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# Computer In-Service Needs of Elementary Teachers in the Council Bluffs, Iowa Community School District

Mary Ann Green Bragg
*University of Nebraska at Omaha*

# COMPUTER IN-SERVICE NEEDS OF ELEMENTARY TEACHERS IN THE COUNCIL BLUFFS, IOWA COMMUNITY SCHOOL DISTRICT

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Mary Ann Green Bragg

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789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

THESIS ACCEPTANCE

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Committee

| Name | Department |
| --- | --- |
| Helen Howell | Teacher Education |
| Darrell Kellams | Educ. Admin. |

Raymond A Zirkel
Chairman

July 18, 1986
Date

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Mary Ann Green Bragg

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# Chapter 1

## INTRODUCTION

In his book Megatrends: Ten New Directions Transforming Our Lives, John Naisbitt (1982) described a world of the 80s that was embracing a new technology in which 75 percent of the jobs were computer dependent. This new technology has "invaded" every aspect of life from grocery store checkout systems, bank transactions, ordering in catalog centers, confirmations of charge card purchases, toll booth tickets, movie animation, office automation, and medicine to the computer system tied into a database providing access to almost any imaginable piece of information in mere seconds.

Further evidence of invading technology was found in the book by Naisbitt, Re-inventing the Corporation (1985). He depicted the world of 1990 as employing a work force where 80 percent of the jobs will require "more thinking and decision-making than traditional blue-collar jobs" while advanced skills to operate sophisticated high-tech tools will be mandatory (102).

Technology is becoming ever more accessible to the public. Fifteen to twenty years ago, computers with a memory of 64K filled a room twice the size of most elementary classrooms. These machines were looked upon as being "giants" by the computer world. Now, American elementary students are given "microcomputers" with a memory of up to 128K to use as an educational "aid."

Microcomputers are appearing on the nation's school scene in staggering numbers. A survey published (Electronic Learning:20) in

December, 1983 estimated that 325,000 microcomputers were in use in American public schools. By January, 1986 (Electronic Learning:12), it was estimated that 1,000,000 microcomputers were now being used by more than 15,000,000 students and some 500,000 teachers in America's schools. It was also estimated that 91 percent of the schools in the nation were now using microcomputers for instruction.

Naisbitt (1984) referred to this as a revolution in American education. It is viewed by some as turning everyone into skilled technicians, capable of using electronic equipment but incapable of meaningful interaction with other humans. Naisbitt disagreed, viewing instead an educational system where technology widens options. Technology can take over mundane record keeping tasks and perform tedious drill and practice sessions in a manner that is motivating and immediately rewarding; thus allowing development of classroom teacher creativity and time for concentration on critical skills such as thinking, reasoning, and basic communication.

Almost all school districts nationwide are implementing microcomputer programs, microcomputer curriculum, microcomputer literacy, or some type of microcomputer project. The journals are filled with articles relating what schools have accomplished and the problems they have encountered. The core of "successes" is a well planned and implemented training program for classroom teachers. Papert (1984:40) admonished teachers to grow with and influence this new technology, rather than letting computers impose their own structure on the educational system. An editorial by Sylvia Charph (T.H.E. Journal:1986:10) called attention to continuation of pressures from both inside and

outside education for the incorporation of technological tools in the educational process. Coupled with these pressures is a lack of understanding concerning how to use technology as an assistance for learning. The skills needed to apply technology in education are becoming more complex and diversified each day. As Karen Hoelscher (1985:81) commented, "Information technology is changing the nature of what needs to be learned, who will provide it, and how it will be provided."

## THE PROBLEM AND ITS SIGNIFICANCE

A need exists to train elementary classroom teachers to effectively use microcomputers in the educational process for the preparation of a computer literate society. The Council Bluffs Community School District is also faced with meeting the needs of preparing its teachers for instructional microcomputer usage. The question of addressing this need can be stated as a basic problem with several sub-problems. This problem, its sub-problems, and a discussion of the significance of the study appear in the following paragraphs.

### The Problem and its Sub-problems

What is the nature of in-service needs of elementary teachers in the Council Bluffs Community School District to become competent users of microcomputers in an elementary classroom setting? This problem gives rise to several sub-problems.

Sub-Problem 1. What is the history of computer usage in elementary classrooms in the Council Bluffs Community School District?

Sub-Problem 2. What is the nature and extent of in-service training in the use of microcomputers that have been provided to elementary teachers in the Council Bluffs Community School District?

Sub-Problem 3. What In-Service Model is presently used by the Council Bluffs Community School District to promote competency in computer usage?

Sub-Problem 4. What do evaluations by participants reveal about the present In-Service Model?

Sub-Problem 5. What future types of training might be appropriate for elementary classroom teachers in Council Bluffs?

## Significance of the Problem

This study has significant implications for continued teacher training in the Council Bluffs Community School District. First, it will give an overview of the history of computer usage in elementary classrooms. Second, information will be presented about microcomputer in-service sessions that have been conducted in the past. In addition, the study should provide information that will have an impact on the direction of future training offered to teachers. Lastly, it will provide a model that other trainers could use to increase instructional use of microcomputers among teachers.

## DEFINITIONS OF TERMS

A number of terms related to microcomputer instructional usage are used in this paper and need to be defined and understood.

Computer Curriculum Guide

A guide prepared by a committee of Council Bluffs teachers and administrators and approved by the School Board. It addresses expectations of K-6 classroom teachers in the area of computer awareness and usage. The guide lists objectives for each grade level. It includes suggested activities and resources to meet the objectives.

Computer Literate

The ability to appropriately use a computer for storage and retrieval of information, decision making, and improvement of basic skills.

In-Service Training

A specific program to enhance teacher skills by demonstrations, lectures, and hands-on experiences.

Microcomputer

A small self-contained computer system with its own CPU, terminal, and storage device, comparable in size to a portable typewriter. Often called a personal computer.

## SETTING/BACKGROUND

The Council Bluffs Community School System is presently comprised of 20 elementary schools which serve approximately 5,400 students in the grades of kindergarten through sixth. Included in the total number of students are 265 who qualify for help through the special education program. There are approximately 200 regular education teachers and 50

special education teachers employed to provide an instructional program for these students. The schools vary in enrollment from 33 students in a K-2 building to 462 students in a K-6 building.

## Microcomputer Equipment

In the spring of 1983, one microcomputer was placed in each fifth grade classroom in the district with Block Grant Funds. By the end of January, 1984 there were 93 microcomputers in the elementary buildings, with 92 of those being available for the students and teachers to use. Since then, PTAs, Booster Clubs, and building principals have continued to buy microcomputers for the buildings. As of April, 1986 there was a total of 181 microcomputers in the elementary schools with all but 13.5 being used for instruction. The remaining few were reserved for use by the administration or libraries.

## Curriculum Impact

The original purchase of microcomputers also included mathematics software packages. Initial usage of microcomputers was obviously math oriented as a basic drill and practice regime. As teachers began to work with microcomputers, it became evident that a plan of action and a set of goals needed to be developed. During the 1984-85 school year, a committee began drafting a microcomputer curriculum for kindergarten through sixth grades, hereafter referred to as the Curriculum Guide. The Curriculum Guide has been revised numerous times with the last revision having been printed in January, 1986. The Curriculum Guide was presented to the school board for approval in May, 1986.

The Computer Curriculum Guide Philosophy points out several

concerns. There exists a need to prepare students to live and function in a highly technologically informational society that is becoming computer oriented. Schools have the responsibility to provide opportunities and experiences for developing the skills necessary to operate and understand the capabilities and limitations of microcomputers. Microcomputer usage and software applications can be incorporated into virtually every discipline and instructional strategy at all levels in an elementary school setting. Students should have opportunities to use microcomputers for problem solving, tutorials, drill and practice, simulations, computation, composition, telecommunications, storage and retrieval of data. These opportunities coupled with exposure to new technology are keys to future successes for a computer oriented generation.

Early studies regarding microcomputers emphasized the need for a computer literate society. Studies then began to discuss ways for evaluating and choosing the best hardware and software. Most of the early research was done using high school, college, or the military as a source for data. Studies and articles have begun to show a need to train those teachers who are directly responsible for creating a computer literate society.

The Council Bluffs Community School District has been addressing the need to train teachers in microcomputer usage for several years. This project is addressed to the aspect of training teachers to use microcomputers for instructional purposes.

## PROCEDURES

The history of computer usage in the Council Bluffs Community School District elementary schools will be shown through the use of four surveys that were conducted by Mr. Ed Propst, Supervisor of Testing, Program Evaluation and Computer Education for the district.

These surveys were compiled in March and December, 1982; January, 1984; and April, 1986. Data collected in 1982 was from junior and senior high school principals and teachers in the district. The 1984 survey contained information from district elementary and junior high principals and teachers. Questions in the 1986 survey were answered by elementary teachers and principals.

As needs for in-service continued to be expressed, several courses were developed. The first centered on an introduction to microcomputers. Classes were also offered in PILOT, BASIC, Utility Applications, and Appleworks. A second introductory class has been designed and will be described in this study. Teacher evaluations of the class will be included. Recommendations for future training will be made.

## ASSUMPTIONS AND LIMITATIONS

Several assumptions underlie this study and must be kept in mind when the results are interpreted.

### Assumptions

Among the underlying assumptions are the following:

1. There will continue to be more computers in elementary buildings.

2. The technological advances will continue to serve as a catalyst in the need for teacher training.

3. The information provided through the surveys is valid.

4. The Council Bluffs Community School District has an ongoing committment to continue in-service training for its teachers.

