

KNOWLEDGE-BUILDING COMMUNITIES PROJECT

Teachers' Profiles

Overview

This section of the report provides descriptive background information about each of the informants. This information, which describes how teachers utilized CSILE in the first phase of the Knowledge-Building Community Project, will help the reader to better contextualize the analysis of the interview research effort.

A total of nine teachers from two different school districts participated in the project. A tenth teacher, a student teacher at the time, was invited to participate in the study so that we could better understand how a student teaching assignment with teachers working in a computer-supported knowledge-building community could affect preservice teachers' professional practice. Table 3 outlines the teacher informants' professional profiles and illustrates the breadth and diversity of the informants' backgrounds and experiences.

Lakeside ISD

Winfield Middle School: Cathy

Cathy, who has more than twenty years experience, has taught language arts, both regular and gifted/talented in grades two, four and six. When she participated in the CSILE project, Cathy was managing the Winfield Gifted and Talented (GT) Program and eighth grade honors Language Arts. What is especially impressive about Cathy's background is that when she first began her teaching career over twenty years ago, she was introduced to a rather non-traditional form of instruction—collaborative learning and team teaching, and was directly involved with developing a thematic curriculum with a team of other teachers. She also had the experience of teaching in England, where discovery learning and cooperative learning enjoy much greater support by the educational system than found in the United States. It is not surprising that, when she moved to Texas in the early 1980s, she had to adjust to working in a more traditional instructional setting—a self-contained classroom environment. Although Cathy still retained her student-centered approach to instruction, she missed collaborating with fellow teachers and thought the CSILE project might offer the opportunities of close collaboration and collegiality with other teachers. Even though the other two teachers at Winfield had been invited by their

principal to participate in the project, Cathy was so intrigued by reports from some of her students that she asked to be considered as an additional participant in the project.

Cathy expressed that prior to the CSILE project, her computer experience was “pretty minimal.” Although she used the computer as a productivity tool, especially for word processing, and encouraged her students to use the computer for such purposes, prior to her participating in the project, Cathy had very little working knowledge about how to integrate them into the curriculum. Since her experience with using CSILE, she has integrated technology into her teaching practice, using telecommunications and the Internet as an instructional resource. She also encourages her students to use Hypercard and Hyperstudio as productivity tools.

Winfield Middle School: Charles

Charles has taught eighth grade Language Arts for approximately fourteen years. At the time he was involved in the CSILE project, Charles was teaching eighth grade “regular students who were pretty basic in English” and had also experienced team teaching with a Special Education teacher. Charles believed that his principal asked him to participate in the project because of his background in using computers and also because she sensed he needed an opportunity that would “revitalize his energies and refocus him.”

In terms of Charles’ teaching style before his exposure to CSILE, he described his method as “teacher-directed and, curriculum-wise, it was literature-directed” versus interdisciplinary. Charles also reported that he had prior experience with using computers as a productivity tool (spreadsheet and word processing), but had not attempted to integrate technology into his teaching practices or the curriculum.

Winfield Middle School: Jack

In graduate school, Jack worked as an assistant instructor and gained experience teaching an undergraduate college history course for one year. A short time after receiving his Master’s degree in history, Jack taught high school history (sophomore, junior and senior) for three years while completing an alternative teacher certification program. He team-taught in a special GT interdisciplinary humanities program (i.e. history, literature and the humanities) during his initial high school experience and described his teaching style as “a lot of lecture with the Socratic questioning built in.” He believes that although it was teacher-directed, it was highly interactive. The predesigned curriculum focused on projects and various group activities. During his first

semester at Winfield Middle School, Jack, who was teaching regular and honors eighth grade history, was invited by the principal to participate in the CSILE project. Jack believed that he was invited to participate in the project because of his background in interdisciplinary studies and advanced education.

As for computer experience, Jack purchased his first computer in 1984 which he used as a productivity tool at home. In addition, some of the academic teams he coached in high school won state championships and were given computers as prizes. Jack put these computers in his classroom and his students used them for word processing.

Winfield Middle School: Edith

At the time of the Knowledge-Building Communities Project, Edith was teaching her first semester sixth grade social studies (World History) at Winfield. Though she was not a part of the TCET spring 1993 project, she is included in the study because, as part of her preservice teacher program, she had been a student observer and then a student teacher for Jack during the first two semesters he was implementing CSILE into his teaching practice. Edith had taught private piano lessons for several years before she decided to get certified as a public school teacher.

Prior to her experience with CSILE in her preservice teacher program, Edith had limited experience with computers, using them only as word processors. Her notion of teaching was very traditional as well. As she explains, “I had envisioned that you would stand up in front of the classroom. You would have notes that the student would take—that you would put up on the board or overhead. They would copy them down, read them, memorize them, regurgitate the facts and give you what you wanted because you are the teacher, you are an authority, and you are all-knowing.” Needless to say, her preservice teaching experience countered that impression. Because her first experience in her student teaching with Jack was that of a more student-directed model, she, unlike other teachers who had adopted a more traditional teacher-directed approach to instruction, did not have to unlearn years of teacher-directed practice. Edith was pleased with how different a teacher she had become in relation to her lifelong vision of the “ideal teacher.”

