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A FINAL REPORT TO THE SPENCER FOUNDATION

CREATING SUSTAINABLE NEW FORMS OF EDUCATIONAL ACTIVITY IN AFTERSCHOOL SETTINGS

Report prepared by
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In asking ourselves who the appropriate audience for this report would be, we visualized Larry Cremins as the ideal reader. Our initial proposal was greatly influenced by Larry's thinking about the role of education in society and his hopes that institutions beyond the school would become involved in providing children with genuine educational experiences. Larry died as the report was being completed. He remains a symbol of the audience we hope to reach with this work, and we gratefully dedicate our efforts to his memory.

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Chapter 1

Introduction

Our goal at the outset of this project was to determine if it is possible to create sustainable new forms of educational activity during afterschool hours. The activities were designed to promote children's cognitive and social development with a special emphasis on bringing them into productive contact with new information technologies. We were motivated to study this problem for several reasons.

First, in an extensive review of barriers to increasing technological literacy among under-represented populations in the United States, it became apparent that the kinds of quantum change in academic achievement levels being called for by government, business, and the academic community were impossible to achieve unless it could be arranged for children to spend a good deal more time engaged in educational activity (Cole, Griffin, & LCHC, 1987). While we found that a number of schemes for increasing "quality time on task" during regular school lessons had been advanced, their efficacy was in dispute. Moreover, even if one assumed that the effects of treatments to increase time on task were statistically significant, the magnitude of the effects was far too small to achieve a socially significant impact on children's achievement levels.

An apparently obvious alternative for increasing the amount of children's academic experience would be to lengthen the school day or the school year, since American children spend markedly less time in school than, say, their counterparts in Japan. However a variety of public opinion surveys have revealed that the American public is ill disposed to provide taxes for longer school days or school years (a position with which we sympathize because it is not at all clear that simply providing "more of the same" would make a substantial difference). Put slightly differently, there is widespread

agreement among academics that children should be spending more quality time on academic tasks, but our society does not know how to provide it.

Given these barriers of working within the existing institutional framework of the school, it is not surprising that a number of educational theorists have promoted the idea that education should not be restricted to public schools. So, for example, Cremins (1976) urged that we consider the "configurations of education" to see if it would not be possible to involve existing community institutions other than public schools in promoting educational activity. Goodlad (1984) suggested the creation of "educative communities." Fantini and others, in a special edition of the NSSE Yearbook (1985), proposed similar ideas for creating constructive associations between school and non-school settings.

These currents in the larger society and in the educational establishment came together with the research program of the Laboratory of Comparative Human Cognition (LCHC) in the early 1980's. In following a long tradition of the laboratory (e.g., Cole, Hood, & McDermott, 1979), we found ourselves--somewhat inadvertently--creating an afterschool educational activity for elementary school children whose teachers identified them as being at severe risk of academic failure (LCHC, 1982). At about the same time, Alonzo Anderson, another member of our laboratory, created another such center in a predominantly black neighborhood in southeast San Diego; and two other laboratory members, Esteban Diaz and Luis Moll, created yet a third program in a Latino neighborhood (Anderson, Diaz, & Moll, 1984).

Although the populations served and the precise organization of the activities differed from one afterschool setting to another, the three systems shared several common characteristics. First, they all were voluntary afterschool activities conducted on the premises of a school (e.g., an

auditorium or an empty classroom). Second, all used computers and computer technology as the medium for at least part of the children's activities. Third, all focused on communication skills, both basic reading/writing and the use of telecommunications, as an integral part of the children's activities. Fourth, all involved the participation of undergraduates from the Public University in the role of "older siblings" of the participating children. In short, as a result of the local combinations of these factors, the programs mixed education, play, and peer activities in a single syncretic system.

As a result of this work, we were quite certain that given sufficient external resources it is possible to create effective afterschool educational activities in at least some institutional settings. For example, feedback from parents was quite positive: they much preferred their kids to be reading, writing, and engaging in educational computer games than watching TV or hanging out with their friends unsupervised. Teachers reported that several of the children participating in our programs showed both improved behavior in class and, in some cases, marked increases in academic achievement. And our own indicators showed that most of these children were able to engage in more advanced activities at the end of the year than at the beginning.

Despite these encouraging successes, we knew that we faced several formidable problems. The aforementioned systems operated exclusively within the physical confines of elementary schools. While school personnel were supportive of those efforts, they remained a "frill" and as such suffered the typical fate of "successful" educational innovations: when the specific funding for them dried up, they disappeared. This pattern of short-term, local success followed by eventual failure set the fundamental challenge of the present project: could we organize afterschool educational activities in a way such that the host institutions would actually assimilate them into their basic

structures? In addition, could this goal be accomplished in a way that enabled the new forms of activity to retain their quality when external funds dried up? And what kinds of community institutions would be best suited to this purpose? The schools were certainly one candidate, but our prior experience had made us aware of our local school systems' limited interest in afterschool programs so we wanted to be certain to cast a wide net, including youth clubs, day care facilities, libraries, and churches.

In approaching these question we were influenced by several lines of theory which we sought to integrate as a guide to our research strategy. At perhaps the most "macro" level we had great sympathy for efforts such as those proposed by Bronfenbrenner (1979), Cremins (1976) and others to take account of the "ecology" of education and to create "educative communities." At a more "micro" level we drew upon our own prior formulations of a cultural context approach to learning and development which uses "persons acting in a setting" or "cultural practices" as a basic unit of analysis (Cole, 1985; LCHC, 1983). And as time went on, we increasingly found ourselves thinking in terms of the closely related concept of an activity system (Engestrom, 1987; Leontiev, 1981), emphasizing both the quality of activity as it occurs <u>within</u> contexts and the power of structured communication <u>between</u> contexts to guide our work with children and personnel in the institutions where they gathered.

Here is how we summarized this approach in our initial proposal:

> Within each [community] institution that will be a part of the proposed experiment there will be a variety of educational activities, each of which affords different mixes of educational tasks and technology; comparisons made across institutional settings will help to specify the conditions needed to create maximally effective instruction in each. Our use of communicative potential of new information technologies provides for coordination of resources along two crucial dimensions: horizontal integration is achieved by site-to-site connections; vertical integration is achieved by inclusion of small children, university students, and adults in a single,

> interactive network. The data gathered from educational activities **within** contexts provide one essential stream of data for analysis of the **processes** characterizing the impact new technologies in the teaching-learning process. Additional process data come from the flow of discourse **between** sites. The **products** are measured in terms of change in standardized test scores, teacher and parent evaluation, and increases in community support (Original proposal, p.2).

Looking back at this summary of our hopes and expectations from the heights provided by four years of experience and the fidelity of hindsight is illuminating both for the large extent to which we actually did what we set out to do and the ways in which we were subject to illusions about what could be done owing to our always-limited experience and understanding. We will return to discuss the implications of the pattern of successes and failures we experienced after we have provided the reader with a summary of our actual work and the state of the project at the present time.

An Overview of Our Strategy

Both our own previous experience and the evidence from research on educational innovations argued persuasively that a straightforward approach in which we went to various candidate institutions and offered them a prepared package of activities to try out, whatever its initial success, would be likely to fail when the research project came to an end three or four years later. Consequently, at the outset, we adopted several, somewhat unusual strategies. First, we did not provide any of the candidate institutions a ready-made package of activities. Instead we devoted the entire first year of the project to informing community personnel of the widest possible range of activities involving computers that adults or children might find interesting as a basis for the afterschool activities they would be engaging in. We firmly believed, and told our community colleagues, that unless they found that the activity

helped them to achieve their important institutional goals, it would fail. Second (and closely related) we informed them that our goal was to insure that our institution, the Public University, would not disappear from the scene as soon as the research phase of the project was over. Rather, we promised that so long as they found the activity useful and were prepared to support it, we would continue to be involved through the mechanisms of special practicum classes at the University. However, we explained that we would not be able to continue providing them with computers and a trained site coordinator following the end of the project. Hence, in entering into this activity, the institutions were simultaneously entering into an agreement to pick up significant costs of running the activity two years hence.

In order for this strategy to work, we had to create a distributed, interconnected system of institutions, in which each institution amplified its abilities to achieve its own local goals, because it participated in a system of joint activity with the (an)other institution.

Our overall strategy led us to identify three phases in this project. Each phase dealt with a different reorganization of the relationship between the research team and the program it promoted as well as a reorganization of its relationship with the various community institutions. In this way, the passage from each phase to the next marks a point of transition, which is also, for the institutions involved, a moment of decision. In Phase I, which corresponded to the first year of the project, we focused primarily on developing our relationships with the community organizations that we had initially contacted and helping them to gather information so that they could form their own goals for the project. In Phase II, we concentrated on implementing the forms of activity that were agreed upon during the first phase as well as on tracing and monitoring these activities in order to evaluate

them. Finally, in Phase III we began tracking the fate of the system once sources of support external to the system created during Phase II came to an end.