Limitations

Among the underlying limitations are the following:

1. A major limitation of this paper concerned its preparation as a description of events that had already taken place with little planning having been effected in correlation with the surveys.

2. Many differences are apparent in the format of the surveys. The instruments were prepared at different intervals with input from various people.

3. This report was also limited in scope, since it involved only the schools and teachers in Council Bluffs, Iowa.

## ORGANIZATION OF THE REPORT

The background for the study, the premise behind the study, the significance of the study, the description of the procedures that were followed, the definition of terms, and the assumption and limitations of the study have been included in this chapter.

A review of the literature related to training teachers in computer education is presented in Chapter Two.

Chapter Three presents a description of the procedures used to obtain information for the study.

Chapter Four contains a summary of the findings obtained through the use of the surveys.

Chapter Five includes a summary of the study, the conclusions, and the recommendations formulated from the findings.

# Chapter 2

## REVIEW OF RELATED RESEARCH AND LITERATURE

This chapter will deal with literature that was reviewed as a background and basis for this study. The literature has been grouped into four categories. The first relates to the growth in numbers of computers in schools in recent years. The second grouping describes concerns about training for teachers to use computers in a meaningful and advantageous manner. The third grouping describes contents of in-service training for educators and some models that have been tested or suggested as workable. The fourth grouping presents topics that have implications for types of future in-service training.

## NUMBER OF COMPUTERS IN SCHOOLS

The 1980s have seen a rapid growth in numbers of computers in American schools. Harper and Stewart (1983:ix) tell of a grass roots movement in which teachers, parents and students are bringing microcomputers into classrooms in growing numbers. Nordman (1982:6) commented on how microcomputer science and technology have penetrated the home environment and enhanced the growing expectations from the public regarding the school's role in microcomputer education and usage. Diem (1981:30) predicted that purchases of computers for home and school were expected to be in excess of 600,000 by 1982. O'Donnell (1985:54) supported this prediction quoting a 1983 Market Data Retrieval survey of 15,275 American school districts. The number of public schools using microcomputers had more than doubled in the period of a year. This report also showed an increase in the rate of first-time school users

from 56 percent in September, 1982 to 125 percent in September, 1983.

Tashner (1984:83) made a similar report using data from a Johns Hopkins survey of approximately 1,600 public, private and parochial elementary and secondary schools in the United States. The data compiled between December, 1982 and February, 1983, indicated that by January 1983, "53 percent of all schools in the United States had at least one microcomputer obtained for use in instructing students." Elementary schools that had one or more microcomputers rose to 42 percent by January, 1983. According to the second survey by Johns Hopkins (Electronic Learning:January, 1986) "one million computers are now in place in schools across the nation, used by more than 15 million students and some half million teachers." Most elementary schools had five or more microcomputers.

Further substantiation came from Talmis, a market research company. "A total of 1,035,000 computers have been installed in schools as of June, 1985." (Electronic Learning:Nov/Dec 1985)

Two annual summer telephone surveys of 16,932 United States school districts further verified an increase in numbers of school microcomputers. Jeanne Hayes, President of Quality Education Data, (1984:14; 1983:33-34), found 14,132 schools with microcomputers in 1981-82. In 1982-83, 30,859 schools had microcomputers, accounting for an increase of 118.3 percent from 1981-82. The increase for 1983-84 was 75 percent with a total of 54,050 schools having microcomputers.

Hayes (1984:14) also related that the fifty largest school districts in the United States with an enrollment of 6.25 million students attending 9.3 thousand schools were using 36.8 thousand microcomputers.

This averaged four microcomputers per school building. Assuming equal access to microcomputers in every school by every student, this tranlates into each student spending 10.59 minutes on a microcomputer during the school week or a little over six hours during an entire thirty-six week school year.

Electronic Learning (May/June 1986), reported the 1985-86 QED survey revealed that 91 percent of the schools in the nation were using microcomputers. This was a four percent increase from 1984-85.

## CONCERNS FOR TRAINING PERSONNEL

As microcomputers in United States schools continue to increase, attention must be given to the implementation of appropriate microcomputer uses. Educators have shown concern about a lack of microcomputer training possessed by classroom teachers who are responsible for the introduction and usage of microcomputers in an educational setting.

### Concerns

Most authors recognized the presence of an element of fear when dealing with teachers and microcomputers. Jay (1981) cited "computerphobia" as a factor needing to be addressed with encouragement and incentives for teachers attending computer seminars and courses. Callison (1985:105) stated:

> Computers are moving into the school setting so rapidly in some districts that this new technology may cause fear on the part of staff who imagine they will not be able to learn the skills required to use microcomputers. If such fears are to be reduced, an in-service program should be developed to provide a minimal level of computer literacy for all staff.

A study by Johnson (Winter 1986:75) reflected the "mixture of anxiety, concern, and enthusiasm that most teachers have when they attempt to integrate computers into their classrooms." A segment of the teacher population is still dealing with major concerns regarding microcomputer instructional usage. They need support and training to overcome their reluctance.

Needs

This concern was apparent throughout the literature. Harper and Steward (1983:ix) have prepared a book aimed at teachers of all levels to help them understand the new microcomputer technology "because so many teachers are inadequately prepared to understand the new technology fully." The book contains excerpts from books and reprints of articles published in major educational journals and bulletins, in leading computer magazines, and as conference reports by leaders in the field of instructional computing throughout the world. While the articles were written prior to 1983 the content and projection still have relevance.

The third chapter of this book provided "a substantial introduction to what is being done to help alleviate the need for contemporary teacher training in computer use" (1983:60). The authors cited needs for teacher training. Suggestions included instructional models to allay fears and provide in-service training that enables teacher usage of microcomputers.

Dennis (1979) pointed out a lack of teacher preparedness as a major reason for a narrow impact in the field of instructional computing. Milner (1979) also indicated a general acknowledgment that teacher education was one of the most critical problems facing effective and

widespread use of microcomputers in education. He referred to a 1978 survey that showed only 39 percent of 1,300 teacher respondents agreed or strongly agreed that their training was adequate for instructional computer usage. Dickerson and Pritchard (1981) and Morsund (1982) also agreed on the critical need to prepare teachers in educational computing. Rawitsch (1981) stated that the new microcomputer technology had created an "insatiable demand" for instruction in microcomputer usage. This caused a demand for workshops and classes taught by qualified personnel. Meyers (1980) reported that Braun, Luehrmann, and Opie referred to the need for training and information dissemination regarding microcomputers for the educational community.

Smith (1982:43) felt that if problems in numbers of available machines and needs for software were met, there would still be a need for "massive in-service" to enable teachers to use microcomputers. "Technical Training of Staff" was found to be the number one concern expressed by 1,360 school districts in a survey by Educational Research Service in 1983 (Spectrum: Spring 1983:36). As district size increased, concern decreased, yet 43.5 percent still ranked training as the number one concern.

Swartz, Shuller, and Chernow (1984:137) added further concurrence:

> ...the linchpin of any successful innovative school project is adequate and proper training for the relevant members of the staff. The importance of such training is directly proportional to the significance of the change being introduced. Given that the introduction of computer power into the fabric of your school's life represents a potentially enormous improvement at many levels, it follows that success or failure can easily hinge on how well the staff's needs for worthwhile fundamental training are met.

Johnson and Hoot (Educational Horizons:Winter 1986) reported on responses from 224 elementary teacher questionnaires. A rating on level of competence in using the microcomputer showed "...7 percent competent, 20 percent comfortable, and 73 percent insecure." Approximately 16 percent of the respondents considered themselves to be "computer literate." The need for adequate preparation of teachers in microcomputer instructional usage still exists.

John H. Tashner wrote a similar book in 1984 that explored educational computing by "...considering state-of-the-art perspectives of recognized experts in the field" (Tashner 1984:ix). Griffin (1983) commented on the failure of education to embrace technology foremost because teachers are reluctant and ill-prepared to embrace new technologies. Bonner (1984) continued to confirm the premise that teachers need training in educational uses of microcomputers to be effective microcomputer users in school classrooms. Quinn (1983) felt that "...staff development is a critical function in the development of 'futures' education."

The concept of teacher training was evident in all literature examined from school districts that had successfully introduced educational computing. An overview of six schools involved in Project BEST (Basic Education Skills through Technology) indicated teacher training was an integral factor in successfully introducing microcomputer usage in these districts (Tashner 1984:105-111).

Implications for Adult Learners/In-Service

Along with describing the need for teacher training in microcomputer usage, ways of dealing with adult learners are also presented in the literature. It was acknowledged that adults respond differently in training situations. Hedges (1981) and Rawitsch (1981) both pointed out concerns when teaching adults. Highlights from Hedges (1981) included providing a relaxed environment, not stressing speed, peer instruction, need for purpose and periodic sharing as integral components for working effectively with adult learners. The other points dealt with programming, a facet that causes many elementary teachers undue stress during their first training sessions.

The concern of Rawitsch (1981) centered on the people who train educators. He saw most trainers as coming from a technical or computer science point of view. Lacking in educational perspective, they produce technical people while overlooking needs of educators.

Bedient and Rosenberg (1981) pointed out several considerable differences of adult learners. They have had more educational or training experiences coupled with a variety of life experiences. Adult learners enrolled for classes with expectations for self improvement. They wanted a role in planning what was to be learned. Practical education, not theory, was their goal.