Howard Middle School: Nancy

Nancy has fourteen years of teaching that has spanned from sophomore English to sixth grade reading and writing resource, seventh grade language arts, eighth grade language arts and,

finally at Howard Middle School, eighth grade American history. Nancy had no prior experience with using computers either as a personal productivity tool or in the classroom. She described herself as a “non-technical person,” a characteristic which she assumed described a “traditional teacher in the most positive way.” Prior to her exposure to CSILE her teaching style was “lecture, essay-type feedback from the students . . . confined to the traditional approach like textbook, paper and pencil.” She explained that she had “never dreamed of letting kids have an active role or even responsibility for what they learned.”

Reflecting on why she thought her principal selected her to participate in the CSILE project, she reported that “it was really kind of a lark.” Nancy had some prior experience with team teaching and project based curriculum, but had not encouraged collaborative learning, because she believed that “each student had to show exactly how much they individually had produced.” In terms of curriculum development, prior to CSILE Nancy strictly followed state-mandated guidelines, and would only make minor changes to her curriculum. However, as indicated above, teachers working on the CSILE project were relieved of having to address the state guidelines. This gave her the freedom to experiment. At one point she realized that rewriting the entire curriculum was necessary so that it would better “fit” with CSILE. Nancy specifically focused on developing an interdisciplinary curriculum based on thematic units.

Howard Middle School: Sue

Sue has taught for twelve years including third grade, sixth grade language arts, math and social studies. When asked to participate in the CSILE project, Sue was teaching sixth grade social studies. She had suspected that she was asked to become a part of the project because she had a background in elementary teaching, and therefore was comfortable with collaborative learning, and also because she had no background with using computers.

Prior to her experience with using CSILE, Sue had not used computers as a personal productivity tool, nor in the classroom. In fact, Sue stated that she was “very against any type of computers in the classroom.” When she was first introduced to the software, Sue literally “did not even know how to turn a computer on.” Her distaste for computers in the classroom sprung from her impression that they were “impersonal” and that their educational uses were limited to being an “electronic worksheet.”

Central ISD

Oakes Middle School: Doug

Doug has taught sixth grade for twelve years in both elementary and middle school settings and has taught mostly language arts and social studies. When he participated in this project, Doug was teaching sixth grade social studies, English and science. He suspected that the reason he was invited to participate in the project was because he expressed “interest in technology and innovative teaching techniques.” One hallmark of his innovative teaching was the minimal use he made of textbooks, relying instead on more primary sources for his students’ learning, including library resources, computer programs, videos and field trips.

Doug, who is comfortable with computers, has served on his school’s technology committee, and always had one computer in his room. His classes often frequented the school’s computer lab, learning keyboarding skills as well as various other computer programs. Some of the programs were drill and practice; others were games like “Carmen Sandiego” and “Oregon Trail” which he used specifically for geography.

Oakes Middle School: Jane

Jane has the longest classroom teaching experience in the group, twenty-two years, mostly in elementary school. Her experience includes almost every grade from kindergarten to sixth grade. She prefers teaching assignments more in keeping with her elementary school experience, where she enjoyed teaching a wide range of subjects. Jane maintains that “. . . everyone should be a kindergarten teacher to start out,” because they learn a teaching style where students explore a topic and build a broad range of knowledge around a topic. She disapproved of the teaching practices she was pressured into starting around the fourth grade, in which curriculum became textbook-based, assessment required memorization, and instruction became more traditional. At the time of the Knowledge-Building Communities Project, Jane was teaching seventh grade science for the first time, which fit her preferred teaching style even less. She states that “I was thinking about going back to elementary, because I like pulling all my subjects together.”

Like Doug, Jane was familiar with the educational uses of computers. She had used micro-world based computer instruction such as LOGO and taught students BASIC programming, word-processing and graphics programs. CSILE was a natural extension to her educa-

tional technology skills. Since the project, she and Doug have incorporated telecommunications into their teaching practice as well.

Milroy Junior High: Peggy

Peggy had been teaching for eighteen months prior to the Knowledge-Building Communities Project. Her first year of teaching was high school mathematics. She was teaching eighth grade mathematics at Milroy Junior High at the start of the project. Both schools' mathematics departments focused on integrating computer technology into their mathematics curriculum. Peggy, a proponent of educational technology, has focused on learning how to successfully integrate technology into her instructional practices.

Peggy characterized her eclectic teaching style as “dynamic,” “theatrical” and “structured.” Her first year of teaching, however, was mostly “direct teach.” After receiving training in cooperative learning, she immediately integrated the techniques into her teaching. She stated that “I very strongly believe in collaborative work. I do a lot of direct teaching broken up with exploratory work” where students work in cooperative groups.

