

- P.R. Portes, T.E. Cuentas, and M. Zady, "Cognitive socialization across ethnocultural contexts: Literacy and cultural differences in intellectual performance and parent-child interaction," *Journal of Genetic Psychology*, 161 (2000), 79-98.
- H. Pullmann, J. Allik, and R. Lynn, "The growth of IQ among Estonian schoolchildren from ages 7 to 19," *Journal of Biosocial Science*, 36 (2004), 735-40.
- N. Rao and S.M. Stewart, "Cultural influences on sharer and recipient behavior: Sharing in Chinese and Indian preschool children," *Journal of Cross-Cultural Psychology*, 30 (1999), 219-41.
- L.W. Rodney, D.L. Johnson, and R.P. Srivastava, "The impact of culturally relevant violence prevention models on school-age youth," *Journal of Primary Prevention*, 26 (2005), 439-54.
- D. Rudy and J.E. Grusec, "Authoritarian parenting in individualist and collectivist groups: Associations with maternal emotion and cognition and children's self-esteem," *Journal of Family Psychology*, 20 (2006), 68-78.
- S.M. Stewart, M.H. Bond, W. Chan, R.M. Zaman, R. Dar, and M. Anwar, "Autonomy from parents and psychological adjustment in an interdependent culture," *Psychology and Developing Societies*, 15 (2003), 31-49.
- T. Tulviste, "Sociocultural variation in mothers' control over children's behavior," *Ethos*, 32 (2004), 34-50.
- I.A. Valdivia, B.H. Schneider, K.L. Chavez, and X. Chen, "Social withdrawal and maladjustment in a very group-oriented society," *International Journal of Behavioral Development*, 29 (2005), 219-28.
- R.E. Varela, E.M. Vernberg, J.J. Sánchez-Sosa, A. Riveros, M. Mitchell, and J. Mashunkashey, "Parenting style of Mexican, Mexican American, and Caucasian-non-Hispanic families: Social context and cultural influences," *Journal of Family Psychology*, 18 (2004), 651-57.
- P.G. Vinden, "Children's understanding of mind and emotion: A multi-culture study," *Cognition & Emotion*, 13 (1999), 19-48.
- Q. Wang, "The emergence of cultural self-constructs: Autobiographical memory and self-description in European American and Chinese children," *Developmental Psychology*, 40 (2004), 3-15.
- Q. Wang and M.D. Leichtman, "Same beginnings, different stories: A comparison of American and Chinese children's narratives," *Child Development*, 71 (2000), 1329-46.
- Q. Wang, M.D. Leichtman, and K.I. Davies, "Sharing memories and telling stories: American and Chinese mothers and their 3-year-olds," *Memory*, 8 (2000), 159-78.
- T.S. Weisner, "Introduction," in T.S. Weisner (ed.), *Discovering Successful Pathways in Children's Development: Mixed Methods in the Study of Childhood and Family Life* (Chicago, IL: University of Chicago Press, 2005), pp. 1-20.

20 Designing, implementing, sustaining, and evaluating idiocultures for learning and development: The case study of the Fifth Dimension

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Of the multitude of contributions that Çiğdem Kağıtçıbaşı has made to our understanding of culture and human psychological development, I focus here on her achievements in the creation of development-promoting early childhood education. The work that I present does not approach in scale that which Professor Kağıtçıbaşı has accomplished in her native land of Turkey. However, I hope that the model underlying the project I describe will provide ways to think about two important issues facing developmentalists today. First, how to design development-enhancing environments for culturally diverse populations of children living in a wide variety of socio-ecological conditions. Second, how to create modes of higher education that will produce young practitioners who are capable of implementing and developing such environments.

Designing education after school

The first peculiarity of the approach adopted in the project described here is that it is designed to take place in the *after*-school hours. Consequently, it presupposes the existence of a society where schooling is pervasive, if not universal, and cultural circumstances where children's after-school hours are not highly institutionalized; rather, they are characterized by a great variety of arrangements, including participation in unsupervised play, attendance at various kinds of youth clubs, formal or informal sports activities, and various cultural enrichment activities such as music, dance, art, and the like.

It also presupposes that the society in question has a variety of institutions of post-secondary education, designed to train experts in a variety of knowledge required for participation in advanced industrialized societies with their expectations of high levels of literacy and numeracy, and specialized technical knowledge. Such social conditions ordinarily co-occur and, to one degree or another, currently exist in many

countries in the world, including Turkey, the primary site of Professor Kağıtçıbaşı's own work.

After-school education in the United States: a brief history

The idea that providing supplementary forms of after-school care for children, including care that contains an explicit educational component, has a long history in the United States (Halpern 2003). Dating from the late nineteenth century, American educators have drawn upon a wide variety of social concerns and ideological commitments to justify their advocacy of the after-school involvement of adults and children in organized settings. Chief among the issues that motivated early proponents of after-school education were restrictions on child labor, attempts to keep children in school for more years, and the social disruption caused by children because they either did not attend compulsory schools or were unsupervised during the hours between school dismissal and the return of their parents from work, putting them, presumably, at risk in a variety of ways until their parents returned home from work.