Dennis (1979) listed several items of concern when dealing with in-service for educators. Due to constraints on teacher time, concepts must be capsulated. Structure must allow for relatively short investments of time. Job demands cause learning skills to be less sharp and attentions to be fragmented. Resources must be readily available to the trainee for

the accomplishment of gaining a background in instructional computing. He described three stages to in-service training designed to bring teachers to a level of competency in instructional computing. These are the Awareness stage, Implementing stage, and Maintenance of Growth stage.

Rawitsch (1981) felt that general computer knowledge workshops for educators should follow three principles. They should start with demonstrations of computer applications followed by evaluations of the applications. Technical labels do not need to be introduced at early levels. Using an outline can reassure the participants that the main point concerns the instructional value of computers when it is necessary to cover minor technical points. He also identified operation of computers, use of applications, integration in curriculum and evaluation of applications as critical aspects to be included in computing for educators.

Bedient and Rosenberg (1981) presented a four-stage model for interacting with adults. Stage one involved an "instructor presentation." This alternated between a variety of activities, such as, lectures, demonstrations, lab work, and projects. Stage two was "guided practice" which allowed time to practice skills presented in stage one. Peer instruction should be an integral part of both stages one and two whenever possible. Stage three allowed for formative evaluation through a "sharing experience." Feedback was given by the instructor and other students. Stage four, "evaluate completed project," was a summative evaluation.

Worth (1982) reported these conditions to be essential for successful in-service: hands-on orientation, an adequate number of

computers, working in pairs for the inhibited, adequate time to preview software, training as soon as possible after acquisition of equipment, an adequate library of software to demonstrate appropriate computer uses. The content should be kept simple.

Garcia and Vizbara-Kessler (1984:40) assumed that "In-service should be structured so that threats and anxiety are minimized." This is a vital component of microcomputer in-service training.

Nathan (1985) reported several characteristics of a successful educational computing workshop. Time was allowed for participant use of programs relevant to classes they taught. There were enough computers so that sharing was with only one other person. The leaser was someone who could answer specific, critical questions about classroom applications. Follow-up sessions were provided.

Tauber (1985) listed objectives to be covered in a six-hour microcomputer workshop for teachers. Teachers should be given a general knowledge of computer functions as well as specific skills in operation of hardware and software. The session should foster a positive attitude toward computers. It should explore specific ways that the knowledge, skills, and attitudes of educators can influence positively the work force of tomorrow.

Morsund (1986) reported on key aspects of an in-service project under development that will work with elementary school teachers in grades three to five. Two of his points strongly meshed with the other writers. There should be formal instruction based on a model of demonstration. Peer support, with an emphasis on collegiality, should be in evidence.

Spitzer (1986) discussed resistance to change as related to an educational technologist. He represented it with the acronym "STRIFE."

STRIFE stands for:
- Satisfaction
- Tradition
- Risk
- Inconvenience
- Fear
- Expenditure

Spitzer (1986) listed several ways for overcoming "STRIFE." Those most applicable to microcomputer in-service included an emphasis on benefits while minimizing the risks. Initial efforts should be concentrated on those who are not resistant to change. The client group should have a high level of involvement. Discuss the threatening aspects and reduce the threat. Demonstrate sensitivity to your clients.

Guskey (1986:9) gave three guiding principles to consider when planning effective staff development. "Recognize that change is a gradual and difficult process for teachers. Ensure that teachers receive regular feedback on student learning progress. Provide continued support and follow-up after the initial training."

Rawitsch (1981) felt:

> We may not yet know the most effective way to train educators to use computers. However, it seems reasonable to assume that this training is different than the way we teach children about computers or the way we teach adult computer professionals about them. Instructors involved in training educators in the use of computers must keep in mind the perspective from which educators come. Such instructors would benefit from a set of instructional principles that apply when teaching about a field entirely new to them.

While these statements were published in 1981, they appear to have relevance today.

## TRAINING MODELS

The literature presented several actual in-service models that have been used around the country. Basic formats appeared to address the concerns expressed by the authors. Jay (1981) described one computer seminar model. The session should cover two to three days depending on participant experience. The participants should come from a variety of positions and possess various levels of expertise. They should be introduced to the literature and philosophy of instructional computing. It should be reinforced that they control technology. Hands-on experience with hardware and software should be provided. Reinforcement should stress the fact that they do not need to be programmers or expert technicians. If possible, use time-sharing systems. Reinforce that "they" are experts in instructing learners.

Diem (1981) devised a one week summer training program. Following introductory activities, effort concentrated on immediate hands-on experiences with computers. A second section reviewed all available software for a particular teaching assignment. Stage three dealt with reviewing adopted curriculum to find correlation for computer usage. Stage four familiarized teachers with capabilities and limitations of computer technology. This was presented by a programmer, who, under ideal circumstances, would be on staff. The final stage allowed for ongoing development, with local training staff providing observations, critiques and recommendations throughout the year.

Worth (1982) described a course consisting of eight, two-hour sessions with some instructional time but mostly devoted to lab exercises

and software usage. Her description included discussion of computer terminology and use of keyboard activity sheets during the first session. The second session dealt with a discussion of order of operations, PRINT, and use of calculator pad activity sheets. During the third class, loading programs from tape, using them, and generating listings on screen were covered. Class four concentrated on previewing and evaluating software. Using peripherals was covered in the fifth session. The sixth session dealt with typing and saving a program on tape and generating a printed program listing. Session seven consisted of a disk drive demonstration and software previewing. The last session centered on previewing group-participation-oriented software.

Dearborn (1983) listed six main headings from an "Elementary Computer Literacy Course for Teachers." The class met a total of seventeen and one-half hours over a five week period. The topics covered were Computer Operations, Computer Literacy, Incorporation into the Curriculum, Educational Applications, Computer Programs, and Development of Problem Solving/Logical Thinking Skills. The teachers received one unit of noncollege credit, applicable toward certificate renewal.

Tauber (1985) presented an outline of a six-hour workshop for teachers. Topics covered were a twenty minute course orientation which outlined the program and put the participants at ease. The next thirty minutes covered the history and operation of microcomputers. The microcomputer as a word processing tool was covered in one hundred twenty minutes. Eighty minutes were spent showing how to use the microcomputer as an administrative and clerical tool. The microcomputer as a drill and practice tool was covered for the next forty minutes. A forty minute

discussion then followed on the impact of the microcomputer. The next forty minute discussion addressed the transfer of microcomputer literacy. The workshop ended with a thirty minute wrap up and evaluation period.

## IMPLICATIONS FOR FUTURE TRAINING

Papert (1984) predicted that by 1990 one computer per child would be common. He viewed this as freeing the teacher from simple things to spend time on subtle things. Computers would allow the matching of learning styles, subject matter, and personality types. The computers would bring a new dimension of motivation to the classroom. Teachers would need to change their teaching styles to match the technology.

In 1985 a task force was established by former Secretary of Education Bell. (Electronic Learning:September 1985) This group agreed that technology was a tool for achieving excellence in education and that research was essential for its effective use. Planning for this use should occur at all levels and involve a cross section of society.

Fuchs (1985) commented that the computer will be to the human mind what the industrial revolution was to the human muscle. Curriculum, today, is based on needs of the industrial revolution. The fundamental ways the curriculum is created and implemented need to be changed, as do the ways students are taught and learn. He also pointed out that education was changing with the computer, by pressuring software manufacturers to create improved software, by providing teacher training, and through involvement of a wide variety of people in the integration of technology into education. His recommendations for the future included preparation of teachers to access and use comprehensive informational

networks for educational information and resources. He also forecasted that broadcast computer information, "BCI", would serialize computer programs and direct them at special audiences in the same way television does today. This would allow high speed transmission of information through teletext and videotext, thus allowing easy communication between computers miles apart.

Decker and Krajewski (1985) forecasted that high schools will utilize up-to-date computer technology to improve education both for students and for administrative management. They envisioned a school without paper and pencil. They predicted the use of distant computer data bases. They commented that on-line microcomputer education would revolutionize computer use in education.

Charp (1986) related the need to incorporate technological tools into the educational process. She listed networking computers, use of data banks, and accessing informational banks as ways of using microcomputers in the schools.

Arch (1986) commented that A Nation at Risk recommended that every high school student be required to take a computer science course. He viewed training for computer-related jobs as essential. He stated that an integrated approach which merged the computer into all curricular areas may be desirable.

Benson was quoted (Electronic Learning:May/June:1986) as saying "...the largest contributing factor to the success of any district computer program" is an "...enormous commitment to staff development." Further training would need to take these ideas into consideration. It would also need to incorporate suggestions from other computer people.

Johnson and Hoot (1986) recommended an ongoing hands-on in-service training program appropriate to specific grade levels. Neisbitt predicted the resurgence of interest in art, music, literature, and drama as a result of increased access to technology in the classroom.

## SUMMARY

Much has been written about the growth in number of and access to microcomputers in an educational setting. Many arguments have been made concerning the importance of training educators to deal with instructional computing. Numerous models and a wide range of advice are available for establishing an in-service training program for teachers at the elementary level. Various topics are recommended for future in-service courses. However, actual research based materials in the area of teacher training are virtually non-existent.

# Chapter 3

## DESIGN OF THE STUDY

This study was undertaken to determine the nature of in-service needs of elementary teachers in the Council Bluffs Community School District relative to the use of microcomputers in an elementary classroom setting. This chapter will indicate how the information and data were gathered to address this main concern and the questions posed in the following sub-problems.