Milroy Junior High: George

George, also a math teacher, worked with Peggy to introduce CSILE at Milroy. Peggy and George state that the principal selected them, not only because of their interest in technology, but because the project designers were interested in how well CSILE would work to support a mathematics curriculum, and both of them were “pretty willing to try new things.”

George had taught mathematics for one year when, because of the high turn-over rate at the school, he found himself in the position as the head of the department because he was the senior math teacher at Milroy.

Before he experienced working with CSILE, George stated that his teaching style was “lecture-oriented.” He had taken a workshop on hands-on learning techniques and was in the process of incorporating these strategies as well as cooperative learning into his teaching practice at the time of the project. He soon found that he did not enjoy having computers in the classroom, because they were too distracting to his students. He preferred to have the class focus on their work, a goal that required his constant supervision. Consequently, in terms of using educational technology, he preferred visits to a computer lab.

Teachers' Profiles

School	Teacher	Yrs. Exp. / Subjects, Grades	Assignment Spring '93
Winfield M.S. (Lakeside ISD)	Cathy	20 years experience - language arts, regular and G/T, grades two, four, six; honors English, grade eight	honors English, grade eight
	Charles	14 years experience - language arts, grade eight	language arts, grade eight.
	Jack	4 years - one year assistant instructor college history; three years high school history & humanities, grades 10, 11, 12	history, grade eight
	Edith	No experience - student observer/teacher for Jack (history, grade eight)	social studies, grade six
Howard M.S. (Lakeside ISD)	Nancy	14 years - English, grade 10; reading & writing resource class, grade six; language arts, grades seven & eight; social studies, grade eight	social studies (American history), grade eight
	Sue	12 years experience - third grade; sixth grade language arts, athematics, social studies	social studies (world history), grade six
Oakes M.S. (Central ISD)	Doug	12 years experience - sixth grade language arts, social studies, and science	language arts, social studies and science, grade six
	Jane	22 years experience - elementary all levels (K-6); middle school sixth grade science, mathematics & language arts; science, grade seven	science, grade seven
Milroy Jr. High (Central ISD)	Peggy	1 year - high school mathematics	mathematics, grade eight
	George	2 years - mathematics, grade eight, honors algebra, grade eight	mathematics, grade eight

Table 3: Teachers' Profiles

Site-by-Site Narrative

Rationale for the Narrative Approach

Because the analysis process often strips qualitative data of its context, we feel it is necessary to provide our readers with detailed narratives so that they can get a sense of the context, settings, and the individuals who participated in the Knowledge-Building Communities Project. It is important to provide this information if readers wish to transfer their understanding of our findings to other settings, where similar results may or may not occur, depending on the similarity of the new settings to the conditions of this study. This is analogous to providing claims of generalization in quantitative research (Patton, 1990). In addition to the foregoing description of the informants, the following narrative, which describes the diffusion of the CSILE software into both districts, will assist with the transferability of the study's findings. In addition, this section lends primary support to points raised in the subsequent data analysis, specifically to Theme One which describes changes in the informants' instructional practices during their use of CSILE. This section also describes how the inclusion of preservice student teachers from the sponsoring university and the use of an electronic bulletin board system (BBS) provided by the sponsoring university influenced the teachers' experience with using CSILE.

Table 4 is a timeline which features the highlights of the diffusion process. This timeline guides the descriptive narrative which follows below. Before we begin the descriptive narrative, the reader is asked to keep in mind how three major factors influenced the circumstances which structured the diffusion and adoption processes.

Three Major Factors Influenced the Diffusion and Adoption Processes

Based on the analysis of the teacher's experiences, it became apparent that three major factors influenced the diffusion process of CSILE. First, teachers at Lakeside ISD had longer exposure to CSILE and were therefore much further along in the adoption process than their counterparts at Central ISD. For example, in February 1992, the CSILE computers were in the Lakeside schools. Project teachers, who previously received their CSILE training in a three-day workshop in the fall of 1991, were busy preparing an instructional unit that reflected the integration of CSILE into their curriculum which was projected to be implemented in the following spring semester. In contrast, the networked CSILE system was not installed into the Central ISD schools until late February 1993—one year later. Therefore, when the spring 1993 project began, the Lakeside teachers were at a much different level of concern and use than the Central teachers.

Secondly, as a consequence of their prior experience and as an integrated part of the project design, the Lakeside ISD teachers took a leadership position and assumed a mentoring role towards the teachers at Central ISD. For example, the Lakeside ISD teachers developed and coordinated a two-day training session for the Central ISD teachers in January 1993 at the sponsoring university. At this seminar, the Lakeside teachers not only shared their experiences and curriculum plans which incorporated CSILE, but also “used CSILE to teach about CSILE.” In other words, participants not only received hands-on experience with using CSILE as an instructional tool, but they also explored social constructivist theory through the act of using the CSILE program to build their own database of comments and insights about the current CSILE research.