This same concern for social order and children's safety remains one of the major motivations behind such efforts (Newman et al. 2000). This document and similar reports highlight evidence that children are most likely to be the victims or perpetrators of crime between 3:00 and 4:00 in the afternoon and that children attending after-school programs are more likely to do well in school (Lauer et al. 2004). More recently, the possibility that after-school programs may foster achievement has been added to the list of reasons put forward for the formation and support of such institutions (Belle 1999; Eccles and Gootman 2002).

As a consequence of these concerns, a multitude of programs, financed not only by federal, state, and local governments but also by several large philanthropic foundations, have been put in place. In addition, prestigious institutions of higher learning have set up programs devoted to the promotion of widely available and high-quality after-school educational programs. These programs have built upon such long-standing institutions as the Boys and Girls Club of America, or the Scouts (versions of which are to be found in many industrialized countries throughout the world).

Despite this increased interest in the creation of more settings that would enrich the lives of children in the hours between the end of school and the beginning of evening life in the home, these efforts have faced a number of recurring problems. These include insufficient funding,

quality control, and sustainability. In some cases parents or religious organizations have been able to mount programs that achieve the goals of providing a safe place for children and education, to the extent possible with staff who are not themselves well trained in child development. But a large number of such programs are judged to be of low quality (Eccles and Gootman 2002). Where they are government financed, bureaucratic requirements and rigidity are likely to set in, and funding may be cut back when other national priorities intrude.

A second motivation for the present model: problems in higher education

During the same decades when interest in organized after-school activities for children was growing in the US, the percentage of young people graduating high school and matriculating into various post-secondary colleges and universities was also increasing. Whereas, fifty years ago, most youth did not graduate from high school, today most youth not only complete high school, but go on to experience some level of "higher" education.

This average increase in educational levels was driven by a variety of factors and had a variety of consequences, not all of which could be considered an unalloyed good for society. On the one hand, the levels of numeracy and literacy deemed necessary for success in the world of work increased. Modern industrialism built upon the model of Fordism was giving way to the "information" society, and failure to obtain a college degree came to mean a life of diminished earnings and the social consequences that accompany lower income (Carnoy 2002). On the other hand, the provision of post-secondary education to a far larger part of the population has meant not only a swelling of enrollments, but also a swelling of enrollments that has not kept pace with a corresponding increase in teaching faculty. As a consequence, many students, even at relatively high status universities, and especially in popular majors such as psychology, go through their entire college education taking primarily large courses, numbering into the hundreds, reading textbooks, and being evaluated by multiple choice questions. In addition (and most important to my present concerns), they have little or no opportunity to discover how the phenomena they read about actually manifest themselves in live circumstances. If there are provisions for laboratory courses, they are most often restricted to experiments with rats or pigeons, or, perhaps, to canned experiments involving computer-generated displays.

This form of education produces an odd, alienated form of academic learning. I have, for example, taught classes with students who have just

taken an introductory course in human development using a textbook of which I am a co-author (Cole et al. 2004). On the first day of class, I tell them that in the present course they will be playing with children who range in age from about four to fourteen and inquire about what they know concerning age-related differences in the kinds of play that children in the US typically engage in. The initial result is blank stares. I then ask if they have taken the introductory course in child development. Yes. Do they recall, from their reading, anything about age-related change in children's play? With these prompts, a few students raise their hands and provide some relevant information. On the basis of this information I continue to ask questions, ask about their own experiences as children or as babysitters. At the end of half an hour or so, most in the class can remember that, yes, indeed, their textbook had contained material about differences in children's play, and some could relate this to some aspect of their personal experience. But many could not. Yet judging from their grades, they were excellent students. This is the second area of human development that motivates the current mode of designing after-school activities, the alienated education of college students in psychology and the social sciences (at least!).¹

The roots of a design: solving two problems by combining them in one location

The preceding pages describe two problems, each of which appears to promise no rapid solution: lack of resources in many communities to provide supplementary educational experiences to school-age children, and lack of resources in many universities and colleges to provide students with an education that will afford them the possibility of small, problem-oriented courses in their major subject that will enable them to grasp the relationship between the theory-driven materials they are exposed to in classes and the practical life to which those theories are directed. The macro-architecture of the designed solution studied in this project is to combine the two problems: community institutions with an interest in the welfare of children afterschool, team up with professors and students at the university, providing the university participants with a living laboratory in which to study the theories they focus on at school, while providing the community institutions with well-educated and

¹ I am not alone in my concern about this situation. There is at present rapid growth in the provision of "service learning" courses, some of which explicitly have as their goal the provision of opportunities for college students to integrate what they are learning in their courses with organized experiences in their communities (Butin 2005).

highly motivated, but naïve, students to enrich their after-school programming.

