in ABL classrooms of sustained, task-related**

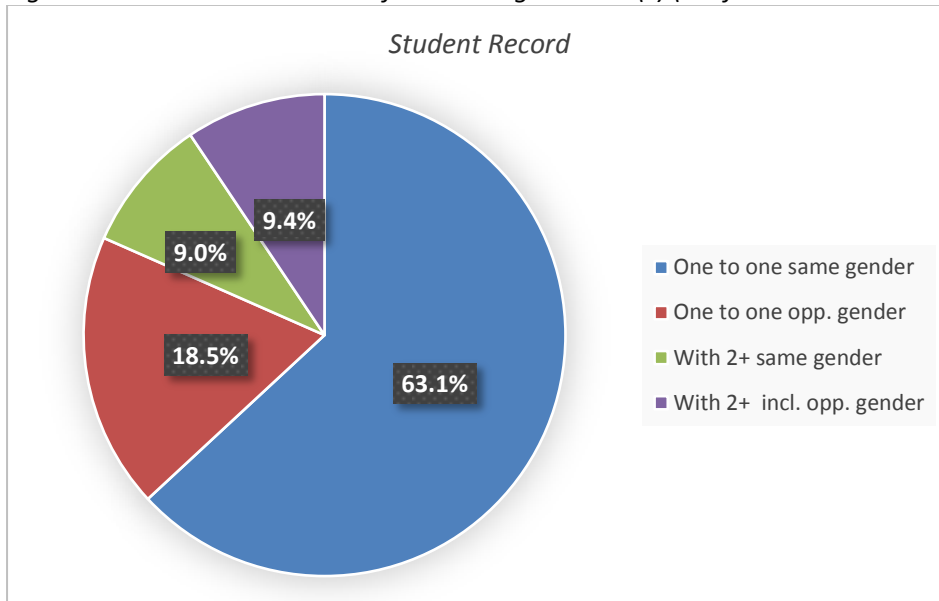


**interactions when students interact together.** We turn now to summarise the gender and number of interacting students.

**Predominance of one-to-one interactions with a student of the same gender**

Figure 8 shows a marked tendency towards one-to-one interactions among students. Fully 81.6% of all student-student interactions were one to one. A typical student is more than likely to interact with a student of the same gender; 72.1% of all student-student interactions involved students of the same gender, 63.1% on a one-to-one basis and 9% when more than one other student was involved.

*Figure 8: Gender and number of interacting students(s) (% of all student-student interactions)*

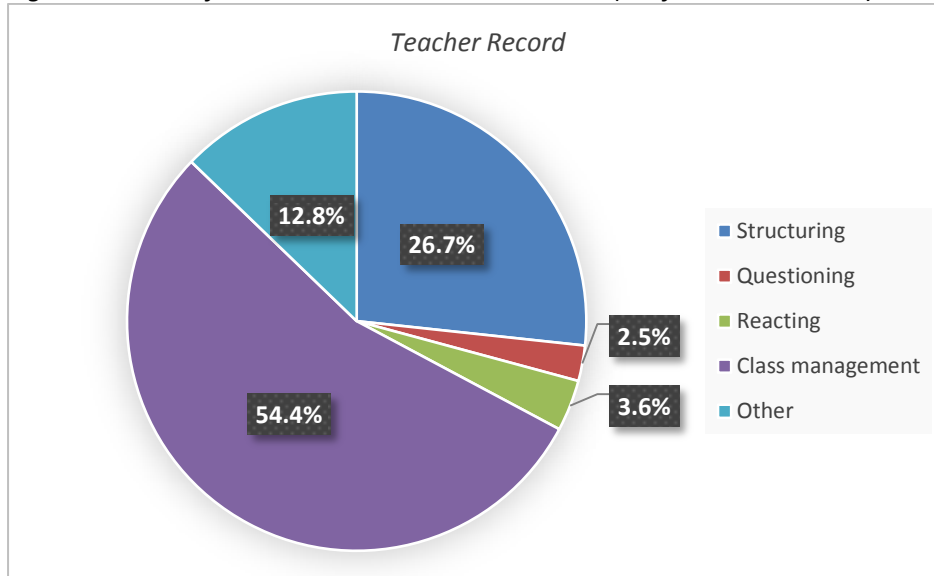


**1E: Teacher’s classroom interactions with their students (Teacher Record)**

We turn in this section to look into the focus and content of teachers’ interactions with their students. Figure 9 summarises the proportion of the teacher’s time devoted to ‘structuring’ (presenting new or previously taught curriculum concepts and ideas), ‘questioning’, ‘reacting to students’ contributions’ and ‘class management’. The ‘other’ category was coded when the teacher was listening to students, reading aloud, marking students’ work, or doing something else.

**Predominance of teacher-student interactions focused on class management**

Figure 9: Focus of teachers' classroom interactions (% of all observations)



A clear pattern in teachers' classroom interactions with their students is the high proportion of time spent on class management (54.4%). Admittedly this category encapsulates a wide range of teacher concerns related to the supervision and resourcing of tasks, the control of students' behaviour, the maintenance of discipline, administrative routines such as taking the register and managing the various comings and goings of students during the course of a lesson. However **our analysis of teachers' class management interactions shows that their focus was almost entirely on task supervision** (91.3% of all teachers' class management interactions). Task supervision consists of teachers ensuring students were approaching and undertaking tasks appropriately, that they were adequately resourced for a given task, and that they had the correct task card which corresponded to the appropriate stage of progress on the learning ladder. Time a teacher spends supervising the tasks and resources of the ABL method is time not available for interactions that more directly relate to learning. Nevertheless, **clear supervisory guidance is an important pre-condition for the high levels of task-related and sustained kinds of interactions between students reported above.** As figure 9 shows, when not interacting about class management, teachers tended to be providing 'structuring' of curriculum content and this amounted to 26.7% of all teachers' interactions with their students.

Figure 9 also shows that **little time remained for 'questioning'** (2.5% of all teachers' classroom interactions) **and 'reacting to students' contributions or ideas' during discussions and question-answer phases of lessons** (3.6% of all teachers' classroom interactions). And yet it is through the skilful incorporation of such strategies as questioning and reacting to students' ideas that teachers are able to probe, test, explore and support formative development of ideas and understandings with their students, but these aspects of teaching were negligible in the ABL classrooms we observed.

## 2: Variations in observable practices in ABL classrooms (Teacher and Student records)

In the previous section we provided an overview of classroom practices in ABL classrooms based on broad patterns of interactions for all teachers and students in our sample. In this section our focus is on patterns of variation in teachers' and students' interactions and behaviours in the different district, classroom and curricular contexts in which they were observed. Variations in practices by district, class size, subject and class standard are summarised in this section drawing on both Teacher and Student Records in turn.

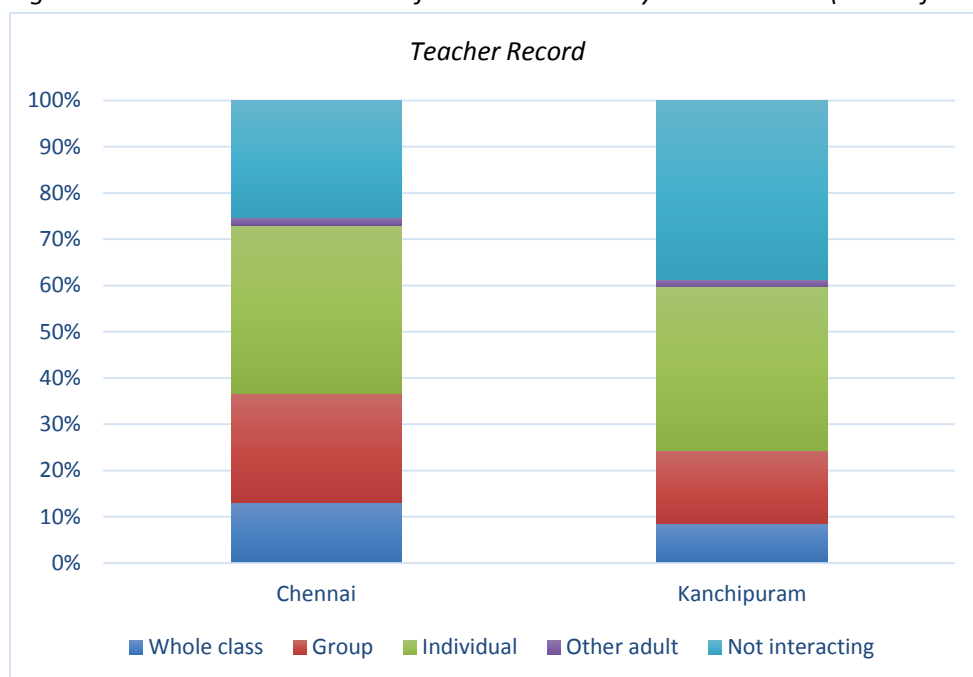
## 2A: Patterns of variation in teachers' interactions with their students (Teacher Record)

In understanding teachers' interactions with their students we summarise patterns of variations in these interactions according to audience of interaction (table A10, Appendix 3), location of interaction (table A11, appendix3) and focus of interaction (table A12, appendix 3).