A third important factor relates to the issue of access to hardware. From the outset, in every school site, the number of computers per classroom fell short of the recommended eight computers per classroom that had been the ideal model described in existing CSILE research. Originally, Apple had provided eight computers per school. However, it was the decision of the Lakeside school district to involve two teachers at each site, therefore there were only four computers per class. Subsequent funding from the TCET project added two more computers at each of the Lakeside schools. Thus, each participating teacher’s classroom at Lakeside had an average number of five computers. However, the Knowledge-Building Communities Project only provided eight computers to each of the Central ISD sites; thus creating an average of four computers in each of the four classrooms in the Oakes and Milroy schools.

The teachers at Central ISD were also challenged by other circumstances related to access. For example, the Knowledge-Building Communities Project was approved for funding in late December 1992, and although the initial two-day training for the Central ISD teachers took place in mid-January 1993, administrative delays and delivery mistakes delayed the arrival of the computers for the MacCSILE networks. The last of the computers finally were installed in the Central ISD classrooms between mid-February and late March—nearly midway into the spring semester. In addition, because the Central ISD schools were not officially a part of the international research effort coordinated by Apple Computer and OISE (as were the Lakeside schools), updates to the MacCSILE pre-beta software were not made available to the Central ISD sites. Unknown at the time was the fact that Apple programmers had implemented a time stamp in the experimental software that resulted in an error message whenever the date on the MacCSILE server exceeded a certain value. In attempting to remedy the problem when it first arose in late March, the first knowledge bases at both Central ISD sites were inadvertently corrupted and lost. Glitches such as these are not unusual in ambitious learning technology projects, or even in non-educational settings where “bleeding-edge” technology is adopted by the

pioneers of their professions. It is a credit to these teachers, who, by their dedication to the educational principles behind the CSILE concept, patiently contended with such technical problems throughout the semester.

Chronology of Events

(Events prior to Knowledge-Building Communities Project in *italics*)

1986		<i>CSILE research begins in Toronto, Canada by OISE.</i>
1991	Fall	<i>Apple Computer and OISE invites Lakeside ISD to participate as one of the first US CSILE research sites. Four Lakeside ISD teachers participate in a 3-day CSILE workshop.</i>
1992	Feb.	<i>Networked computers with CSILE installed in Lakeside middle schools.</i>
	Apr.	<i>Lakeside ISD teachers use CSILE the first time in an instructional unit.</i>
	Fall	<i>Lakeside ISD teachers use CSILE as major component of classroom practice (e.g.. historical novel project)</i>
	Nov.	<i>Lakeside ISD teachers give presentation at the National Middle School Conference about their experiences with using CSILE</i>
	Dec.	TCET and Apple Computer fund the Knowledge-Building Communities Project. Project implementation plans underway.
1993	Jan.	Two-day workshop on CSILE for Central ISD teachers and university staff is planned, coordinated, and conducted by Lakeside CSILE teachers at participating university.
		Access to LearnNet BBS made available to project participants
	Feb.-Mar.	Networked computers with CSILE installed in Central ISD middle schools.
	Mar.	Preservice teachers available to all CSILE classrooms in both districts.
	June	Project support for Knowledge-Building Communities Project ends.
	Sept.	All project participants submit summary reports and related documents.
		Due to lack of technical support, Milroy discontinues use of CSILE. All other sites continue the use of CSILE for instruction.
1994	Spring	All sites except for Milroy continue using CSILE.
	June	Interview research phase begins.
1995	Aug.	Interview research analysis begins.

Table 4: Chronology of Events

**Early Lakeside ISD CSILE Experience:
November 1991 through the Fall/Winter Semester 1992**

Prior to 1991, CSILE research had been confined largely to one elementary school in Toronto, Ontario. Apple Computer and the Ontario Institute for Studies in Education (OISE) decided to expand the research to more school sites, including four new sites in the United States. Lakeside ISD was selected by Apple to be one of these second-phase research sites. Because the software had not been researched at the middle school level, Winfield Middle School and Howard Middle School were selected as research settings. In November of 1991, four of the Lakeside ISD teachers, who were later to be part of the TCET Knowledge-Building Communities Project, met with Marlene Scardamalia, teachers from the original Toronto CSILE school, Apple MacCSILE programmers and staff, and other participating teachers joined together for a three-day hands-on workshop hosted by Apple Computer in St. Louis.

Winfield Middle School

Charles and Jack at Winfield Middle School and Nancy and Sue at Howard Middle School were the first teachers to use MacCSILE in the spring of 1992. ‘During this time they explored and experimented with the software. That summer they devised curriculum ideas for the upcoming fall semester. Though the leeway given by the district included waivers over having to cover the state-mandated curriculum, these teachers worked on devising creative, innovative, “interactive” CSILE curricula that complimented the state mandated essential elements of the curriculum. Nancy explained how she, “worked through that spring and summer on a curriculum that I felt didn’t compromise me and what I felt like my students needed.” Charles added how in the entire year, “we missed only five percent of the original objectives [for curriculum mandated by the state].”