But how is this combination to be achieved? There are two routes, only one of which is explored here. The organization of the activities in the community takes as its initial model a theoretically motivated, and empirically tested, ensemble of activities as a starting point. Using this ensemble as a starting point, the university and community participants begin a process of adaptation in which, over time (if they are successful!) they arrive at an equilibrium: an after-school program that satisfies the individual goals of both institutions and their common, overarching goal—to maximize the developmental impact of the activities in the young people involved. The overall architecture of the university–community interaction is termed a "U–C Link." The architecture of the activities at the community site is termed a "Fifth Dimension." I will describe the structure of each in turn.

A U–C Link

As noted above, the key ingredients for a university–community partnership to offer regular after-school activities to school-age children is an agreement to conduct such activities in such a manner that both sides of the agreement are making substantial contributions to the other. In fact, in almost all known cases of such arrangements, neither side can obtain its objectives *unless* it cooperates with the other side. Community organizations have resources that are extremely expensive, if not impossible, for the university to provide its students: a ready population of school-age children who participate voluntarily, space, a budget that allows whatever level of programming it habitually can give such that the basic infrastructure of the activity is in place. In this sense, the community is providing gratis a laboratory to the university, which would have to spend untold thousands of dollars to run on its own, given the needs to provide space, facilities, transportation, legal agreements with parents, etc.

For its part, the community organizations which form such partnerships are habitually short of funds, even when "well-funded." By this I mean that they operate on local funds or temporary government grants that are sufficient to pay the salaries of the director and perhaps one permanent staff member. But other staff members are generally young, work for minimum wages, do not work enough hours to be eligible for health care, and hence are transient. Adult–child ratios are high, often on the order of 1:15. Under these conditions, it is unreasonable to expect quality programming with a serious educational component and, if the existing data are accurate, are not generally provided.

By combining resources, both institutions can leverage the resources they are lacking, although each must pay its share. The university must offer a course for the entire academic year in a manner that attracts sufficient students to implement the on-site Fifth Dimension model. The community must allow intruders on its territory, however well intentioned, and the two participating institutions must work out an understanding about the content and conduct of the activities that is consistent with the norms of both. This understanding may sound easy, given how much each has to gain. But it is not automatic. In addition, the two institutions work on different schedules, so some time (which *de facto* means some money in the form of a person to worry about coordination) must be devoted to the collaboration itself.

A Fifth Dimension: basic principles

As described in previous publications (e.g., Cole and the Distributed Literacy Consortium 2006), the activity at community sites of various kinds that I have focused on are based on principles of learning and development first proposed by L. S. Vygotsky and his students, complemented by ideas proposed by a variety of non-Russian scholars concerned with the socio-cultural contexts that undergird human development (Cole 1996; Lave 1989; Rogoff 2003; Wertsch 1991). As an ensemble, these common roots lead us to think simultaneously about the social organization of activity, the various tools used to carry out the various tasks required to engage successfully in the activity, the social roles and modes of participation of those who engage in the activity, and the relation of the activity to its socio-ecological context. These common theoretical roots also influence our strategies for evaluating the effectiveness of the systems we design and implement. The following design principles can serve as a minimal set to motivate the design of specific after-school activity systems discussed later in the chapter.

The centrality of context As many scholars sympathetic to a socio-cultural perspective have noted, notions such as context, activity, setting, and situation are used in a variety of ways by contemporary social scientists (Chaiklin and Lave 1993; Duranti and Goodwin 1992). We have found it useful to adopt two somewhat different notions of context in addressing different parts of the design and implementation process. The first might be termed a “social-ecological” concept of context, ordinarily represented as a set of concentric circles in which the focal activities are at or near the center; context is constituted by and constitutes the levels ranging outward from the center (Bronfenbrenner 2005).

The image of concentric circles is helpful in capturing the embeddedness of the actual after-school program, as in a larger social ecology that will influence its specific character and the conditions it must meet to be sustainable. The innermost circle contains the interactions of children and undergraduates as they engage in joint activities at a specific time, in a specific place, and as part of an inclusive setting – the activity we call the Fifth Dimension. At the next “level of context,” we focus on the Fifth Dimension as one element within a larger institution – for example, a youth club, a church, or a school. At the next level, we consider the program and its institutional context as part of a neighborhood ecology, for example the community served by the school district from which the children attending the after-school program come. State-wide and national policies concerning provision of funds for after-school programs, and the overall willingness to provide funds for the promotion of children’s development, provide a yet-broader, but often decisive, influence on the local activity. Depending on which issue we are addressing, different levels of the system become the focus of our attention, but we need to remain aware of all the other levels as much as possible.

An essential contextual fact about Fifth Dimension programs is that they generally run after school. For over 100 years in the US, the after-school hours have been treated as discretionary time in which play or cultural enrichment have often been favored forms of children’s activities, depending upon their families’ resources (Halpern 2002; Larson and Verma 1999). And, of course, for some children after school is a time to attend one of a variety of loosely structured after-school care programs designed to keep children safe, active, and engaged in satisfying activities until their parents have time for them (Belle 1999).

The location of a Fifth Dimension in the context between home and school, points immediately to an important design requirement. The program must provide a variety of sources of motivation for children’s participation or they will not come. The opportunity to play is, of course, one such motivation, but affiliation, peer interaction, and learning are also obvious candidates (Griffin and Cole 1984; Leontiev 1978).

