Part VI
Analysing Prospects for MLE to Increase Social Justice

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Language Matters, so does Culture Beyond the Rhetoric of Culture in Multilingual Education

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Multilingual education (MLE) is much more than just bringing in languages into the process of education; it is, in fact, deeply rooted in a philosophy of critical pedagogy that seeks to actively empower the learners and their communities. If MLE is to be seen as providing a powerful model for the education of the indigenous/tribal and linguistic minority communities, it needs to replace the authoritarian, rigid, pre-ordained knowledge approach of dominant-culture-centric education by a system of critical educational experiences empowering them to become valued, equal, and responsible members of their own and the larger society outside their community and not feel estranged from it (Panda 2006). At one level, strong MLE practices seek to develop children's home language competence from basic interpersonal communication skills (BICS) to cognitive-academic language proficiency (CALP) in the mother tongue through at least five to eight years of schooling before bringing in gradually second, third and other languages into formal education. And, at a deeper level, such programmes of MLE develop strong multilingual competence, identity and a few vital collective processes that sustain the linguistic and the eco-cultural diversity of the society (see Cummins 2009, this volume, for elaboration of the psycholinguistic principles underlying MLE and the role of empowerment; Skutnabb-Kangas 2009, this volume).

In India, experimental programmes of MLE have started in government schools for tribal children in Andhra Pradesh, Orissa and are about to start in Chhattisgarh and other states with very high tribal population (see Mohanty, Mishra, Reddy and Ramesh 2009, this volume). Seeking to provide quality education for tribal children who are otherwise forced into subtractive type submersion education in the mainstream majority language government schools (see Mohanty 2008a for a discussion), this experimental programme of MLE started in Orissa under the government *Sarva Sikhsa Aviyan* (Education for All) initiative for 10 tribal languages

in 195 schools in Orissa. The first batch of MLE children is now in grade 2 in these schools. A special intervention called *MLE Plus* (MLE+)[1] is being simultaneously implemented by the authors in eight of the government MLE schools for the children of Saora and Kond tribal communities speaking Saora and Kui languages respectively, with an objective of strengthening the MLE practices in these schools by establishing a bridge between tribal children's everyday discourse[2] and the scientific/academic discourse of the school.

This chapter provides a description of the MLE+ approach based on our ongoing project *Education in Mother Tongue and Other Tongue.* The MLE+ intervention in this project envisages good MLE practices to be holistic, culturally situated and historically informed of culturally embedded social, mathematical, literacy/oracy and science practices. Taking a Vygotskyan (1978) line, the MLE Plus approach takes off from exhaustive ethnographic survey of the everyday practices and knowledge of the communities with a view to using the cultural practices to evolve a set of classroom as well as community based activities. Various intervention strategies at the school and community level such as motivating parents to send their children to school and close monitoring of the academic history of these children, developing the reading environment both in the community and in the school through a synergistic *'Read Together'* approach are discussed in this chapter with a focus on making classroom learning a culturally shared collaborative activity. We illustrate and discuss some specific classroom interventions based on ethnographic data and developed as activities using a Cultural Historical Activity Theory (CHAT)[3] approach to facilitate critical dialectic exchanges and movements from culture to classroom making the linkages from language to mathematics and to science easy, smooth and culturally meaningful for children (see Panda 2006, 2007 for a discussion). The paper concludes with the assertion that the use of linguistic and cultural diversity as resources in the classroom is central to MLE and, therefore, to any enterprise that concerns the education of children from the dominated and minority communities. Use of these resources in the official/formal space of school is also viewed as necessary to augment the process of cultural maintenance. It may be pointed out that the MLE and MLE+ programmes for the tribal children in Orissa that we discuss here need to be viewed in the context of the nature of societal multilingualility and the current languages-in-education practices in India which are dealt with in this volume (Jhingran 2009, Agnihotri 2009, Mohanty et al. 2009). As has been shown in these chapters, Indian multilingualism is both a resource and a challenge. Given the inequalities across languages, tribal languages suffer gross neglect and exclusion from significant social, political, economic and educational domains leading to serious language disadvantage of tribal children and large scale failure and 'pushout' in dominant language classrooms, where their mother tongues have little space. As discussed in Mohanty et al. (2009, this volume), this has led to some experimental MLE projects in several states.

MLE initiatives for tribal children in India

After several aborted efforts to bring in mother tongue based education for tribal children in several states such as Orissa (Mohanty 2006), some states have now started structured programmes of MLE for tribal children whose mother tongues are different from the state majority language used as language of classroom instruction. There are also some local programmes under the initiatives of several non-government organisations throughout India which claim to be mother tongue based programmes of bilingual/multilingual education. Such programmes are mostly soft assimilation type transitional early exit programmes seeking to ease minority language children's transition to majority language classrooms. However, in the absence of any shared documentation of these programmes, it is difficult to analyse their nature. Large scale government programmes have started in two states—Andhra Pradesh and Orissa—and a few more are being planned. The multilingual education programme in Andhra Pradesh (see Mohanty et al. 2009, this volume) started in 2004 in eight tribal languages. Another state level programme is in place in Orissa. The initial evaluation in Andhra Pradesh and Orissa shows that the MLE programmes are somewhat more successful than the traditional programmes of submersion education. These MLE programmes have a deliberate focus on bringing in elements of children's culture into the classroom and curricular materials. However, the theoretical and methodological groundings of the programme planners have not been explicitly stated so far. Hence, the pedagogical practices needed to help children to gradually move from everyday (empirical) discourse to a theoretical discourse are not clear and the programmes face the risk of being reduced to a set of routines. This is typical of the nature of the current Indian experimental MLE projects in different states, including some planned initiatives in Chhattisgarh, Jharkhand and other states. Some aspects of the Orissa MLE programme will be discussed here before we describe the MLE Plus approach.