In the summer of 1992, Cathy, a new member of the Winfield Middle School team, worked with Charles and Jack on developing interdisciplinary plans for the 1992-93 school year. Jack proposed an ambitious CSILE project that spanned over two semesters and was based on a similar project he had used during his previous high school teaching experience. He explains his proposal to the other teachers as follows:

I had developed this idea about writing historical novels and started designing it. I began to feel that it could be used to drive a whole curriculum in social studies, and there were lots of applications for language arts. And I convinced Cathy and Charles to take a model of it and use it as a way to use MacCSILE. So we began to try to plan ways to use MacCSILE to write a historical fiction beginning in the Fall of 1992, and things were

going pretty well and we were learning a lot about how to teach the software and learning a lot about how it could be used.

In addition, during the November of 1992, the project teachers at Lakeside ISD presented a paper at the National Middle School Conference which related their general impressions about CSILE as an instructional tool as well as their classroom experiences with using the software for the first time on an experimental basis. For many of these teachers this was their first presentation at a National Conference. Exposure to CSILE had provided new opportunities to the Lakeside project teachers for embracing a new level of professional participation and leadership.

During the fall 1992 semester, the three Winfield teachers configured their classes to accommodate the CSILE-based historical novel curriculum. By coordinating class scheduling and student placement, the teachers were able to arrange Cathy's honors English and Charles' language arts students into a block scheduling pattern that included three of Jack's American history classes. To make the scheduling work, Jack involved only three of his classes in the historical novel curriculum and taught his remaining classes in his accustomed direct-teach format, providing a unique opportunity to compare MacCSILE and non-MacCSILE approaches to the same curriculum (Kennedy, 1993). The strategy among the three collaborating teachers was deliberately designed to optimize student access to the computers and to give extended project time across three class periods for the students in Charles' language arts classes and Cathy's honors English class, each of which met for two class periods. This configuration enabled a total of 80 students to become involved in the project.

In addition, the students at Winfield were primed for their first CSILE experience by a unit on thinking skills designed by Jack, who had seen its effectiveness in his prior teaching experience. Jack introduced this unit during the first five weeks of class along with a geography unit. A natural introduction to the knowledge-building classroom, the thinking skills unit focused on the development of metacognitive skills and inquiry-based learning.

Jack and Charles reported to having felt confident with negotiating the technical details of the MacCSILE network by mid October. They also noted that although a few students "messed around" with the system and caused some technical problems, such instances created only minor frustrations and delays. In terms of managing access to the networked computers, the teachers decided to put all of the computers into Jack's room, and Jack shared his room with Cathy and Charles. Despite having worked with her colleagues over the summer, Cathy reported how at this time in the semester she was still working on ways to involve her honors English

classes in the historical novel project. Also, since she became a participant later in project, Cathy did not attend the software training that was offered the previous semester. To compensate for this Cathy found it helpful to spend some time observing Jack's use of CSILE in his classes.

Howard Middle School

Meanwhile, at Howard Middle School, Nancy and Sue engaged in their own planning to maximize the use of the technology for their sixth and eighth grade students. One of the teachers moved to a new classroom so that their rooms would be located next door to one another. This arrangement facilitated the sharing of the computers. The teachers gathered the computers into one room, which meant they would have to "swap rooms."

Two factors made Nancy's and Sue's MacCSILE experience different from the Winfield model. First, they were implementing their plans for nearly 240 students in their combined classes, and second, they had not committed themselves to a two-semester curriculum project. Similar to the Winfield teachers, Nancy and Sue introduced CSILE to students with a unit on thinking skills. In addition, the Howard teachers took the timely opportunity of the 1992 presidential campaign and election to provide a basis to bridge Sue's sixth grade world history classes with Nancy's eighth grade American history classes.

Spring 1993: The Knowledge-Building Communities Project Semester

Lakeside ISD: Winfield Middle School

By the spring of 1993, the Winfield Middle School teachers were one semester into their year-long interdisciplinary historical novel project. Students had been entering their research notes regarding the literature and history of the geographical area and time-span of the characters whom they had been developing since the middle of the prior fall semester. The level of interdisciplinary collaboration between Jack, Charles, and Cathy intensified and went beyond that at the other sites, a factor related to the interdisciplinary nature of the project, the three period coordinated scheduling among the three teachers, their shared responsibility for 80 students, and the time frame of a two-semester endeavor. However some concern was expressed about how the historical novel “drove the curriculum” for all subject areas. For example, because most of the students’ research for the CSILE knowledge-base focused on history versus literature, the project was a better fit for Jack’s history classes. In fact, the historical novel project held some unique challenges for the English teachers involved in the project. Charles stated, “. . .we really started changing the curriculum and [made] sure that the basic skills in English were taught through historic literature and history readings. We threw out the majority of the novels [of the typical eighth grade reading list] that had maintained the . . . literature-based curriculum.” Both Charles and Cathy remarked about the difficulty of finding appropriate literature to match the history in the project. For example, Charles stated, “We were just starting to meld some of our grammar skills and, trying desperately in the fall, a little easier in the spring, to bring the literature base from the historical pieces in.”