Sub-Problem 1. What is the history of computer usage in elementary classrooms in the Council Bluffs Community School District?

Sub-Problem 2. What is the nature and extent of in-service training in the use of microcomputers that has been provided to elementary teachers in the Council Bluffs Community School District?

Sub-Problem 3. What In-Service Model is presently used by the Council Bluffs Community School District to promote competency in computer usage?

Sub-Problem 4. What do evaluations by participants reveal about the present In-Service Model?

Sub-Problem 5. What future types of training might be appropriate for elementary classroom teachers in Council Bluffs?

## ACQUISITION OF MICROCOMPUTERS

Information pertaining to the history of microcomputer usage in elementary classrooms in the Council Bluffs Community School District was

compiled from summaries of five surveys and from personal interviews. Prior to 1983, junior and senior high school teachers and principals completed a one-page survey, entitled Microcomputer Utilization Survey (Appendix A). The survey was completed at three different times. It contained questions which asked for specific information on types and numbers of microcomputers in use. The data were collected and summarized by Central Office personnel.

A summary of the data from a 1984, three-page questionnaire entitled Computer Project Follow-up Survey (Appendix B) was also examined. This survey was completed by principals and teachers from nineteen elementary buildings. Questions were asked to determine the number of microcomputers in elementary buildings. Central Office personnel designed the survey and compiled the information.

A final survey, conducted in 1986 and done in two parts, was an evaluation of the elementary computer program. One form, entitled Computer Utilization Survey Building Form (Appendix D), was completed by seventeen elementary principals. Ten questions were used to determine the level and type of usage of computers by teachers and students before implementation of the Elementary Computer Curriculum Guide. Two of the questions centered on number of computers and printers in elementary buildings and plans for future purchases.

The second form, entitled QUICK SCREEN SURVEY Computer Utilization Survey Teacher Form (Appendix C), was sent to all elementary teachers in the district. The responses from approximately 250 teachers were summarized by Central Office personnel in two reports. One included data for all the teachers by building and by district totals. The other

reported building and district information from only regular education teachers. Questions were used to ascertain accessibility to computers and amount of student and teacher usage.

The surveys were sent to the building principals and teachers by central administration personnel. Design of the last survey was done mainly by Central Office personnel, with input from a computer committee. Interviews were conducted with Central Office personnel to clarify information from the summaries. These interviews were conducted both in person and by telephone between September, 1985 and June, 1986 as questions arose. Information relating to survey titles, dates and respondents can be found in Table I.

## NATURE AND EXTENT OF PAST IN-SERVICE TRAINING

With the acquisition of microcomputers, attention also centered on providing in-service training on their use. Interviews with district personnel provided information concerning the development of past microcomputer in-service training for teachers in Council Bluffs. Bulletins listing the course offerings and their descriptions were also consulted. Data concerning the extent of training came from a question on the QUICK SCREEN SURVEY Computer Utilization Survey Teacher Form.

Table I

Summary of Surveys

| Title | Date | Respondents |
|---|---|---|
| Microcomputer Utilization Survey | Prior to 1982 | principals and teachers from 3 junior high schools |
| Microcomputer Utilization Survey | March 1982 | principals and teachers from 2 junior highs and 2 high schools |
| Microcomputer Utilization Survey | December 1982 | principals and teachers from 2 high schools |
| Computer Project Follow-Up Survey | January 1984 | principals and teachers from 19 elementary schools |
| Computer Utilization Survey Building Form | April 1986 | principals from 17 elementary schools |
| QUICK SCREEN SURVEY Computer Utilization Survey Teacher Form | April 1986 | staff members from 19 elementary schools |

## CURRENT IN-SERVICE MODEL

As a computer Curriculum Guide was being developed, it became apparent that a way was needed to introduce all K-6 teachers to the materials in that Curriculum Guide. The original in-service classes had centered on a general introduction to microcomputers, programming, and software applications. A course was designed specifically to look at the objectives and software for K-6 and their implementation in the current curriculum. The information about the need for a new course came from discussion with computer committee members and district personnel, a statement in the Computer Curriculum Guide, and from the QUICK SCREEN SURVEY Computer Utilization Survey Teacher Form. Journal articles, computer conferences, and college courses provided information for the formation of this course. The course description was provided by those responsible.

## EVALUATION OF THE PRESENT MODEL

A Staff Development Evaluation Form (Appendix E) was completed by each person who participated in each of the three in-service staff development sessions. Forms were completed by a total of 38 participants. Summaries of the responses were provided by Area Education Agency XIII personnel.

## FUTURE TRAINING NEEDS

Data indicating needs for further microcomputer training were compiled from the Computer Project Follow-up Survey and the Computer

Utilization Survey Building Form and Teacher Form. Questions were asked concerning the need for further in-service training. Additional questions were asked about the types of in-service training to be provided. Journal articles and computer conference presentations have provided further information about the types of training to be considered in the future.

## SUMMARY

The data needed for this study were compiled from summaries of five questionnaires completed by principals and teachers in the Council Bluffs Community School District during the period from 1980-86. Data from the surveys provided an overview of the history of microcomputer usage in elementary classrooms in the Council Bluffs Community School District. Interviews and bulletins provided descriptions of past microcomputer in-service courses for teachers. Responses from principals and teachers indicated the extent of past microcomputer in-service training for staff members. Information regarding an in-service model that is presently being used was gathered from the presenter. The survey data also revealed concerns for future types of microcomputer in-service training. Journal articles, computer conference presentations and college courses also influenced future training concerns.

The data-gathering instruments were designed to answer specific questions. The responses were summarized in a manner that provided appropriate information for this study.

# Chapter 4

## PRESENTATION AND ANALYSIS OF THE DATA

The purpose of this study was to determine what elementary teachers in the Council Bluffs, Iowa, school system need to become competent users of microcomputers in elementary classroom settings. To address this concern and answer the questions posed in this study, the procedures described in the previous chapter were conducted. This chapter contains a summary and analysis of the information that was gathered from surveys and interviews.

## ACQUISITION OF MICROCOMPUTERS

### Survey Data Prior to 1983

Responses on the three Microcomputer Utilization Survey forms, indicated no district owned microcomputers in elementary buildings as of December, 1982. This did not preclude the possibility of teacher owned microcomputers in elementary buildings. The survey done prior to 1982, revealed one microcomputer in each of three junior high school buildings.

The March, 1982, survey showed one microcomputer in each of two junior high schools, six at Abraham Lincoln High School, and eight at Thomas Jefferson High School.

The December, 1982, survey showed one additional computer at Abraham Lincoln and two at Thomas Jefferson. Thirteen of the computers were Apples, two were Xerox, two were TRS-80, and one was a PET. The memory sizes ranged from 16K to 48K. A summary of this data is presented in Table II.

Table II

Number of Microcomputers Used in Junior and Senior High Schools in Council Bluffs, Iowa as of December, 1982

| School | Type of Micro in Use | Memory | Number of micros |
|---|---|---|---|
| Kirn Junior High | Apple | 48K | 1 |
| Wilson Junior High | TRS-80 | 16K | 1 |
| Edison Junior High | Apple | 48K | 1 |
| Abraham Lincoln High School | | | |
| Business | Xerox | | 1 |
| | Apple | 48K | 2 |
| Math | Apple | 48K | 3 |
| | | 32K | 1 |
| Thomas Jefferson High School | | | |
| Business | Xerox | | 1 |
| Printing | TRS-80 | | 1 |
| Science | PET | 16K | 3 |
| Math | Apple | 32K | 3 |
| | | 48K | 2 * |
| Total | | | 20 |

* 1 in the office

At that time, there were no microcomputers in the elementary schools in Council Bluffs. National surveys, conducted at this same time, indicated that 42 percent of the elementary schools in the nation had microcomputers. Council Bluffs lagged substantially behind national trends at this point.

1984 Survey Data

In the spring of 1983, Block Grant Funds were used to purchase thirty-two, 64K Apple microcomputers for 19 of the district's 20 elementary buildings. One very small K-2 building was not included in the distribution of microcomputers nor in the survey results. The district had designated that microcomputer education should be emphasized at the fifth grade level; therefore, one microcomputer was placed in each fifth grade classroom. This was the only location for microcomputers at this time.

Survey data compiled in January, 1984, revealed that 61 additional microcomputers had been purchased by the district and PTA groups. This resulted in a total of 93 microcomputers in 19 elementary buildings. Ninety-two of these were available for instructional purposes with one reserved for office use. The ratio was one microcomputer for every 60 students. Since fifth grade was the "designated" level for microcomputer use, each fifth grade classroom had complete access to one microcomputer. There were 32 fifth grade classrooms serving 730 students. The remaining 60 computers were shared by the rest of the elementary grade students resulting in a ratio of one computer to 83 students. The national ratio at this time was one microcomputer for every 170 students. Council

Bluffs was substantially ahead of national trends at this time.

Hayes reported that the number of microcomputers in schools across the nation had increased by 118.3 percent from the summer of 1981-82 through the summer of 1982-83. A similar report indicated a 75 percent national increase in microcomputer numbers from the summer 1982-83 until the summer 1983-84. From January, 1983 until January, 1984 the Council Bluffs elementary schools acquired 93 microcomputers for an increase in the number of microcomputers of 100 percent. Prior to 1983, the Council Bluffs schools were behind the national trends. The acquisition of microcomputers for elementary classroom use in 1983, exceeded the 75 percent national growth rate for the same period. However, comparing the national growth rates for the period from 1981 through 1984, Council Bluffs appeared to be behind national averages.