MLE in Orissa

As mentioned in Mohanty et al. (2009, this volume), the MLE programme in Orissa started in 2006. The schools selected have nearly 100% children who speak a tribal language. Thus, the classrooms are quite homogeneous[4] with all the tribal children and their teacher speaking a common language. For each of the 10 tribal languages, teachers and language resource persons were selected from among the tribal communities for development of teaching–learning materials (such as picture cards, stories, songs and activities) and the content and design of the text books, following a curricular framework common to all the schools in Orissa. Community culture is being integrated into the curricular materials through what is known as the village calendar and the theme web approach which are used to select the text themes. The calendar year is divided into seasonal village activities from which the content of the textual and teaching–learning materials are derived. Basic skills in different curricular areas such as language, mathematics, and environmental studies

are related to different activities and thematic content. For example, a particular theme is related to writing as a broad skill. This is then related to specific skills such as writing a word list and individual workbook writings. The theme web is divided into two tracks or roads, one for accuracy and correctness and the other for meaning and communication. Corresponding to these tracks, the instructional materials for language, such as alphabet charts and alphabet books are grouped under the accuracy and correctness track whereas the storybooks are grouped under the meaning and communication track. The instructional materials developed through a series of workshops were pilot-tested in schools and through community feedback. Besides the materials development, teacher training and attitudinal training of teachers were also undertaken through a series of specific programmes. Singh and Mishra[5] (2008) report some initial success for the MLE programme in Orissa assessed in terms of increased student interest, attendance and community involvement.

Cultural-philosophical underpinnings of Orissa MLE

As there is no one uniform kind of MLE programme, it is imperative to ask a few questions in order to map out the nature and the form of MLE that is in place in Orissa. How are 'culture' and 'activity' defined and treated within the epistemic system of the Orissa MLE approach? What forms of empowerment models and pedagogic practices are in place? If children's everyday activities are used as critical cultural resources to teach in the classroom, how are the relationships between everyday (empirical) and school (theoretical/academic) concepts viewed? The processes of acquisition of an everyday concept and a mathematical concept are very different as both are part of two very different epistemic practices—home and school (Bernstein 1996; Panda and Cole 2007). Use of many examples of everyday concepts does not necessarily lead to an understanding of a corresponding theoretical concept. It requires use of carefully planned intervention by the teacher where the children are assisted to perceive, for instance, a quantity in relation to another quantity and move gradually from the notion of sharing to the theoretical concept of ratio. In terms of discourse, the child's discourse moves qualitatively from the everyday (empirical) discourse to scientific (theoretical) discourse (see Karpov 2003 for detailed discussion on everyday and scientific concepts). Even though everyday examples and discourses are vital to start with, the use of everyday examples and discourses in the classrooms may not in itself be sufficient to ensure children's access to academic mathematics and science discourse.

In the MLE programmes in Orissa, the mother tongue is the teaching language in grades 1 and 2. The second language is used for oral communication in grade 1 and grade 2 and increasingly as a language of teaching from grade 3 onwards. In grade 5, the second language will be used as the medium of teaching and the place of the MT remains unspecified. From grade 6, the second language is supposed to become the sole medium of instruction. A number of issues remain unclear which the Orissa MLE programme needs to address in the coming years. If the use of

the mother tongue stops in grade 6, what happens to children's cultural resources? The current programme envisages the use of books and other teaching–learning materials written in the MT and drawing almost exclusively from their experiential and cultural resources till the point of complete transition to the second language. It is likely that the withdrawal of children's mother tongue from the classroom as early as grade 6, would lead to sudden loss of children's cultural capital since the standard Oriya textbooks for use in the classrooms are common to all the children in Orissa and usually they represent the culture of the dominant Oriya community. In that case, this system of transition with an early exit programme could be a trap, as it cleverly would click to a minimalist agenda of the government and, at the same time, caters to the concerns of the a few optimistic reformists. Unless some of these issues are addressed before the first batch of children reach the point of transition to the second language only, the extent to which the present MLE programme in Orissa succeeds in providing the necessary scaffolding from children's cultural resources will remain in doubt. On a positive note, there are clear signs of growing interest in MT based MLE for tribal children and the MLE programme in Orissa has just decided to continue with the tribal MTs at least till grade 5 and a proposal to have these languages as a school subject thereafter is being seriously examined by the Government of Orissa. Further, the MLE programme in Orissa is now poised to be extended to at least six more tribal languages.

