from developmental-constructivism to socio-cultural theory and practice: an expansive analysis of teachers' professional learning in early childhood education

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Journal of Early Childhood Research 2007 5: 83
DOI: 10.1177/1476718X07072155

The online version of this article can be found at: http://ecr.sagepub.com/content/5/1/83
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Suzy Edwards
Monash University, Australia

ABSTRACT
In recent years, sociocultural theory has become an increasingly popular theoretical explanation for development and learning in early childhood education. The articulation of sociocultural theory to practice by teachers used to a predominately developmental-constructivist theoretical perspective represents an area of emerging research interest. This article examines the appropriation of sociocultural theory by a group of Australian early childhood educators participating in a professional development program informed by Developmental Work Research (DWR). The DWR methodology offers the opportunity to examine the processes involved for educators when learning to operate within a new conceptual framework and the implications this holds for their practice. The findings suggest that appropriation of a new theoretical framework such as sociocultural theory involves educators critiquing and analysing existing practices, participating in opportunities to implement new models of work in addition to reflection on new ways of seeing children, growth, learning and development.

KEYWORDS activity theory, curriculum, early childhood education, sociocultural theory

introduction
In recent years discussion surrounding early childhood education and curriculum has shifted from a predominately developmental-constructivist to sociocultural discourse.
This shift has been informed by a number of theoretical developments in early childhood education, including postmodern arguments regarding the subjective nature of knowledge; continued dissatisfaction with the normative approach to development promoted by Piagetian theory; and increased familiarity in western academia with Vygotsky’s sociohistorical explanation for development (Ryan and Grieshaber, 2005; Stott and Bowman, 1996). Since the late 1980s the early childhood curriculum literature has been drawing more frequently on arguments related predominately to the Vygotskian conception of knowledge development. Here, references to the social and cultural nature of the developmental process, the role of peers and adults in learning and the famous notion of the Zone of Proximal Development (ZPD) abound. Important arguments have been made about the need for early childhood curricula to draw on sociocultural constructions of knowledge development to promote learning and to support children’s development in socially and culturally respectful ways (Edwards, 2005a; Fleer, 2006, Singer, 1996; Smith, 1996).

As is the situation in many western and European countries, sociocultural theory has continued to attract attention within the Australian early childhood sector as a contemporary theoretical informant of value to early childhood curricula (Anning et al., 2004). Increasingly, arguments regarding the need to operate from a sociocultural basis in terms of early childhood curricula practice (for example, observation, programming and planning) are to be found in state-mandated early childhood curriculum documents (Queensland School Curriculum Council, 1998; Stonehouse and Duffie, 2003; Tasmanian Department of Education, 2004) and in the research and theoretical literature (Fleer, 2002, 2003; Raban, 2001; Robbins, 2005). Despite such a high level textual presence the translation of sociocultural theory into practice has been hampered by the historical commitment the field holds to cognitive-developmentalism. Expressed in long-held values and past practices in teacher education, this commitment has promoted a normative conception of childhood and development. Existing beliefs about early education, combined with the arrival of sociocultural theory as an informant to practice, represent a situation whereby more knowledge is needed to understand how teachers appropriate contemporary perspectives in their work with children:

One of the greatest challenges facing the reform of early childhood education in Australia has been the growing chasm between theory and practice that has emerged as the field has matured – with most staff having trained well over twenty years ago. As such the dominant theoretical paradigm held by many early childhood teachers is situated within a constructivist-developmental orientation. Although these traditional beliefs and practices have been called into question by scholars, very little research has been directed towards understanding the difficulties with changing teachers’ beliefs and practices from a developmental to a sociocultural approach. (Fleer and Robbins, 2004: 47)
An emerging research focus in Australian early childhood education has begun to contrast teachers' understandings of sociocultural theory with more traditional theoretical orientations such as developmental-constructivism (Edwards and Hammer, 2006; Fleer and Richardson, 2004a; Fleer and Robbins, 2004; Fleet and Patterson, 2001). This research focus has resulted in examinations of teacher learning, particularly those associated with participation in professional development opportunities (Potter, 2001; Wood and Bennett, 2000) which mirror an emerging trend in the international literature arguing that teacher research should provide reflexive learning experiences for teachers in addition to contributing to the knowledge base (Pring, 2000). Edwards (2000) argues that early childhood teacher research needs to be orientated towards developing the interpretations and responses available to teachers in order to contribute meaningfully to solving practice-based problems. Accordingly, research activity that respects teachers' practices whilst offering opportunities for challenge and reflection on that same practice is necessary:

> Research needs to become embedded in the practical knowledge of the community of practitioners and inform practitioners' ways of seeing and being as they work with clients. At the same time it needs to be sensitive to the existing values and expertise, that is cultural capital, that practitioners already bring to bear on their professional decision making. (pp. 16–17)

Edwards' positioning of the research-practice relationship provides a research approach that contributes to practice rather than seeking to identify differences between theory and practice. Of particular importance to this conceptualization is the sensitivity extended to teachers' existing cultural capital. This is important because it allows teachers' activity to operate as the starting point for theoretical and practical change. Focusing on activity allows the interactions within work environments to be examined and acted upon in order to encourage reflexivity and support change in the community of practice.