When asked about the adequacy of microcomputers in each building, sixteen of the nineteen respondents indicated an inadequate number of microcomputers. Those responding "no" were asked to indicate their needs for additional hardware purchases. Fourteen principals indicated the need for 46 additional microcomputers. Twelve of them planned to purchase a total of 21 to 23 microcomputers by January, 1985. Accomplishment of these plans would account for a district increase of 25 percent in the number of microcomputers between 1984 and 1985. The data for number of microcomputers, adequacy, microcomputers needed, and planned purchases are summarized in Table III.

Table III

Microcomputers in Elementary Schools
in Council Bluffs, Iowa
as of January, 1984

| School | Number of Micros in Building | Is This Adequate? Yes | No | Number Needed | Plans to Purchase in the Next Year |
|---|---|---|---|---|---|
| Bloomer | 4 | | X | 6 | 2 |
| Carter Lake | 12 | | X | 5 | 3 |
| Crescent | 3 | X | | | |
| DeForest | 4 | | X | | |
| Edison | 4 | | X | 6 | 4 |
| Franklin | 6 | | X | 2 | 1 |
| Glendale | 2 | | X | 2 | 1 |
| Gunn | 3 | | X | | |
| Hoover | 7 | X | | | |
| Lewis & Clark | 3 | | X | 3 | |
| Longfellow | 4 | | X | 2 | |
| Myers | 5 | | X | 2 | 1-2 |
| Peterson | 8 | | X | 1 | 1 |
| Pusey | 1 | | X | 2 | 1 |
| Roosevelt | 4 | | X | 4 | |
| Rue | 7 | | X | 2 | 2 |
| Tinley | 4 | X | | | 1 |
| Walnut Grove | 5 | | X | 3 | 2 |
| Washington | 7 | | X | 6 | 2-3 |
| Total | 93 | 3 | 16 | 46 | 21-23 |

Responses from Principals in 1986

The final survey, done in two parts, was completed in April, 1986. Part one was returned by seventeen elementary principals. There were 181 microcomputers in seventeen elementary buildings, with 167.5 of these available for classroom use. The others were reserved for administrative purposes. This was a ratio of one microcomputer for every 32 elementary students. The national average at this time was one microcomputer for

every 15 students. While the national average counts all students and this study only dealt with averages for elementary students, Council Bluffs appeared to be lagging behind national trends in 1986.

Possible reasons for this lag, may be attributed to funding and lack of a specific district level microcomputer purchasing plan. In 1983, Block Grant Funds were used for the initial purchase of microcomputers for elementary schools. Between 1983 and April, 1986, Block Grant Funds had not been allocated for additional microcomputer purchases at the elementary level. The responsibility for microcomputer purchases fell on individual building budgets and parent organizations. However, these sources did not provide sufficient funding to keep pace with national trends. The lack of a district level plan for microcomputer purchases, left these decisions up to building principals. Each principal had a different level of commitment to microcomputer education. Data for numbers of microcomputers in elementary schools as of April, 1986 and their allocated use is presented in Table IV.

Table IV

Number of Computers in Elementary Buildings and Their Ratio to Students in Council Bluffs, Iowa as of April, 1986

| Usage | Number of Computers | Ratio of Micros to Students |
|---|---|---|
| For Classroom Use | 167.5 | 1 to 32 |
| For Office Use | 10.5 | |
| Other | 3 | |
| TOTAL | 181 | |

Responses on the 1984 survey indicated plans to purchase between 21 and 23 microcomputers by January, 1985. The 1986 survey indicated that 88 additional microcomputers had been purchased. Actual purchases were four times greater than planned. The difference between planned and actual purchases may be attributed to pressure from staffs and parent groups, high usage of available machines, increased awareness of national trends, enthusiasm of students, and perhaps a greater allocation of financial resources.

Questions also ascertained the number of printers in each building. A total of 42 printers were available in elementary buildings. They were classified as 32 Apple and ten other brands. The others included Swintek Typewriter/Printers for office use and Epson printers for classroom use. Each of the nineteen elementary buildings had at least one printer available for instructional purposes.

The principals revealed a goal of having 226 computers and 55 printers in the buildings by the end of the 1987-88 school year. This would be an increase of 35 percent in the number of microcomputers. It would also result in a ratio of one microcomputer for every 24 elementary students. Accomplishment of these plans by 1988 would bring Council Bluffs into closer alignment with the 1986 national ratio of one microcomputer for every 15 students. However, since decreases could also be expected in this national ratio, Council Bluffs could well remain further behind the national average.

Responses from Teachers in 1986

Part two of the 1986 survey was completed by 250 teachers from 19 elementary buildings. The responses were summarized by individual building and by district totals. Not all teachers answered all questions.

The teachers were asked to indicate the accessibility of microcomputers. Responses indicated that 86 percent of the teachers had access to a microcomputer for classroom use. The teachers were asked to indicate the availability of a microcomputer for their own record keeping and use with utility programs. Responses revealed that 79 percent of the staff had access to a microcomputer for personal applications. This question was intended to provide possible training needs. A summary of the responses is presented in Table V.

Table V

Access to Microcomputers by Teachers in Council Bluffs as of April 1986

| Type of Access | No. | % |
|---|---|---|
| Classroom use | 201 | 86 |
| Personal use | 156 | 79 |

In 1984, the national average for student usage of microcomputers was six hours during a school year. Responses on the 1986 teacher survey revealed how many times the students used microcomputers during the year and for what period of time. Council Bluffs students used microcomputers an average of 22.4 times a year. They spent an average of 16 minutes at

any one time. This amounted to six hours during the year. In contrast to the lag in acquisition of microcomputers, Council Bluffs students equaled the national average for time spent on the computers with fewer machines.

The amount of usage might be attributed to the initial district purchase of drill and practice math software that was operable with little teacher instruction. Since the game format of much of the software coincided with the "video game craze", students also spent time outside normal school hours using the microcomputers, thus increasing the average for Council Bluffs. Several schools within the district had teachers with above average interest in microcomputers and enthusiasm for their use with students. This enthusiasm created a "Pied Piper" situation which in turn gave those buildings high averages of student time on computers. The building averages ranged from students using microcomputers 5.8 times a year to 64.2 times a year.

## NATURE AND EXTENT OF PAST IN-SERVICE TRAINING

### Initial In-Service Training

In the spring of 1983, Block Grant Funds were used for an initial purchase of 32 microcomputers, which were placed in each fifth grade classroom in Council Bluffs. The first microcomputer staff development consisted of training all fifth grade classroom teachers in basic mechanics of computer operations. This involved a two and one-half hour hands-on workshop presented immediately prior to placement of microcomputers in the classrooms. The training was conducted by service

representatives from the Milliken company and the vendor from whom the computers were purchased.

In-Service Offered in 1983

As the school board and parent groups purchased additional microcomputers for the elementary schools, they expressed expectations for worthwhile microcomputer activities. Area Education Agency XIII, serving southwest Iowa, aided in the development of microcomputer in-service staff development programs for its service area which included Council Bluffs. The first of these programs was offered during the summer of 1983. The classes were open to all staff members and enrollments included a cross section of teacher levels and specialization. Offerings included an introductory class, programming with BASIC, and authoring with SUPER PILOT.

The introductory course provided an introduction to instructional computing for educators. Class format consisted of lectures, demonstrations, videotaped programs and discussions. Lecture topics covered getting started with computers, understanding computers, using and evaluating software, planning lessons, and considering how computing fits into the curriculum. "Adventure of the Mind," a series of six, 15 minute video lessons, produced by The Johns Hopkins University Applied Physics Laboratory and The ITV CO-OP, was used. The course outline was determined by the nature of the teaching assignments of each student, therefore, each course varied according to need.

The Basic and SUPER PILOT classes involved 15 contact hours consisting of lectures followed by time to develop programming

techniques. These early programming courses attracted people already interested in and eager to learn about computers.

## In-Service Developed Between 1983 and 1985

Between 1983 and 1985 the offerings expanded to include word processing, data base structures, and spreadsheet applications. Each class met for 15 hours. Class time included lectures and hands-on activities with the particular application.

In the fall of 1985 a fifteen hour class on utility programs was added. Programs that aided teachers with record keeping, printer applications, and test preparation were explored.

These sessions could be taken for graduate credit, state recertification requirements, or personal growth. Fifteen contact hours equaled one credit hour.

Data describing past microcomputer in-service offerings was obtained from bulletins advertising the courses. Interviews with Central Office personnel provided further information regarding the courses.

## 1984 In-Service Needs

One question on the 1984 survey asked the elementary principals if their staffs needed more microcomputer in-service training. Seventeen principals expressed this need. This data is summarized in Table VI. Responses to the type of in-service training needed included previewing and uses of individual software packages, record keeping, PILOT, programming, and printer support. These needs were addressed through in-service training courses of BASIC, the introductory course, word processing, spreadsheet, and a new course in computer assisted

instruction. The choice of course offerings was based on availability of materials and instructors.