Packaging! An inevitable trap

Our observations of MLE schools in Orissa show that what has been transcribed in training the MLE teachers is a package, one which is often performed as a routine in actual classroom practices.

The teachers were found to be holding a big book and reading a sentence from the book aloud followed by the children repeating the sentence in chorus. In grade 1 of one Saora area school, the teacher read a sentence aloud four times and then called on a student, who moved her index finger over the words while reading. The student was made to read the sentence four times. The teacher then asked the student to identify one particular alphabetic symbol. In another class, the teacher read the sentence aloud seven times followed by the chorus produced by children. The teacher then asked the children one by one to identify specific alphabetic symbols. The process of reading was almost the same across the schools. These observations reveal continued emphasis on only repetitions and rote memorisation as a strategy. It was obvious that in such pedagogic practices, the rules and the grammar of the package were transferred and not the theory or the principles underlying such an approach. Theme web was a concept, an idea that was used to organise the curricular materials and the teaching–learning programmes. But in practice it was treated as yet another routine in the class, a calendar that has to be followed. Activities that occur in a season were often routinely picked up and discussed in the class without treating them or converting them into a classroom activity in a Vygotskyan sense. It

is often ignored in the process that a web of concepts which exist in an interrelated manner needs to be unpacked and discussed in order to facilitate transfer from everyday to scientific discourse.

The current MLE programmes are still an improvement over the earlier programmes which almost completely excluded children's language as well as culture. For a change, the children in MLE classrooms looked happy and confident and they seemed to be relating to the classroom themes transacted in their mother tongue. The children found the materials such as big and small books,[6] activity charts, storybooks and a small book on mathematics familiar. However, the approach was still very much materials- and teacher-centered. Moreover, the way the children's culture was represented in the classrooms seemed to be subscribing to a mentalistic[7] definition of culture (Ratner, 2001). The programmes looked quite structured, as the same model is used everywhere and teaching–learning activities are often performed as a routine using methods which are, at the most, close to the Initiation-Response-Evaluation format (see Mehan, 1979).

The MLE teachers were found to have very little idea of an everyday concept and its relationship to a theoretical/scientific concept. There was little understanding of how cultural artifacts like agricultural practices, art, craft and games mediate learning in the classroom. Our observation showed that a limited understanding of the concept of 'activity' led to limited empowering of teachers; they continued to axiomatically follow the given teacher training modules and manuals exercising little independent control on their own. Everyday knowledge was romanticised without converting it into a strong resource for education in formal schools for children. One therefore fears that among the teachers, a cadre of hardcore believers in the MLE routines of the kinds mentioned above may emerge. This may subsequently limit the prospects of developing dynamic and strong MLE practices.

MLE Plus: a culturally rooted holistic approach

MLE Plus programme therefore aimed at strengthening the existing MLE practices in the schoolrooms taking the Cultural Historical Activity Theory (CHAT) approach of Vygotsky (Cole and Engeström 2007). This programme was implemented in four MLE schools each in Phulbani (for Kui speakers) and Gajapati (for Saora speakers) districts of Orissa. This approach envisages good MLE practices to be holistic, culturally situated and historically informed of the culturally embedded social, mathematical, literacy/oracy and science practices. This action research project sought to further the MLE objectives through a different kind of bridging between school and homes of Kui and Saora children. In the MLE Plus programme, the children's own cultural resources such as language, cultural artifacts, institutions and practices are used for teaching them formal concepts and theories. A number of activities were planned to empower not only the children but also the parents so that they participate in children's learning processes. Activities were planned at the level of both school and community for developing effective classroom pedagogy

based on children's everyday experiences. These interventions included motivating parents to send their children to school and closely monitoring the academic history of these children, developing the reading environment both in the community and in the school through a synergistic *Read Together* approach, providing authorship to the tribal villagers in these selected villages for the documents/books published on the basis of oral narratives provided by them on the local history, ecology, stories, songs etc. and making these books part of the *Read Together* programmes. MLE Plus sought to develop the community's interest in children's schooling by developing community reading and learning resource centres in which the oral tradition (story telling, songs and rhymes in the community) was linked to written texts.[8]

Besides this, the proposed action research through the MLE Plus initiative aimed at adding value to the government MLE programmes by monitoring children's transition to school languages based on strengthening their mother tongue by increasing the cultural inputs into language as well as mathematics, science and environmental studies curricula through the use of ethnographic analyses. Community awareness and involvement was particularly emphasised since most of the tribal children were the first generation that joined formal schools for learning.