### District variations in the audience of teachers' interactions

Analysis of district variations in the audience of teachers' interactions reveals some interesting and perhaps unexpected patterns. Figure 10 shows that **teachers in schools in the urban district of Chennai tended to spend more time (13.2% of all observations) interacting with their students as a whole class than teachers in schools in the rural district of Kanchipuram (8.6%)**. In schools in Kanchipuram teachers tended to spend more time not interacting (38.6% of all observations) than teachers in schools in Chennai (25.2%).

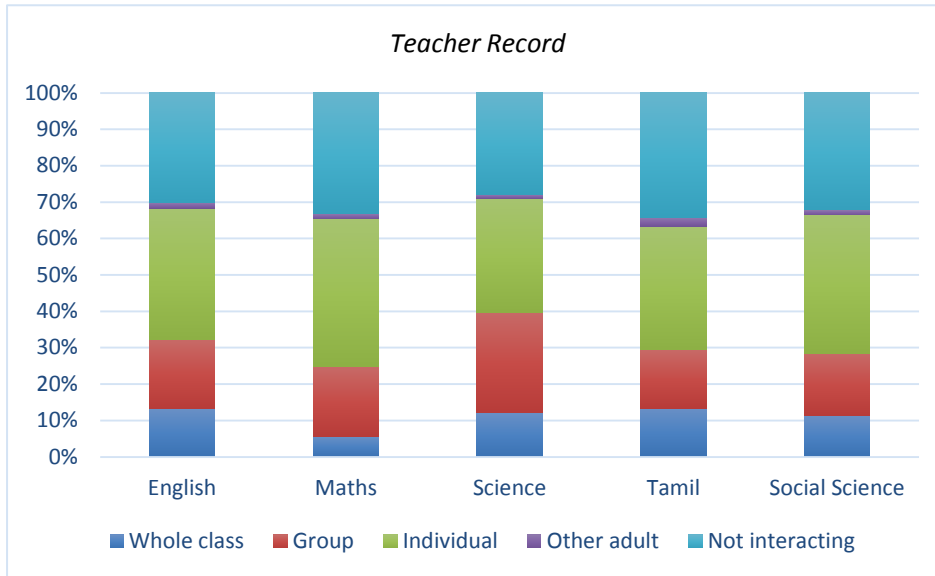
Figure 10: Distribution of audience by district (% of all observations)



### Subject variations in the audience of teachers' interactions

Subject variations (Figure 11) tended to centre on the teaching of maths and science. Maths teachers spent notably less classroom time in whole class interactions (5.7%) with their students than teachers of other subjects and more time than teachers of other subjects interacting with students individually (40.6%). Science teachers interacted with students in groups more than teachers of all other subjects (27.6%).

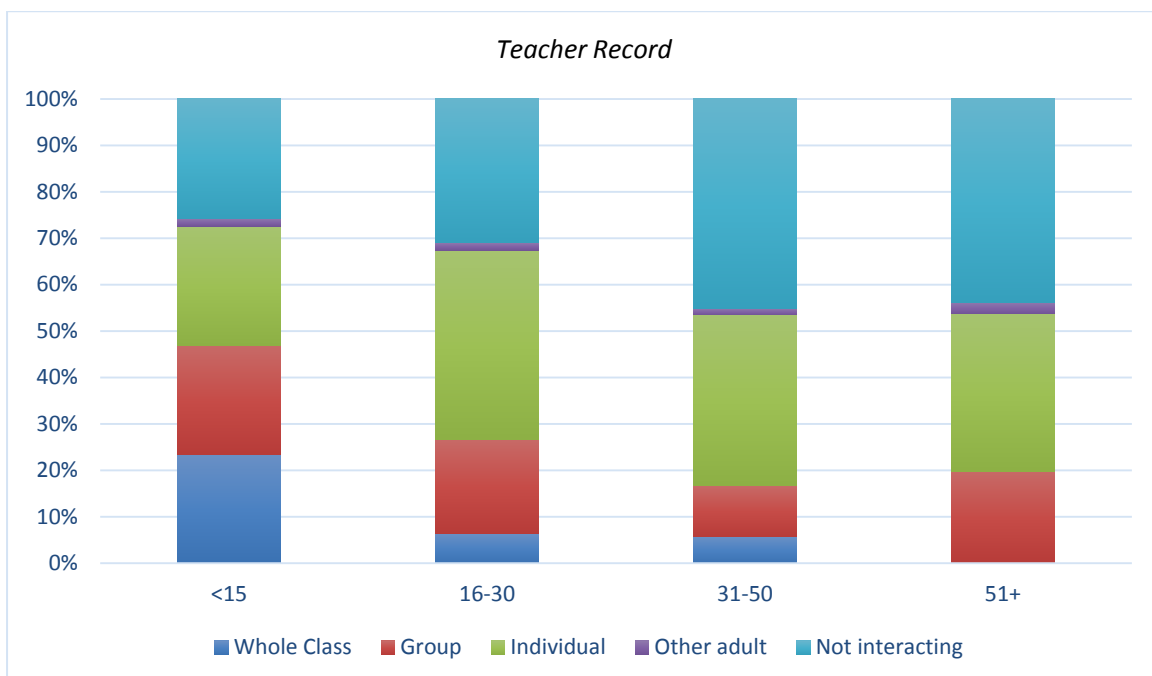
Figure 11: Distribution of audience by subject (% of all observations)



### Class size variations in the audience of teachers' interactions

The class size variations summarised in figure 12 are interesting. In general terms the following patterns were reflected in the Teacher Record data. **The larger the class size, the lower the proportion of time a teacher spent interacting with the whole class. It was teachers in the smallest class size category (<15) that recorded the highest levels of whole class interactions (23.3%) and the lowest levels of individual interactions with students (25.8%).**

Figure 12: Distribution of audience by class size (% of all observations)



These patterns are inconsistent with much class size research which reports increased opportunities in smaller classes, especially in class sizes below 15, for private one to one interactions between teachers and students. **One way forward might be for professional development support to be available to teachers to help them identify and then exploit increased opportunities in smaller**

**classes for more sustained individual interactions with their students.** Such interactions in theory can help to establish and maintain rapport with students, develop knowledge of students' needs, interests, backgrounds, and academic progress, provide personalised support and guidance, and interactive formative assessment opportunities.

**Class standard variations in the audience of teacher’s interactions**

There are no straightforward patterns of variation between class standard and audience of teachers’ interaction (see table A10, appendix 3) except that **teachers of students in the first standard spent notably more time interacting with their teacher on an individual basis (56.6%) than older children in the second standard and above.**

**There was little difference in levels of individual teacher-student interaction in monograde compared to multigrade classes overall although children in multigrade classes spent markedly less time not interacting with their teacher than children in monograde classes (see table 13 in appendix 3) .**

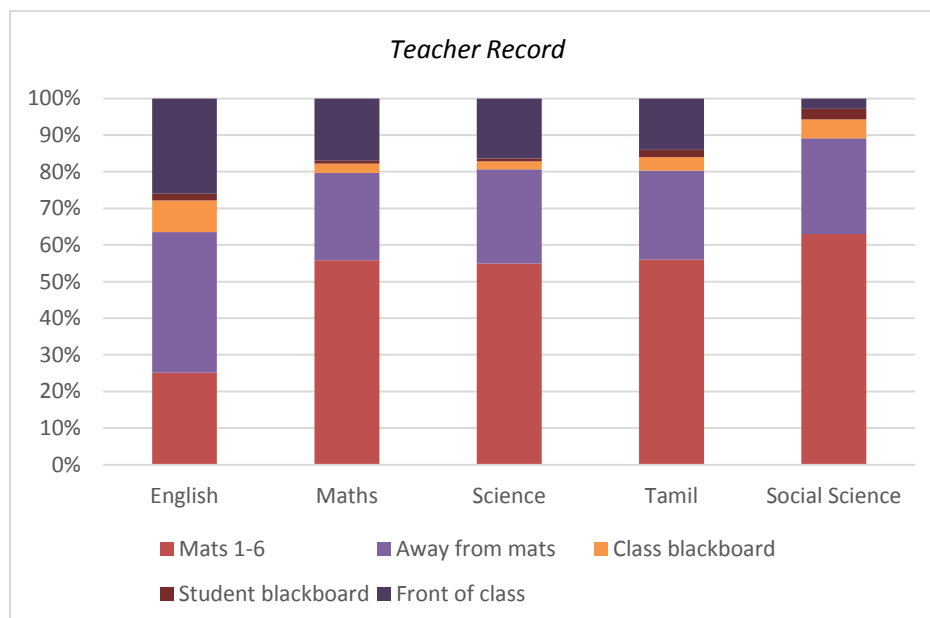
**Teachers’ location: district and subject variations**

Turning to variations in patterns of teachers’ location (table A11, appendix 4) we found little district variation, with teachers in both districts tending to spend similar amounts of time in class sitting on the mats.