Promoting play was a particularly prominent objective in Fifth Dimension design, both for the practical reason that it would attract school-age children after school and for the theoretical reason that play promotes and creates essential resources for development (Vygotsky 1978). Computer games and other playful Fifth Dimension artifacts were included in the design in part for both of these reasons.

The particular way in which play is incorporated into a given Fifth Dimension requires that we pay attention to a different level of context – the relationship of the Fifth Dimension to its local institutional home.

For example, play needs to be incorporated into an after-school program at a youth center in a way somewhat different from its use in a program offered through a library, a school, or for-profit tutoring company. A Fifth Dimension in a library, for example, is conducted both more quietly than a Fifth Dimension in a Boys and Girls club and more noisily than other activities happening elsewhere in the library at the same time (Nicolopoulou and Cole 1993).

A second conception of context that has proven valuable in designing and implementing Fifth Dimensions is the idea of context as the weaving together of many elements over time. Context conceived of in this way helps to capture the dynamics of interaction that change from day to day in what would otherwise be considered "the same context" when viewed in terms of the concentric circles representation. On a day-to-day basis, it makes a difference which children and undergraduates, and how many of them, are present and in what order they appear at the activity, because the particular pairings of children and undergraduates are shaped by the relationships they have built over time, and by the needs of particular children at any given moment. Those social arrangements, in turn, must be woven together with the availability of particular games and with the condition and occupancy rate of the equipment needed to run them or demands that homework be done in preparation for a test the next day. The "weaving together" notion of context keeps the designer of a Fifth Dimension program alive to the constant and daily need to deal with the heterogeneous and changing mix of factors influencing the implementation of a Fifth Dimension and the need to plan for contest and confrontation as well as playfulness and affection.

Despite its manifest usefulness, there are limits to how far the concept of context can take us in designing Fifth Dimensions. The metaphors of circles and levels and threads are helpful in the abstract, but we also need a more concrete set of concepts to guide the design of precisely *how*, for example, play and learning are combined as a routine part of an activity. There is nothing automatic about mixing play, educational games, and college-age companions in a manner that not only is appropriate to the institutional context but also optimizes learning and development.

Providing a wide range of motivations To address the issue of how to design play and learning activities for children who vary widely in age and other demographic characteristics, my colleagues and I have drawn on the concept of "leading activity," as developed by Lev Vygotsky and his students (for an extended summary and examples, see Griffin and Cole 1984). In the Russian cultural-historical tradition, stages of

development are interpreted in terms of the kinds of activity that dominate the lives of children at a given age, each characterized by a distinctive source of motivation (Elkonin 1977).

In infancy, attachment to others is the leading activity. Play is the leading activity of early childhood, learning of middle childhood, peer interaction of the transition to adolescence, and work of the transition to adulthood (ibid.). Crucial to this way of thinking is the belief that prior leading activities and associated motives do not simply disappear. Rather, prior leading activities become part of the foundation of everyday activities upon which the new form of activity is built. The design implication of this insight is the need to create programs that provide access to *all* of the leading activities of childhood, forming a rich collection of motives from which children and their college student partners could choose, according to their personal preferences.

For example, undergraduates were not assigned to work with particular children; they typically worked with a variety of children during their participation in the Fifth Dimension. But undergraduates routinely formed close attachments with particular children; such pairs sought each other out, expressed their pleasure at being together and their sadness at parting.

It is also important to keep in mind that any given Fifth Dimension session presented a range of critical factors that were routinely in flux: a high level of participant heterogeneity; the working condition of computer software and hardware; the uncanny ability of board game pieces to disappear; the ages, ability levels, and experiences of the children present; and the ratio of undergraduates to children. Such variation was the norm, not the exception. If we were to come up with the right conditions for maximizing learning and development, we needed to combine insights into leading activities with the actual social organization of participants' interactions. Here another theoretical principle became essential.

The role of intergenerational participation We have already mentioned that the participation of undergraduates was a critical resource for staffing Fifth Dimensions at minimal cost to the community host institution as well as a source of motivation for the children. Here, too, theory guided us in organizing the roles of undergraduates to regulate the quality of their interactions with children. To optimize learning and development in these interactions, we found concepts such as Vygotsky's "zone of proximal development," Rogoff's "guided participation," and Lave and Wenger's "legitimate peripheral participation" to be critical resources.

Presupposed in all of these formulations is the idea that certain kinds of social arrangements create optimal conditions for development. Vygotsky (1978) emphasized that individual psychological functions have their origins in socially shared, culturally mediated activities between children and more experienced bearers of their society's cultural toolkit. The implications of this idea for the design of after-school activities are clear. There must be a functioning social level that includes both novices and more experienced members and a social setting that provides everyone with goals relevant to their joint participation or novices will have no opportunity to emulate and appropriate more mature, social-level functions. Since the more adept participants are pursuing goals that overlap substantially with those of less adept participants (for example, trying to catch the thief in the computer game, "Carmen San Diego"), inclusion of the novices provides them with the opportunity both to learn from and to contribute to (or at least not detract from) the goal-directed actions of the more adept.