Toward the end of the semester, the historical novel CSILE database, containing between two and three thousand notes, was getting so large that the performance of the CSILE software was deteriorating. The Winfield teachers decided to put it aside for a couple of weeks and start with a new, short-term database. Charles and his student teacher began the new CSILE database with a discussion about the concept of a “lesser man,” which captured the imagination of students in all of the classes, who also worked to integrate all of their current learning into the discussion. As Cathy describes it,

We were looking at issues in current society where there are “lesser people,” and they got really fired-up about that. . . . and it was a really exciting exchange going on. The kids were learning how to address each other’s perspectives without condemning someone else for having a different idea. It was a really beautiful way for them to see, to retrieve, to discuss, to be able to pull back up and explore further other people’s perspectives. No

shouting matches or anything like that. They could keep coming back in and discuss and debate, and that discussion and debate did spill over into the cafeteria and into everywhere else. . . . It was really exciting to see what was going on the computers.

In two weeks this database grew to approximately 300 notes. The subject matter extended to include some controversial issues which led to some “heated discussions,” so the interchange was brought to a close. The teachers were, however, very excited about the level of engagement the “lesser man” topic produced in their students.

Lakeside ISD: Howard Middle School

Unlike the Winfield teachers, the Howard Middle School teachers had developed, not an ambitious year-long interdisciplinary project, but rather a few thematic units which afforded some collaborative work. During the prior semester, Sue’s sixth grade world history classes and Nancy’s eighth grade American history classes engaged in building collaborative knowledge bases on constitutional government and the electoral process as they researched and followed the 1992 presidential campaign. They had clustered their computers into one room and swapped rooms periodically throughout the fall semester. When this configuration became burdensome for the teachers, Sue and Nancy decided to divide the ten MacCSILE computers between their two adjacent classrooms so students could work in their own classrooms in the spring 1993 semester.

Nancy demonstrated how she had expanded her strategic understanding about implementing knowledge-building units using CSILE technology. She explained that her students began with a theme broken into five or six theme topics. Each student then explored a core knowledge assignment and would share their findings by posting notes in MacCSILE, creating a common knowledge database. Concurrent activities not directly involving MacCSILE included group discussion, mapping, visual displays, selected reading on the thematic topic, library research, skits, and vocabulary activities. During that spring semester, Nancy’s curriculum expanded beyond the traditional American History curriculum. Nancy opened each historical unit of study by eliciting the students questions, their wonderings and their gaps in knowledge, they clustered these into key topics in the database which students researched and discussed within MacCSILE and in class discussions and presentations. For example, starting with how some key figures in American history have used and abused power, she used MacCSILE to help students explore the concept of power in their personal lives as they also learned the central issues of the Declaration of Independence and the Revolutionary War.

Sue's approach to the CSILE classroom was similar to Nancy's. Her students explored their topic through several weeks of study on the computers in combination with a rich array of connected on-going activities. For instance, in her medieval unit, Sue sought to enable her students to make connections between medieval life and contemporary life by becoming acquainted with different members of medieval society, and comparing them to similar members of contemporary society.

Though Nancy and Sue were no longer doing a coordinated interdisciplinary curriculum, it is clear that their attempts to implement a knowledge-building classroom revolved around three elements: (1) increasing student opportunities for directing their own learning, (2) developing a rich variety of engaging classroom activities, and (3) creating relevant connections between the curriculum and the everyday life of the child, and (4) driving much of the work of the classroom through the questions and knowledge gaps of the students.

Central ISD: Oakes Middle School

The first issue Doug and Jane contended with was the allocation of available computers to be able to effect the kind of interdisciplinary, collaborative curriculum which Doug and Jane envisioned and which MacCSILE supports. As Doug explains, their physical setting at the school provided a unique set of problems to overcome as they worked to implement their understanding of the pedagogy even before the project computers arrived or the network was fully functioning:

I was in the portable. Jane was in the same room she's in now. [Doug's portable classroom was a short distance from Jane's classroom which is located in the main building of the school.] She had the file server so I got a real late start on it. We were already doing things without the computer, and I had to teach the KBS*s, which I found out are kind of Jack's invention, but we always referred to them like they're some basic education concept. There were a lot of things we really couldn't do until we were networked to MacCSILE. What we ended-up doing, was stringing up a clothesline [to network the classrooms]. We had to drill a hole in the portable and school building. The Apple guy wasn't real happy about that! So there was a lot of frustration about getting set-up at first.