Teachers in Kanchipuram spent a little more time than teachers in Chennai away from the mats while teachers in Chennai spent a little more time than teachers in Kanchipuram at the front of the class (but away from the class blackboard).

In relation to subject variations (figure 13), English teachers spent markedly less time on the mats and more time away from the mats (36.5%) and at the front (26%) or at the class blackboard (8.7%) than teachers of all other subjects, while Social Science teachers tended to spend the most time on the mats.

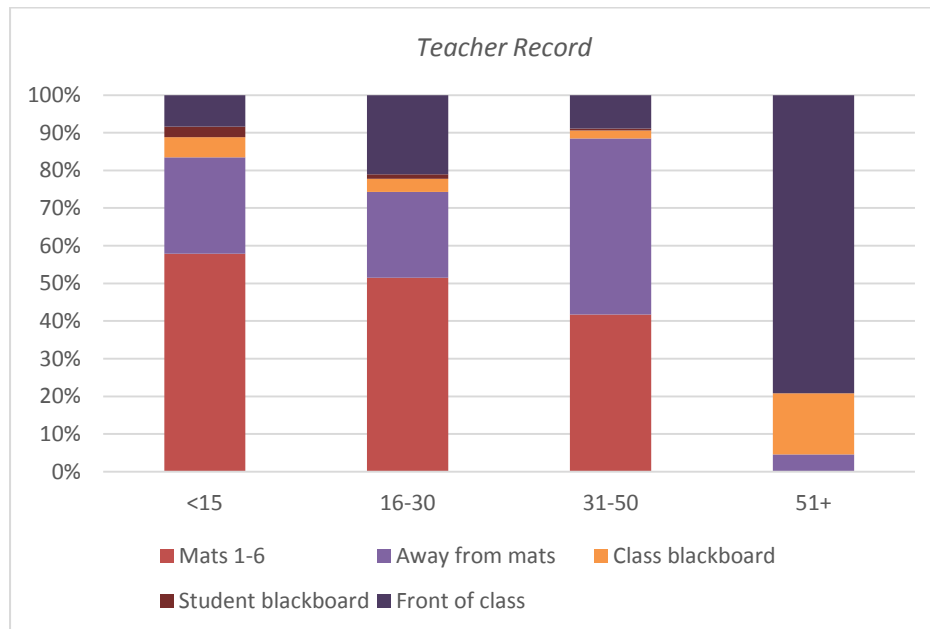
*Figure 13: Distribution of teacher’s location by subject*



### Class size variations in teachers' location

Patterns of class size showed interesting patterns of difference (figure 14).

Figure 14: Distribution of teacher's location by class size

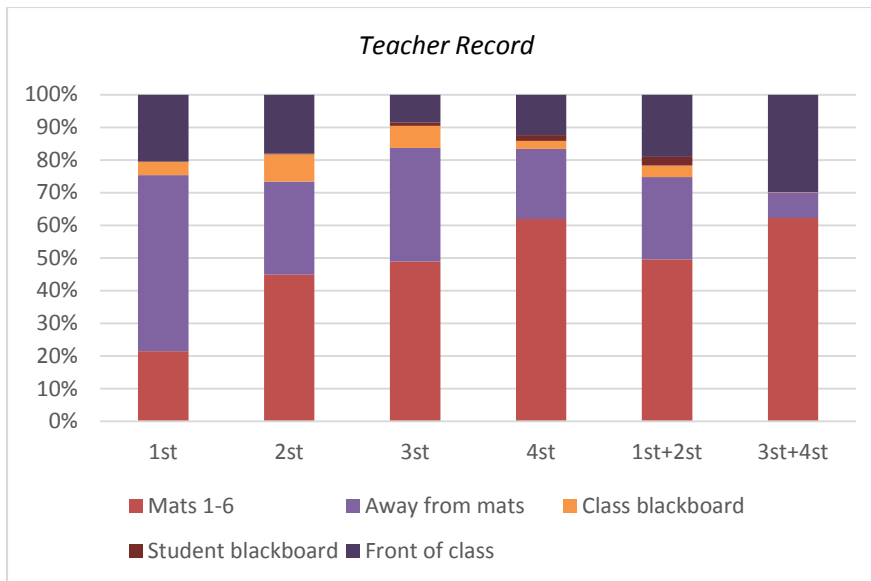


From figure 14 we can see that teachers in the smallest two categories of class size (<15 and 16-30) spent more time on the mats than teachers in larger classes, while teachers in the largest class size category (51+) spent the majority of their time (and far more than teachers in smaller classes) at the front (79.2%) or at the class blackboard (16.2%).

### Class standard variations in teachers' location

With regard to variation in teachers' location by class standard (figure 15), it was the teachers of younger classes (standards 1 and 2) that spent the least amount of time on the mats whereas teachers of older children in the third and fourth standard were more likely to be on the mats.

Figure 15: Teacher record



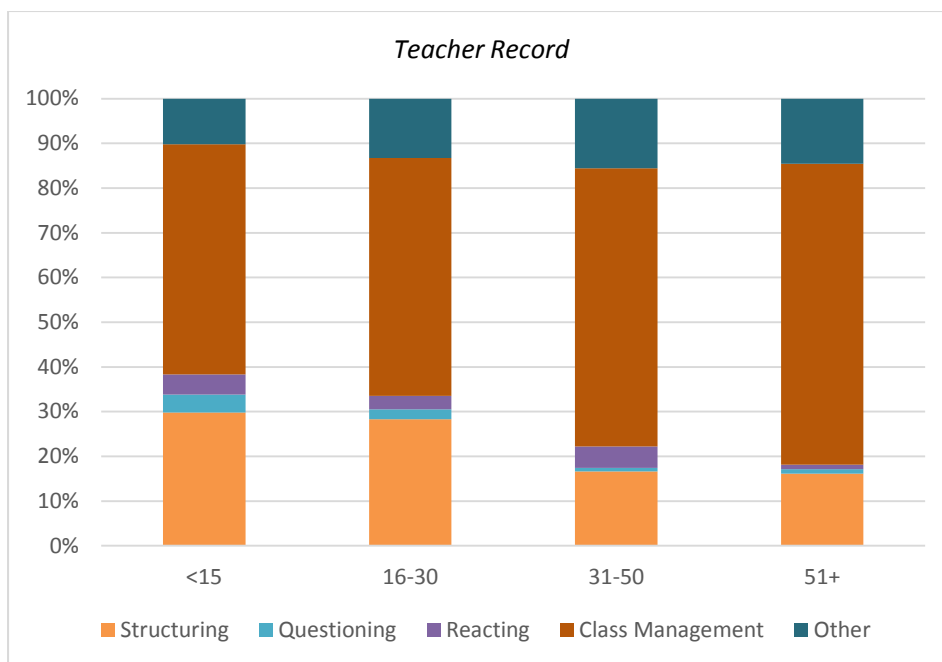
### District variations in the focus of teachers' interactions with their students

Observations of the focus of teachers' interactions with their students (table A12, appendix 3) revealed less variation but one or two interesting patterns. **The focus of teachers' interactions did not vary by district.** Observations of teachers in Chennai district were broadly similar to the focus of teachers' interactions in the district of Kanchipuram with a predominance of class management and structuring interactions with their students. Teachers of different subjects tended to interact in similar ways, except for the 'other' category which accounted for as much 49.3% of all interactions of English teachers.