This report is divided in two main sections. First, Section I (which includes chapters 2-5) presents a comprehensive description of our activities for Phases I, II, & III of the research (chapters 2, 4, & 5, respectively). Consistent with our overall framework, we present our observations at two levels of analysis: the "macro" or institutional level, and the "micro" or the after-school activity level. Chapter 3 presents an account of the inner logic and some of the theoretical principles that underline the "Fifth Dimension," which was the afterschool program chosen by all the participating institutions during Phase II.

Second, Section II (which includes chapter 6-7) presents an evaluation of our four years of experiences from two different perspectives. Chapter 6 offers an evaluation of the quality of educational experiences of the children participating in the Fifth Dimension programs at the various sites; this is an evaluation at what we might call the "micro" level or the first level of contextual embeddedness. And chapter 7 offers an evaluation of the program taking into account the different institutional perspectives; this we might call the "macro" level or the second level of contextual embeddedness. What we will seek to show is how these two levels of contextual embeddedness constitute two concentric circles of a single dynamic, multi-layered social system composed of developing people of different ages, statuses, and roles embedded in different social institutions. In the final chapter, we discuss the implications of our experiences; it is our hope and intention that the multi-layered perspective we have followed throughout our report will be informative for those, like the board of the Spencer Foundation, are seeking to broaden the

contexts of education at the same time that they are seeking fundamental knowledge about the intermingling processes of education and development.

I. DESCRIPTION

Chapter 2

Phase 1: A Historical Account of the Initial Goal Formation at the Institutional level

The site chosen for study was a suburb of a metropolitan city in Southern California with a heterogeneous student population representing a range of problems faced by communities throughout California and many other states. The initial core group of participants were four institutions from the community, La Playa, which ordinarily deal with elementary age children: the school system, the library, a Children's Center, and the local Community Youth Club[1]. (Subsequently, the project diffused to other schools, as well as to churches in this community, other neighboring communities, and even other cities in the U.S. and abroad.)

Phase 1 of the research--which extended from the period between July, 1986 to approximately September, 1987--had as a general goal the establishment of a mutual knowledge base for the researchers and the community. Specifically, this translated into an interconnected set of goals: (1) to help the community institutions participating in our study come up with a plan for the content and structure of computer-mediated educational activities that would suit their own goals; (2) to get an overview of the after-school facilities for the children in these institutions and to collect baseline data for community level changes; and, (3) to develop the means for coordination among the settings which required us to create the necessary infrastructure at the Public University to support and sustain the goals that the community institutions adopted. In short, we aimed to create the best conditions for the possibility of maintenance and sustenance the after-school activities, after the research

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[1]All names of places and the names of the community institutions are fictitious.

support was discontinued.

To these ends, we had project staff make regular visits to the sites; we also held three seminar/workshops and an end-of-the year interview involving representatives of all of the initial community sites. The workshops introduced potential site personnel to a wide variety of activities involving computers and communication. The interviews provided site personnel an opportunity to discuss their plans for the start of the activities (which coincided with the start of the academic year at the Public University). In this chapter, we summarize the process of the initial goal formation of the different sites and the difficulties we encountered along the way as well as the articulations of these goals by each of the participating institutions at the end of the year. In the meantime, we will introduce the main research sites in some more detail.

The Process of the Initial Goal Formation

The first general observation is that passages from one phase of the project to the next proved to be critical points of transition, which strained the interactions between the research team (and the program it promoted) and the community institutions involved. It is at these critical moments of reorganization of the relationship between the research team and the institutions when decisions are made of whether the institutions involved would continue their collaboration or would terminate it. Because these moments of transition were experienced differently by the various institutions, examining them in some detail gives us a handle as to why a particular passage was more critical for some of them but not for others.

In this sense, initiation of Phase I of the project marked the first point of transition which brought about difficulties of coordination between our

research team from the University and all the community institutions involved. It is at this moment that one of the institutions, the school system, re-examined its role and decided to withdraw. This initial discoordination was manifested by difficulty in translating into action what was once only agreed in words; in other words, to face up to the commitments that words entail. This happened not because the different institutions were trying to avoid their commitments, but probably because these commitments were not really thought through very carefully from the very beginning; or to put it in more self-critical language, that the research team never succeeded in arranging for the community institutions to think through the implications of their commitments.

The first difficulty was encountered when scheduling the first workshop. Although the written summaries of selected portions of the research proposal were given at each institution, and face-to-face meetings were conducted to discuss it with staff members of each institution, there were misunderstandings on both sides; there was no lack of good will, even enthusiasm, nor lack of attention to the details; there was however an apparent inability on everyone's part to convert the "words" into the concreteness of who would attend the first "short seminar."

The school reexamined its situation and its understanding of Phase II and concluded that one staff member should attend since it appeared that the school district support of the Children's Center's after-school program would be the best way for them to participate; thus, it withdrew from a fully operational role to a supportive one. The library fulfilled the "letter" of the plan and produced a full constituency for the seminar, but two members came from libraries outside the focal community, one was a part-time staff member with a heavy commitment for a degree who could not guarantee continued intensive involvement in the project. And, the Children's Center and the Community Youth

Club were undergoing staff changes (which emerged over the year to be a stable characteristic of all these institutions) and resolved the problems this created for participation in the project by "drafting" staff who would not be heavily involved in Phase II, but who, in each case, were less likely to be transient members of the institution (the administrative secretary of the Children's Center and the administrators for the Club.

In the long run none of these institutions had any of their regular staff involved directly in Phase II of the research, which exacerbated the difficulties of passing from one phase to the next in various ways.

The Workshops

During the workshops, we introduced the community personnel to a wide range of overarching metaphors and corresponding activities that educators have used for involving children with computers. During the first workshop, we placed special emphasis on activity systems that have been developed around LCHC including a "mental gymnasium" "communication experts," "computer chronicles," the Fifth Dimension," and so on, all of which involve some form of game-mediated work with computers and some form of telecommunications. We provided information about local experts in implementing the various metaphors and how to contact them. We also introduced the participants to computer mediated communication and word processing. Electronic mail, computer conferences, and real-time computer "conversations" were used, emphasizing the idea that reading and writing could be undertaken without a "school" lesson atmosphere.

The second workshop was devoted to a wide-ranging demonstration of many different kinds of educational software, chosen to sample as broadly across domains and age-categories as possible so that personnel from each site could

decide for themselves what kinds of activities they thought suited their own setting. Only software that was obviously designed for recognizable educational domains was used in this workshop.

The third workshop focused on computer application to the world outside of their immediate setting. A variety of local contacts were made to help local sites gain information about the ways that computers are being used in business and research around the larger metropolitan area. There was further introduction to a larger variety of software demonstrating the way that arcade-like games and music editors could be used for assisting children in their school-related development. Also we demonstrated special activities that used adult computer tools such as data bases, spreadsheets, and simulations in ways that young children could participate.

These demonstrations involved hands-on experiences in which we used some of the larger overarching metaphors demonstrated to structure the adults' activity. The first workshop followed the structure of a round-robin, where participants circulated among various stations for allotted periods of time. While the participants were engaged, interested, and gave positive comments about the individual "stations," they did not like the overall structure because they had to adhere to strict time constraints and hence lost control over their activity. In the second and third workshops, we used the structuring device called the "Fifth Dimension" which we had previously found to be an especially flexible and powerful means of organizing educational activity in a wide variety of institutional settings. It might be this contrast to the "round-robin" structure as well as their growing familiarity with it, but when they were asked in the end-of-the year interview what activity they wanted to use in order to structure the different activities used, all three institutions chose the "Fifth Dimension."

Generally speaking, participants seemed to enjoy the workshops and reported enjoying them on later occasions. However, all of the community personnel who participated in these workshops manifested something akin to "computer phobia." They believed strongly that it would be good for their children to be involved with computers but they repeatedly expressed uneasiness about their own ignorance and ability to help the children.

The Institutions

Between workshop sessions, project staff spent most of their time visiting the various community institutions to observe the flow of activity and to get some idea of institutional priorities and constraints. To this end each site was visited on the average of two times a week. We also followed up on special notices regarding the sites that appeared in local newspapers and on bulletin boards and fliers at the sites. In addition, we worked with the equipment (and potentials and limitations regarding equipment) at each site. These observations lead to the second major set of observations of this phase of the work: we were dealing with three institutions that were distinct in their organization, culture, and orientation.

The Children's Center

The Children's Center is a community child care center supported partly by government funds and partly by private funds (mainly tuition). Bureaucratically it falls under the administrative control of the community's elementary school district. It accommodates children of a broad age range, from 2 to 12 years, and it includes programs for infant, preschool, and after-school care. Besides an entire program for toddlers, it also has an after-school program for children of elementary school age. These children were bussed directly from

the schools to the center. Our focus was on the 45-60 elementary school children who are bussed there after-school and remain until their parents pick them up or 6:00 p.m., whichever comes first.