* KBS, or Knowledge Building Structure, was a Lakeside ISD rubric which had been instituted to give students a quick start on creating their CSILE knowledge bases. Student work began with a worksheet which named the "thinking types" provided by the system: Problem, My Theory, I Need to Know, Plan, and New Learning; thus introducing students to the "thinking types" model embedded within MacCSILE. Each student wrote entries for each thinking type on his particular topic. The approach was a teacher response to the limited student/computer ratio. The KBS worksheed did not spring directly from the CSILE cognitive science research base. It was widely adopted by teachers involved in TCET project and has since faded from use.

I think we had four computers then. I got one at the end of the year, and that really wasn't enough access to computers for those kids. So Jane would send her kids over to use my computers during my off periods.

Doug had two regular language arts classes which were scheduled for two-hour blocks. After the CSILE workstations and networking were stable, Doug was able to implement a project on wildlife that spanned two six-week grading periods. Doug helped students to choose wildlife projects with each individual student being responsible for a written and an oral report. Groups of students worked collaboratively on a mural depicting their chosen animals in their natural habitats. For assessment, students maintained their own portfolios which included their KBSs, a grid outline, text notes and graphic notes from the MacCSILE knowledge base, their written report and notes from their oral reports. Following both his primary source, exploratory teaching style and the example of the Lakeside teachers, Doug offered a rich array of research materials and activities to support their knowledge building: library materials, phone interviews, guest speakers, and a field trip to a large metropolitan zoo.

Doug, impressed by the effect the computer-supported knowledge building environment had on his urban students, observed these students demonstrating increased computer literacy, more efficient problem solving, better environmental awareness, and improved research, writing, and public speaking skills. He concluded that, "it's one of the most rewarding units I taught."

In addition, Doug's honors English class chose to work on a civil rights project, but due to the large class size (34 students) and his decision to give free reign to his student teacher who wanted to practice more direct-teaching methods, "the project never drove the curriculum." Even so, he saw some similar positive outcomes accrue from the limited implementation of a MacCSILE project in the honors English class.

Jane learned that she had a knack for guiding students to topics that were not only of interest to them, but relevant to their lives and fertile in curricular content as well. Under her guidance, students chose research problems like "how can we feed the hungry people in the world?" and generated well-researched, creative solutions that she felt gave them a sense of empowerment.

Central ISD: Milroy Junior High

Of all the sites in the project, the Milroy Junior High teachers found themselves facing the greatest challenges and confronting the most obstacles to implementing MacCSILE. There was a significant research question as to how well MacCSILE, as it was configured, would support mathematics. The student population for Milroy consisted of a large proportion of students who demographically would be considered urban poor. Also, Milroy's student population had the largest percentage of households in Central ISD where Spanish is the primary language. Some students felt intimidated by their initial exposure to computer technology, as reported by one of the informants. Doubly unfortunate is the fact that Milroy suffered the greatest number of technical glitches.

Peggy reported that her classes were able to use MacCSILE "maybe three or four weeks at the most. We'd get things up and running and something would happen and we lost quite a few things along the way." Yet, she was able to implement MacCSILE just enough to get a glimpse of its potential:

It seemed like we had to spend a lot of time training ourselves and the kids on just usage. How to move around in the system. We did a few small questions and discussions. One of the projects we did that I felt worked well was writing word problems. Creating your own problems to solve, and then having other students critique them and try and solve those problems. I also put a few other big problems on the computer myself, and let the kids try to brainstorm on solutions to those large problems.

When asked how much he used MacCSILE in his classes, George, who is head of the school's math department, replied, "Not a whole lot, honestly." In addition to the lack of computer access and technical disasters that semester, George had a pedagogical reason for not using the software: he did not think that the MacCSILE implementation was well-suited to his subject because "it doesn't have a lot of math-oriented stuff." George also had problems with keeping computers in his classroom because he experienced the computers as being a constant distraction to his students. After a few weeks he moved the computers into Peggy's room.

Other Noteworthy Elements of the Knowledge-Building Communities Project

The Preservice Teacher Experience

One important component of the project pertains to the experiences and observations of the preservice teachers from the sponsoring university who participated as student observers or student teachers for the MacCSILE teachers. These preservice teachers also took classes from faculty at the sponsoring university who used MacCSILE as a component of their teaching methods classes. A few of the informants remarked that exposure to CSILE gave their student teachers and student observers a unique and beneficial experience. This factor suggests far-reaching implications for preservice teacher education.

Charles was particularly impressed by the fact that Doris, the student observer who worked with him in the spring of 1993, returned to do her student teaching with him the following fall. He believed such a “double-exposure” to one teacher’s innovative classroom was particularly “powerful.” He appreciated the supervising faculty member who welcomed the opportunity to offer her students exposure to “break-the-mold” teaching practices and believed that the two semester mentoring relationship with a single master teacher, who was actively working to restructure the school setting was extremely valuable to a novice teacher. Charles stated strongly that this combination of innovation and longer mentoring is necessary if preservice teachers are to overcome traditional teacher-directed instructional practices.