Activity theory, a branch of sociohistorical theory, suggests that the complex relationships and interactions within a community of practice can be examined using the activity of the community as the unit of analysis. Activity is represented by the 'activity system' which is underpinned by the idea that human action represents a collective and culturally mediated process (Cole and Engestrom, 1993). An activity system comprises the object of the activity, the subjects involved in the activity, the mediating artefacts relevant to the activity, rules surrounding participation in the activity, the community of practice relevant to the activity and the division of labour involved in completion of the activity (Engestrom and Miettinen, 1999). Each component of the activity system relates to the other with the tensions between them serving to operate as a motive for change and development within the system itself, often giving rise to new or modified objects or...
mediating artefacts which in turn have implications for the cultural practices of the community of practice involved in the activity (Cole and Engestrom, 1993) (Figure 1).

Research focusing on activity as the unit of analysis enables the relationships between components of an activity to be examined, shedding light on how the activity is constructed, what historical dimensions are attached to the activity, how rules shape the nature of the activity and how the activity is related to the community in which it is enacted. Analysing these relationships provides a way of considering how and why particular cultural practices in a community are being used:

An important feature of activity as the basic unit of analysis of human behaviour is that when activities become institutionalized, they are rather robust and enduring. Once they gain the status of cultural practices, they often have radically longer half-lives than an individual goal directed action. In fact, activity systems such as those in schools and doctors’ offices, for example, appear to reproduce similar actions and outcomes over and over again in a seemingly monotonous and repetitive manner that gives cultural constraints on action a seemingly overpowering quality. (Cole and Engestrom, 1993: 8)

This idea is particularly pertinent to early childhood education during a period of theoretical change. Historically, constructivist-developmental theory has operated as a powerful tool for informing teachers’ understandings of curriculum (Spodek and Sarach, 1999) consequently shaping the nature of the learning experiences teachers implement for young children. Given that activity theory draws on the idea that tools are culturally mediated and defined, tools themselves come to have a historical importance having derived from the community and its practices in the first instance. In early childhood education the historical dominance of constructivist-developmentalism has seen this theoretical tool assume a mantle of normalcy that has served to define appropriate practice (i.e. the activity of

**figure 1** components of the activity system (Engestrom, 1987). Tensions between components operate as a motive for change and development within the system

Tools (mediating artifacts)  
Subjects  
Object → Outcome  
Rules  
Community  
Division of labour
early childhood), as hands-on, play-based and largely individualistic (Edwards, 2005b). However, because the activity system is sensitive to contradictions and open to reorganization, potential exists for older tools to be examined in light of more contemporary offerings. The advent of sociocultural theory in early childhood education is an opportunity to examine how a new theoretical tool is appropriated by teachers and the implications this holds for the object and outcomes of their activity in terms of their conceptions of curriculum and resultant approaches to practice.

**Methodology**

Activity theory formed the basis of a research project conducted in a local municipality in Victoria, Australia, with a group of early childhood teachers. Using Developmental Work Research (DWR) as the methodology this project aimed to challenge teachers' practice by providing them with access to the conceptual tools and discourse of sociocultural theory whilst simultaneously developing a comprehensive philosophy document aimed at describing the pedagogical imperatives of teachers working within the region. This article reports the findings from phase one of the project which was concerned with challenging teachers' existing understandings of curriculum to generate reflective practice regarding the use of sociocultural theory in early childhood education as an outcome of the activity system.

DWR methodology draws on the relationships between components of an activity system to help practitioners within a work setting generate changes in practice. An important aspect of DWR is that change must be generated within the activity system itself placing the researcher and the participants in a dialogical relationship. This idea contradicts the notion of the ‘independent and objective researcher via whom practices can be observed and/or modified at will by the use of theoretical texts exhorting practitioners to change their ways’ (Engestrom and Miettinen, 1999: 10). Research using DWR operates on the idea that intervention within the system is necessary to support practitioners to generate practical change (Edwards, 2000). Reflecting on components of the activity system is a crucial aspect of the generative process that involves practitioner examination of how and why particular tools are used and/or how the division of labour relates to objects and outcomes achieved (Engestrom, 1999b). Participating in the reflective process leads to the development of an expansive cycle which involves the existing culture of practice (referred to as internalization) and the creation of new artefacts aimed at addressing the issues or contradictions arising from the reflective process (referred to as externalization). The expansive cycle ultimately produces a modified activity system represented by the presence and application of new tools, objects and outcomes that consequently impact community practice:
An expansive cycle is a developmental process that involves both the internalization of a given culture of practice and the creation of novel artifacts and patterns of interaction. The new activity structure does not emerge out of the blue. It requires reflective analysis of the existing activity structure – participants must learn to know and understand what they want to transcend. And the creation of a new activity system requires the reflective appropriation of advanced models and tools that offer ways out of the internal contradictions. (Cole and Engestrom, 1993: 40)