Ethnographic survey

The MLE Plus approach began with an extensive ethnographic survey of the everyday practices and the knowledge systems in these two tribal communities of Orissa—Kond and Saora. The programme placed a special emphasis on teachers themselves making efforts to use these knowledge systems to strengthen the existing MLE practices in the schools. This was facilitated by regular interaction between the Community MLE Workers (CMW) who undertook this survey and the Government MLE teachers. An exhaustive exercise of concept mapping was done to identify various mathematical and science concepts the Saoras and Konds use in their everyday activities. These concepts are angle, length, force, weight, pull, shapes like square, rectangle, rhombus etc., and units for measurements like weight, length, volume etc. The cultural activities like folk games, weaving, art/craft, agricultural practices and house construction etc. were documented and analysed to show how these concepts, notions and ideas are embedded in these activities. The most noteworthy part of this documentation process was the careful analysis undertaken to examine how Saoras and Konds use these concepts to talk about balance, stability, equilibrium, best fit and gravity etc. The exact linguistic terms used for these concepts were documented. Where, why and how the communities use these concepts and the meanings embedded in their use were analysed. The CMWs collected the pictures of wall painting, *rangoli* and crafts that contain mathematical concepts like pattern, symmetry, progression etc. and interviewed Saora and Kond adults about the knowledge that helped them produce these crafts/arts. Mathematics/ Science knowledge and ideas embedded in weaving were documented. Various aspects like what patterns do the clothes have, how do the villagers describe a

pattern, and how do young learners learn specific designs, motifs and patterns were documented. Agricultural tool making, irrigation, laying plots for irrigation and sowing, buying and selling agricultural lands were analysed to show what concepts Saoras and Konds have to describe angle, length, force, gravity etc. The deep design structures of houses in these regions were analysed for similar purposes. Video recording and analysis of at least five to six folk games played by children in their communities were carried out for understanding the rules of the game and the kind of mathematics people use to play the games. The indigenous knowledge and classification systems used by Konds and Saoras in respect of trees, plants, and herbs, the soil properties for growth of plants and trees and their medicinal use and animal types, habitats, food and ecology were documented. Contextual use of linguistic terms for everyday discourse in respect of the social institutions, local governance, the line of authority and inter-community relationship and the larger democratic system of political governance and the conceptual relationship of these notions to the villagers' notions of time, history, geographical boundary, rights and duties were documented and analysed. These knowledge systems were then used as some guiding principles in workshops to develop culturally relevant and meaningful pedagogic activities (Panda 2007, Panda and Cole 2007).

Moving from everyday to scientific discourse

By the time young tribal children come to school, they already possess a vast repertoire of knowledge about their environment, family, relationships, quantities, numbers etc. Their knowledge is built around loosely connected everyday concepts rooted in their everyday practices. For example, our ethnographic data showed how different mathematical concepts and ideas are embedded in various cultural practices like cooking, agriculture, house construction, folk games, buying-and-selling etc. Children do possess basic knowledge of some of these mathematical concepts and ideas. So, one of the major objectives of MLE Plus programme was to link students' everyday knowledge as an epistemic system and the academic mathematics discourse so that the children could easily build the latter on the basis of the former (see Panda, 2008 for details). Vygotsky (1987) described conceptual development as an interaction between spontaneous everyday concepts and the organised systems of concepts referred to as 'scientific' concepts. He proposed that through formal instruction, children are given access to scientific concepts that enable them to reconceptualise their everyday experiences. In this sense, scientific concepts replace children's everyday concepts and they can begin to work within the more formal and generalised conceptual frameworks associated with schooling. But this is possible only if children's own knowledge systems, beliefs and values are used as the basis for development of more formal scientific knowledge. The interaction between scientific and spontaneous concepts can also be described as an interweaving process where scientific concepts grow downward through spontaneous concepts, while spontaneous concepts grow upward through scientific concepts.

In the present programme the children, while playing a folk game, are made to mathematise the situation in hand, talk about the mathematical concepts used in the game and the meanings of those in the given game context. Sometimes they are put in buying-and-selling activity or use a barter system to assess equivalence, determine the value or the price of the object, and handle money using their own Saora or Kond number system. Once they make certain transactions, they are asked some questions that require mathematisation or, at least talking about the transactions using a few mathematical terms. Here, the role of the instructor is crucial. Therefore, when mathematical activities are developed using folk practices, the teachers' roles become crucial. Often the moderation of the discussion is so managed that the children gradually learn to mathematise everyday experiences using the conventional school mathematical discourse and its symbols. Like Davydov's approach (1990), the children's notion of quantity, equality, more, less etc. are used along with numerous modal logic terms from everyday discourses to conceptualise the conventional mathematical symbols of equal (=), addition (+), subtraction(-) etc. Many folk games are manipulated where the notion of equity is evoked by making unequal distribution of objects or misappropriation and the children are asked to do justice to the partners. When the children redistribute the objects, they are asked to describe the process. Here, children often used the terms like 'I took back these many from Rama', 'Gave these many to Shyam', 'I saw to it that both get equal numbers' etc. These descriptive terms are then replaced by the symbols in the next step in which the students are not allowed to use the descriptive terms any more. They were given specific symbols that mean the same. Only after sufficiently dealing with the quantity concepts and schools mathematics symbols in the context of folk games, stories, barter games etc. in their own number system, do the children learn to use numbers, symbols and algorithms formally.

In the state MLE programme, the Saora children were taught counting first up to 20 in the Saora number system and then up to 30 in grade 1. The textbooks treated number 10 as the base value and the concept of base value was introduced by showing pictorially a bundle of 10 sticks, and a number like 11 was shown as the bundle along with one loose stick. Subsequently, one loose stick was added each time to show 12 till 19 and twenty is shown as two bundles of 10 sticks each.