### Class size variations in the focus of teachers' interactions with their students

Class size variations were recorded in relation to the focus of teachers' interactions. Levels of questioning and reacting were unvaryingly low in all class sizes. By contrast, time teachers spent structuring new or previously taught material and interacting about class management interactions did vary by class size. Figure 16 shows that the proportion of time teachers of smaller classes of less than 30 children devoted to structuring was more (almost 30%) than the time devoted to structuring by teachers of larger classes of more than 30 children (16%). **Considerably more time was spent by teachers in larger classes than smaller classes interacting with students about class management.**

Figure 16: Distribution of teachers' interactions by class size



### Class standard variations in the focus of teachers' interactions with their students

And finally we report little variation in the focus of teachers' interactions in different class standards except that the highest proportion of class management interactions were recorded for teachers in the younger standards and the lowest class management interactions were recorded for teachers in the older classes.

### 2B: Patterns of variation in students' classroom interactions, activities and engagement (Student Record)

We now consider variations in interactions between students and with the teacher in light of observations from the Student Record. We present patterns of variation in these interactions in terms of audience (table A13, appendix 3) and location (table A14, appendix 3).

#### District variations in the audience of students' interactions with their teacher

Teachers in the urban district of Chennai and the rural district of Kanchipuram do not appear to differ greatly in terms of the audience of their interactions. However, a student taught by a teacher at a school in Chennai district is slightly more likely to be engaged passively as a member of the audience of the teacher's interactions than a student taught at a school in Kanchipuram. Both districts recorded high levels of 'no teacher-student interactions' with a slightly higher level in Kanchipuram district.

#### Subject variations in the audience of students' interactions with their teacher

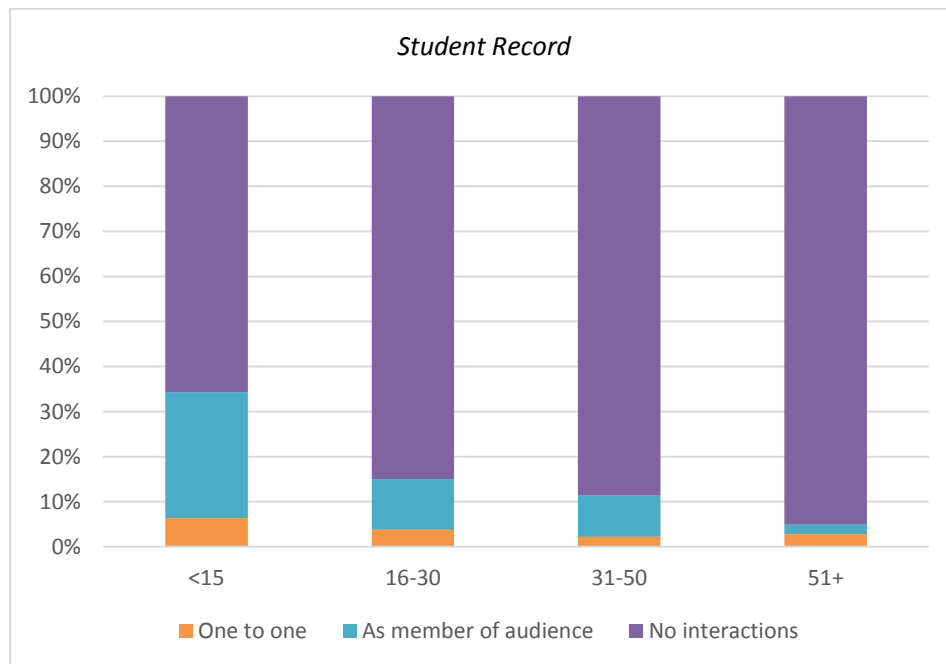
Subject variations were also slight in terms of the audience of teachers' interactions with their students. Students in maths were more likely than in other subjects to interact individually with their teacher but the general pattern remains that students interacted individually with their teachers on rare occasions.

#### Class size variations in the audience of students' interactions with their teacher



Class size variations (figure 17) were more marked. Students in classes of 15 or less tended to spend more time than students in larger classes interacting with their teacher either individually (6.3% of all observations) or as a member of the audience (28% of all observations). **Students in larger classes of 15 or more tended to spend a much higher proportion of time not interacting with the teacher; indeed, in classes over 50 the proportion of time a student would spend not interacting with the teacher was as high as 95.1%.**

Figure 17: Distribution of teachers' interactions with students by class size



### Class standard variations in the audience of students' interactions with their teacher

Although we can report no clear patterns of variation by class standard it is interesting to note that students in standard 1, typically the youngest students, spent longer than students in older classes (82.1% of all class time) not interacting with their teacher.

### Variations in student location according by district, subject, class size

A number of interesting patterns of variations related to student location are evident from our analysis. District variations were slight, with students taught at school in Chennai district spending slightly more time on the mats than students in Kanchipuram schools. Students in English lessons tended to spend more time than students in other subjects away from the mats (27.8% of all class time). **Class size variations in relation to student location were not marked except for students in very large class sizes of 50 or more spending almost all their time away from the mats (90.2%) compared to students in smaller classes who all spent less than 20% of class time away from the mats.** Given the importance to the ABL method of students spending substantial amounts of time on a particular mat, the high proportion of time students spent away from mats in very large classes might suggest that the ABL method was not being followed in those contexts. The main pattern recorded for student location in relation to class standard shows a clear tendency for older students in standards 3 and 4 to spend less time away from the mats than students in standards 1 and 2.

## 6. Discussion

In this section of the report we bring together findings from interview and observation data sets, highlighting five main themes.

**Patterns of student engagement in ABL classrooms when not interacting with the teacher or with fellow students appear to reflect well-established classroom conditions of independent learning.**

As we argued at the beginning of this report, the introduction of ABL entails change in the culture of classroom teaching and learning if it is to foster independent student learning. Both interview and observation data suggests that ABL is indeed fostering habits of independent learning. Our analysis of observation data leads us to conclude that students spent considerable time (54.2% of all time not interacting with their teacher or with their peers) working alone on academic, curriculum-related tasks. Such data of course cannot help us understand the internal cognitive processes of these students as they were working alone, but we can conclude that the classroom conditions for independent learning appeared to be well established in so far as observed lessons consisted of a great deal of task-related work undertaken by students working alone on individually chosen tasks and undistracted by others. This is entirely consistent with headteachers' accounts that emphasised the importance of promoting individualised learning and moving away from whole class teaching. It is also consistent with teachers' accounts that focused on opportunities provided by the ABL method for fostering self-directed learning and learning at the pace of each individual student.

**Nurturing a classroom culture of interdependence is a crucial step towards successfully promoting independent learning in ABL classrooms.**

Teachers also reported that most students require help from teachers in order to learn and make choices in the more individualised approach of ABL and so the large amount of time students spent not interacting with either teacher or students discussed above becomes an important point for consideration. Some teachers reported that peer support among students was also important. Teachers' accounts point to the importance of nurturing an interdependent classroom culture in order to support development of the dispositions and practices of independent learning among their students. At the heart of such interdependence is a set of relationships and social processes that teachers told us about and which we have referred to as 'pedagogic bonding'. The reconfiguration of space afforded by the mat system brought something of a collapse of the physical distance between teacher and students typical of traditional classroom arrangements. This, according to our teachers, facilitated a deepening and a personalising of relationships with students. As students and teachers developed trust and greater willingness to engage on a more personal basis, students became less inhibited in sharing problems related to their learning and this led not only to fruitful pedagogic exchanges but also to fruitful pedagogic relationships. This was clearly an important benefit of ABL from teachers' perspectives.

**While teachers spend substantial amounts of classroom time interacting with their students individually, only a small proportion of students benefit from their teacher's individual attention in any one lesson**

One would expect that such 'pedagogic bonding' and relationship-building would be reflected in a high proportion of private interactions between the teacher and individual students. Our analysis of observation data from the Teacher Record throws some interesting light on this. Teachers were observed to spend 35.8% of classroom time engaged individually with students and a further 19.8% engaged privately with groups. However, while almost all of their interactions with students tended to be private with individuals or small groups, teachers were understandably 'spread thin', interacting with different individuals and different groups as a lesson progressed. Our Student Record data showed that an individual student experiences less than 5% of their classroom time interacting individually with the teacher, and so at any one time only a small number of students can benefit from the individual attention of their teacher and from the relationship-building and pedagogic bonding that teachers report flow from such interactions. It is important therefore that teachers plan carefully how they will distribute opportunities across a series of lessons so that all members of a class have similar opportunities to get to know their teachers at this more personal level and benefit from their teacher's one-to-one guidance and support.