Engestrom (1999a) details seven stages related to the expansive cycle through which participants must move in order to generate change. The first involves questioning and criticizing aspects of existing practice; the second, an analysis of the situation to determine the causes identified during the questioning process; the third, an attempt at modelling a new approach that addresses the issues identified in stages one and two; the fourth, an examination and testing of the model to establish its potential and limitations; the fifth the implementation of the model in order to concretize its application to practice; the sixth, reflection and evaluation of the model and the seventh, a consolidation process where the outcomes of the model become a new and stable form of practice [sic] (Engestrom, 1999a).

**research process**

The project was conducted in two phases with each phase representing a particular activity system. The object of phase one was to examine teachers' existing understandings of curriculum, with curriculum considered in terms of their informing theoretical informants to early education, their approaches to observation and their beliefs about programming and planning (Nuttall and Edwards, 2004). The object was addressed by using sociocultural theory as a new conceptual tool to challenge teachers' current thinking about early childhood education. The purpose the object was to generate reflective practice regarding the use of sociocultural theory in early childhood education amongst the teachers so that this outcome could be utilized as the new tool for generating change in phase two of the project. Figure 2 details the tool (sociocultural theory), the object (existing understandings of curriculum) and the outcome (reflective practice regarding the use of sociocultural theory) of phase one of the project. This article reports the findings from phase one of the project.

**research context, participants, method and data collection**

The research was conducted in a metropolitan municipality in south-eastern Melbourne, Victoria. The municipality caters for a growing early childhood cohort with approximately 14,000 children aged 0–4 comprising 10 per cent of the total
population. Preschool services in the area serve children aged three–five with the dominant delivery model serving four-year-olds attending sessional programs in the year prior to school. Twenty-five of the municipality preschools operate under a cluster management model which meets the administration, finance and legal responsibilities of each centre. A team of managers, leaders and Preschool Resource Liaison Officers (PRLOs) are employed by the municipality to address the preschools’ responsibilities. The study evolved from a desire within the preschool management team to continue some earlier professional development work which had focused on supporting teachers to move from a thematic to more constructivist orientation to their work. The management team was interested in documenting the core beliefs and values associated with early childhood education to be used as a common philosophical starting point for pedagogical work conducted within the municipality preschools. Therefore the project aimed to challenge teachers’ thinking (phase one) in addition to developing an over-arching philosophy document for informing practice (phase two).

All teachers and assistants working under the municipality were invited to participate in the project. From 25 preschools, 13 teachers and one assistant agreed to participate. Participation in the project involved the educators attending nine workshops (referred to as Professional Learning Sessions) of two hours duration over a nine month period. During each session a range of theoretical perspectives relevant to early childhood education were presented for discussion, including developmental theory, constructivism, sociocultural theory and approaches to sociocultural curriculum. Each Professional Learning Session (PLS) was audio-recorded and transcribed. Teachers maintained reflective journals
during the research period in which they recorded their responses to the PLSs. Questionnaires containing quantitative and qualitative items were administered prior to, and at the completion of, the nine sessions. Teachers also participated in an action research period where they drew on their developing understandings of sociocultural theory to implement sociocultural observations of children and reflected on what these meant for their practice. These observations and reflections were recorded in teacher data files. Individual on-site teacher interviews recording the teachers' interpretations of their data files were conducted with the PRLOs in attendance. Following the onsite interviews the data files were collected and the data collated by the researcher and used in a presentation during PLS seven to show teachers the different ways each approached the use of sociocultural theory in practice. Teacher discussions regarding this presentation were audio-recorded and transcribed with the teacher responses utilised in PLS eight as stimulus to examine the teachers' appropriation of sociocultural theory and its relationship to practice. Teachers' current understandings of curriculum and views and values in early childhood education were re-canvassed in this session. Key elements of the phase two data, including the teacher data files, individual interviews, session transcripts and reflective journals were relevant to the phase one focus on sociocultural theory as a tool for challenging teachers existing understandings of curriculum and are included in this article. Whilst this article focuses on the findings for phase one of the project, the research process and data collection for both phases are presented in Table 1.

findings

Intervention in the activity system was represented by sociocultural theory which operated as a ‘culturally advanced model and tool’ (Engestrom, 1999a: 33) for encouraging teachers to reflect on how and why they were using current tools (such as developmental constructivism) to inform their curriculum decision making (particularly with respect to approaches to observation). This involved the teachers reflecting on early childhood ‘rules’ such as those prescribing the use of individual domains-based observations, the provision of play-based materials and assumptions about learning being an ‘active’ process for young children. Movement from the internalized to externalized phase of the expansive cycle allowed the teachers to consider sociocultural theory as an alternative theoretical framework for informing practice leading to the exploration of new approaches to curriculum associated with their observational practices. This progression resulted in an adapted activity system comprising new tools and rules for thinking about curriculum. The stages of the expansive cycle enacted during phase one of the project are detailed in Table 2 and discussed in detail under the analysis heading.
Table 1: Research process and data collection