If one looks at the Saora number system carefully, one finds the use of two base values: 12 and 20. There are thirteen basic numbers in the Saora number system. These are *ariba*(0), *abay*(1), *bagu*(2), *yagi*(3), *unji*(4), *manlai*(5), *turu*(6), *gulji*(7), *tanji*(8), *tinji*(9), *galji*(10), *galmuai*(11), *migal*(12). The numbers from 13 to 19 are created by adding base numbers to migal (12). So, 13 is m*igalbay [(migal (12) + abay (1)]*. Similarly, fourteen is formed by combining twelve with two i.e m*igalbagu [(migal(12)+bagu (2)]* and so on until nineteen i.e. m*igalgulj [(migal (12) +gulji (7)]*. They use *kudi* (20) then as a base for counting up to 39 (Panda, 2004). It is obvious that if one is using the Saora number system to teach counting and provide a basic understanding of the relationship between quantities and the

numbers, 10 as base value should not be introduced right away. The Saora children should be helped to deconstruct the numbers from 13 to 19 as 12 plus 1, 12 plus 2 etc. Similarly, 20 becomes the base value for generating numbers from 21 to 32. Once the Saora children get the notion of base value, they can be introduced to the Oriya number system. When they deconstruct values higher than 10 and compare those with the Saora number system, they understand the mathematical concept 'base value'. The CMWs attempted to help children look at their own number system and talk about 12 and 20 as base values for creating bigger numbers and then to show that other number systems including the Oriya number system have base values too, though they may be different. It is important to note here that pedagogues and teacher trainers in Orissa (as also in other states with large tribal populations) often complain about lack of ability among the tribal communities to conceptualise 10 as base value and put the blame on their oral traditions and lack of literacy among parents. Our MLE Plus intervention programme shows that this problem could be tackled only when the children's own knowledge and experiences are brought into focus in understanding the scientific concepts rather than being viewed as a deficit and interference and, hence, excluded. The base value issue is only one of many mathematical and science concepts in the schools which are clearly related to the everyday discourse of the tribal children. They can be accessed by the children more effectively through activities based on everyday knowledge; use of their everyday knowledge increases the ontological qualities of mathematical experiences and the discourses.[9]

Saoras do not have a writing system. The numbers are basically words that are spoken. Therefore all the calculations in the Saora system are done orally. Our earlier studies show that Saoras use various regrouping methods for doing basic calculations like addition, subtraction etc. (Panda 2004, 2006). So the Saora children were not introduced to the written symbols for numbers in the beginning of class one. The concept and the use of numbers and the number system were first strengthened orally through careful selection and analysis of everyday activities of children. Different everyday activities were planned to talk about numbers and some of the basic properties of the number system. The notion of odd numbers and even numbers, the concept of basic numbers, numbers growing till infinity, that the numbers can be added and subtracted and arranged in different patterns were discussed in the context of children's everyday activities. The deep design structure of craft objects like hat and umbrella made out of bamboo strips were brought to the classroom and discussed to show how different crafts use different systems of progressions of numbers and that there is a regularity or pattern in most of the crafts. In other words, the children are made to discover the use of the number system and its properties in almost every activity of human life. The conversations are organised in such a manner that the children can discuss the number system in as many ways as possible. Pattern recognition and mathematisation of patterns were specially promoted through these activities as higher mathematics builds on this

knowledge system. So, it is not only the use of the mother tongue that accounts for the difference in children's learning, it is also the more careful use of their everyday discourses in the classroom that makes learning possible.

Since this intervention programme is for three years, it is imperative to provide a theoretical distinction between 'replacement' (i.e., the substitution for an 'everyday' understanding of a more sophisticated conventionalised academic understanding) and 'interweaving' (i.e., maintenance of and interaction between the everyday and the scientific concepts) and make our position on these two clear. Integrating everyday and scientific discourses is regarded as essential in developing a deep understanding of specific domains of knowledge. The process of integration, however, may occur in quite different ways such as 'replacement' format and 'interweaving'.[10] 'Replacement' format refers to a process that emphasises substitution of an 'everyday' understanding with a more sophisticated conventionalised academic understanding, whereas 'interweaving' stresses maintenance of and interaction between the everyday and the scientific concepts in the classroom. We have noted that too much focus on 'replacement' may deter students from actively participating in socially constituted practices such as 'conjecturing' and 'justifying'. This may constrain creativity on the part of the students. Similarly, greater focus on 'interweaving' may result in children continuing in everyday discourse longer. This may sometimes reduce student inquiry to a process that lacks mathematical substance and clarity. Therefore both 'replacement' and 'interweaving' could be seen as necessary elements of the discourse practices of a classroom community. In the beginning, interweaving could be the dominant mode of transaction where the everyday spontaneous concepts form the basis of transaction. Once the children get the theoretical concepts, the everyday discourse may be replaced by the conventionalised academic mathematics discourse.