And here again our findings in relation to the focus of teachers' interactions with their students were interesting. A marked pattern in the Teacher Record data was very low proportions of time devoted to teacher questioning (2.5%) and reacting to student contributions (3.6%), higher levels of teachers' structuring of new and previously taught ideas (26.7%) and a predominance of task supervision or class management interactions (54.4%). What is clear from our data is that the majority of time teachers spend talking with their students is not directly related to learning. The main focus of teacher-student interaction concerns class management and task supervision. These are indeed important for establishing the conditions of learning – ensuring students have the appropriate task and the necessary resources and so on. However, spending such a high proportion of time on managerial interactions eats into time that could otherwise be spent in supportive interactions that support advances in thinking and understanding through skilful teacher questioning and responding to students' developing ideas. Encouragingly a high proportion of teachers' interactions with students were sustained. And it is in these more sustained interactions that rich learning can take place. However, the overwhelming tendency reflected in our Student Record data (see figure 5 above) was for students to be passively rather than actively engaged during such interactions with their teacher. In light of this, professional development opportunities for supporting teachers find ways of incorporating a higher proportion of academic interactions with students, while at the same time encouraging and supporting them to play a more active role based on the more dialogic practices of questioning and reacting to students' contributions.

**Teachers are caught between the need to comply with the group/mat-based configuration of the ABL system and to maintain standards of discipline in class.**

While teachers reported that the mat configuration facilitates development of much of the individualised learning and relationships in ABL classrooms that they valued, some teachers also commented more critically about these arrangements. Teachers reported difficulties in managing the behaviour of students located at mats designated for individual or peer-supported task work. They felt they needed to leave their mats in order to deal with behavioural issues arising with students at other mats. Indeed, overall, teachers were observed to spend nearly half their time in class at locations away from the mats. In smaller classes with less than 15 students, teachers typically spent more time (57.9%) on the mats than teachers in larger classes (a little over 40% for class sizes between 16 and 50). In very large classes, teachers spent nearly all the time in class at the

front or by the class blackboard as might be expected in more traditionally configured classes. This is consistent with teachers' accounts claiming that discipline problems more typically arise in their larger classes. In such cases teachers were required to leave their mats more frequently in order to re-establish desired standards of behaviour. And from this we would expect teachers in smaller classes to engage in a higher proportion of private interactions with individual students because they spend more time on the mats in those smaller classes.

Contrary to expectations however, our findings show that, despite spending more time at the mats in the smallest classes compared to larger classes, teachers in the smallest classes tended to spend the least proportion of time interacting with individual students compared to teachers in larger classes. This might be due to the composition of students in the smallest classes. Perhaps there was a higher proportion of students disposed to misbehaviour of one kind or another in those small classes. Or the teachers in those small classes were neither aware of the opportunities for sustained private interactions with individual students that can arise in small classes nor how to exploit such opportunities for optimising the quality of students' learning.

It was clear from our data that the task of complying with the ABL principle of individualised child-centred learning underpinned by tailored one-to-one or small group support presented dilemmas, trade-offs and constraints for teachers. On the one hand, staying on the mats to engage individually with a student meant that teachers would find it difficult to monitor closely the work and engagement of students on other mats. On the other hand, ensuring that all students in the class were appropriately engaged in different learning activities and knew how to proceed with their respective task cards would mean leaving the mat, perhaps bringing a one-to-one conversation with a student to a premature conclusion.

### **Teachers have sophisticated and constructive ideas for refining and enhancing the ABL method.**

In the face of such dilemmas and constraints, teachers had insightful and constructive ideas for refining and enhancing the ABL method. They suggested building in whole class teaching phases to ABL lessons in order to teach one card at a time to all students before dividing students into groups. This way they would avoid time-consuming repetition of guidance and task instructions and free up time for more productive guidance and support. Other teachers reported that incorporating whole class teaching phases would support students to move more closely together through the different stages of a syllabus and avoid some students lagging too far behind. Encouragingly, these teachers' recommendations can be understood as a sophisticated and constructive response to a common and enduring pedagogic dilemma about what balance is optimal between collective and individualised teaching approaches.

Our data suggests that this balance remains a problematic aspect of the ABL method and one which perhaps can be modified with wider scope and explicit permission for teachers to introduce whole class phases of teaching for particular purposes. Our observation data casts some interesting light in this respect. The highest proportion of time during lessons teachers spent interacting with the whole class was when teaching the smallest classes (23.3%). Whole class interactions for the larger class sizes were much less than 10% by contrast. This might suggest the need for some focused professional development support exploring with teachers what patterns of interaction might be optimal for supporting learning in different class sizes and in relation to different curriculum purposes. A particular focus of such professional development support might be on how best to identify and then exploit opportunities for one-to-one interactions with students in classes of different size, especially though not limited to small class sizes, and what kinds of sustained interactions will provide most useful formative learning support for students.

## 7. Conclusions

This study highlighted the unequivocal view among head teachers and teachers that ABL promoted learning for all children. They regarded learning in ABL as self-directed and individualised, being more than subject based knowledge and as encouraging students to connect classroom learning with their real life experiences. This is despite the fact that the learning outcomes report does not find evidence to support the claim that ABL has necessarily improved learning outcomes.

While teachers' willingness to adopt new approaches is strongly influenced by their contexts, position and knowledge, another significant factor influencing these decisions is their perception of the kinds of benefit these new approaches hold for their students and their own teaching. Headteachers and teachers in this study held very strong beliefs about the impact of ABL in fostering more nurturing, 'learning without fear' classrooms. In contrast the cultivation of less formal and more personal relationships was also cited as a source of tension in that the teacher's traditional authority base was weakened by the more fluid spatial configurations with resultant negative implications for student discipline.

Given the important strategic role of head-teachers, they were seen to view their own role merely in terms of monitoring and inspection as opposed to what would have been more effective, namely an active engagement with the policy. Given the fact that an effective school leader can successfully transform even a failing school, strong leadership is critical for broader system-wide reforms. Active engagement with the policy on the part of school leadership could have potentially enhanced the effectiveness of the ABL intervention and is a lesson to emerge from this study.

Resourcing also **emerged as an important factor in the implementation of ABL**. Teachers stressed the need for sufficient ABL related resources, such as activity cards, learning ladders, weather charts, health wheels and other additional/supplementary materials as these are the basis for organising learning effectively. ABL requires well-resourced classrooms, not only in terms of pre-designed resources, such as learning cards, learning ladders etc, but also in terms of the willingness of teachers to build local, easily available resources into their classroom routines such as seeds for counting, old newspapers for making wall pictures etc. Innovations that are heavily dependent on new materials need to be supported with not only the budget but also the logistics to deliver these materials not only initially but in a sustained manner. In addition to this, the study highlights broader policy implications such as improving teacher training, materials provision, as well as re-assessing the classroom physical space to address the concerns that appear to have arisen, particularly in larger classrooms where discipline has been highlighted as a key challenge resulting from the ABL pedagogy.

While this research addresses some important gaps in the existing literature on ABL, **more in-depth classroom based research is needed to understand how classroom processes adopted in ABL come to impact on students' learning processes, relationships and achievements**. Hardman (2015) rightly notes that systematic classroom observation also works best when it is informed by a more nuanced understanding of classroom talk derived from linguistic and micro-ethnographic analysis. This is particularly useful to fully understand classroom discourse, such as teachers' use on open or closed questions, amount and type of teacher feedback etc., and also to better understand impact on student outcomes. Additionally, more subject specific exploration, which is possible with more time in the field, will be essential in understanding how basic ABL principles support different subject specific pedagogical engagements. Research which continues to focus on variation in ABL practice in different contexts will be particularly useful in informing policy development. In particular, there is a need to identify the individual components that make up the ABL pedagogy with further evidence

needed on how to take pedagogic reform forward and in particular focus these efforts on the *change process* as opposed to the intervention alone.

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## Appendix 1: Categories of observation and definitions: Teacher Record

### *Audience of teachers' interactions*

#### 1. WHOLE CLASS

Code when a teacher engages in a public interaction with the whole class. Here the class as a whole is the focus of the teacher's attention.

#### 2. GROUP FOR CLASS

Code when a teacher engages in a public interaction with a group such that the teacher's utterance or the group's responses are meant to be shared by the whole class. Here the group is not the sole focus of the teacher's attention; this is shared with the whole class.

#### 3. INDIVIDUAL FOR CLASS

Code when a teacher engages in a public interaction with an individual student such that the student's responses are meant to be shared by the whole class. Here the individual student is not the sole focus of the teacher's attention; this is shared with the rest of the class.

#### 4. INDIVIDUAL FOR GROUP

Code when a teacher engages in an interaction with an individual student such that the student's responses are meant to be shared by his/her group but not the whole class. Here the individual student is not the sole focus of the teacher's attention; this is shared with the rest of the group.