<table>
<thead>
<tr>
<th>Action</th>
<th>Data</th>
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</thead>
<tbody>
<tr>
<td><strong>Phase one: Challenging existing understandings of curriculum</strong></td>
<td></td>
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<tr>
<td>Introduction to the project</td>
<td>• Educators begin data files</td>
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<tr>
<td>PLS1: Existing conceptions of curriculum and philosophical beliefs</td>
<td>• Pre-project questionnaire</td>
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<td></td>
<td>• Reflective journal</td>
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<tr>
<td></td>
<td>• Tape recording of discussion</td>
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<td></td>
<td>• Maintenance of data files</td>
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<tr>
<td>PLS2: Piagetian theory and DAP</td>
<td>• Reflective journal</td>
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<td></td>
<td>• Tape recording of discussion</td>
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<tr>
<td></td>
<td>• Maintenance of data files</td>
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<tr>
<td>PLS3: Sociocultural theory (Vygotsky)</td>
<td>• Reflective journal</td>
</tr>
<tr>
<td></td>
<td>• Tape recording of discussion</td>
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<td></td>
<td>• Maintenance of data files</td>
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<tr>
<td>PLS4: Sociocultural theory (Rogoff)</td>
<td>• Reflective journal</td>
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<tr>
<td></td>
<td>• Tape recording of discussion</td>
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<td></td>
<td>• Maintenance of data files</td>
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<tr>
<td>PLS5: Sociocultural approaches to curriculum</td>
<td>• Reflective journal</td>
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<tr>
<td>(Te whariki, Reggio Emilia, Practice of Relationships, Essential Learnings)</td>
<td>• Tape recording of discussion</td>
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<td></td>
<td>• Maintenance of data files</td>
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<tr>
<td><strong>Phase two: Development of philosophy document</strong></td>
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<tr>
<td>PLS6: Compare and contrast theoretical approaches and observational techniques</td>
<td>• Reflective journal</td>
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<td></td>
<td>• Tape recording of discussion</td>
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<td></td>
<td>• Maintenance of data files</td>
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<tr>
<td>Action research: teachers implement sociocultural observations and programming and planning techniques</td>
<td>• Data files</td>
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<tr>
<td></td>
<td>• Teachers document children’s beliefs and values about preschool education</td>
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<td></td>
<td>• Individual interviews about data files</td>
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<tr>
<td>PLS7: Presentation of data from teacher data files</td>
<td>• Post-project questionnaire</td>
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<td></td>
<td>• Reflective journal</td>
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<tr>
<td></td>
<td>• Tape recording of discussion</td>
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<tr>
<td>PLS8: Presentation of summarized data from session 7 and current conceptions of curriculum and philosophical beliefs</td>
<td>• Reflective journal</td>
</tr>
<tr>
<td></td>
<td>• Tape recording of discussion</td>
</tr>
<tr>
<td>Parent discussion session 1: beliefs and values about teaching and learning</td>
<td>• Tape recording of parent discussion</td>
</tr>
<tr>
<td>PLS9: Presentation and discussion of draft Preschool Philosophy Document</td>
<td>• Field notes</td>
</tr>
<tr>
<td></td>
<td>• Teacher evaluation forms regarding document</td>
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<tr>
<td></td>
<td>• Collect teacher copies of draft with notes</td>
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<tr>
<td>Parent session 2: presentation and discussion of draft Preschool Philosophy Document</td>
<td>• Tape recording of discussion</td>
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<tr>
<td></td>
<td>• Collect parent copies of draft with notes</td>
</tr>
</tbody>
</table>
### Table 2: The expansive cycle as it unfolded during phase one of the project

<table>
<thead>
<tr>
<th>Project phase</th>
<th>Stages of the expansive cycle (Engestrom, 1999a)</th>
<th>Corresponding stage in the project</th>
<th>Outcome of the stage in the project</th>
<th>Associated expansive cycle process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1: Challenging existing understandings of curriculum</td>
<td>1. Questioning aspects of existing practice</td>
<td>Teachers examine existing understandings of curriculum, DAP, Piagetian theory and constructivism. Issues regarding these informants raised by the researcher from postmodern and sociocultural perspectives.</td>
<td>Teachers question assumed dominance of developmentalism as informant to their practice</td>
<td>Internalization (existing practices) Reflection (on existing practices)</td>
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<tr>
<td></td>
<td>2. Analysis of the situation to identify causes related to issues raised during questioning</td>
<td>Teachers consider why and how they use developmental constructivism in their practice</td>
<td>Teachers examine how theoretical constructs from sociocultural theory relate to developmentalism</td>
<td>Contradictions (posed by new theoretical tool)</td>
</tr>
<tr>
<td></td>
<td>3. Modelling a new approach that addresses concerns raised during questioning and analysis</td>
<td>Teachers implement understandings of sociocultural theory in practice</td>
<td>Teachers develop sociocultural approaches to observation</td>
<td>Appropriation (of new theoretical tool in practice)</td>
</tr>
<tr>
<td></td>
<td>4. Examining and testing the model</td>
<td>Teachers examine use of sociocultural theory in observations and consider implications for practice</td>
<td>Teachers express understandings about development and learning informed by sociocultural approaches to observation</td>
<td></td>
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</tbody>
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**Phase 1: Challenging existing understandings of curriculum**