For Vygotsky, the arrangement of the social interactions involving more and less capable participants was of paramount importance as a means both of assessing the gap between what participants could accomplish on their own and what they could accomplish jointly with more experienced partners and as a way of organizing to take advantage of this gap. It is in this context that he formulated the notion of a "zone of proximal development" (zoped) as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (ibid.: 86).

This idea has several important implications for the design of Fifth Dimensions. First, expertise should be made available from many sources throughout the entire system of activity, including other children and the undergraduates, as well as the site staff. In this respect the undergraduates play a complex role. On the one hand, the idea of them as "more capable peers" is useful because it explicitly blocks the notion that they should adopt the role of teacher. On the other hand, their greater capability with respect to various aspects of the task at hand obliges them to capitalize on their knowledge on behalf of the children. In addition, the undergraduates are instructed not to adopt the role of authority figure with respect to the children's social behavior. If conflicts arise, the undergraduate is expected to defer to the site coordinator and to intervene directly only when safety is at stake.

Other design features of the Fifth Dimension help to maintain undergraduates' intermediate role as peers. For one thing, at the beginning of

any given academic semester or quarter, the undergraduates are in fact less capable than children who are longtime participants in playing the games and know how to "play the Fifth Dimension." Undergraduates often attest to their chagrin at their own ignorance and their desire to become more adept as quickly as possible. In addition, we provide undergraduates with a rule of thumb for the perennial question of how much help they should give the children: "Give as little help as you can, but enough so that both you and the child are having a good time." This heuristic has proven useful in helping undergraduates create zones of proximal development.

As a consequence of such measures, data indicate that daily Fifth Dimension interactions are affectively positive and that zopedes are routinely created, even as the participant playing the role of more capable peer in dyads, triads, or larger groups is constantly changing. This characterization fits with Rogoff's idea of fluid reversals of student and teacher roles in communities of learners; such reversals seem to arise naturally in the sort of inter-institutional arrangements that make Fifth Dimensions possible in the first place.

The centrality of mediational means for organizing activity While it is critical to understand the overall context and the social relations organized to maximize learning and development in the design of Fifth Dimensions, the needed organizational properties could not be attained if we did not have a systematic way to introduce deliberately constructed *mediational means* (tools or artifacts) that participants use to regulate their interactions as they pursue their personal goals. Several of the more widely used mediational means are described below.

Computers. For a variety of reasons, the most ubiquitous mediational means adopted in design of Fifth Dimensions have been computers and computer networks. Fifth Dimensions can, and have, been successfully conducted with no computers whatsoever, but the general social belief in their importance for children's educational and vocational success and their affordances as interactive problem-solving and communications media, make them attractive where circumstances permit.

Task cards. The tool we created to regulate the relation between play and education in computer games, as well as the difficulty of engaging the software, was the task card. In principle, every time a child played a Fifth Dimension game, engagement was mediated by a task card that specified what had to be accomplished to get credit for "beginner," "good," or "excellent" performance of the activity in the Fifth Dimension. Gaining credit for a pre-specified number of "goods" and "excellents" was the criterion for promotion to a new role of assistant to a "Wizard"

(a mythical figurehead invoked at each site, although the particular name of the figurehead varied from site to site). In addition to shifting control of assessing high-level performance away from the software designer and toward Fifth Dimension designers, the task cards accomplished several other goals. They provided information to undergraduates to assist them in helping the child even if they had not encountered the particular game before, and to specify a proximal goal for the child. They connected simultaneously to play and learning and generated possible divisions of labor. If the game was designed purely for entertainment ("Brick Out," for example), the task card included more educational elements – such as formulating a strategy in writing or teaching a strategy to another person. If the game was designed purely for education, the task card introduced a more playful element, such as earning the right to play a game of the children's choice if they achieved the level of "good." Finally, they helped achieve the major goal of getting the children to read, write, and reflect.

The maze. Another mediational tool is a maze, a symbolic space embodied as a wall chart or physical labyrinth containing all the games and other tasks that are an official part of the Fifth Dimension. The presence of a maze with multiple rooms provides a tool for distributing the activities in a flexible manner so that even if a computer breaks down or a desired game is occupied, the undergraduates and staff engaged with the children can find ready substitutes.

The mythical figurehead. Earlier we referred to a mythical figurehead that goes by various names in various instantiations of the Fifth Dimension. The mythical figurehead fulfills several functions. The figurehead ensures an element of play as children engage in what otherwise might appear to be strictly a learning task, such as reading instructions for an educational game. By subordinating themselves to the figurehead, the adults can collude with the children in the pretense of the figurehead's existence and thereby play *with* them. The figurehead also reorders power relations between adults and children. When conflicts arise, adults need not confront children directly, since it is the figurehead, not the participants, who is said to have the power to adjudicate disputes. In such cases, adults as well as children must write to the figurehead, who makes proposals for how matters will proceed. Finally, the figurehead, because it communicates only in writing, provides many different occasions for children to engage in reading, writing, word play, and communication skills more generally.