#### 5. PRIVATE GROUP

Code when the teacher privately interacts with a group of two or more students. The group is the sole focus of the teacher's attention.

#### 6. PRIVATE INDIVIDUAL

Code when the teacher interacts privately with an individual student. The individual student is the sole focus of the teacher's attention.

#### 7. OTHER TEACHER (team teaching)

Code when the teacher is interacting with another teacher in a team teaching or training situation only

#### 8. VISITOR

Code when the teacher is interacting with a visitor (a parent, the headteacher, another teacher who is only in the class for a temporary period of time and who has no direct class teaching responsibility in the observed class)

#### 9. NOT INTERACTING

Code when the teacher is not interacting with anyone

### *Teacher's location*

#### 10 – 15: MATS 1-6

Code when the teacher is at a particular mat, 1-6 – there are separate categories for each mat.

#### 16. BETWEEN MATS/GROUPS

Code when the teacher is between mats or moving between groups.

#### 17. CLASS BLACKBOARD

Code when the teacher is at the class blackboard.

#### 18. STUDENT'S BLACKBOARD

Code when the teacher is at the student's blackboard.

#### 19. AWAY FROM MATS/GROUPS

Code when the teacher is away from the mats or groups and not at front, back, sides, or blackboards.

#### 20. FRONT

Code when the teacher is at the front of the class, away from the mats and away from the class blackboard

#### 21. BACK

Code when the teacher is at the back of the class, away from the mats

#### 22. SIDES

Code when the teacher is at the side of the class, away from the mats

#### 23. OUT OF ROOM

Refers to instances when the teacher is out of the room

### *Functions of Teacher's interactions*

#### Structuring

#### 24. TEACHER PRESENTS OR REVIEWS CURRICULAR IDEAS

Refers to all utterances in which a teacher presents, explains, describes, summarises, reviews, re-presents, exemplifies or in any way mentions or talks about ideas, concepts, theories, events and any curricular material with the aim of generating new understandings or stimulating the recall or re-engagement of students, whether of previously or newly taught concepts. Strategies a teacher might use in structuring meaning include the following:

- paraphrase
- use of students' ideas
- use of authentic and other source material
- comparison and contrast
- use of examples
- metaphor
- analogy

## Soliciting

### 25. LOW-ORDER QUESTION:

Refers to any utterance of the teacher that seeks an answer and where there is evidence that the teacher is only prepared to accept a single answer. Commonly these kinds of questions seek accurate recall of fact, the reporting of closed solutions without supporting reasons, and the naming of examples of an event or principle. This category does not refer to the questions or problems that characterise a task on a task card.

### 26. HIGH-ORDER QUESTION:

Refers to any utterance of the teacher which seeks an answer and where there is evidence that the teacher is prepared to accept more than one answer. Commonly these kinds of questions seek reasons, interpretations, imaginative suggestions, opinions, value judgements, inference, hypotheses from current evidence or a set of facts or the synthesis of several ideas or concepts. This category does not refer to the questions or problems that a teacher sets for a task.

### 27. 3 SECS+ WAIT TIME AND THINKING TIME

Refers to a period of three seconds or more after a teacher has asked a question that a teacher waits before asking a student to respond. It also refers to occasions when a teacher explicitly provides time for students, individually or in groups, to think, discuss, consider, or write down responses to a question or problem before selecting a student or group to make a contribution.

## Reacting to student contributions (including but not limited to student responses to teacher questions)

### 28. NO RESPONSE

Code when a teacher does not respond verbally to a student's contribution.

### 29. REPEATS OR REPLHRASES QUESTION

Code when a teacher reacts to no student verbal response by asking the question again or rephrasing the question.

### 30. REDIRECTS QUESTION

Code when a teacher reacts to no student verbal response by asking the same question to another student or otherwise indicating that another student should answer.

### 31. PROBES STUDENT CONTRIBUTION

Refers to teacher's probing reactions or follow-up questions in response to student contributions or other work in progress that stimulate, support or otherwise challenge a student to extend their response by:

- requesting further clarification from the student with the aim of obtaining more correct or fuller, more adequate student response;
- offering clues to guide the recall, or support a student's reasoning toward a more adequate response;
- seeking a more complete or detailed student response;
- encouraging the student to increase the cognitive sophistication of a response;
- urging students to respond when they say they can not answer a question;
- expressing dissatisfaction with a student response when a teacher imputes lack of effort, engagement or application as reason(s) for the inadequate response.

### 32. ACCEPTS NO EXPLANATION

Refers to teacher reactions that positively evaluate or accept the validity or relevance of a student's performance or academic contribution offered in response to a teacher's question, or as a volunteered statement. The teacher offers no explanation for her reaction.

### 33. REJECTS NO EXPLANATION

Refers to teacher reactions that negatively evaluate or do not accept the validity or relevance of a student's performance or academic contribution offered in response to a question, or as a volunteered statement. The teacher offers no explanation for her reaction.

### 34. ACCEPTS WITH EXPLANATION

Refers to teacher reactions that positively evaluate or accept the validity or relevance of a student's performance or academic contribution offered in response to a teacher's question or as a volunteered statement. The teacher explains her reaction or otherwise provides additional support or guidance related to the students' contribution.

### 35. REJECTS WITH EXPLANATION

Refers to teacher reactions that negatively evaluate or do not accept the validity or relevance of a student's performance or academic contribution offered in response to a question, or as a volunteered statement, or as part of taskwork. The teacher explains her reaction or otherwise provides additional support or guidance related to the students' contribution.

### 36. SUSTAINED INTERACTION

Code when an academic interaction between a teacher and a student or group of students continues into the next 25-second time interval .

## Class Management

### 37. DISCIPLINE/CONTROL

Refers to all utterances in which a teacher seeks to establish or re-establish desired standards of classroom behaviour and task engagement in response to behaviour inputed by the teacher to be deviant.

### 38. TASK SUPERVISION AND ADMIN

Refers to all utterances, statements or questions in which a teacher seeks to set up, maintain or bring to an end a learning task activity or set of activities. This includes the following:

- talking about and arranging availability of and access to necessary resources, including task cards, for task engagement;
- signalling the end of a task;
- directing the movement of students (ie into groups, pairs etc) especially at the beginning of tasks or at transitions between tasks.
- providing resources related to a task activity
- the return of students' marked work;
- the taking in of students' work for marking;
- the timings of homework;
- the updating of students' record sheets and progress reports;
- the administration of reward schemes;
- the sorting of textbook and exercise book stock.

### 39. CLASS ORGANISATION

Refers to all utterances, statements or questions related to the following:

- directing the movement of students on entering and leaving the classroom at the beginning and end of a lesson or when taking a toilet or some other break;
- the arrangement of classroom furniture, equipment and other fixtures (such as window blinds) and of students' belongings - commonly observed at the start and end of lessons or at transitions between activities;
- the taking of the class register or otherwise checking on student presence/absence;
- the preparation, updating and taking down of display work including all associated glue, scissor and reprographic work;
- settling the class down ready to start or end the lesson.

### 40. TEACHER MONITORS

Refers to all time a teacher spends silently monitoring students' task behaviour and engagement.

### Other interaction categories

#### 41. TEACHER LISTENS /WATCHES

Refers to all instances when a teacher listens and watches while a student or group of students or the whole class read out a piece of work or otherwise perform (ie dramatic monologue, play, or summary of results from task activity etc).

#### 42. READ ALOUD

Refers to any instance when the teacher reads from any text.

#### 43. TEACHER MARKS STUDENTS' WORK

Refers to instances when the teacher is engaged in marking or discussing a student's or a group's piece of work in the presence of that student or group.

#### 44. OTHER

Refers to any other instance of teacher behavior and interaction that cannot be coded by other categories in the Teacher Record.

## Appendix 2: Categories of observation and definitions: Student Record

### *Location of target student*

1-6: MATS 1-6

Code when the student is at a particular mat, 1-6 – there are separate categories for each mat.

7. AWAY FROM MATS/GROUPS

Code when the target student is away from the mats and not at task card trays, learning ladder or blackboards.

8. TASK CARD TRAYS

Code when the target student is at the task card trays.

9. LEARNING LADDER

Code when the target student is at the learning ladder.

10. CLASS BLACKBOARD

Code when the target student is at the class blackboard

11. STUDENT BLACKBOARD

Code when the target student is at a student blackboard.

### *Student-adult interactions*

### Target student's role

12. ATTEMPTS

Code when the target student attempts to become focus of teachers' attention (not focus at previous signal).