On a typical day, the children appear in their busses about 3:20 p.m. and line up for attendance. This is more than an empty ritual: the Children's Center has legal responsibility for the children until their parents arrive, and if an expected child is absent, the staff must immediately initiate a search for the child's whereabouts. In this way, the center has a rigid structure about child participation (attendance lists and a follow-up on absences), but it has a very informal structure of activities.

The atmosphere is pleasant and the activities available for the children revolve mainly around play and much less on education. After a small snack, the children are free to choose various activities including a prepared arts-and-crafts project, board games, and outdoor games of many kinds, and free play. There is a strong positive value in helping in the development of the children and a strong negative attitude toward being "school-like," "not fun," or "stressing."

During the period of our observations, three day care workers were present to supervise the after-school children. In this setting, staff responsibility was to a specified group of children. The children seemed generally to interact in groups of 3-5, which meant that at an approximately 20:1 child:caretaker ratio, supervision was somewhat distant. As one teacher remarked, "I learned that you have to have good peripheral vision to work here."

A major concern voiced repeatedly by both the Children's Center staff and the observer was the rapid turnover of Children's Center staff, with the exception of the Directress. For example, the April 6, 1987 notes report a

conversation between our staff observer and the Directress which went as follows:

> I observed out loud that there was a frequent turnover of teachers. She agreed and said it had to be that way. The contracts were through the school district and that means being bound by their work procedures. She said that she had to be careful not to have people working full time because then the Children's Center would be required to pay benefits. She has 37 part-time people working. She said that it would be nice to be able to hire 12 full-time people and that would give a continuity to the program but that would cost three times more than having part-time workers.
>
> I mentioned that she seemed to have found some positive people who were very responsive to the children. She responded with a comment on her preference to stay clear of career people because they enter the field with a real caring for children but then after working find that there is no future in this field. When that day comes they become bitter. They are less positive with the kids. ...I commented on how hard it must be to think of a plan for the UC students to help them when she has part-time and temporary staff. She immediately said that she understood that the University was going to bring the students and the students were going to run the program. She was not aware that she needed to have a person to oversee the students. I mentioned that these students were capable people but that they were going to help her with her plans. She completed the sentence with "and not superimpose an activity on us."

As we shall see, the concerns expressed here about rapid staff turnover and the subsequent need for the Directress to distance herself from responsibility for University-linked activities made themselves felt throughout our involvement with the Children's Center. Another crucial concern, the presence of unfamiliar adults, was manifested the first time a LCHC staff member visited the Children's Center to make observations: The observer's first comment was that as she walked down the driveway to enter the center, the Directress came out of her office to see who she was, since she looked unfamiliar.

The Community Youth Club

The Community Youth Club is a non-profit, privately funded youth center. It is located in a spacious building that houses the staff of the regional Club

organization, game rooms, an arts and crafts area, a large gymnasium, a swimming pool, and an outdoor courtyard where various games can be played. The Club is part of the Community Youth Club of America and this branch is one of three branches that the parent Club organization has founded in this and neighboring communities. Its costs are born largely by individual contributions and special events, supplemented by corporate contributions, membership dues, and program fees, which are kept very low so that all children can participate, regardless of family economic circumstances.

It is intended as a place where children from elementary to middle-school age can go during after-school hours. The Club complements the Children's Center in many respects. While the Center has a rigid structure about child participants and a very informal structure of activities, the Club has a very rich structure of activities and a very loose organization for who comes when. It is located within easy walking distance of an elementary school and a middle school, a large number of children have ready access to it and can come without requiring parental assistance (or often bussing arrangements); but children who live some distance away normally depend on their parents to pick them up. The Club provides every day a wide range of social and recreational activities, ranging from indoor and outdoor games and sports to cooking classes, arts-and-crafts, and so on. These activities are the responsibility of specific staff, who are there to loosely supervise the children.

The basic philosophy of the club is very similar to that of the center: strong positive value on helping the development of the children and a strong negative attitude on toward being "school-like." In keeping with this philosophy the director of the Community Youth Clubs for the local region stated that part of their policy is to provide the children with a place that "does not taste or feel like school, a place that the children feel is practic-

al and fun" and a place where "the educational objectives must be disguised." Furthermore, the club is self-consciously committed to maximizing the children's freedom of choice, and to allowing them maximum flexibility in participating in different activities. Aside from providing the children with an extensive range of alternatives, there is a general feeling that children ought to be able to begin and end particular activities as they please.

Whereas the Children's Center's after-school program caters especially to children in the lower elementary school age, the Community Youth Club attitudes range up to 16 years of age with a median of perhaps 10 or 11, the upper limit of the Child Development Center. Instead of a system where adults kept a detailed record of who is present and children are bussed in, children arrive at the on their own and are not required to check in with anyone. Moreover, consistent with their "drop in" philosophy, the children are as free to leave as they are to come. The result, when combined with the wide range of recreational facilities, is a somewhat noisy, boisterous atmosphere, with balls bouncing, children chasing around after each other, a loudspeaker punctuating the activity from time to time to call someone to the phone or announce the start of an activity, and so on.

One way in which there was a marked similarity between the Community Youth Club and Children's Center was the rapid turnover of junior staff. On the first staff visit it was mentioned that the person currently filling the role of education director was leaving and that no one had yet been found to replace her. Senior Club staff, like the Directress of the Children's Center wondered aloud how they would be able to provide staff to supervise undergraduates. And they wondered about their ability to hire someone who could become sufficiently involved in the activities to be able eventually to guide them. As the regional director put it, "I am concerned about personnel. I don't know if the

person that I will hire will be interested. How much time and energy will be needed to make it work? The person must work on 5-15 projects, not just one."

Despite these doubts, in the course of later visits for purposes of observation, a new educational director who took an active interest in learning about telecommunications, uses of computers was present. In addition, a possible source of computers for the club was identified in the local junior high school which was located on the adjacent property. This coincided with the express wish of Community Youth Club personnel to find more compelling activities for teenagers, very few of whom attended the club on a regular basis.

The Library

The Library, located in a shopping mall perhaps half a mile from the Community Youth Club is administratively a part of the metropolitan city County library system. It relies primarily on public funds, supplemented by voluntary contributions of time and money from a community "Friends of the Library" organization; it charges no fees. Like other local libraries around the country, it attempts to provide a range of informational and educational resources for community members. Thus, in addition to traditional loan services and reference books, it contains a section in Spanish and books on tape; from time to time it puts on special events such as dramatic readings for small children, financial counselling for widows, and in the spring, tax consultations supported by The United Way. Based on this broad range of activities, they were interested in offering special computer activities for children.

When visited for the first observational session it was estimated that 15-20 children between the ages of 6 and 16 were present along with three adults

and three staff members. On later visits considerably more adults were present, and quite often one encountered mothers bringing their children in to check out books.

The issue of how computers were to be used at the library came up in several ways as Phase I progressed. In the spring the Library was connected to a dial-in system used for inter-library loans and circulation management. They also gained access to the Dialogue on-line subscription service which provides access to some 400 data bases. However, we have no records of this facility being used.

At about the same time, an IBM clone was purchased for the Library by the local Friends of the Library, who had been discussing ways in which computers might be useful for the previous three years. Once purchased, the computer went untouched for quite a while. Not only did the Librarians have no idea of how it could be useful to them in their work, they were not encouraged by the experience of other libraries that had made computers available to patrons. On more than one occasion LCHC staff were told about the dismal experience of an associated branch library that had acquired a coin operated computer which kept breaking down because coins got jammed, disrupting normal library routines.

As late as July, after all of the workshops had been completed, the Regional Library Director called a meeting at the Library to decide how computers would be made available to patrons. The general policy that was formulated is worth quoting for the rationale that it reflects:

> How will the computers be used? Primarily, the computer will be available to the public to help them learn how to use the computer. Many people do not have access to computers and it seems appropriate for the Library to have one computer available as a standard resource. It is not expected that the Library will provide a literacy program but that by having software available, the patrons will become comfortable with a computer. The secondary use of the computer may be the availability of a resource for knowledgeable users who only need to use a piece of software

once a month and may not want to purchase it for their own limited use: genealogies, insurance estimates, astronomy, practice for the SAT, tutorials in applications software, encyclopedia searches, etc.

There was a good deal of discussion about how the Library could provide support for use of the computer. The upshot of this discussion was that it would have to rely on volunteers, and it was not at all clear where the volunteers would come from. Nor was it clear how the use of this one computer would fit into the anticipated work with University students set to begin in the fall. Thus matters stood at the time of the first year-end- interview.