In an intervention study, a folk game called *Apphuchi* was used in grade 7 to teach the Saora children probability (Panda and Cole 2007). Initially, when the game was played by the children on the board (drawn with fingers on the ground) using four tamarind seeds as dice to earn points so that the players can move the counters on the board, the game itself evoked spontaneous concepts like chance, relative value, bias and many modal logic terms like would, could, should, may be etc. Chance, bias and relative value are called spontaneous concepts because these are loosely defined and regarded as everyday concepts by the children. When the children discussed the rules of the game using these terms and subsequently reflected on probability (the teacher tried to moderate the discourse so that the children examine the concept of probability in the context of the game), at one point the teacher realised that actual outcomes of the tosses interfere in children's acceptance of the theoretical probability of equal chances. At this point the teacher decided to dispense with everyday examples and engaged the children in theoretical possibilities. He discussed the concept of actual probability and theoretical probability with the children, drawing on their notion of bias evoked in the context of the folk game

Apphuchi. When the children freed themselves from the real life event to appreciate theoretical probability, they were given more abstract questions so that they indulged in more conventionalised mathematical discourse. At this point, 'interweaving' was replaced by the 'replacement' as the dominant mode of pedagogic approach for teaching probability. However, the interweaving method continues in other areas of mathematics and also for students who make a late transition (some spontaneously) to the theoretical concept of probability. Therefore we decided to use 'replacement' and 'interweaving' patterns of discourse as alternatives to the Initiation-Response-Evaluation format[11] (as advanced by Mehan 1979) that pervades classroom talk and as an initial heuristic to process information. A judicious alternative use of 'interweaving' and 'replacement' patterns of discourse in the mathematics class helped the MLE teachers understand how the everyday and scientific concepts could be linked in classroom talk to promote deep understanding among the tribal children. This, no doubt, requires a very different kind of teacher preparation.

Community MLE workers: The link between culture and school

Though the teaching–learning activities are taken from the community itself and the curriculum is organised in accordance with the seasonal activities of Konds and Saoras in state MLE programmes, there was a limited dialectical exchange between epistemic knowledge and practices in the community and in the classroom processes. This is mainly because the teachers were often not in dialogue with the communities. Further, they do not develop the activities themselves; rather they transact a pre-ordained programme under MLE. As mentioned earlier, the use of cultural materials within the framework of the theme web alone does not make the classroom transactions of the MLE teachers in government schools child-centered and joyful. In the MLE Plus programme, the CMWs provided this missing link. The MLE Plus programme essentially revolves around the issue of linking school to community as efforts are being made to simultaneously empower both and to use one to enrich the other. The growth of one is integrally linked to the growth of the other. Regular meetings of the CMWs with the parents, the development of community libraries run with the help of the *mukhia* (tribal leaders or heads of the village) and the schoolgoing children, documentation and printing of the stories, songs, rhymes and riddles with the speakers' authorship, and inclusion of these books in both school and community libraries are a few of these steps towards this end. In fact, the very act of undertaking the ethnographic survey was a significant first step towards bridging the gap between school and community. In MLE Plus, the ethnographic survey served two purposes; one, to make available a systematic documentation of the relevant cultural knowledge systems and epistemic practices that were subsequently used to evolve a culturally situated pedagogic practice, and two, to train the CMWs to look at everyday activities/practices from the children's

learning perspective and to develop these activities into culturally informed pedagogic tools.

The CMWs meet once every month for three days in a workshop where not only MLE issues (materials production, pedagogic issues) are discussed but also relevant teaching–learning materials and activities are developed on the basis of the ethnographic survey data. In this workshop, the State Project Manager, MLE+ Teachers, CMWs, and Language Group Coordinators jointly discuss various pedagogic and materials-related issues and problems and share best practice. Periodic observation of classroom processes by the Project Directors (the authors of this chapter) and the state level project staff such as the State Project Manager and the district level Language group Coordinators helped us identify specific issues and to address them both in the monthly meetings and in the workshops. Every month, one day is devoted to sharing and discussing each others' issues and problems like 'how best can the MLE Plus workers monitor each child's progress', 'how do they support individual children's learning and the transition from one language to another' and 'how do they prepare the community for children's education'.

Synergistic *read together* programme

The synergistic *Read Together* programme is a specially designed programme to facilitate the process of developing a sense of continuity between oral and written practices by collecting folk tales, stories and songs from individual community members and transcribing them into written texts with authorship and photographs. These and other selected reading resource materials go into a community library/resource centre for children, parents, and other adults in the community. In every village where an MLE+ School is located, a community resource centre is opened with the help of villagers under the leadership of village head (*mukhia*) and the members of Village Education Committee. The Kond and Saora community members were first approached by the CMWs to provide a space for opening this library/resource centre. A storage box was provided to store the reading materials. In most villages, a common meeting ground (ground space under a big tree located in the place where villagers meet) was used in the evening hours from 4–5 p.m. to read and discuss the books. The village heads (*mukhia*) have generally agreed to keep the storage box in their houses when not in use. In the first few months, community workers (CMW) go to the village during this hour, collect the box with the help of villagers from the *mukhia's* house and spread the books on a mat in the common meeting ground. In the first phase of this initiative, the CMWs used to read the story books, or asked some schoolchildren to read. Subsequently, the schoolchildren and adults, by and large, took charge of the library. By now, in three out of eight villages, parents have started demanding specific kinds of books. A few parents in these villages requested the CMWs to teach them to write their names and to learn to read small sentences in the story books. Initially, the CMWs helped

these parents in reading and writing and gradually passed this responsibility on to the schoolgoing children. After a month, some paper, pencils and crayons were also provided to these centres.