13. SUCCESSFULLY BEGINS

Code when student successfully begins a new interaction with the teacher

14. TEACHER INITIATES WITH TARGET STUDENT

Code when the teacher initiates a new interaction with the target student

15. SUSTAINED TEACHER-STUDENT INTERACTION

Code when an academic interaction between a teacher and a student or group of students continues into the next 25-second time interval .

16. TARGET IN AUDIENCE (teacher interacts with other student(s).

Code when another student(s) is the focus of teacher's interaction and the target is paying attention.

### Identity of target student's interacting adult

17. TEACHER

Code when the target is interacting with the teacher

18. OBSERVER

Code when the target is interacting with the observer

19. OTHER

Code when the target is interacting with any other adult

### Focus of interaction between adult and target student

20. TASK OR ACTIVITY (task content or supervision)

Code when the focus of interaction is about task or activity (task content or supervision)

21. CLASS MANAGEMENT, ADMIN OR ORGANISATION

Code when the focus of interaction is about class management (including behaviour), admin or organisation routines.

22. POSITIVE TASK ACTIVITY

Code when adult reacts positively to task activity (ie praise)

23. NEGATIVE TASK ACTIVITY

Code when adult reacts negatively to task work (ie criticises)

24. ADULT IGNORES TARGET

Code when adult ignores attempted initiation by target student

### *Student-student interactions*

#### Target's role

25. TARGET BEGINS AN INTERACTION

Code when target successfully begins a new interaction.

26. TARGET RESPONDS

Code when target responds to the initiation of another student.

27. TARGET UNSUCCESSFULLY TRIES TO INITIATE

Code when target unsuccessfully tries an initiation.

28. TARGET IGNORES ATTEMPTED INITIATION

Code when target ignores attempted initiation by another student.

29. TARGET SUSTAINS INTERACTION

Code when target sustains an interaction that began at or before the previous time signal.

Mode of interaction

30. NON-VERBAL

Code when interaction is non-verbal (with or without materials, physical contact or gesture)

31. VERBAL

Code when interaction is verbal (with or without materials, physical contact or gesture)

Task of other student(s)

32. SAME AS TARGET

Code when the task of other student(s) is the same as target's task.

33. DIFFERENT TO TARGET

Code when the task of other student(s) is different to target's task.

Gender and number of other student(s)

34. ONE-TO-ONE WITH SAME GENDER

Code when target interacts privately with one student of the same gender.

35. ONE-TO-ONE WITH OPPOSITE GENDER

Code when target interacts privately with one student of opposite gender.

36. WITH 2+ STUDENTS SAME GENDER

Code when target interacts publicly with two or more students of same gender as target

37. WITH 2+ STUDENTS AT LEAST 1 IS OPPOSITE

Code when target interacts with two or more students, at least one of whom is the opposite gender to the target.

Base of other student(s)

38. SAME MAT

Code when interacting student(s) is on the same mat as target.

39. OTHER MAT

Code when interacting student(s) is on a different mat to target.

Target student's activity and engagement:

40. WORKING ALONE

Code when target is working alone and involved in task.

41. DISTRACTED BY OTHER(S)

Code when target is not involved in task and totally distracted from all work by other student(s).

42. MESSING ABOUT OR DISRUPTING OTHERS

Code when target is not involved in task, messing about or disrupting the work of other student(s).



43. WAITING TO INTERACT WITH THE TEACHER

Code when target is waiting to interact with the teacher

44. INTERESTED IN TEACHER'S ACTIVITY

Code when target is interested in teacher's activity or teacher's private interaction with other student(s).

45. INTERESTED IN STUDENT ACTIVITY

Code when target is interested in the work of other student(s).

Other

46. NOT OBSERVED FOR SOME REASON

Not coded because target is not observed for some reason.

47. NOT LISTED.

Not coded because target's activity is not listed.

## Appendix 3: Table summaries of classroom behaviours and interactions

Table A1: Forms of student-teacher interaction (% of all observations)

Teacher Record		Student Record	
<i>Teacher interacts with:</i>		<i>Teacher interacts with student:</i>	
Individuals	35.8%	Individually	4.3%
Group	19.8%	As member of audience	15.6%
Whole class	10.9%		
Total teacher-student interactions	66.5%	Total teacher-student interactions	19.9%
No teacher-student interactions	33.5%	No teacher-student interactions	80.1%
Total	100.0%	Total	100.0%

Table A2: The balance between teacher-student, student-student and not interacting (% of all observations)

Student Record	
Student-teacher interactions	19.9%
Student-student interactions	12.3%
Not interacting	67.8%
Total	100.0%

Table A3: Location of teacher-student interactions (% of all observations)

Teacher Record		Student Record	
Mat 1	10.8%	Mat 1	10.2%
Mat 2	18.6%	Mat 2	18.8%
Mat 3	8.8%	Mat 3	15.0%
Mat 4	5.2%	Mat 4	12.5%
Mat 5	5.2%	Mat 5	11.3%
Mat 6	2.5%	Mat 6	7.0%
Total % of time on mats	51.1%	Total % of time on mats	74.8%
Class blackboard	4.0%	Class blackboard	0.2%
Student's blackboard	1.5%	Student's blackboard	5.1%
Away from mats	5.9%	Away from mats	18.3%
Between mats	18.8%		
Front	16.4%	Task card trays	1.1%
Back	0.4%	Learning Ladder	0.5%
Side	1.0%		
Out of room	0.9%		
Total	100.0%	Total	100.0%

Table A4: Student activity (% of all 'not interacting' observations)

Student Record	
Working alone	54.2%
Distracted by other(s) or messing about	17.7%
Waiting to interact with teacher	10.4%
Interested in teacher activity	6.5%
Interested in student activity	5.2%
Taking part in a performance	1.4%
Not observed	.1%
Not listed	4.5%
Total	100.0%

*Table A5: Students' role when interacting with the teacher (Student record) (% of all student-teacher interactions)*

Student Record	
Target attempts to be focus of attention	1.5%
Target successfully begins interaction with teacher	2.5%
Teacher initiates interaction with target	2.4%
Sustained teacher-student interaction	16.3%
Target in audience	77.3%
Total	100.0%

*Table A6: Focus of teachers' interactions with students (Student record) (% of all teacher-student interactions)*

Student Record	
Task or activity	80.8%
Class management, behaviour or organisation	18.1%
Teacher ignores student	1.1%
Total	100.0%

*Table A7: Students' role (Student record) (% of all student-student interactions)*

Student Record	
Target begins interaction	9.3%
Target responds to other's interaction	7.1%
Target tries unsuccessfully	1.3%
Target ignores other's interaction	0.9%
Target sustains interaction	81.4%
Total	100.0%

*Table A8: Gender and number of interacting students(s) (Student Record) (% of all student-student interactions)*

Student record	
One-to-one same gender	63.1%
One-to-one opposite gender	18.5%
Total one-to-one interactions	81.6%
With two or more students same gender	9.0%
With two or more students including opposite gender	9.4%
Total	100.0%

*Table A9: Focus of teachers' classroom interactions (Teacher Record) (% of all observations)*

Teacher Record	
Structuring	26.7%
Questioning	2.5%
Reacting to students' contributions	3.6%
Class management	54.4%
Other	12.8%
Total	100.0%

Table A10: Distribution of audience by covariates (Teacher Record) (% of all observations)

		Whole Class	Group	Individual	Other adult	Not interacting	Total
District	Chennai	13.2%	23.6%	36.3%	1.7%	25.2%	100.0%
	Kanchipuram	8.6%	15.7%	35.4%	1.7%	38.6%	100.0%
Subjects	English	13.2%	19.0%	36.1%	1.6%	30.1%	100.0%
	Maths	5.7%	19.1%	40.6%	1.5%	33.1%	100.0%
	Science	12.1%	27.6%	31.3%	1.1%	27.9%	100.0%
	Tamil	13.4%	16.0%	34.0%	2.4%	34.2%	100.0%
	Social Science <sup>9</sup>	11.3%	17.2%	38.0%	1.4%	32.1%	100.0%
Class size	<15	23.3%	23.5%	25.8%	1.7%	25.7%	100.0%
	16-30	6.4%	20.2%	40.8%	1.7%	30.9%	100.0%
	31-50	5.7%	11.0%	36.8%	1.4%	45.1%	100.0%
	51+	0.0%	19.8%	33.9%	2.5%	43.8%	100.0%
Class standard	1st	0.1%	8.6%	56.6%	1.5%	33.2%	100.0%
	2st	9.5%	12.1%	36.3%	3.5%	38.6%	100.0%
	3st	16.6%	14.1%	28.0%	1.9%	39.4%	100.0%
	4st	9.4%	14.2%	38.2%	1.6%	36.6%	100.0%
	1st+2st	12.3%	29.6%	32.5%	1.5%	24.1%	100.0%
	3st+4st	5.2%	23.9%	44.3%	1.3%	25.3%	100.0%
Mono or multigrade	Monograde	11.1%	13.1%	36.3%	2.0%	37.5%	100.0%
	Multigrade	10.6%	28.3%	35.3%	1.4%	24.4%	100.0%

Note: Chi-squared tests were computed separately for each covariate and 'audience'. Chi-squared test on each association resulted in p-values of less than 0.001.