Institutional Arrangements at the Public University

It is all too easy in this kind of work to focus on the institutions "out there" and to ignore the fact that a crucial factor involved in institutionalizing the activities we were planning was the ability to bring about institutional changes at the University. We have already seen that continuity of staffing was a problem in the community, and it was a problem at the University as well, although it took a different form. First, there was an issue of continuity of student involvement. The Public University runs on a quarter system, which meant that we would need to work in 10 week cycles, the first two of which would have to be devoted to teaching the students how to use the UNIX system, how to access it by modem, how to assemble the microprocessors at the community sites, enough about the various games to be of some help to the children and as much about the Fifth Dimension as we could teach in such a short period of time. The overwhelming majority of student participants were from the Psychology and Communication Departments and many were enrolled in the class because they wanted experience working with children. As a natural correlate of this entering point, most students could be considered "computer phobic" which meant that teaching them the basic technical requirements would

be difficult. While we could, and did, use project staff to help in this training (we ran weekend workshops, for example, in addition to regular class periods) but we were mindful at the beginning that we needed additional staff help from the University. We obtained this help in the form of a half time "computer media clerk" in the Communication Department provided with temporary funds.

In addition to the discontinuities within a quarter, discontinuity also resulted from the schedule of student participation over the entire year. The work involved in this course was very demanding, and as a consequence, a good many students felt that they were just getting the hang of things when the quarter ended. We solved this problem by getting the class certified as a three quarter sequence which could be entered at any quarter.

Eventually, we had to face the fact that faculty staffing of the course would also become an issue. If the activities were to be fully institutionalized, it would be necessary to arrange for faculty other than Cole to teach this course. This issue was muted in the first year of the project, but even then it was a tangible problem because this one course constituted 3/5 of a normal teaching load and colleagues wondered aloud if it was appropriate for Cole to be spending so much time on this course which, while useful to students might not be that useful. In later years the issue became more pronounced; we mention it here to emphasize the need to attend to the complex institutional issues within the University on an equal footing with the community components of the project.

Articulating their goals: End of the Year Interviews

The differences in the institutional arrangements at each site produced very different patterns of possibilities and constraints for incorporating new

activities of the kind we were proposing. Although we do not want to bore the reader with detail, in following the logic of the research it is important to provide some feel for the real-life constraints operating in the various institutions considered individually, as these were expressed during the end-of-the-year interviews.

The Children's Center

By design, during the first year of the project, Michael Cole did not participate in the workshops or planning sessions which were conducted entirely by other project staff. Consequently, when the end of the first year arrived, he could legitimately claim to be ignorant of the conclusions that personnel at the different sites had drawn from the first year's experiences. Using this designed ignorance as a rhetorical frame, Cole and project staff who **had** been present for workshops during the year visited each site to "debrief" site directors about their plans based upon the first year's experience. These conversations were tape recorded, both to create a record of project members' understanding as they got set to initiate new activities, and as a way of making the point to site directors that from our point of view this was a research project in which keeping an accurate record of participants' understandings played an important role.

Perhaps the most remarkable aspect of these tape recorded interviews is the extent to which, in retrospect, they reveal, right at the outset, problems that would arise during the course of the ensuing three years, coupled with the fact that in prospect we failed to understand the significance of much of what we were told. This discrepancy between prospect and retrospect is, of course, what one would expect of a developing system. It is nonetheless striking to us as developmental researchers to find in our intuitive post-hoc responses to

these interviews living proof of the difficulties of predication in this developing system of which we were a part.

When Cole met with the Directress of the Children's Center to debrief her on the previous year's experience and to elicit her formulation of goals for the coming year, the Directress's first comment was that the teacher she had planned to have specialize in computer activities was leaving. Her goals, she said, remained the same as they had been a year earlier: to find a way to "have the kids, when they are here, be interested and stimulated by the activities." She was especially interested in activities for third and fourth graders, the upper age range of children attending the center after school. Beyond this initial general goal, she found it difficult to be more specific and as a consequence, the conversation proceeded with Cole asking leading questions, from which she chose alternatives (e.g., "How many kids would you like to have involved?" "How many days a week?" "From the workshops, what kinds of activities would you like to have the kids engaged in?"). The result of this exercise was a decision to have 6-10 children play interesting educational games "like Oregon Trails" twice a week with two University undergraduates present each session using the Fifth Dimension as an organizing metaphor.

Next the discussion turned to computers and telecommunication facilities. The Directress was somewhat concerned about the costs of telecommunications and was reassured when she learned that only a local phone call was involved. She was also confident that getting computers for her children to use was not a problem, because she had been assured of support by the computer coordinator of the school system. As matters turned out, both of these issues posed serious problems.

One topic that the Directress initiated was the process by which we select the students who would be coming to the center.

> One of my concerns...I'm not particularly concerned about it but I want you to be aware of it, is that I am not in the classroom and parents, because of day care problems, if they see a young man on campus, they are going to want to know everything about that young man. So, there isn't someone in that group that...you have assistants but that person is not on site. [She was assured that an assistant would always be present]...OK, that's the one I could coordinate with.

In further discussion, Cole explained the entire dynamics of supervision of the students and it seemed that the matter was resolved. However, near the end of this part of the conversation, the Directress mentioned the issue again, commenting that she would have to check with the organization that licenses the Children's Center about the proper procedures for dealing with the students.

We did not anticipate it at the time, but as a result of publicity surrounding the McMartin case in Los Angeles and a high level of concern about child abuse more generally, the licensing agency insisted that all adults working in a day care facility register their fingerprints with the Department of Justice and obtain a TB test (at one point in a later planning meeting, one of the Children's Center participants referred to the "situation up in LA," an explicit reference to concern about child abuse sparked by the McMartin trial). The TB test could be obtained quickly and without cost, but the fingerprinting was time-consuming and cost $16.50 a person. When it is remembered that the University works on a system of 10 week quarters, and that the research project had to have checks issued by the university for the costs involved, it is clear that this procedure put a heavy administrative burden on the project, quite apart from any direct costs involved.

One week following this interview and one week before courses began at the University, we held a second meeting at the Children's Center which was attended by the research assistant who would have responsibility for running

the activities and the computer supervisor from the school district. It was clear that a good deal had changed in a week's time. The Directress opened the discussion with the comment that "You know how I am feeling. I really don't have time for a lot of theoretical kinds of things." Cole emphasized that this was a meeting to determine as precisely as possible what she wanted the research team to be doing 3 weeks hence when, according to the previous week's discussion, the activity should get under way. The Directress replied:

> "Let me tell you how this was presented to me initially. "E" [a local school official] came to me and presented me with this bountiful platter. "I've tied up this wonderful thing at the Public University. They will send a student in and they will train your kids on the computer. That's what my goal is, I am very simplistic." Now I am ending up where I am going to in-services, I had to release my secretary to go to an in-service, I had a teacher at in-service two days, all of which costs me money... Now that teacher has left and I do not even have a teacher who can coordinate this thing... So what I was looking for was someone from the University to come in and work with the children. And when I was talking to [the research assistant] the other day she was saying that I had to get a teacher involved."

Assured that all we were asking presently was where physically she wanted us to work and with whom on what basis, she next brought up the fact that "all of these people have to be cleared." We had already been told what the clearance procedure would be and were planning to take responsibility for it, which seemed to relieve her, but her list of concerns was long and pressing. Next she stated that she needed a limit on the number of people who came because "whether you have someone in charge or not, I still end up being the one who has to supervise.... So I don't want several students from the University coming in or various students."

The school district's computer director, who was present at this second in-service, suggested that after we had spent a few weeks getting started, that we draw up a plan for the entire year, to which we readily agreed. The

Directress, however, indicated that she was more interested in putting an end "to all these meetings" than to worrying about time lines for future development. She seemed pleased with the idea that the supervisor would worry about logistics and let her worry about her center.

Since we had agreed the previous week to have two students come on a Tuesday and two on a Thursday, the somewhat strained way in which this list of concerns was posed was a little disconcerting, but we simply reiterated our understandings, which already relieved the Children's Center staff of all but the most minimal responsibilities and the Directress seemed to be reassured. These "internal" issues settled, she now brought up some new concerns with the statement, "Since you were here last week, some things have changed." (Which was certainly clear enough from the change in the atmosphere of the discussion!) The crux of the change was the opening of a new after school center in the same school district but in a neighboring town to which the bulk of the older children attending the center were to be assigned. Since the Directress had initially wanted us to work with the older children and had seen software appropriate to older children, this shift in local organization appeared to her as a difficulty, and indeed it turned out to be one.

In the discussion that followed, it was agreed that we would, despite the change in student composition, go ahead with the project, beginning with some new observations of the conditions that obtained at the present moment, and continuing with a plausible form of after school activity that involved children with computers a few weeks hence, once four appropriate undergraduates had been chosen and trained. We emphasized that we were not in a hurry, that whatever we began with would deliberately be incomplete, so that we could cooperate with whatever staff were present to build something that worked for the Children's Center.

At this point, the computer supervisor from the school district entered the conversation, urging a "go slow approach" (which was completely acceptable to us) and then asking about the "time line for bringing in the computers." In addition, he raised a new difficulty. If the University program brought the computers on Tuesday and Thursday, the kids would expect computers on the other days and there would be no one to work them.

Our response was straight forward. The Directress had asked that we come only two days a week, and the computer director was urging us to "start slow." We stressed that while we were prepared to provide everyday support, all prior discussions had indicated that this was the **wrong** way to go. And the Directress confirmed that a two day a week schedule was what she wanted.