A preliminary assessment of MLE Plus

Our observations and monitoring of children's progress under the MLE+ show definite signs of positive effects on children's classroom attendance and participation, greater involvement in learning as well as planned activities under MLE+, and community interest in the teaching–learning processes. Teachers also reported better classroom achievement and participation of children. We undertook some formal assessment of classroom achievement in different subject areas at the end of the first year of the MLE as well as MLE+ programmes. All the children in the eight MLE+ schools and children from eight other adjacent MLE schools and eight non-MLE government schools in the vicinity were selected for a comparative assessment of classroom achievement. The Classroom Achievement measures were developed in a workshop with the help of CMWs, some teachers and language coordinators. These measures were directly related to the thematic content of the curricular materials used in the MLE classrooms. The measures used were modelled after the assessment tools used for all the State Government schools of Orissa. The measures used for our assessment were in children's MT and required both oral and written responses from them to specific items. The results of the evaluation undertaken at the end of year I for the Saora MLE+, MLE and Non-MLE schools on Language, Environmental Science (EVS), Mathematics and Drawing subjects are given in Table 18.1. Detailed analysis of the data and also the findings in respect of the Kond programmes are still in process. Further assessment of metacognitive processes underlying language and mathematics are planned. The items for all the assessment tools were developed in a workshop in Kui, Saora and Oriya languages.

The data clearly show that the Saora children from the MLE+ schools performed better than the Saora children from MLE and non-MLE Oriya-medium schools. However, the difference between the Saora students from MLE and non-MLE schools was not very prominent. It is, of course, too early to expect the difference in achievement levels among the children, particularly after only one year of intervention. A continuous evaluation at the middle and the end of the second and third years of the programme for classroom achievement and developments in the cognitive, metacognitive and affective domains will enable us draw preliminary conclusions with a certain amount of confidence. The present data may at best be seen as initial signs of some positive role of the cultural psychological pedagogy in MLE+ schools.

Table 18.1. Achievement scores of grade 1 children in 4 MLE+ schools, 4 MLE schools and 1 Oriya-medium school.

Subjects		**MLE+ School** N=74	**MLE School** N=47	**Oriya-Medium School** N=55
Language Subject	*Total Marks: 100* Oral: 70 Written: 30	55.36 36.32 17.04	36.59 21.04 14.55	37.40 23.40 14.00
Mathematics	*Total Marks: 100* Oral: 40 Written: 60	58.29 25.00 33.29	38.95 19.89 19.06	40.62 18.02 22.60
Environmental Science	*Total Marks: 50* Oral: 30 Written: 20	32.55 18.45 14.10	27.31 14.78 12.53	23.60 12.60 11.00
Drawing	*Total Marks: 25*	15.87	12.82	15.00

MLE Plus: some reflections

Our attempt to problematise 'Plus' through a careful planning of activities and our retrospective reconstruction of the processes that were put in place in the first year of the programme such as carrying out an ethnographic survey, training of CMWs, development of classroom activities in children's mother tongues, and developing community reading programmes all reveal that 'Plus' does not mean merely something extra to the existing MLE programme. It is rather a perspective, a metaphor that entails the philosophical underpinnings of critical pedagogy as advocated by Freire (2001), Apple (2004), Giroux (1997) and others and the principles of Cultural Historical Activity Theory (CHAT) as advocated by Vygotsky (Cole and Engeström 2007). This raises a question as to whether MLE and MLE Plus programmes are based on the same or two different perspectives. On the surface, they seem to be based on the same perspective, both aiming at using children's everyday context and materials for classroom teaching and building community awareness for education in their mother tongues. But MLE, being a fairly structured programme, seems to be still adhering to a minimalist agenda. What is required is intense engagement with pedagogic processes, a different quality of community participation, and the establishment of regular give-and-take between school and

community resources and knowledge systems with an objective of putting in place a critical pedagogy that helps students question and challenge domination and the beliefs and practices that dominate (Freire 2005). A social and educational vision of justice and equality need to inform all aspects of MLE practices. The MLE Plus programme seeks to strengthen this aspect of MLE through qualitative changes in classroom and community practices and by further reinforcing the cultural bases of school learning. The involvement of our CMWs with the community, such as tracking each individual child, holding regular meetings with the community members, teachers and the tribal leaders, involving tribal leaders at all levels of school education and community initiatives, running synergistic community reading programmes, developing classroom activities on a regular basis from the everyday materials and experiences of tribal children using robust pedagogic principles of cultural psychology, and, finally, using these activities with children in the presence of adults, yielded a unique example of scaffolding. The learning and development of critical consciousness and collective identity is expected to build on the sustained dialectical tension between home and school knowledge systems. This is possible only when there is a more regular give-and-take between the children's own culture and the classroom, without romanticising or privileging[12] any one form of discourse. Such practices can make school learning more meaningful and engaging for tribal children. This will definitely not estrange the tribal children from their land, language and culture as often happens in existing classroom practices.