Other mediational means. In addition to these more or less universal mediational means, each site invents tools of its own. One site uses a "hints book" in which children and undergraduates describe helpful

strategies for dealing with different games. Another site creates merit badges, and another has bilingual task cards that help children who cannot read well but speak English and undergraduates who read just fine but do not understand Spanish to negotiate meaningful goals and strategies as they work and play together.

The centrality of communicative practices Implicit in much of the foregoing is the belief that the development of communication skills in many media is of positive intellectual benefit to children. There are many theoretical justifications for emphasizing communication skills. For example, Vygotsky is perhaps best known for placing communication – the mediation of activity through language and other "psychological tools" – at the center of his theory of language, thought, and development. In arguing that "the thought is completed in the word," he focused attention on the intellectual importance of communication and the necessity of active, goal-oriented behavior in learners. Such communicative demands also embody Jean Piaget's (1970) notion of reflective abstraction and Annette Karmiloff-Smith's (1992) idea of the importance of re-description in cognitive development. Therefore, in designing Fifth Dimension activities, we paid close attention to arranging interactions in which adult and child participants had to pause to comment on their problem-solving efforts in oral or written reflections in addition to engaging in an ongoing dialogue as they worked together on the problem.

The importance of goal formation From prior work conducted in classrooms (Newman et al. 1989), as well as from literature on the formation of school settings (Sarason 1997), my colleagues and I emphasize the importance of ensuring that participants are engaged in such a way that they have many opportunities to form goals for their own actions. This principle affected both the design of activities within our various community settings and inter-institutional collaboration.

We emphasized individual children's ability to form their own goals in part because research has demonstrated that when children's learning is tightly controlled by pre-specified goals and procedures, the resulting learning does not transfer widely to other problems to which it might be relevant (Newman et al. 1989). We maximized goal formation in the Fifth Dimension by arranging for children to choose the games they wanted to play and the level of expertise they wished to achieve. Sometimes goals were fixed within the games themselves so as to ensure that the children had such options. When needed, we added goals that were achievable by using a task card to reach a higher level of expertise. We also added the ready-made goal of achieving the status of "Wizard's

assistant,” which carried rewards such as the right to choose a new game for inclusion in the Fifth Dimension maze. However, there was no fixed order for achieving such goals, and children were given other choices as well, such as choice of games, choice of partners, specific goals (often not those intended by the designers, such as seeing how many ways one could destroy a city in “Sim City”), and, of course, the choice not to participate.

At the level of institutional cooperation, goal formation was also emphasized. At the highest level this was easy: all of the participating institutions were focused on after-school activities and saw the object of the project as providing enriched educational experiences for children. But when it came to deciding on the subgoals necessary to implement the project, joint goal formation was often difficult to achieve, although everyone recognized it as a primary condition for the continued existence of the program. But even when there were common goals and goodwill, significant problems could arise owing to pressing local institutional needs, turnover in personnel (which often meant loss of memory of the goal formation process), and differing time schedules for vital functions. In some cases, these problems led to the demise of a Fifth Dimension system.

The cultural “atmosphere” of a Fifth Dimension: a brief example

A remarkable feature of Fifth Dimensions is that, within a few weeks of their initiation, they form a unique “idioculture” with its own instantiations of the various principles, depending upon the nature of the host institution, its neighborhood, the cultural and social class features, and ages of the participants, and a number of other factors (see Cole and the Distributed Literacy Consortium 2006 for a fuller account of this variability). However, a feel for the kind of atmosphere and the quality of interactions routinely created in Fifth Dimensions can be provided from one such activity system that I participated in over the course of about fifteen years.

To begin with, when a new group of undergraduates enters the Fifth Dimension, they routinely provide evidence that they are entering an ongoing cultural system characterized by shared understandings that are mysterious to them. Because they are not casual observers, but novice participants, the recognition that they have to learn the culture of the Fifth Dimension generally evokes anxiety and an expressed desire to figure out what it takes to become a member. For example: “As I looked into that room through the windows I had many questions running

through my head. How does this program work? What am I supposed to do here? How can I possibly be a leader here when I don’t know the first thing about computer games?” and

It was really odd having a young adolescent guiding us through the game. I sort of felt helpless in a way, considering that knowledge is power in this society. Here we were, elders who would soon take on the challenge of helping children develop their minds and to help them get through the Fifth Dimension and we couldn’t even finish the first round! Boy was I humiliated in a fun way!

As the weeks pass, these kinds of tentative, anxiety-laden descriptions are replaced by expressions of pleasure in working with the children, forming friendships, and regretting the coming of the end of the academic year.