Returning to the concrete plans for the start of activities, we suggested that 5 computers be made available for approximately 10 child-participants. At this point, the computer supervisor asserted that although they were a relatively affluent district, they could not provide any help with computers (contrary to prior promises). His justification was an interesting "Catch-22." He went on to say that they had discussed placing computers at the Children's Center, but the rapid staff turnover precluded training a person to work with them. Our response was simply to formulate this difficulty in theoretical terms and to take it in stride as something to be dealt with as part of the project. As Cole put it in the discussion:

> One of the things I see happening over time--this is also a problem at the Community Youth Club but not so much at the Library, each of these institutions being different--is to address the question of how to create a continuous program in the face of discontinuous staffing and computer support. I think this is a problem that the University can really worry about. How can we over the long run provide a kind of continuity that will provide a kind of on-the-job training while helping the teachers to do their thing? I think that's a serious responsibility of ours. (Fieldnotes, September 16, 1987).

As we attempted to make it clear that we were not interested in being a nuisance to the Directress, she broke in with an account of her empathetic concerns to put a stop to extra meetings and get down to business in a way that reduced the hassles she faced:

> Directress: "I don't mean to come across like that.
> Cole: "I know you are being pressured."
> Directress: "Our focus is completely different. We are not part of the school district...well, we are and we aren't. We operate as a small business within the school district with a separate budget and we only exist as long as we collect tuition and so it doesn't give us much room for meetings and all those kinds of things.
> Cole: "I understand, but I have to learn how to coordinate with your system."
> Directress: "I understand and it sounds like a good plan."

To this day we are not certain of all the dynamics at work in this situation. We know that one of the unspoken pressures on the Directress was to move our activities from her center to the new facility a few miles away, which she and we were resisting. It is possible that support from the school district was eroded because we would not move our operation from that center to a new one. As matters turned out, the school district provided no support to the Children's Center in the form of computers or access to telephone lines, or any other manner that we are aware of. But here we are getting ahead or our story; before going forward, we need to stop and look at the goal formation process in the other institutions. Certain patterns reappear there, as well as certain unique issues. After looking into the observations at the other settings and the debriefing interviews that indicated their end-of-the-year conceptions of the project.

The Community Youth Club

At the very outset of our end-of-year interview with the Educational Director, we were confronted with the problem of unstable staffing; in two weeks she would be leaving the Community Youth Club and no one had yet been hired to replace her. Consequently, the interview was explicitly carried out as if she were not leaving so that we could assess how far the process of goal formation had proceeded, even if subsequent development was endangered by the discontinuity of staff changes. As indicated in our discussions at the Children's Center, after a year of observation at all of the sites we were coming to the realization that to be successful, any innovation we introduced was going to have to withstand the disruptions attendant on rapidly changing personnel.

The Educational Director started her account by pointing to two TI computers without monitors, which she had checked out with the LCHC staff member who had been making observations at the Community Youth Club in recent months. She had a pretty explicit idea of what she wanted to do.

> I am hoping that two TV's will come in [through donations] that I can put these [computers] up to for a permanent thing, like they can be right here so that whenever the kids want they can access the computer. Otherwise I have to set up certain times of day, or one day a week, and that doesn't work for all the kids that come to this club. It's easier to get more kids involved if I leave it set up. I will hopefully start up the Fifth Dimension. I just want to make the box and that type of thing and function just like we were [during the workshops] using the games that we have for these computers in the Fifth Dimension. That's as far as I've gotten so far on the planning (Interview, Aug. 24, 1987).

Discussion moved on to a consideration of telecommunications plans. At the time of the interview, the Community Youth Club was at a low point in fund raising and the cost of putting in a phone line to secure telecommunications was still a low priority. However, existing phones in a room not too far from

the computers were put at our disposal on a "use-if available" basis.

As we worked through scheduling, the Educational Director reiterated that she hoped to see the Fifth Dimension operating on as constant a basis as possible. In practical terms she imagined that this would mean that it would be available from 2:30 - 5:00 p.m. four or five days a week. We suggested that perhaps it would be possible to schedule children to come on Tuesday and Thursday or Monday and Wednesday [implicitly thinking in terms of university schedules and means of providing a structured way of interacting with the children].

> Cole: "The way the thing works, would it be like a club or would the kids drift in and out?"
>
> Educational Director: "Drift, because they have more of a record with me of doing that. They drift in, they get real excited about it; then they get excited about something in a different area of the club and if I have it here for them to come back to, that is the way it will work."

(In light of later developments in the Community Youth Club, this exchange is especially important, because of the relative lack of structure within the Fifth Dimension was [and remains] a constant issue in its development, as we shall see.)

A goodly part of the interview was devoted to discussing the possibility that the Community Youth Club's older children, who participated in a service club, might play a special role in the development of the computer activities. This idea appealed to the Educational Director who was experiencing difficulty in creating a cohesive teenage service group and thought that the teenagers might find "service" in the Fifth Dimension attractive. However, the idea never came to fruition.

The Library

Four people representing the Library participated in the end-of-the-year interview, the local librarian and a staff member, as well as two county-wide library employees, one of whom specialized in "technical resources," the other of whom was the supervisor for libraries in the region. In light of staffing problems encountered at the Children's Center and the Community Youth Club, it is worth noting that one staff member who had participated in the workshops had already left the Library for another job and that the local staff person present would soon depart.

The interview opened with a review of the Library's goals for involving children with computers during after school hours. The Librarian stated that the basic goal should be to introduce the children to the library through a computer-based educational program that would show them the resources that the Library possesses and how to use them. This idea had a history considerably longer than the project, dating back to 1983 when it was raised at a meeting of the local Friends of the Library by Cole's wife, who was a founder of the Library support group and who knew about earlier after school work by LCHC. In addition, the Librarian reported that a computer had been donated to the Library, and they were in the process of figuring out how it might be used (as indicated in the fieldnotes reported above.).

Cole asked about the workshops and ideas for activity that arose there. The Librarian said that she had been impressed by the after school activities that had been reported on during the workshops and that she had especially enjoyed the Fifth Dimension games where she had learned a lot.

When asked about telecommunications, the Librarian reported that a telephone line was "in the works" and that the Friends of the Library had provided a budget of $2000.00 for computer activities, a sum that we all agreed

was very large. In discussing how this money was to be spent, we explored ways in which LCHC could fill in with certain forms of equipment in order to allow the Library to stretch their budget as far as it could go.

This line of discussion brought the technical resources person into the conversation. She recounted the sad experiences of local libraries which had installed computers for use by patrons, explaining that as a result of prior experiences branch library staff didn't want to have "anything to do with this type of thing." (She offered the interesting rationale that "when a computer breaks down, you have an irate customer.") This concern led to a discussion of ways in which the program for the children would avoid these problems, since we were not proposing to use coin operated computers. This brought out the next level of difficulties, that the branch libraries did not have staff who were trained in the use of computers. Our program also seemed to offer a solution to this problem because we had spent a good deal of time working with branch personnel and we were planning to have a knowledgeable staff person present when the computers were in use.

One conceptual point worth highlighting in this discussion was that the library personnel consistently referred to "the" computer in a way that implied both fixed form and function. We found ourselves several times referring to our belief that there is no fixed "it" that corresponds to "the computer" but rather that we were dealing with ways of organizing activities using computers considered as flexible tools that could take on many forms and fulfill many functions.

As examples of this variety we talked about two different kinds of computer-mediated activity that the Librarian had already indicated interest in: an adventure game that would teach children about the library, and the Fifth Dimension, which had impressed her during the workshops. In each case,

the children would be active builders of a form of activity using the computer and in neither case was the "it" involved, ["The computer"], a fixed entity.

We then went over scheduling. The Library folk had no clear idea of how often or for how long they wanted the activity to go on. Cole raised possible problems if there were too many children or the activity went on a lot of the time, in particular, the possibility that the children would become noisy or disruptive of other activities. Prompted to consider if they wanted the activity every day or less frequently, they decided that twice a week would be about the right level to begin at. The issue of how many children would be involved was not taken up, but it would surface again later, along with other issues signalled in this discussion, to play an important role in the evolution of these activities.

The First Year--A Summary of Main Points

In sum: (1) Each institution has very different organizational structure, different demand, and different goals to fulfill, but they all chose the same computer-based educational activity, the Fifth Dimension, with some variations as the overall metaphor. That is, the Library wanted to promote geography and general world knowledge which would enable the children to use some of the facilities of the Library. Both Children's Center and the Community Youth Club had no such real demands.

(2) Some institutional difficulties in coordinating with us are quite apparent for the Children's Center from this phase of the research so that it might not come as a surprise that they did not remain as part of the project for much longer.