- Teachers examine existing understandings of curriculum, DAP, Piagetian theory and constructivism.
- Issues regarding these informants raised by the researcher from postmodern and sociocultural perspectives.
- Teachers consider why and how they use developmental constructivism in their practice.
- Teachers examine how theoretical constructs from sociocultural theory relate to developmentalism.
- Teachers develop sociocultural approaches to observation.
- Teachers express understandings about development and learning informed by sociocultural approaches to observation.
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</tr>
</thead>
<tbody>
<tr>
<td>5. Implementing the model</td>
<td>Teachers implement sociocultural observations of children</td>
<td></td>
<td></td>
<td>Externalization (new theoretical tool modelled, designed and implemented)</td>
</tr>
<tr>
<td>6. Reflection and evaluation of the model</td>
<td>Teachers share new approaches to observation and changing ideas about curriculum practice</td>
<td></td>
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<tr>
<td>7. Consolidation of the model</td>
<td>Teachers appropriate sociocultural discourse for thinking about early childhood education</td>
<td></td>
<td></td>
<td>Internalization (new model the dominant way of working)</td>
</tr>
</tbody>
</table>
analysis: moving through the expansive cycle

The expansive cycle emphasizes the internalization of existing processes which are the norm for operation within a community in relation to its activity. In this study, internalization was manifest in constructivist-developmental approaches to observation and beliefs about curriculum which represented existing thinking about development. Externalization began with the interruption of the existing activity allowing criticism and reflection of internalized beliefs and processes. This occurred when the teachers reflected on their use of constructivist-developmentalism in comparison with arguments arising from sociocultural theory. New approaches to curriculum were necessitated and externalization reached its peak when the new designs were implemented representing a new model for activity. These became the norm for thinking about and engaging in community activity as represented by the teachers’ framing of observational and curricular practices from a sociocultural perspective (Engestrom, 1999a). The stages of the expansive cycle are discussed in more detail below.

stages one and two: questioning and analysing existing practices

Stages one and two of the expansive cycle involved examination of the teachers’ existing understandings of curriculum which were expressed in constructivist, individual and domains-based terms. For example, individual developmental progress and the role of play in learning were evident in the initial descriptions of curriculum expressed in the pre-project questionnaires:

My philosophy is that all children have individual needs and develop at different stages. This means the curriculum comes from the children. Their interests/needs/wants are met by planning play-based experiences. (Teacher two)

The program is play-based and based on the observed needs, interests and developmental progress of the children. (Teacher four)

The curriculum is child-centred, initiated, directed an adult supported. It considers all developmental areas – social, emotional, cognitive and physical. It should be flexible. (Teacher seven)

These ideas were also reported during PLS one with child-centeredness and children’s interests considered important:

We follow the children's interests; basically follow their needs and interests and take it from there. If they are really interested in something then we put out that, and if they go with that we extend on it, so you say to yourself 'ok, they are going this way, so we will go this direction'. Sometimes, they go a bit further, sometimes they don’t. We have a variety of experiences out there, that they are interested in, just having lots of materials available for them so that they can each work with them at their own different ages and stages. (PLS one, teacher one)
Reflection on existing beliefs and practices continued during PLS two with a focus on constructivist-developmentalism framed from a Piagetian perspective. Discussion during this session was preceded by a lecture on Piaget's genetic epistemology which identified Piaget's interest in determining the origins of knowledge as the basis of the theory. This enabled the ages and stages of development to be positioned as a theoretical outcome of the explanatory power of the genetic epistemology rather than as a central component of the theory itself as commonly represented in many early childhood texts. Piagetian theory was a dominant influence on the teachers' thinking with references made to the theory as a starting point for curriculum common in the transcript data from PLSs one and two, the teacher journals and the pre-project questionnaires. Piagetian theory was explicitly identified as a central informant to the teachers' thinking in nine out of 17 responses in the pre-project questionnaires, with a further five responses identifying either play-based learning and/or ages and stages of development as important. A journal entry completed by teacher three after PLS two illustrates the use of Piagetian theory in relation to curriculum formation with the ages and stages of development considered a guide to practice, and ideas about the active construction of knowledge informing pedagogical decision-making:

Piaget was the theory that I remember most from university and I believe that the ages and stages gave me the basis of where a child should be when I needed guidance and ideas as a beginning teacher. Even though children are very different and move through stages at different rates it was comforting to be familiar with these stages. The thoughts of being interactive with experiences – touch, handle, move, taste, see and hear to be involved in an activity I believe are important – although I know some children need to have extended periods of watching and observing before they are ready for the interactive level. By providing open ended activities children are given an opportunity to be involved at their own level of development. Even today I use checklists, running records, anecdotal records for individual and group records. (Reflective journal, teacher three)

Teacher two also reflected on the role of Piagetian theory in relation to her practice and expressed surprise at learning more about the genetic epistemology in contrast to the ages and stages component of Piaget's theory. Here, whilst the teacher described Piagetian theory as the status quo during her training, her reflection on the use of the theory still positioned it as ‘useful' and ‘foundational' to her work with children:

I had never heard before that Piaget had not originally set out to create ages/stages of development. In all the discussions at university this never came up! We weren’t encouraged to question this and it was not presented as a theory – rather as a fact. I do like aspects of the theory where the children are regarded as individuals who will get to each milestone in their own time and the ‘discovery learning' where children are seen as active learners and the ages and stages approach maybe useful as a foundation but the individual focus and reflection of the equipment and experience...
An important contribution to the teachers' movement from the internalizing to externalizing phase of the expansive cycle came from one of the teachers during the second PLS discussion regarding Piagetian theory. This teacher had previous experience working with immigrant children in inner-city Melbourne. She described how the children, and their approaches to play contrasted with the constructivist-developmental theoretical perspective she held as the norm regarding appropriate developmental development and therefore the provision of appropriate curriculum:

In some cultures there are things that children have just never experienced in any way, shape or form. They might be really interested when they first see it but they have no knowledge to bring to that table. The Somalian communities I worked with, these children had never seen scissors or toys. They actually climbed the walls and tables because they had never been in that [preschool] environment. I tried doing things [to support the children] but even that was from a white perspective, like I put out little black dolls and they would have played with a stick for hours. So they come to a traditional western kindergarten which is foreign in its expectations of how you play – you know, do you play with a stick or do you play with a computer? So what are you doing to those children? Does Piaget's theory actually work for those children? (PLS two, teacher eight)

Reflecting on her experience working with children from a culture different to her own allowed this teacher to critique the extent to which developmentalism operated as an informant to her practice. Her attempt to meet the children's needs from a developmental perspective originally involved the well intentioned, but inappropriate, provision of the 'little black dolls'. Her realization that her attempt to meet their needs was occurring from an Anglo-Saxon perspective led her to question the theoretical foundation that had prompted the provision of the dolls in the first instance – the traditional kindergarten based on a constructivist-developmental theoretical framework was not necessarily meeting the children's needs. Admittedly, this teacher's realization was prompted by her teaching experience rather than her participation in the project. Nonetheless, this contribution allowed her to publicly question the relevance of the theory to the teachers' work in general:

And we are all taught about it. Is it a theory that still has relevance in early childhood education now? Or are we using it out of habit? Has it become institutionalized? (PLS two, teacher eight)

Considering developmentalism in habitual terms allowed the teachers to examine the relevance of the theory to their work with children and families. However, questioning the assumed dominance of developmentalism was
considered daunting and raised the possibility of working within a theoretical vacuum:

Piaget's theory has been promoted all the way through University so questioning his concepts/relevance is a little daunting. Piaget's theory still has some relevance in providing guidelines although we must take in account culture, today's society, families in particular and environmental considerations. (Reflective journal, teacher four)

This session helped to focus on the different cultures we work with – different values. How do we incorporate these differing values into our programs? We value children's independence and ability to do things themselves – compared to Sri Lankan children who are still dependent on their parents, e.g. preschool children still spoon-fed – this is how parents show their love and caring, our way would appear uncaring. If we dismiss Piaget altogether what is left? (Reflective journal, teacher eleven)

These reflections were important to movement through the expansive cycle with questions such as ‘if we dismiss Piaget altogether what is left?’, or ‘are we using it out of habit?’ challenging developmentalism's position as a universal truth in early education allowing different theories and their potential for informing practice to be considered. By PLS six the teachers had examined sociocultural explanations for development that emphasised Vygotsky's and Rogoff's theories of development. The Vygotskian explanation highlighted the sociohistorical argument regarding the role of psychological tools in development and the role of social interactions in learning across the intrapersonal and interpersonal planes (Vygotsky, 1978). Rogoff's work highlighted the community/institutional plane of development in relation to the intrapersonal and interpersonal planes established by Vygotsky and emphasized transformation of participation in cultural activities as central to developmental progress (Rogoff, 1998). Sociocultural approaches to early childhood curriculum, including New Zealand's *Te whariki* (Ministry of Education, 1996), elements of the project work in Reggio Emilia (Malaguzzi, 1998) and Australia's New South Wales' *Practice of Relationships* (Stonehouse and Duffie, 2003) were made available for examination and critique. Sociocultural approaches to observation, drawing in particular on Fleer and Richardson's (2004b) work were demonstrated to the teachers as examples of sociocultural theory-in-practice and were compared with traditional domains-based individual observations.