Table VI

Indicated Needs for Microcomputer In-Service Training for Elementary Teachers in Council Bluffs, Iowa as of January, 1984

| School | In-Service Needed | |
|---|---|---|
| | Yes | No |
| Bloomer | X | |
| Carter Lake | X | |
| Crescent | X | |
| DeForest | X | |
| Edison | X | |
| Franklin | X | |
| Glendale | X | |
| Gunn | X | |
| Hoover | | X |
| Lewis & Clark | X | |
| Longfellow | X | |
| Myers | X | |
| Peterson | X | |
| Pusey | | X |
| Roosevelt | X | |
| Rue | X | |
| Tinley | X | |
| Walnut Grove | X | |
| Washington | X | |
| Total | 17 | 2 |

Almost 90 percent of the principals indicated a need of further training for their staff members. A 1983 study by Educational Research Service revealed that 43.5 percent of 1,360 districts, ranked staff training as their number one concern. Council Bluffs principals considered staff training a necessity. The two "no" responses may have

occurred because the teachers in those buildings all had microcomputer training or because one or two trained teachers in each building had assumed the responsibility for using microcomputers with the students and staff.

Extent of Past In-Service

The extent of past microcomputer in-service training received by the elementary teachers of Council Bluffs was gained through questions on the 1986 teacher survey. Twenty eight per cent of the district's teachers indicated no previous microcomputer training. The other 72 percent revealed training that consisted of district workshops, or a combination of district workshops, college classes, and other training.

As of April, 1986 a total of 275 Council Bluffs staff members from all disciplines had taken district workshops. The 144 elementary teachers accounted for 52 percent of the teachers who had taken district sponsored microcomputer in-service training. The other 48 percent included junior and senior high teachers, and administrators from all levels. The Table VII presents a summary of responses to questions regarding training taken.

Table VII
Summary of Responses Concerning Training Taken by Elementary Teachers in Council Bluffs as of April, 1986

| Type of Training | No. | % |
|---|---|---|
| None | 66 | 28 |
| District workshops | 144 | 61 |
| College classes | 27 | 11 |
| Other | 22 | 9 |

# AN IN-SERVICE MODEL

## Initial Plan

When the Council Bluffs Community School District Computer Advisory Committee began developing a K-6 Computer Curriculum Guide, one goal was to continue providing in-service training to teachers in areas identified as important to the overall computer goals of the district. Of major concern was providing in-service training for the elementary teachers who were to implement goals set forth in this Curriculum Guide. In January, 1985 an application was filed with the Northwest Area Foundation in Saint Paul, Minnesota. The proposal planned for two computer trained teachers to spend the 1985-86 school year working with the elementary teachers in Council Bluffs. The trainers would have spent time doing demonstration teaching lessons in each elementary classroom and helping the teachers "ease" into ongoing microcomputer usage. They would have helped establish building level computer committees and identify at least one person in each building as a computer facilitator responsible for maintenance of the program when funding expired. The proposal was not funded.

## Development of a New In-Service Course

In May, 1985, plans were made to develop a new in-service course designed specifically to familiarize K-6 teachers in Council Bluffs with the objectives in the computer guide. Implementation of software at each grade level was to be explored. This course addressed training concerns of the committee and those indicated by the principals on the 1984 survey. These responses indicated a need for further in-service training

in the area of previewing software. Since one of the staff development goals for Council Bluffs was to use district personnel as trainers whenever possible, the course was taught by district personnel.

Previous classes had concentrated on basics of computer operations, programming, and software applications. Because of the varied backgrounds of the participants and a lack of appropriate software for use with younger children, instructional stategies often dealt with the use of microcomputers for older students. Application software courses were directed toward making teachers more competent with the software and did not consider usage with students.

Attendance at educational computer conferences, informal discussions with in-service developers of other districts, curriculum classes taken by the course developer, and general knowledge of educational practices also influenced the course development. These influences resulted in the utilization of the Concerns-Based Adoption Model (CBAM) developed at the Texas Research & Development Center for Teacher Education (Hall:1979). The CBAM model identified seven stages of concern about innovation. The levels are:

| | | |
|---|---|---|
| 0 | Awareness | little concern |
| 1 | Informational | interest is indicated |
| 2 | Personal | perception of threat to individual |
| 3 | Management | how to best use |
| 4 | Consequence | how it affects students |
| 5 | Collaboration | coordination and cooperation with others |
| 6 | Refocusing | ways to make it better |

## Course Goals

Goal One. The course had two main goals. One was to enable the participants to become "comfortable" with computers. The conference and

class presentations on awareness levels focused on recognizing the personal concerns level of participants regarding microcomputer usage. A majority of the Council Bluffs teachers, enrolled in this class, were at the informational level. The next step was to help them move through the remaining levels until the refocusing process made microcomputers an integral part of their teaching.

Presentations by, and discussions with, out of district people responsible for implementation of computer usage, stressed a hands-on, non-technical approach for best results. A major caution was the avoidance of programming and concentration on software usage. Programming sessions often caused frustration for those who had not yet mastered turning on the microcomputer. Participants needed to conquer their "fear of breaking the machine" and concentrate on previewing software that could be used in their classrooms.

The literature reflected similar concerns when training adults for microcomputer usage. Hedges suggested a relaxed atmosphere. Dennis discussed three levels; awareness, implementation, and maintenance for teacher microcomputer competency. The writers all stressed time for participants to engage in hands-on previewing of software applicable to their classroom. Demonstration techniques were stressed as an integral facet of training.

Goal Two. The second goal focused on familiarizing the teachers with the Curriculum Guide and available software. The class met in blocks of three hours for five days. During the summer the class met from 8:30 - 11:30 a.m. for a one week period. The school year schedule consisted of

three-hour blocks meeting five times over a two and one half week period from 6:30 - 9:30 p.m. The class focused on ease of working with computers, familiarity with the objectives in the guide, and with available software.

Course Description

The class began with a presentation on the basic mechanics of computer operation. The philosophy of the district and the Curriculum Guide were discussed during the course. Demonstrations of large group presentations emphasized the use of problem solving software. Utility programs, keyboarding activities, and word processing materials were introduced during hands-on sessions. Time was provided for previewing all available software. A brief programming session would be included, if interest warranted. A typical class session consisted of 30-45 minutes of lecture concerning the Curriculum Guide, 10-15 minutes to answer questions, 45-60 minutes of demonstration and guided hands-on activities, with the remaining time allotted for previewing and sharing software programs. (See Appendix F)

A hands-on experiential approach was the basis for the class. Ample time was allowed for previewing software. Help from peers was encouraged. Technical terms were introduced only when necessary or if questions were raised. This format was supported by the models presented in the literature review, college classes, and conference presentations. The CBAM concerns were addressed by moving the teachers from an awareness level to one of refocusing on how they could use these new skills in their classrooms. Participants who entered the class at a personal

concern level higher than the awareness level, were introduced on an individual basis to activities that encouraged growth toward the refocusing level.

Class Participants

A total of 38 Council Bluffs staff members participated in this course. Participants included mostly elementary classroom teachers plus an elementary librarian, a home bound teacher, a school office clerk, and one high school teacher. The class was presented three times between May, 1985 and April, 1986. Ten people participated in the June, 1985 class. A session in August, 1985 had eighteen members. The third session was offered in January, 1986 for ten teachers. Registration for the class was voluntary. To date everyone that registered was allowed to participate. The course was offered for one hour of college credit through Marycrest College in Davenport, Iowa; one hour of recertification credit; or one hour of professional growth credit.

As of April, 1986 the class had reached 35 elementary teachers. This represented only 13 percent of the elementary staff. A possible reason for the low number of teachers completing the class is that the computer Curriculum Guide was not approved by the school board until May, 1986. It has been scheduled to be introduced to the elementary teachers in the fall of 1986. In the past, fifth grade was the "designated" area for microcomputer usage. This precipitated a certain "ownership of the computers" by fifth grade teachers and students. In some buildings this idea was still in evidence. Teachers need to be made aware of new

computer goals at the elementary level. When this occurs, enrollment in the class may increase.

## EVALUATION OF THE PRESENT MODEL

The written and oral evaluations by the thirty-eight participants of the staff development class indicated satisfaction. Thirty-seven participants indicated that the course had helped them become better teachers, was worthy of recertification credit, and gave them new insights. One person was uncertain. All thirty-eight participants indicated the course was interesting and worthy of recommendation to others. Thirty-five of the participants indicated the course fulfilled their expectations. Three people were uncertain. Table VIII presents a summary of the written evaluations. The oral evaluations were carried on during the class to ensure achievement of personal goals. The most repeated comments dealt with satisfaction in having time to become familiar with the available materials.

Formal follow-up to verify behavior changes relative to computer usage in the classrooms of the participants had not been planned. Informal observations and discussions indicated most of the participants have increased their usage of microcomputers with students in their classrooms. In some cases, they had also effected a change in the behavior of their colleagues. This is an area that needs to be explored in detail. The Curriculum Guide did address this as an issue to be dealt with by comparison of the 1986 survey responses with a survey planned for 1987. However, it must be remembered that with self-evaluation, bias must be considered when analyzing the results.

Table VIII

Staff Development Evaluation Summary
June, 1985; August, 1985; and January, 1986

| Questions | Yes | Uncertain | No |
|---|---|---|---|
| Have you become a better teacher as a result of this course? | 37 | 1 | 0 |
| Is this course worthy of credit for certification renewal purposes? | 37 | 1 | 0 |
| Did the staff development course fulfill your expectations? | 35 | 3 | 0 |
| Did the staff development course give you any new insight? | 37 | 1 | 0 |
| Was the staff development course of interest to you? | 38 | 0 | 0 |
| Would you recommend the staff development course to others? | 38 | 0 | 0 |

The participants were asked to rate their in-service course in relation to its value compared to other general college classes they had taken. Fifty percent of the teachers rated it equal in value to other classes they had taken. Fifty percent rated it of greater value. A summary of this information is presented in Table IX.