The quality of the interactions that develop around particular games is illustrated by an excerpt from the following fieldnote, in which an undergraduate plays a game with two children that is intended to teach principles of phonics in a game-like manner. The game in question is called *Word Munchers*. *Word Munchers* challenges the players to identify a particular sound within given words, displayed on a 5 × 6 matrix. The player must manipulate the keyboard effectively in order to move their character up, down, left, and right in order to escape a bad guy (referred to as a trogggle) that appears intermittently. It is not an easy game for beginners to win, not even UCSD undergraduates. The notes were written by Teri Moore, playing with eight-year-old Aaron Seals:

Aaron got *Word Munchers* with no problem and started to play at the first level. *Word Munchers* is divided into different categories according to vowel sounds – “e” as in tree, “ou” as in mouse. The first one was “e” as in tree. He sounded out a lot of the words correctly, but not all of them. Even when he sounded them out right, he often “munched” words that weren’t in the same category. It was hard for Aaron to distinguish between long and short vowel sounds and he repeatedly stumbled over close pronunciations. An example was in the category “oo” as in book. I have to admit that the categories can be quite tricky sometimes, with only subtle differentiations between the words. For example, “hook” and “rope” both have a long-ish sounding “o” but they are not the same sound. This case was hard for Aaron, and I think that he is just starting to get the grasp of phonics in school. Between munching the wrong words and not getting them right and his friend Charlie next to him yelling at him to munch certain words, Aaron was unable to finish even five levels (it is necessary to complete five levels in the game to complete the beginner level according to the task card). I decided to help him out.

I told him that he had to finish five levels to complete the beginner level. By this time, Aaron was frustrated and was often losing all three men in one level. “I can help you complete five levels,” I told him. “I’m an expert.” We switched chairs and I started to play.

Instead of just letting him watch me, though, I got him and Charlie both to verbalize the target words. This was Aaron’s LAST man and I promised him that

I wouldn't let it die. I wouldn't munch on the words unless they told me to and for words they were uncertain of, I would linger on it, pronounce it a couple of times and then pronounce the category a few times. This repetition seemed to work and to help Aaron, especially, distinguish between long and short vowel sounds.

An example that I particularly remember (of the difficulty in distinguishing long and short vowels) was in the category "u" as in "mouse." The boys thought that we had munched all the words, but we hadn't. There were a lot left, with spellings different than "ou" but with the same pronunciation. I went to the word "clown." "Clown?" I asked, and Aaron said "No." "Listen again: clooowwn. And now mooouuse. They don't have to be spelled the same to sound the same." Aaron eventually accepted this idea, though reluctantly. He assumed that they had to be spelled the same, but I said the words didn't have to. They just had to sound the same. We made it to level four with me munching and the two of them giving me feedback on the words.

"Ok, now YOU have to finish," I told Aaron. "You can make it to level five." This was the last man. I told him I'd help.

These notes describe an undergraduate engaging two children in a reading task and providing assistance for one of them in particular. They illustrate several routine features of the Fifth Dimension and the way it mixes play, friendship, and education.

There is no doubt that instruction is going on here, but it is different from school instruction in several ways. The undergraduate supports the boys in a flexible manner that is regulated by her interpretation of what they know and her knowledge of the task. Although there are three participants, the division of labor that the undergraduate negotiates allows her to pinpoint one child's biggest problem vis-à-vis phonics – the contrast between long and short vowel sounds.

Using the possibilities provided by the rules of the Fifth Dimension and the structure of this particular game, the undergraduate provides encouragement by actually helping the child achieve his goals: she takes over part of the task while getting the boys to chip in and then turns the task back to the boy she is concentrating on and adopts the role of helpful spectator. Along the way she discovers a conceptual confusion that could be expected to prolong Aaron's difficulties if not corrected – his belief that for words to sound alike they must be identically represented in writing.

Is the Fifth Dimension effective?

Technically adequate evaluation of Fifth Dimensions has proven an ongoing problem precisely because they occupy the after-school hours and participation is not mandatory. In some settings, the only way to

evaluate the effects of participation in the Fifth Dimension is through careful, longitudinal records of the changing behaviors of individual children based on fieldnotes such as that given for the Word Munchers example. In other settings (for example, when a Fifth Dimension is implemented in a rural school where children stay after school under loose supervision so that their parents can complete their work days and there are many more children wishing to participate than the facilities can handle), true experimental evaluations have proven possible. In still other settings, it is possible to obtain school performance measures from participants and match them with similar children who do not attend. In all but a few cases where such comparisons have been possible, the Fifth Dimension has proven an effective way to promote children's academic development. It has also been shown to promote the educational development of participating undergraduates (summarized in Cole and the Distributed Literacy Consortium 2006). My overall assessment is that the Fifth Dimension is an effective program that justifies the theoretical principles upon which it is based.

Is the Fifth Dimension scalable?

It is possible to interpret a developmental intervention as a "boutique program," implementable only under the rare circumstances of an individual college course with a willing professor, a supportive administration, and an eager community partner. However, in recent decades we have witnessed in the US a growing movement in higher education to provide students with the kinds of academically-linked practicum experiences that are the core of the overall macro-structure of Fifth Dimension programs. Such arrangements are ordinarily discussed under the rubric of "academic service learning" (Butin 2005), and, as with the Fifth Dimension, there is accumulating evidence that such programs improve the performance of the college students involved.