Notes

[1] This Project is supported by a grant (INA-2006-102) from the Bernard van Leer Foundation, the Netherlands. Both authors are Directors of this project. A team of project staff (one State Project Manger and eight Community MLE Workers who are native speakers of the language) is appointed in the field (Phulbani and Gajapati districts, Orissa, India) in order to carry out the activities decided in periodically organised workshops through a larger consultative process. Two native speakers of both tribal languages, Kond and Saora, with some experience of school education, are appointed as language co-coordinators.

[2] Here, discourse means knowledge. Therefore, everyday discourse means everyday knowledge.

[3] We have chosen to use Cultural Historical Activity Theory (CHAT) as a general theoretical framework as it captures the paradigmatic essences of Vygotsky, Luria and Leont'ev (for the latest developments, see Engeström 2001 and Cole and Engeström 2007). We use those aspects of CHAT that recognise the role of action, labour and activity settings in the co-construction of mind. The CHAT framework is particularly instrumental because any reform would require a good historical analysis of socio-political conditions that result in certain kinds of arrangement of human life. It privileges children's everyday knowledge without undermining the power for formal literacy and academic practices. More than anything else, it has a clear theory of pedagogy based on a theory of action.

[4] The term 'homogenous' does not mean that children are essentially monolingual. It only refers to the fact that most of these children have the same mother tongue albeit with

some regional variation and they may have varying degrees of exposure to the second, third and other languages. Such exposures, however, are still quite limited for the purposes of their direct classroom use.

5 Singh, Deo Ranjan and Mahendra Kumar Mishra 2008. 'Orissa MLE'. Paper presented at the 'International Conference on Multilingual Education: Challenges, Perspectives and Opportunity', New Delhi, 5–8 February, 2008.

6 Some of the routine practices of the state-level programmers in India, particularly those in Andhra Pradesh and Orissa, are used as uniform and structured aspects of the MLE procedures, including the Theme web and Calendar approach mentioned earlier. These seem to have percolated into various MLE plans in India through the involvement of SIL (Summer Institute of Linguistics, a US missionary organisation—see Perez 2009, Phillipson 2009, Skutnabb-Kangas 2009, all this volume) early in the development of the MLE programmes.

7 Culture is often looked at by developmental and educational psychologists as something that is represented in the human mind. Such a definition is mentalistic as it doesn't capture the actual dialectical relationship between different sub-systems or activities that shape the human mind. It rather glosses over the tensions and conflicts that characterise the cultural activities, institutions and artifacts that mediate human learning. Cultural Historical Activity Theory does not subscribe to the mentalistic view of culture as it recommends use of children's language and everyday activities in classrooms so that they learn the concepts in an inter-subjectively shared environment where emotion and identity are part of the learning environment.

8 The idea here is to develop a sense of continuity between oral and written practices by collecting folktales, stories and songs from individual community members and transcribing them into written texts with authorship and photographs. These and other reading resource materials go into community resource centres as well as school libraries. The International Reading Association has implemented similar programmes in African countries.

9 Panda, Minati 2006. 'Ontological qualities of mathematical experiences: Comparison of two cultures'. Paper presented in IACCP 2006, Spetses, Greece.

10 Renshaw, Raymond and Peter Brown 2000. 'Four models of the processing integrating everyday and scientific discourse: Replacement, interweaving, contextual privileging and pastiche'. Paper presented as part of the symposium 'The discourse of science classrooms and popular science texts: Multiplicity in meanings, devices and rhetorical models', at the 3 Conference for Sociocultural Research, Campinas, Sao Paulo Brazil, 16–20 July, 2000.

11 Initiation-Response-Evaluation (I-R-E) refers to a method where the teacher asks students to answer questions, repeats students' responses and prods students to clarify their positions. The interweaving format allows the children to move back and forth between loose everyday talk and scientific discourse. The replacement format differs from the traditional I-R-E script in that it delays teacher evaluations of students' responses in favour of recontextualising what the students 'think' within the discourse practices of a mathematical community (Brown and Renshaw 2000). The discourse format is not about transmitting mathematical knowledge to students, but about motivating students to think of themselves as capable of engaging in the co-construction and interpretation of meaning, about propelling students in different directions through the subject

matter. As such, the replacement format contextualises the learning of mathematical knowledge within a classroom discourse that foregrounds mathematical practices such as 'representing', 'comparing', and 'justifying' and evaluates student products in terms of mathematical norms (e.g. 'efficiency' and 'clarity') that relate to those practices. In this way, students are equipped with the tools necessary to communicate their ways of doing mathematics to a wider classroom audience where the concrete and experiential may be rephrased, re-represented and replaced by the more abstract and general concepts of mathematics.

[12] We do not undermine the power of academic mathematics and science discourses for changing the quality of human life, the ability of communities to decide what is good for them as well as for the wider society, and to facilitate their social and politically informed participation in micro- and macro-cultural resource allocation and decision-making. But the politics of knowledge and issues of epistemology need to be understood so that 'validated' scientific knowledge does not function as a basis of oppression. Education, when it works as critical transformative praxis, may expose new modes of colonialism. It can, therefore, be used to empower the marginalised tribal and indigenous communities.