(3) A problem common to all the institutions we dealt with is the fluidity of the liaison person(s). Institutions tend to divide the people who

make the everyday decisions of how a setting is run and those who decide whether a program is to be incorporated or not. Later on, it became clear to us that these people who we had hoped to help us run the program in the long run were never stable, but also they were not the appropriate ones to contact when we were dealing with issue of long-term consolidation of the program. Thus, while the first phase of our research established contacts with people, because of their temporary nature we were dealing with those who worked a set number of hours and had a set number of tasks. It proved difficult to add a new activity, let alone to maintain it. Thus, we learned that the way we had to interact with the institutions and what we could legitimately expect was very different from what we originally had in mind. In the final analysis, a new person was needed to run the program, who would have to be hired by the institutions to do just that.

Chapter 3

An Overview of the Fifth Dimension Program[1]

The Fifth Dimension, an after-school educational program for elementary school children that has been a long-term project of the Laboratory of Comparative Human Cognition (LCHC), was adopted by each community site that participated in Phase II. While this program has been a collective project of LCHC over the last decade, and many people have contributed to its present structure and organization, two people who have played a central role in initiating and developing it have been Peg Griffin and one of the present authors, Michael Cole. The principles that have guided this effort are drawn primarily from the approach to cultural psychology advocated by Cole (for one formulation, with explicit reference to the Fifth Dimension, see Griffin & Cole, 1984; for elaborations, see Cole, 1990a, 1990b, 1990c).

The program is designed to promote computer literacy (at a fairly basic level), and at the same time to use computer software to promote more general cognitive and social skills. It is aimed at children of elementary-school age, 6-12 years, both boys and girls.

The Fifth Dimension program combines two key functions (among others): (1) It is an attempt to construct workable models for developing certain forms of community-based, after-school educational activity--some elements of which can be applied in regular school settings; and (2) it also provides a framework for more basic research into processes of learning and development, as the present chapter will attempt to illustrate.

The most important of these research issues emerge from a central, theoretically informed question which the program addresses: how to create

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[1]The analysis in this chapter and chapter 6 is drawn from Nicolopoulou & Cole, forthcoming.

sustainable systems of educational activity based on a culture of collaborative learning, in which play and imagination have a major role. (Griffin & Cole, 1984, formulate this goal in terms of the systematic mixture of different forms of "leading activity" as a developmental strategy.) Since the attempt to pursue this goal in the Fifth Dimension makes use of computers and computer-related materials, it bears, in addition, on the question of how resources of this sort can most usefully play a role in education. In this respect, the most significant implication of the present study is to underline the message that the potential educational contributions of computer technology cannot be evaluated in isolation; rather, it is necessary to examine how computers--and other resources--can be integrated effectively into larger systems of educational practice. The experience of the Fifth Dimension, as we will analyze it in this chapter, suggests some of the ways that this goal can be accomplished.

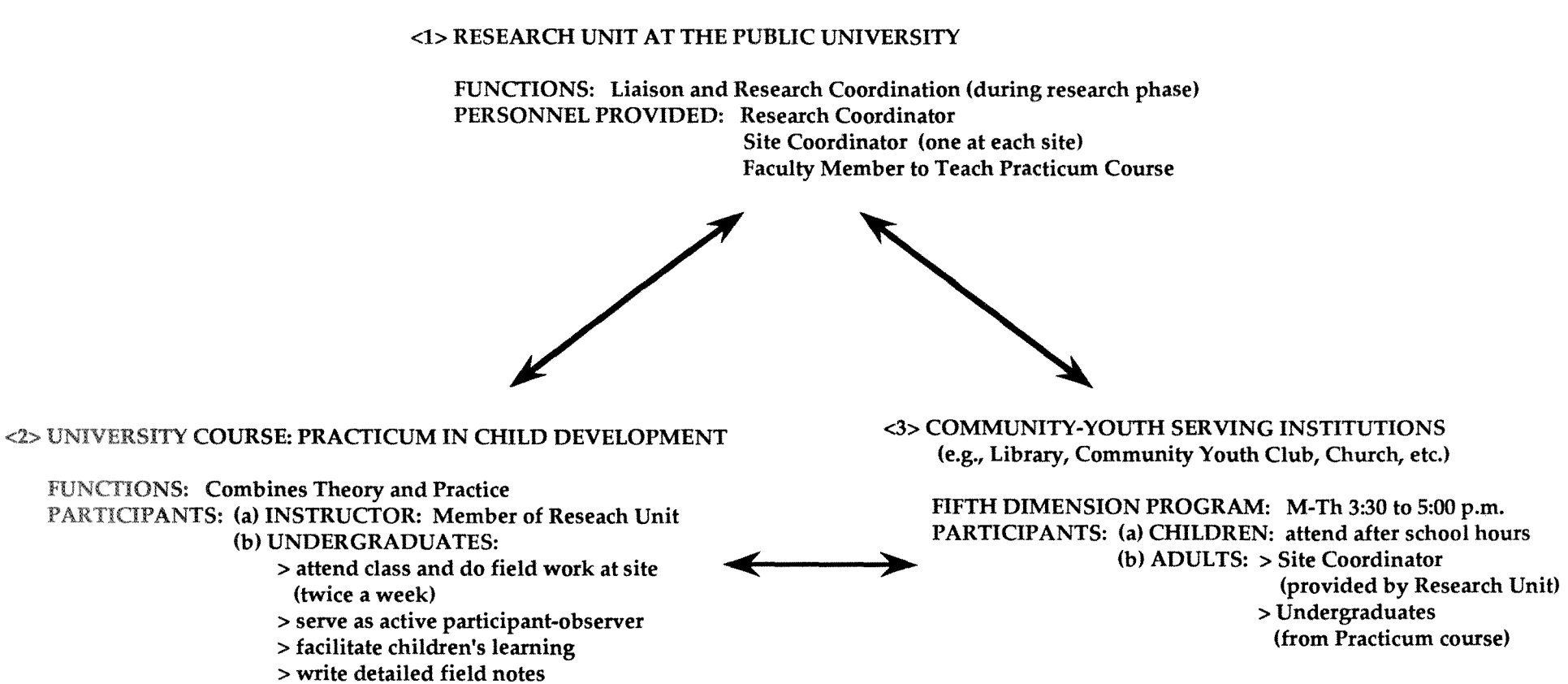
As indicated above, this project attempted to institutionalize a pattern of complementary and mutually beneficial interaction between the University and a variety of community institutions. Thus, the operation of the program requires the cooperation of several institutions (see Figure 1).

Insert Figure 1 about here

The participants at each Fifth Dimension site include both children and adults. In the sites under discussion, the adults directly responsible for the program come from the Public University. With the exception of the site coordinator, to whom we will return in a moment, they are undergraduates participating in a course entitled Practicum in Child Development which the University offers all three quarters each academic year. The students are introduced to relevant ideas from theories of child development and do field

FIGURE 1

INTERACTING INSTITUTIONS (UNIVERSITY AND COMMUNITY)



work in the Fifth Dimension sites. Their field work consists of helping the children with the Fifth Dimension activities and writing field notes based on their site experience. Most of the undergraduates participate for a quarter, but some carry on for two or even three quarters in succession.

Each site also has a coordinator, who is always present during the operation of the program and whose role is to supervise the program closely and ensure its smooth functioning. The coordinator plays a major role in training and supervising the undergraduates, facilitating the interactions between children and undergraduates, and maintaining the continuity of the site from day to day and from quarter to quarter. During Phase II, the coordinator at each site was a member of the LCHC research staff; and, in general, LCHC served as the liaison between the community institutions and the University.

Structure and Practice of the Fifth Dimension Site: The Play-World

Each Fifth Dimension site had its own designated physical space: at the Children's Center and the Community Youth Club it was housed in a single room, while in the Library it was located around a large table in one corner of the room. These sites had 4-8 personal computers and software for about 40 games and other computer-based activities (about 6-8 of the total are non-computer activities such as Mastermind, Battleship, and Origami). With a few exceptions, these consist of educational software in the form of games that teach children about certain content areas--such as history, geography, and music--while simultaneously promoting the development of cognitive skills such as general problem-solving, strategic thinking, and logical reasoning. Some even introduce the children to simple computer languages such as Logo and Logowriter. There is a deliberate attempt to combine games and activities at very different levels of difficulty and complexity, so that at any given moment every child has some activities that he or she can master and find satisfying.

These games and activities are organized into a complex system, and it is this system which is the key to what is most interesting and distinctive about the Fifth Dimension. The system is designed as a 20-room "maze" (see Figure 2). The maze is, of course, a conceptual structure; but each of the Fifth Dimension sites also has a roughly 4x5 foot physical model of it. When children enter the Fifth Dimension, they move in different sequences through the maze; they choose little figurines to represent them, and they can mark their progress through the maze by moving their figurine around in the model.

Insert Figure 2 about here

The rules which define the maze, and the ways children can move through it, are therefore crucial to the program. The Fifth Dimension is a make-believe play-world constituted by its system of rules. When children join, they become "citizens"; they are given a constitution which describes the rules; and they embark on their journey through the maze, which involves increasing mastery of a sequence of activities.