Key ideas in sociocultural theory regarding the social and cultural formation of development and knowledge challenged many of the teachers' understandings of early education. These ideas contradicted previously internalized behaviours and beliefs promoting movement within the expansive cycle. This was evidenced in the teachers’ discussion surrounding the purpose and function of observations conducted from a developmental perspective. For example, teacher twelve realized that traditional observational approaches positioned developmental knowledge as more important than understanding children's cultural experiences:
It just occurs to me, there are a lot of cultures I don’t know a lot about and so you would go about your normal business. I reckon, more often than not, you would make an assumption about a child before you go and investigate their experiences. I just wonder how much we actually question all that and how quickly we make an assumption based on a single observation in our programming. (PLS three, teacher twelve)

The contradictory phase of the expansive cycle was followed by the teachers’ appropriation of sociocultural theory as a new theoretical tool for thinking about practice. This aspect of the cycle was enacted during the action-research component of the project during which time the teachers attempted to implement observations of children that drew on their interpretations of sociocultural theory. These attempts were recorded in the teachers’ data files and represent those stages of the cycle characterized by modelling, examining and implementing new models of activity.

**stages 3, 4 and 5: modelling, examining and implementing a new model**

These stages of the cycle focused on the teachers’ experimentation with different observational formats based on interpretations of sociocultural theory. Examples of the teachers’ pre-project and during-project observations were collected in the data files with the pre-project observations tending to focus on individual children, their strengths/weaknesses, and on describing children’s actions in particular activities (Figure 3).

Observations drawing on sociocultural theory began to emphasize the teachers’ understandings of the social construction of knowledge. These observations focused on interactions between children and adults, recording learning as it occurred between people rather than describing children’s actions or abilities. Teachers employed Vygotsky’s notion of the two planes of development in an attempt to record how children engaged socially to construct knowledge and understanding of particular concepts and/or their use of tools in given activities. Figures 4 and 5 illustrate observations by teachers six and ten that were conducted from this perspective.

Other teachers built on their interpretation of the ZPD from Vygotsky’s work. These observations recorded children’s existing abilities in relation to target learning achieved with assistance from either themselves or from the children’s peers. Notes were made on these observational diagrams about assistance and recorded as A–C (adult-to-child) or P–P (peer-to-peer) support. These observations focused more on the learning that was actually occurring for children than had the pre-project observations which had tended to describe children’s current levels of achievement rather than their developmental potential. The focus on learning allowed the teachers to note their future intentions for building on children’s developing knowledge and skills within the same observation in a manner that was not present in the pre-project observations (Figure 6).
The observational formats developed by the teachers suggested increased awareness regarding the social construction of knowledge. Observations of children moved from an individual, domains-based approach to an emphasis on recording learning as it occurred between people within given contexts. These understandings were combined with sensitivity to children's cultural experiences and the need to reflect these in the early childhood classroom. This point of the expansive cycle reflected the teachers' appropriation of sociocultural theory as a way of thinking about learning and teaching in early childhood education:
My philosophy now is focusing more on the quality of interactions between children and adults. I believe now in looking and observing children in groups rather than focusing on the individual. Looking at prior notes, I didn't really take into account how important and vital the interactions with their peers are. I still strongly value positive and rich learning environments but the project has also made me think and reflect on my practices interacting with children. Like what questions to ask? Where do ideas come from? And the importance of scaffolding between adult-to-child and peer-to-peer. (Reflective journal, teacher five)

My philosophy now would include acknowledgment of the child's cultural values and beliefs and how important peers and interactions are in the learning process of children; scaffolding, collaboration and interactions. I have a deeper understanding of what 'culture' actually means. We all have our own culture. I never thought this way before. (Reflective journal, teacher nine)
Stages six and seven of the expansive cycle focused on the teachers’ evaluations and consolidated use of sociocultural theory in practice. Teachers described situations from their teaching that highlighted how they were interpreting what they were seeing from an alternative perspective to the traditional developmental approach. This was illustrated by teacher eleven who expressed surprise at the extent to which a child was seen to support the learning of others:

A child and the assistant made a puppet and this sparked off some of the other children. They showed interest and the child was instructing the other children in how to do it. I thought they were just pasting and I looked over and I thought ‘oh she is actually instructing the other children in how to do it.’ I probably wouldn’t have observed for that period of time and thought about what they produced and what they were capable of and how she was able to instruct another child. It told me a lot about her that I wouldn’t have observed and seen that she was capable of doing that. I got excited seeing that with her and now I know that she is capable of telling someone else something. In other circumstances now I will say to her ‘well you know you can show them’. (PLS seven, teacher eleven)
The observation and interpretation in this example was based on the teacher's awareness of how the child was operating within a particular context in relation to her peers and the assistant. In this example the teacher's use of sociocultural theory was evident in her excitement regarding the child's potential and her ability to work with other children, as noted in the teacher's comment that she previously would have thought the children were ‘just pasting’. In contrast the teacher's framing of the observation from a sociocultural perspective alerted her to the interactions occurring between the children and therefore the focus child's ability to teach others. This emphasis on interpreting the preschool context from a sociocultural perspective represented a shift from prior interpretations of early education which had drawn on developmentalism and emphasized individual needs and interests in relation to particular ages and stages of development. At this stage of the expansive cycle the teachers were articulating understandings of practice that drew on sociocultural explanations for learning and development to inform what was happening at a practical level. An interesting example was offered by teacher seven, who described how working from a sociocultural perspective lead her to consider how cultural dynamics were working within the classroom and impacting children's learning:

Our centre is quite multicultural; however as a society we value independence. In the Sri Lankan community it is the mother's role to be doing things for children so these mothers would be neglectful if they didn't spoon-feed their child and help them get dressed. In our centre we are saying to families [helping children] is not teaching them to be independent although helping is something they value. We stopped insisting the children put their smocks on themselves. It became less of an issue. Before we would be going ‘why can't they do it themselves?’ Now we just step back and think it is not such an issue. Before we would say ‘put the smock on and get to work’. Now it is not a big deal anymore, we just help with that. I think it is probably a more genuine acceptance of other cultures and differences. I think it is very easy to say we accept individual differences and cultural differences without really caring. Like ‘we accept them – but put your smock on yourself.’ This is different to tolerance because with tolerance you think ‘we tolerate it’ but you are not necessarily compassionate about it. (PLS seven, teacher six)

This particular evaluation demonstrates the teacher's awareness that sociocultural theory could be used to inform her interactions with the children so that she was more compassionate about understanding how their cultural experiences impacted their ability to operate in the classroom. Her pedagogical actions became informed by an awareness of the children's cultural and developmental needs rather than her interpretation of a developmental skill (independence) derived from the developmental perspective. Insisting the children put on their own smocks because her cultural background valued independence was replaced with respect for the children's cultural experiences which meant the whole issue of developing independence in these children was no longer ‘a big deal.’ Importantly, this shift in orientation resulted in the teacher feeling...
that she was now being genuinely respectful, rather than tokenistic of cultural difference. The comment, ‘we accept them – but put your smock on yourself’ is telling in this instance.

**summary**

DWR offers an approach to teacher research that allows intervention to occur within a community of practice that is respectful of teachers’ existing theoretical orientations and yet offers opportunities for reflexivity that supports opportunity for change. The expansive cycle associated with DWR allows the process involved in generating change to be examined and illustrates how internalized practices can be challenged and new models for practice externalized prior to becoming the next mode of operation. In this project the internalization phase was represented by the teachers’ examination of their existing ways of working, whilst externalization commenced as they began to consider how sociocultural theory could inform their practice. This newly emerging way of working was represented by discussions regarding the teachers’ practice and observations of children that were conducted from a sociocultural rather than developmental-constructivist framework. Movement within the expansive cycle involved a number of processes, including: 1) the teachers’ reflection on their existing tools and practices; 2) the opportunity to implement and model new ways of working; 3) the opportunity to share newly developed models with colleagues; and 4) the consolidation of internalized approaches to work represented by reflection on the role of social and culture experiences in children’s development and learning.

It is important to note that the expansive cycle does not, and should not end with the appropriation of sociocultural theory as a new conceptual tool for informing practice. This is important for two reasons. First, because activity is invariant future contradictions to the system will always impact on associated practices into the future. Challenges from a theoretical and/or practical perspective could promote activity in the system resulting in a new expansive cycle ensuring continued change within the community. Second, sociocultural theory represents only one amongst many contemporary theoretical perspectives in early childhood education. The critical, feminist, postmodern and post-structural based literature (Lubbeck, 1996) also holds potential to operate as new conceptual tools for promoting change in the activity system. Had any of these theoretical informants been used the outcomes in terms of appropriated practices and movement through the expansive cycle would possibly be quite different.

The use of DWR in this project illustrates the extent to which professional development opportunities can be used to provide a forum for teachers to examine their existing modes of operation. DWR suggests that changes adopted within an activity system by teachers are more readily articulated to practice than those externally imposed or exhorted upon practitioners by research and/or theoretical
literature arguing that a particular theoretical perspective has passed its use-by-date. In this way, issues traditionally associated with the gap between theory and practice may be avoided and theory utilized as a genuine driver of change.

references


correspondence

Suzy Edwards, Lecturer at Faculty of Education, Monash University, PO Box 527, Frankston, Victoria 3199, Australia. [email: susan.edwards@education.monash.edu.au]