Nancy also was very pleased the effectiveness of how her student teacher in coaching the students into taking responsibility for their own learning. Nancy describes her student teacher’s practices as follows:

She, on a daily basis, exhibited the attitude that “I want you to have free reign, I want you to do the thinking, I want you to probe, and question.” . . . She automatically went that route, whereas it took me a lot of my teaching career to come to that point. . . . I could see her in another situation, more traditional, . . . and [that would have been] her first impression of teaching, and heaven knows how long that impression would [have lasted] before someone changed it or something happened, like to me with MacCSILE!

Though she was not officially a part of the spring 1993 Knowledge-Building Communities Project, Edith, who was Jack’s student observer in the spring of 1992, and then his student teacher in the fall of 1993, offered a personal testimony about the kind of preservice teacher experiences to which Charles and Nancy refer:

I don't think I would have been a completely traditional teacher because I like the interactions with students. So I think I would have been a little bit less than traditional, but at the same time I definitely would not have done what I am doing now, and I think it would have taken a while, because once a teacher gets into the classroom it's very difficult . . . traditionally it's been very difficult to see other teachers teach once you are the teacher, and so I think you have the tendency to resist change as you are teaching, because you are not observing other teachers, and you don't know what is happening in other classrooms. And that's one thing that is nice with the teaming, as well as this project, is that it's allowing student teachers to come in and see what is being done so that at least they are open-minded about what needs to occur and what could occur in their classroom.

LearnNet: A Serendipitous Element

At the onset of the Knowledge-Building Communities Project the sponsoring university gave accounts on LearnNet, a graphical user interface (GUI) electronic bulletin board system (BBS) to project participants in order to facilitate communications between the teachers, project directors and graduate research assistants involved in the project. LearnNet utilizes a BBS software that is favored for its ease of use. As the teachers became familiar with LearnNet, it grew from being a convenient way for facilitating communication to a means through which teachers experienced collegial interaction, on-line "visits" to their classrooms by guest experts, cross-school peer collaboration for their students, and the benefits of having another learning tool to support the knowledge-building community.

For Cathy, it was a way of freeing her of the role of being the sole expert information provider in the classroom.

I use LearnNet. It's been a really nice plus for the kids to be able to talk to other schools in the city and tap into the university community. That's another . . . "wall-knocking-down" experience for them. . . . I don't like thinking of myself as being the giver of knowledge, etc. I've never felt that way. I've always felt that I can help facilitate something for kids and that's what I think the networking can also do.

During the Knowledge-Building Communities spring 1993 semester, the university was able to convince the lead MacCSILE programmer at Apple Computer in California to access LearnNet to carry on a dialogue with the project teachers and some of the students who were using MacCSILE. A special LearnNet conference called "CSILE 2.0" was created as a forum for brainstorming new features of the next design version of CSILE. This dialogue raised the ante of

student and professional teacher reflection, as each subtle feature of the computer program was dissected for its cognitive science rationale and its practical use in schools.

In the fall semester of 1993, Jack and Sue created a cross-school collaborative communications technologies class. The sponsoring university gave them administrative access on LearnNet so that they could create accounts for their students who then could collaborate on projects between the schools. The BBS became so popular with Sue's classes that some parents asked for accounts. In fact, students graduating from the eighth grade at the end of the year asked if they could keep their accounts.

Meanwhile, because of continuing technical problems, Peggy had lost her access to MacCSILE in Milroy Junior High School, but she was able to implement a "cultural math problem" project over LearnNet with Sue's social study classes. Peggy's students would create math problems dealing with foreign currency exchange and population statistics and send them to Sue's world history students to solve.

Jack saw great potential in LearnNet for professional development. When working as a teacher-consultant with Apple Computer, he convinced Apple of the value of using a LearnNet-type system to support teacher training in the use of their CSILE software product, an idea that was piloted during the summer of 1994 with favorable results.

An Emerging Framework

The preceding sections were a condensed narrative of events and developments leading up to and during the high points of the TCET Spring '93 Knowledge Building Communities Project. Except for a few brief meetings in June and September 1993, where the project participants met to share reports they had written about their experiences that semester, there were no further official project activities after that single semester. A year later, TCET funded the retrospective study, giving researchers the opportunity to interview all of the project teachers one year after official support had ended. These interviews were designed to provide a window into the long-term impact of the knowledge-building ideas and the CSILE software on teachers' classroom practice. Those interviews and the analysis leading to this report constitute interview research phase of the Knowledge-Building Communities Project.

The remaining sections of the report presents—in the teachers’ voices and in our in-depth analysis—the project teachers’ experiences and the five major emergent themes which arose in the qualitative analysis of the aggregate of the informants’ insights and experiences.