Table IX

Comparison of the In-Service Model to Other College Classes

| Question | less value | equal value | greater value |
|---|---|---|---|
| Comparison to college classes | 0 | 19 | 19 |

Course development was influenced because of the needs that had been expressed by teachers and their administrators for in-service training. The evaluations indicated that the needs of the participants had been met.

## FUTURE TRAINING NEEDS

### Administrative Perceptions

The Building Form of the 1986 survey asked three questions concerning training. One asked the principals to rate their familiarity with the Elementary Computer Curriculum Guide. Two of the seventeen principals felt very familiar with the guide. Nine ranked themselves as somewhat familiar and six indicated a need for more training. In January, 1985, the elementary principals had received one two hour training session which provided an introduction to the Curriculum Guide prior to its presentation to the school board. These numbers indicate a need for further training to enable the principals to aid in implementation of the Curriculum Guide.

A second question dealt with the training principals felt was necessary for themselves and/or their secretary/clerks. Not surprisingly, office applications were the main concern of the principals. Seven of the fourteen principals indicated the need for further training in word processing. Four indicated the need for training with data base materials. Three expressed a need for spreadsheet training. Training in these areas would improve office routines. Efficient use of microcomputers in the offices might have a side-effect of encouraging more teachers to use them.

The third question asked about the type of training their teachers needed over the next two years. Six of the fifteen responses from principals indicated a need for training in basic computer usage. Four responses listed software, two indicated the Curriculum Guide, and three mentioned word processing. While the 1986 survey revealed that although 60 percent of the elementary teachers had past microcomputer training, the principals still felt a need for further training for their staffs. The Curriculum Guide coupled with availability and emphasis of microcomputers may have accounted for expression of these needs. The lack of concern for training about the Curriculum Guide may stem from the fact that it had not yet been approved when the survey was completed by the principals. Not all of the principals attended their January training session. These responses are summarized in Table X.

Table X

Responses of Principals to Training Questions
on the 1986 Survey

How familiar are you (principal) with the Elementary Computer Curriculum Guide?

| | Totals | % |
|---|---|---|
| very familiar | 2 | 12 |
| somewhat familiar | 9 | 53 |
| need more training | 6 | 35 |

What type of training do you or your secretary/clerks need in the area of computers?

| | Totals | % |
|---|---|---|
| Word processing | 7 | 50 |
| Data base | 4 | 29 |
| Spreadsheet | 3 | 21 |

What type of training do your teachers need over the next two years?

| | Totals | % |
|---|---|---|
| Basics | 6 | 40 |
| Software | 4 | 27 |
| Guide | 2 | 13 |
| Word Processing | 3 | 20 |

Training Needs Indicated by Teachers

Responses from the Teacher Form of the 1986 survey indicated a need for further microcomputer in-service training. Seventy three percent of the elementary staff members indicated a need for further training. Interviews revealed that a major stumbling block in receiving the training was time. Many people indicated an interest in further training, but felt that with school, home, and outside commitments they were unable to register for the classes.

Teacher Familiarity with Curriculum Guide

When asked to rate their familiarity with the computer Curriculum Guide, only 11 percent of the elementary staff ranked themselves as very familiar. Twenty-seven percent felt somewhat familiar with the guide. Sixty-two percent of the staff indicated a need for more training. It would seem that the 89 percent who did not rank themselves as being very familiar with the Curriculum Guide would have indicated a need for more training. Because of particular teaching assignments (i.e., p.e. or music) these teachers may view themselves as exempt in the area of familiarity with the Curriculum Guide. Table XI presents a summary of responses to questions regarding training needs and familiarity with the Curriculum Guide.

Table XI

Responses to Survey Questions Regarding Familiarity with the Curriculum Guide and the Need for Further Training by Teachers in Council Bluffs as of April 1986

| Question | No. | % |
|---|---|---|
| Do you feel you need/want additional computer training? | 180 | 73 |
| How familiar are you with the Elementary Computer Curriculum Guide? | | |
| very familiar | 24 | 11 |
| somewhat familiar | 56 | 27 |
| need more training | 129 | 62 |

An analysis of the 1986 teacher and principal responses to the need for more training yielded these figures:

73 percent of the total staff needed more training
65 percent of the regular education staff needed more training
88 percent of the principals indicated needs for staff training

Johnson and Hoot found that of 224 elementary teachers only 7 percent ranked themselves as competent in using a microcomputer. Twenty percent indicated they were comfortable and 73 percent ranked themselves as insecure. Council Bluffs appears to be consistent with national trends.

## FUTURE TRAINING

On the 1986 survey, the principals listed basics of computer operation, software, Curriculum Guide, and word processing as areas in which their staffs needed additional training. The computer committee had expressed concern about further staff training, especially for the achievement of goals listed in the Curriculum Guide. One method of accomplishing this would be to continue the present in-service class with the requirement that every elementary teacher either demonstrate the competencies expected for implementation of the district goals or they could take the class.

### CASPER

Another avenue for in-service training would be the Computer Awareness Support Project in Elementary Rooms (CASPER). The district received a $5,000 Educational Improvement Project grant from the Iowa Department of Public Instruction which would be used to fund CASPER for the 1986-87 school year. The purpose of the grant is to help provide

classroom computer training to K-6 teachers in Council Bluffs. Six elementary classroom teachers have been chosen as trainers to work with the other elementary teachers in the district. These trainers were chosen because they had special training and expertise in the area of instructional computing. The trainers would visit each elementary building twice during the year. Each visit would cover from one to two and one half days.

During the first visit, planned for early fall, 45-60 minutes would be spent working with each teacher and student group, demonstrating instructional microcomputer techniques. If possible, a computer lab situation would be provided in the building. The teachers and students would go to the lab for their presentations. Specific teacher training sessions on the use of MECC keyboarding and word processing materials would be held with each building staff before or after school.

The second visit would be of a maintenance nature. Prior to this visit, the building teachers would be asked to indicate areas in need of further assistance. The trainers would then be available to answer questions and provide assistance.

Another task of the trainers would be assisting with the identification of a teacher in each building who could "assume the role of the trainer following the 1986-87 year. These people would form a district level group with the objective of monitoring continuation of worthwhile instructional microcomputing. The computer committee had also recommended establishment of building level computer committees, responsible for implementation of district level goals.

An August, 1986, workshop dealing with specific software and demonstration methods is planned for the trainers. Classroom presentations would need to be consistent, otherwise specific methods to be imparted to the teachers may be lost.

## 1987 Survey

In the spring of 1987, the computer committee would ask for input from the principals and teachers to determine the effectiveness of the 1986-87 CASPER program. The survey form used in 1986 would again be filled out by the elementary teachers and principals. Data from the two surveys would be analyzed. Recommendations based on this analysis would be made for the revision of the elementary Curriculum Guide. Some of these recommendations may have implications for the junior high school programs. Further in-service training would need to be revised in light of the survey data.

## Revision of the Present Model

The present in-service courses need to be evaluated after the analysis of the 1986 and 1987 survey data. The course, described in this paper, should be expanded to approach the introductory microcomputer courses that are requirements for preservice teachers or the classes that are part of an advanced degree program at many universities. These classes normally require 45 contact hours for three hours of credit. They cover the basic operation of computers, background computer history, techniques for using different types of software programs, programming in BASIC, and information on new technological developments.

The new course for Council Bluffs teachers should meet in three hour blocks, one a week for fifteen weeks. This would allow the teachers to use new learnings in their classrooms over a period of time. Successes and pitfalls could be discussed with teachers from similar situations. A feedback and support system for the solution of problems would be provided. Creativity in microcomputer usage would be encouraged. Actual lessons could be presented by the participants either before or after use in their classrooms. The course needs to address correct techniques for teaching keyboarding skills to elementary students. Design and/or teaching of this facet should receive input from the high school teachers who are presently responsible for this curricular area. This would ensure the presentation of correct keyboarding methods for the elementary teachers. The course also needs to address word processing as a writing process not as a software application.

Other In-Service Course Recommendations

Courses will need to be developed that provide teachers information and practice with new advances in technology. Technological developments will change these needs as quickly as the technology is introduced into the schools. The trainers will need to be aware of the advances and include appropriate introductory type activities.

A creative writing course for teachers, taught using the computer as the only tool would bring new insight for using word processing as a writing aid. Mechanics of a word processing software package are relatively easy for most teachers to grasp. The word processor should bring a new dimension to writing expected of students in the classroom.

Data base formation and retrieval of information stored in this manner is another avenue to be explored. Elementary students are often asked to gather information about a variety of items, dealing with a specific topic, i.e., presidents. Creation of and accessing a data base to store this information could take much of the "drudgery" out of the assignment. Teachers need to be trained to be comfortable with and understand these processes themselves before they can be expected to share this knowledge with students.

The data base background could also be expanded to include the establishment of district level bulletin boards for teacher and student use. This would necessitate modem training. Again, a hands-on approach should be of highest priority.

A logical follow-up to data bases and modem training would be on-line searching in which major commercial data bases are accessed by modem for any imaginable type of information. The research possibilities open to students become unlimited. It takes special techniques to make the best use of this technology. Reading or hearing about the process is not enough. Teachers must be actively involved in several hands-on sessions to become proficient. There would also need to be backup personnel that could be contacted for additional help as problems arose.