Consequently, I see enormous potential for scaling up programs such as the Fifth Dimension as colleges and universities, for their own academic reasons (supplemented by a long-standing, but generally empty, ideology of "helping the community"), begin to make the practicum-style course exemplified by the Fifth Dimension a requirement for college graduation. This suggestion has now made its way into the rhetoric of some politicians in the US, and if there is sufficient social intelligence to move these political stirrings into all programs of higher education, an enormous number of children and youth can benefit from the kind of program described in the chapter. There is a way; there is not yet the will.

REFERENCES

- D. Belle, *The After-school Lives of Children* (Mahwah, NJ: Lawrence Erlbaum, 1999).
- U. Bronfenbrenner, *Making Human Beings Human: Bio-ecological Perspectives on Human Development* (Thousand Oaks, CA: Sage, 2005).
- D.W. Butin (ed.), *Service-learning in Higher Education: Critical Issues and Directions* (New York: Palgrave Macmillan, 2005).
- M. Carnoy, *Sustaining the New Economy: Work, Family, and Community in the Information Age* (Cambridge, MA: Harvard University Press, 2002).
- S. Chaiklin and J. Lave (eds.), *Understanding Practice: Perspectives on Activity and Context* (Cambridge: University of Cambridge Press, 1993).
- M. Cole, *Cultural Psychology: A Once and Future Discipline* (Cambridge, MA: Belknap-Harvard University Press, 1996).
- M. Cole and the Distributed Literacy Consortium, *The Fifth Dimension: An After-school Program Build on Diversity* (New York: Russell Sage Foundation, 2006).
- M. Cole, S. Cole, and C. Lightfoot, *The Development of Children*, Fifth edition (New York: Worth, 2004).
- A. Duranti and C. Goodwin, *Rethinking Context: Language as an Interactive Phenomenon* (Cambridge: Cambridge University Press, 1992).
- J. Eccles and J. A. Gootman, *Community Programs to Promote Youth Development: Committee on Community-level Programs for Youth* (Washington, DC: National Academy Press, 2002).
- D. B. Elkoinin, "Toward the problem of stages in the mental development of the child," in M. Cole (ed.), *Soviet Developmental Psychology* (White Plains, NY: M. E. Sharpe, 1977), pp. 538–63.
- P. Griffin and M. Cole, "Current activity for the future: The zo-ped," in B. Rogoff and J. V. Wertsch (eds.), *Children's Learning in the Zone of Proximal Development: New Directions for Child Development* (No. 23) (San Francisco, CA: Jossey-Bass, 1984), pp. 45–64.
- R. Halpern, "A different kind of child development institution: The history of after-school programs for low-income children," *Teachers College Record*, 104 (2002), 178–211.
- R. Halpern, *Making Play Work: The Promise of After-school Programs for Low-income Children* (New York: Teachers College Press, 2003).
- A. Karmiloff-Smith, *Beyond Modularity: A Developmental Perspective on Cognitive Science* (Cambridge, MA: MIT Press, 1992).
- R. Larson and S. Verma, "How children and adolescents spend time across the world: Work, play, and developmental opportunities," *Psychological Bulletin*, 125 (1999), 701–36.
- P. Lauer, M. Akiba, S. Wilkerson, H. Apthorp, D. Snow, and M. Martin-Glenn, *The Effectiveness of Out-of-school-time Strategies in Assisting Low-achieving Students in Reading and Mathematics: A Research Synthesis*, updated edition (Aurora, CO: Mid-Continent Research for Education and Learning, 2004 (www.mcrel.org/topics/productDetail.asp?productID=151)).
- J. Lave, *Cognition in Practice* (New York: Cambridge University Press, 1989).
- A. N. Leontiev, *Activity, Consciousness, and Personality* (Englewood Cliffs, NJ: Prentice-Hall, 1978).
- D. Newman, P. Griffin, and M. Cole, *The Construction Zone* (Cambridge: Cambridge University Press, 1989).
- S. Newman, J. A. Fox, E. A. Flynn, and W. Christeson, *America's After-school Choice: The Prime Time for Juvenile Crime or Youth Enrichment and Achievement* (Washington, DC: Fight Crime: Invest in Kids, 2000).
- A. Nicolopoulou and M. Cole, "The Fifth Dimension, its play-world, and its institutional context: Generation and transmission of shared knowledge in the culture of collaborative learning," in E. A. Forman, N. Minick, and C. A. Stone (eds.), *Context for Learning: Sociocultural Dynamics in Children's Development* (New York: Oxford University Press, 1993).
- J. Piaget, "Piaget's theory," in P. Mussen (ed.), *Charmichael's Manual of Child Psychology. Volume 1*, Third edition (New York: Wiley, 1970), pp. 703–32.
- B. Rogoff, *The Cultural Nature of Human Development* (London: Oxford University Press, 2003).
- S. Sarason, "Revisiting the creation of settings," *Mind, Culture, & Activity*, 4 (1997), 175–82.
- L. S. Vygotsky, *Mind in Society* (Cambridge, MA: Harvard University Press, 1978).
- J. Wertsch, *Voices of the Mind* (Cambridge, MA: Harvard University Press, 1991).