Children generally play the games in pairs (or trios); and they are assisted by one of the undergraduates, whom we mentioned earlier. One important point to mention is that the undergraduates, particularly when they begin, often do not know the games any better than the children--and sometimes they even know less than specific children. So they have to learn along with the children. What they contribute are greater general knowledge and more advanced problem-solving skills. They also bring with them a better grasp of the overall Fifth Dimension system and its goals.

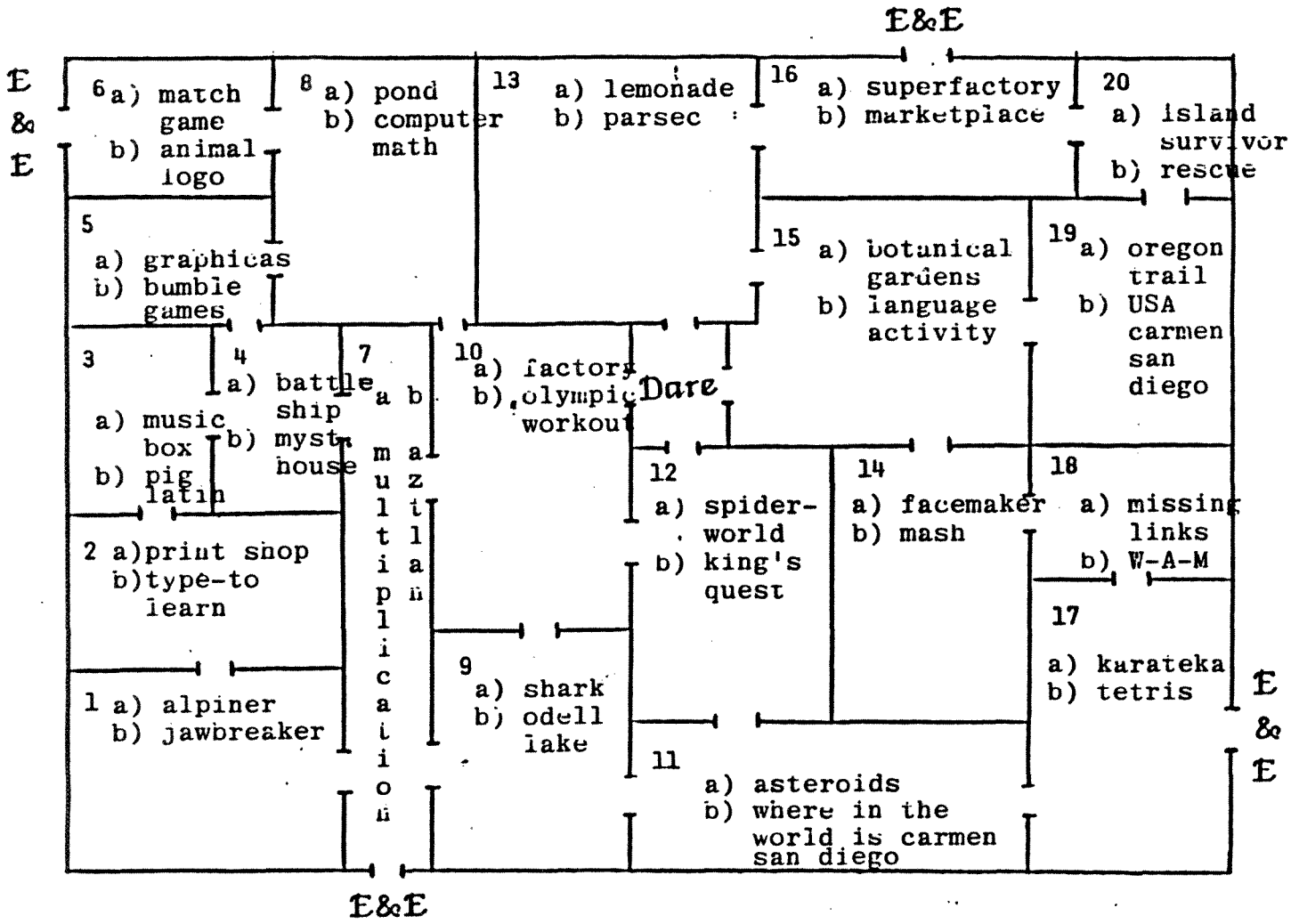
The symbolic center of the system is the mythical figure of the Wizard, the creator and benevolent overseer of the Fifth Dimension, with whom the

FIGURE 2

The Fifth Dimension

Solana Beach Library

_____'s Personal Map



children are in constant communication through electronic mail. Children report regularly to the Wizard about their success or difficulties with different games, and reflect on the strategies they used to master them. This activity of reflection and externalization helps children consolidate the knowledge they have gained, and (among other things) promotes their meta-cognitive skills. In the process, they pass on hints about how to master the games which the Wizard, in turn, can pass on to other children through a Hints Box, which is a computer bulletin board. The Wizard is also the final court of appeal regarding interpretations of the rules; children can send him (or her) petitions, reports of grievances, and suggestions for improving the program.

The child proceeds through the maze in a complex series of steps, which are somewhat different for each child. Each "room" the child enters has two games (or other activities), and the child can choose which one to play (see Figure 2). Each game can be played at three possible levels of expertise; the higher the level achieved, the more choices the child gets for the next move. The general principle is that increasing mastery of a particular game opens up an increasing range of alternatives, and it is up to the child to choose which to pursue.

It should be noted that these three levels of expertise are not already given in the computer software. For each game, on the basis of a task analysis carried out by the LCHC research staff, a task card has been constructed which defines the goals of the game and specifies these levels of mastery as part of the Fifth Dimension. The task card is designed to guide the child through the activity.

The aim is that each level should represent a complete and satisfactory task in itself, clearly connected to the cognitive goals that the game as a whole is supposed to advance. This means, on the one hand, that children are

introduced to the goals of the game and given some means to accomplish them, even if they do not go beyond the beginner level. On the other hand, while the higher levels provide more depth and information, they do not require that the children have completed a lower level. In most cases, the children are able to choose any level at which to begin, and are able to backtrack to a lower level if necessary.

The children's mission is to proceed through the maze until they have visited all the "rooms" in the maze and played at least ten games at the "expert" level. At that point the child can petition to become a Wizard's Assistant (a status already held by the undergraduates). In addition to the honor involved, children who become Wizard's Assistants are introduced to more complex activities, and are given greater responsibilities for helping other children and for representing the Fifth Dimension in general. These are, in broad terms, the main features of the Fifth Dimension and its play-world.

The Theoretical Rationale and Significance of the Fifth Dimension

The Fifth Dimension is fundamentally an activity system with a certain specific inner logic. The goal is to create a context which can promote collaborative learning, and within which children themselves are motivated to progress step-by-step, so that they are actively involved in their own development rather than simply receiving information from other people.

Three key points are especially worth emphasizing in this connection: (1) What the Fifth Dimension does is to create a make-believe world that is constituted by a system of shared rules. (2) It is precisely through the understanding and acceptance of this system of shared rules that children are allowed and encouraged to take an active role in their own education. (3) It is within this context that the role of the undergraduates has to be

understood. They are there to guide and facilitate the children's development, and not to act as authoritarian figures or simply to serve as sources of information in a one-way transmission relationship. (They provide opportunities for affiliative activities with older "peers" at the same time that they act as role models.) In short, what the program attempts to do is create what we will call a culture of collaborative learning. And, for creating and maintaining such a culture, the discipline provided by a system of shared and voluntarily accepted rules is crucial.

This is a point of considerable theoretical importance, so it is worth spelling out. To paraphrase a comment which Peg Griffin once made, a central principle of the Fifth Dimension is that of choice within a structured context. The discipline of this structure is important. But, as far as possible, it should rest, not on the authority of individuals, but on the authority of an impersonal normative system: that is, a system of shared and voluntarily accepted rules which are embedded in, and constitute, an ongoing practice. This happens at two levels in the Fifth Dimension: (1) at the level of the Fifth Dimension system as a whole; and (2) at the level of individual games, each of which constitutes an activity system of its own with its own inherent rules.

The interplay of choice and discipline brings us to another important element of the Fifth Dimension program, which is the attempt to integrate play and imagination into the educational process. It may seem strange to talk of play and discipline in the same breath. But we would argue that they fit together quite naturally, because play is not necessarily frivolous. On the contrary, if properly understood, it can serve precisely as a prototype of an activity constituted by shared and voluntarily accepted rules, within which people can be motivated to strive for excellence and for mastery of the

possibilities inherent in that practice.

This is a key premise behind the whole Fifth Dimension program, which underlies its potential implications for wider issues in education. We should therefore elaborate on the reasoning behind it. The theoretical basis for this approach in the Fifth Dimension is drawn from the work of Vygotsky; one of the best examples of his way of thinking about these issues is his well-known lecture on play (1933/1966), but the same approach informs his theoretical perspective in general (see Vygotsky, 1978, 1987, as well as Wertsch, 1985, and Nicolopoulou, in press). Vygotsky himself draws importantly in this respect from the early work of Piaget, especially Piaget's book The Moral Judgment of the Child (1932/1965)--and thus, indirectly, from Durkheim (in particular, Durkheim, 1925/1973; see also Weintraub, 1974).