<sup>9</sup> Taught in 3st and 4st only

Table A11: Distribution of teachers' location by covariates (Teacher Record) (% of all observations)

		Mats 1-2	Mats 3-6	Away from mats	Class blackboard	Student blackboard	Front of class	Out of room	Total
District	Chennai	30.1%	21.5%	22.7%	3.1%	2.2%	19.6%	0.8%	100.0%
	Kanchipuram	28.7%	21.8%	29.8%	4.9%	0.9%	13.0%	0.9%	100.0%
Subjects	English	12.5%	12.6%	36.5%	8.7%	1.8%	26.0%	1.9%	100.0%
	Maths	29.9%	25.9%	23.5%	2.5%	0.8%	17.0%	0.4%	100.0%
	Science	29.9%	25.0%	25.2%	2.2%	0.8%	16.4%	0.5%	100.0%
	Tamil	35.1%	20.9%	23.3%	3.7%	2.0%	14.0%	1.0%	100.0%
	Social Science <sup>10</sup>	43.9%	19.1%	25.8%	5.2%	2.9%	2.8%	0.3%	100.0%
Class size	<15	38.2%	19.7%	24.6%	5.3%	2.8%	8.4%	1.0%	100.0%
	16-30	29.2%	22.3%	22.2%	3.5%	1.2%	21.0%	0.6%	100.0%
	31-50	17.1%	24.6%	45.2%	2.1%	0.5%	8.9%	1.5%	100.0%
	51+	0.0%	0.0%	4.6%	16.2%	0.0%	79.2%	0.0%	100.0%
Class standard	1st	10.5%	11.0%	53.9%	4.1%	0.0%	20.5%	0.0%	100.0%
	2st	38.0%	6.9%	26.4%	8.3%	0.3%	18.0%	2.1%	100.0%
	3st	24.1%	24.8%	33.7%	6.7%	1.1%	8.5%	1.1%	100.0%
	4st	34.1%	27.8%	20.3%	2.4%	1.8%	12.4%	1.2%	100.0%
	1st+2st	26.7%	22.9%	25.0%	3.5%	2.6%	19.1%	0.2%	100.0%
	3st+4st	45.2%	17.0%	7.4%	0.1%	0.0%	29.8%	0.5%	100.0%

Note: : Chi-squared tests were computed separately for each covariate and 'location'. Chi-squared test on each association resulted in p-values of less than 0.001.

<sup>10</sup> Taught in 3st and 4st only

Table A12: Distribution of teachers' interactions with students by covariates (Teacher Record) (% of all observations)

		Structuring	Questioning	Reacting to students' contributions	Class Management	Other	Total
District	Chennai	26.0%	2.8%	4.1%	54.1%	13.0%	100.0%
	Kanchipuram	27.5%	2.0%	3.2%	54.7%	12.6%	100.0%
Subjects	English	29.1%	2.3%	2.4%	55.9%	49.3%	100.0%
	Maths	26.2%	1.6%	2.8%	54.9%	14.5%	100.0%
	Science	30.7%	4.1%	5.2%	49.3%	10.7%	100.0%
	Tamil	23.7%	2.3%	3.5%	56.4%	14.1%	100.0%
	Social Science <sup>11</sup>	24.7%	2.7%	5.9%	54.3%	12.4%	100.0%
Class size	<15	29.8%	4.0%	4.5%	51.5%	10.2%	100.0%
	16-30	28.3%	2.2%	3.0%	53.2%	13.3%	100.0%
	31-50	16.6%	0.8%	4.8%	62.2%	15.6%	100.0%
	51+	16.1%	1.0%	1.0%	67.3%	14.6%	100.0%
Class standard	1st	23.0%	0.4%	0.5%	67.3%	7.9%	100.0%
	2st	24.4%	1.2%	1.1%	54.1%	19.2%	100.0%
	3st	27.1%	1.7%	3.0%	54.5%	13.7%	100.0%
	4st	23.8%	2.4%	4.3%	53.7%	15.8%	100.0%
	1st+2st	29.9%	3.5%	3.7%	54.8%	8.1%	100.0%
	3st+4st	25.3%	3.1%	7.9%	45.6%	18.1%	100.0%

Note: : Chi-squared tests were computed separately for each covariate and 'teacher interaction'. Chi-squared tests on each association resulted in p-values of less than 0.001 except for the following associations: between questioning and district and subject respectively, and between reacting and district (p of more than 0.05). No measures of association were computed for structuring which is a constant.

<sup>11</sup> Taught in 3st and 4st only

Table A13: Distribution of audience of teacher interactions with target students by covariates (Student record) (% of all observations)

		Teacher interacts with student individually	Teacher interacts with student as member of audience	No teacher-student interactions	Total
District	Chennai	4.1%	18.5%	77.4%	100.0%
	Kanchipuram	4.4%	13.3%	82.3%	100.0%
Subjects	English	3.4%	19.8%	76.8%	100.0%
	Maths	6.5%	12.1%	81.4%	100.0%
	Science	3.3%	16.8%	79.9%	100.0%
	Tamil	3.7%	17.1%	79.2%	100.0%
	Social Science <sup>12</sup>	2.5%	13.0%	84.5%	100.0%
Class size	<15	6.3%	28.0%	65.6%	100.0%
	16-30	3.8%	11.2%	85.0%	100.0%
	31-50	2.2%	9.2%	88.6%	100.0%
	51+	2.8%	2.1%	95.1%	100.0%
Class standard	1st	4.5%	13.4%	82.1%	100.0%
	2st	3.6%	17.6%	78.1%	100.0%
	3st	5.1%	17.6%	78.1%	100.0%
	4st	4.1%	15.0%	80.9%	100.0%

Note: : Chi-squared tests were computed separately for each covariate and 'teacher-student interaction'. Chi-squared tests on each association resulted in p-values of less than 0.001.

<sup>12</sup> Taught in 3st and 4st only



Table A14: Distribution of student location by covariates (Student record) (% of all observations)

		Mats 1-2	Mats 3-6	Away from mats	Class blackboard	Student blackboard	Task card trays	Learning ladder	Total
District	Chennai	28.0%	48.5%	15.8%	0.2%	5.6%	1.6%	0.3%	100.0%
	Kanchipuram	29.9%	43.0%	20.9%	0.2%	4.6%	0.6%	0.8%	100.0%
Subjects	English	29.2%	36.2%	27.8%	0.8%	4.4%	1.3%	0.3%	100.0%
	Maths	27.3%	53.4%	14.9%	0.3%	2.2%	1.0%	0.9%	100.0%
	Science	27.3%	47.1%	18.5%	0.0%	4.8%	1.7%	0.6%	100.0%
	Tamil	31.7%	42.7%	18.6%	0.1%	6.1%	0.5%	0.3%	100.0%
	Social Science <sup>13</sup>	27.5%	49.6%	7.8%	0.0%	13.7%	1.2%	0.2%	100.0%
Class size	<15	31.6%	43.7%	16.1%	0.4%	7.4%	0.5%	0.3%	100.0%
	16-30	28.9%	46.7%	18.0%	0.2%	4.3%	1.3%	0.6%	100.0%
	31-50	27.0%	51.8%	15.9%	0.0%	2.9%	1.9%	0.5%	100.0%
	51+	0.0%	0.0%	90.2%	4.2%	5.6%	0.0	0.0	100.0%
Class standard	1st	36.1%	36.4%	21.3%	0.4%	4.3%	1.2%	0.3%	100.0%
	2st	20.2%	47.2%	25.6%	0.5%	4.5%	1.5%	0.5%	100.0%
	3st	31.1%	48.4%	10.8%	0.0%	8.1%	0.6%	1.0%	100.0%
	4st	31.4%	49.1%	14.5%	0.0%	3.6%	1.0%	0.4%	100.0%

Note: : Chi-squared tests were computed separately for each covariate and 'student location'. Chi-squared tests on each association resulted in p-values of less than 0.001.

<sup>13</sup> Taught in 3rd and 4th only