The crucial orientation shared by Durkheim, Vygotsky, and the early Piaget can be formulated as follows: The coherence of both individual mental life and of social life is structured by systems of rules. This is true of autonomous action as well as action performed under external constraint. Autonomy is not at all the same as arbitrariness; it requires a capacity for self-discipline and self-determination (to paraphrase one of Vygotsky's formulations). However, to be able to think and act autonomously requires moving from dependence on the authority of particular superiors to operating within the framework of a shared and voluntarily accepted system of impersonal rules. People develop this capacity, in part, by acting within a framework of cooperative social relationships. What this kind of activity requires, and what it simultaneously helps people to grasp, is the sense that the rules are not necessarily handed down by a superior; rather, they are inherent in the structure of the activity itself, and are necessary in order to be able to carry out a practice or form of activity that is valued by its participants.

This is true whether the practice involved is a game, or an active collaboration, or making use of the conceptual system of mathematics in order to solve a problem--and so on.

In sum, then, the premise that these three thinkers share, and which Vygotsky emphasizes repeatedly and develops in his own way, is that thinking and cognitive development involve participating in forms of social activity constituted by systems of shared rules which have to be grasped and voluntarily accepted. (To paraphrase a formulation of Anthony Giddens [1979], systems of rules are not only constraining, but can be simultaneously constraining and enabling.) Rules emerge and have force within the context of a cohesive social group; and they serve, as Durkheim (1897/1951) would put it, both to regulate and to integrate the social group--that is, to maintain its cohesion. (These connections became clear to us through reading Weintraub, 1974.)

One of Vygotsky's distinctive contributions to this shared problematic is his insistence that play is a crucial prototype of all such activities. Play is enjoyable, and it is at the same time an essentially rule-governed activity: its two essential components are the presence of an imaginary situation and the rules implicit in this imaginary situation. The system of rules serves, in fact, to constitute the play situation itself; and, in turn, these rules derive their force from the child's enjoyment of, and commitment to, the shared activity of the play-world.

This discussion should help explain why Vygotsky sees play as having an important role in learning and cognitive development. The child learns that realizing the imaginary situation requires adhering to the rules implicit in that situation. This acceptance is voluntary, but necessary: no one is making the child accept these rules; but, without adhering to them, one cannot play the game. Furthermore, play is always a learning activity because it requires

learning and grasping these rules, seeing that they form a system, elaborating them, and mastering the possibilities of the form of practice they constitute. Even simple pretense play--for example, a little girl pretending to be a "mother"--requires attending to and making explicit the normally implicit rules embedded in the role of "mother." A game like Match-23, which children play in the Fifth Dimension, requires grasping and applying fairly sophisticated principles of strategic thinking, and so on.

The relevance of this theoretical discussion to the Fifth Dimension should now be clear. The program's goal is to create a context for self-motivated learning within the framework of a voluntarily accepted system of rules. The authority of the rules is not dependent primarily on the authority of particular individuals, but is embedded within the structure of collectively shared systems of activity. Part of what contributes to the impersonal character of the system of rules, incidentally, is that they are, to a certain extent, built into the computer software rather than being entirely enforced by individuals. Thus, we can take advantage of the possibilities offered by computer technology and telecommunications, even in a fairly unsophisticated form, to help create educational systems of this sort.

Chapter 4

Phase II: Historical Experience of the Fifth Dimension sites

Phase II of the research project began in September 1987 and continued to July 1989. This phase revolved around two main goals: (a) the implementation and operation of the Fifth Dimension programs at each of the participating institutions; and (b) the continuous tracing and monitoring of the activities at each of the sites in order to evaluate the program. In this and the next chapter, we will give an account of the first goal, while in two later chapters we will deal with the second goal, but from two different perspectives: chapter 6 will present an evaluation of the program from the research perspective and the logic of the Fifth Dimension; and chapter 7 will present an evaluation of the program from the perspective of the community institutions.

Given that the participating institutions differ from each other in significant ways, and given that the Fifth Dimension is an activity system with its own specific inner logic, in this chapter we will trace how the implementation of the program unfolded differently in the different settings; that is, we will trace the different bundles of possibilities and constraints that were manifested along the way.

To summarize the main events and conclusions during this phase: Fifth Dimension programs were successfully implemented at the Community Youth Club and the Library, but not at the Children's Center. However, the implementation of the program at the Library and at the Community Youth Club unfolded very differently.

On the one hand, due to the fact that these two institutions serve children in different degrees and capacities, they posed different problems for the program. In the case of the Club, we were faced with a large flow of children who were there for unspecified periods of time and for unspecified

number of activities that made attendance to the Fifth Dimension, while high in numbers, relatively fragmentary and discontinuous. In the case of the Library, children had to be recruited and transported by their parents. Although more effort was needed at the beginning of each new academic year, when the Library's children came they stayed for the whole period which made their attendance in the Fifth Dimension much more continuous and solid.

On the other hand, the distinct mixture of play, fantasy, and collaborative learning that defines the Fifth Dimension program also played out differently in the different settings. In the case of the Club, which is a boisterous and noisy place, the education element of the Fifth Dimension stood out; in the case of the Library, which is a more serious and studious place, the play element stood out.

Finally, it should be noted that the different configurations of activity that emerged as we began to implant the Fifth Dimension in the different institutions had far reaching implications for the way they shaped two different contexts: (a) the sets of relationships within each program; and (b) the interaction of the host institution and the research/teaching team. These further implications are a topic that we develop throughout this report.

In our historical overview of the activities of the Fifth Dimension sites we will focus first on our three main research sites all located in a single metropolitan area in Southern California, La Playa: Children's Center, the community Library, and the local Community Youth Club.[1] Then, we will focus

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[1]It should be mentioned that the majority of the activities we will cover during this phase center around three academic quarters: fall, winter, and spring. This is because the Fifth Dimension program must be coordinated with the undergraduates attending the Practicum class, which we mentioned in chapter 3. Although some variant of the Fifth Dimension program was run during the summers in one of the participating institutions, full-blown operation of the sites occurred only during the three academic quarters. Furthermore, each quarter last for 10 weeks, but the first two weeks are devoted to the intensive training of the students in familiarizing them with the program and in prepar-

briefly on the peripheral sites that sprang up along the way, using the research sites as model and impetus. Finally, we will turn to some of the preparations and decisions for passing on to Phase III of the research made by both the participating community institutions and the research team.

I. The Main Research Sites

(1) The Children's Center

A Fifth Dimension site operated for only two quarters at the Children's Center in the La Playa community: fall 1987 and winter 1988. Although the Fifth Dimension program was rather popular and well attended, other institutional considerations brought about the decision to discontinue the program rather early in Phase II. By the end of the second (winter) quarter, both the research team (LCHC) and the staff of Children's Center decided to discontinue the program because the experience so far indicated that both parties were feeling the strain of trying to coordinate and it was becoming clear that it might not be able to grow any further.

An Account at the Fifth Dimension Level

Based on the desire of the Center for a limited activity (see Chapter 2), the Children's Center's Fifth Dimension was rather small in capacity. It had three to four operating computers (all used in playing games), a fluctuating number of three to five undergraduates, a coordinator who was present every time, and the principal investigator who visited all the sites very frequently. This arrangement allowed the site to accommodate comfortably six to eight children per session. In order to accommodate more children--that apparently

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ing them to work with the children; consequently, full operation of the sites per year involves 3 8-week periods.

was the desire of the Children's Center--it was arranged that two groups of eight children attend site, one group on Tuesday and the other on Thursday. During both quarters, attendance was at its maximum of eight children per day (with a minimum of six and a maximum of ten children) (see Figure 3). During the fall quarter, 14 children were involved, while during the winter quarter there were 22 children, but six of them had also attended in the fall quarter, thus bringing the total number of different children involved both quarters to 28.

Insert Figure 3 about here

The pattern of attendance during the fall quarter was rather high for almost all 14 children involved (see Table 1). Except for one child who participated in the program three times, the rest of the children participated from 6 to 11 times in the 8 week period. The children's attendance was rather high (86%), taking into account that these children were allowed to come only once a week and the site met eight Tuesdays and seven Thursdays in total. Furthermore, the groups mainly adhered to their Tuesday or Thursday schedule, and only when a regular child was absent was a child from the other day allowed to take an additional turn. The overall range of children was from 6- to 10-year-olds (with a higher proportion of 6- and 7-year-olds than generally encountered at other sites); however, as the pattern of children's attendance attests, these children found the activities fun and were very eager to participate.

Figure 3

Average number of children per week participating in the Fifth Dimensionat program at the Children's Center for Fall 1987 & Winter 1988