Consideration should also be given to developing a course to present LOGO to the teachers. The non-threatening, problem solving environment of LOGO should be available for student experimentation. LOGO activities are presented in the current Addison-Wesley elementary math materials. Teacher understanding of the LOGO processes should certainly enhance the math program.

Technological innovations such as CD-ROM disks "compact disk read-only memory," that can store the information contained in 220,000 pages of typed text, voice responsive computers that "act" on commands from a human voice, coupled with interactive laser disks and robotics should present many challenges to future in-service training course developers. Trainers will need to remain actively involved in researching new developments. They will be reshaping the world of education into a technologically advanced environment where students and teachers may achieve to their fullest.

## Follow-up After the Courses

A systematic follow-up needs to be established to determine whether the district goals are being met. An attempt should be made to evaluate the needs teachers express and whether they are met. Objective means of gathering this information need to be formulated. When teachers report about themselves, bias enters the picture.

## Implications for Guide Revisions

Revisions of the computer guide will need to be considered on a yearly basis. Any changes in technology, in-service courses, or funding of purchases would most likely affect district goals. New goals would need to be incorporated and outdated goals eliminated. These revisions would also have implications for the junior and senior high school programs.

## Provisions to Encourage Teacher Training

Since teachers indicated outside commitments as a drawback to

enrolling for in-service training, ways need to be uncovered to provide training co-ordinated with the school schedule. Expansion of the CASPER program would be one alternative. Placing two fulltime teachers in the positions of trainers, would give classroom teachers more access to role models. Funding will be a major stumbling block in this area.

There are four afternoons set aside for in-service training each year. Providing ongoing microcomputer in-service sessions at these times might enable more teachers to attend. At the present time, microcomputer in-service has not been approved for these afternoons.

Teachers will need to be attracted to these courses unless they view them as worthwhile activities that will expand and enhance their teaching abilities for their students. Some "public relations" work may need to be done to entice the teachers to make a commitment to bring microcomputer technology into their world through in-service training.

## SUMMARY

To determine the needs of elementary teachers in Council Bluffs, Iowa to become competent users of microcomputers, data was gathered from the principals, teachers, and Central Office personnel in Council Bluffs.

Microcomputers had been in the elementary classrooms since 1983. In-service training was provided for the teachers since 1983. In 1984, almost 90 percent of the principals indicated the need for further microcomputer in-service training for their staff members in the areas of previewing and using software, record keeping, PILOT, programming, and printer support.

In 1986, fifteen elementary principals indicated a need for further training for their staff members in the areas of basic computer usage, software, the elementary Curriculum Guide, and word processing. At this same time, while 60 percent of the teachers indicated that they had received past training, 73 percent indicated a need for further training.

The present in-service model, developed in 1985, offered the teachers a hands-on based approach to microcomputer competency. Lectures, demonstrations, and previewing software comprised the course. Evaluations revealed that the class met the needs of the participants.

Recommendations for future in-service included revision of the present model to bring it in line with university courses offered to preservice and graduate students. Consideration should be given to expansion of the CASPER program as a means of providing classroom teachers with access to a district microcomputer trainer. Inclusion of the topics of creative writing using word processing, data base creation and usage, bulletin board establishment, and on-line searching should be considered.

A systematic follow-up of the classes should be established. Feedback from these areas should govern the revision of the Curriculum Guide. Provisions should be made to "entice" teachers to avail themselves of further microcomputer in-service training.

# Chapter 5

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The problem investigated in this study was to determine the following:

1. What is the nature of in-service needs of elementary teachers in the Council Bluffs Community School District to become competent users of microcomputers in an elementary classroom setting?
2. What is the history of computer usage in elementary classrooms in the Council Bluffs Community School District?
3. What is the nature and extent of in-service training in the use of microcomputers that has been provided to elementary teachers in the Council Bluffs Community School District?
4. What In-Service Model is presently used by the Council Bluffs Community School District to promote competency in computer usage?
5. What do evaluations by participants reveal about the present In-Service Model?
6. What future types of training might be appropriate for elementary classroom teachers in Council Bluffs?

To provide data relative to these concerns, five survey summaries compiled by the district were examined. A description of an in-service training model was written. Recommendations were made for future in-service training and revision of the Curriculum Guide. This chapter contains a summary of findings, conclusions based on the information obtained, and recommendations for further research.

The study was limited to the Council Bluffs Community School

District. Surveys were completed by teachers and principals in the district. The data were summarized by Central Office personnel.

Three surveys were completed prior to 1984 by teachers and principals from three junior and two senior high schools. These surveys focused on the number and kind of microcomputers that were being used by students and teachers. Information was collected from buildings known to have microcomputers.

Information for the fourth survey summary was collected in January, 1984. This survey was sent to teachers and principals in elementary buildings in the Council Bluffs Community School District. Questions were asked regarding the number of microcomputers in the buildings, their availability to teachers and students, plans for future purchases, and the need for further in-service training. Data was compiled from seventeen elementary buildings in Council Bluffs.

The fifth survey, done in two parts, was completed in April, 1986. One form was distributed to elementary principals in the Council Bluffs Community School District, while another form was distributed to the elementary teachers. The principals were asked three questions concerning the present training levels of themselves and their staffs and future training needs. Questions were also asked to determine the number of microcomputers and printers in the elementary buildings and their usage. Seventeen elementary principals responded to the survey.

Approximately 250 elementary teachers from nineteen elementary buildings responded to the Teacher Form of the fifth survey. Their questions dealt with access to microcomputers, present training level, future training needs, and familiarity with the computer curriculum.

Interviews were conducted with key office personnel to gain further interpretations of the summarized data. These were conducted between September, 1985 and June, 1986.

## SUMMARY

The nature of in-service needs of elementary teachers in the Council Bluffs Community School District to become competent users of microcomputers in an elementary classroom setting are varied. They can best be assessed by considering the information gained regarding the sub-problems.

### History of Microcomputers in Elementary Buildings

The first question studied was the history of microcomputer usage in elementary classrooms in the Council Bluffs Community District. The first documented presence of microcomputers in elementary classrooms occurred in January, 1984. At that time there were 93 microcomputers in seventeen elementary buildings. All but one of that number were available for student and teacher use. By April, 1986, there were 181 microcomputers in the elementary buildings in Council Bluffs, with all but 13.5 being accessible to students and teachers. This final accounting indicated the growth in number of microcomputers at a rate that compared with the national average.

### Nature and Extent of Past Microcomputer Training

When assessing the nature and extent of in-service training in the use of microcomputers for elementary teachers in Council Bluffs, Iowa results of surveys indicated that while training had occurred, there was

still a perceived need for further training. In 1984, seventeen of the nineteen principals answered "yes" to a question concerning the need of more in-service training for their staffs. In 1986, only two of the seventeen principals saw themselves as very familiar with the computer curriculum for elementary schools. Only one of the seventeen principals indicated no further training was needed for his staff members.

The teachers responses to the 1986 survey indicated that 144 of the respondents had taken at least one microcomputer in-service workshop offered by the district. There were 66 teachers who had not received any microcomputer training. Nearly 72 percent of the teachers indicated a need for further training. These responses also followed national trends.

The nature of the in-service classes that had been offered to teachers in the Council Bluffs Community School District included a one time two-hour workshop, offered in the spring of 1983, specifically for all fifth grade teachers on mechanics of running microcomputers. During the summer of 1984 an introduction to microcomputer class along with classes in BASIC and SUPER PILOT were offered. The 1985 summer in-service offerings included the introduction class and BASIC with the addition of word processing, data base, spreadsheet and a class designed specifically to look at microcomputer implementation into the curriculum. In the fall of 1985, a class on uses of teacher utility programs was added to the list.

The In-Service Model used by the Council Bluffs Community School District to promote competency in computer usage was a fifteen hour hands-on workshop. This workshop was designed specifically for K-6

teachers to become familiar with the objectives and software listed in the Curriculum Guide. Implementation of instructional microcomputing within the current program was also explored. The workshop focused on familiarity and ease of use of computers, a knowledge of grade level objectives, and an awareness of available software.

Workshop participant evaluations indicated that this model was fulfilling training needs expressed by the teachers. When compared to other college courses, this course was rated of equal or greater value by all 38 participants. Informal interviews and observations indicated that these participants were using microcomputers in their classrooms.

Principals indicated that further training areas for teachers should include basics, software, Curriculum Guide, and word processing. With new technological developments, these needs will change as quickly as the technology is introduced into the schools.

In-service training needs were acknowledged by the teachers and administrators in Council Bluffs. The needs appeared to center around basic microcomputer usage and software applications. Staff development courses aimed at meeting those needs were offered to the teachers by district personnel. Future staff development needs would be determined by the growing technology.

Revision of the present model to bring it into alignment with required microcomputer classes for preservice and graduate students was suggested. Recommendations were made to expand the in-service classes to include creative writing with word processing, creation of data bases, and on-line searching.

Suggestions for follow-up after the courses, revision of the Curriculum Guide, and provisions to interest the teachers in further training were included.

## CONCLUSIONS

Based on the findings of the study, the following conclusions can be made:

1. The history of microcomputer usage in elementary schools in the Council Bluffs Community School District covered a very short period. Microcomputers began appearing in elementary classrooms in 1983. In the following three year period, 181 microcomputers were purchased for use in elementary buildings. All but 13.5 of this number were available for student and teacher use. It can be expected that the number of microcomputers in the elementary buildings will continue to increase, but not as rapidly as during the period from 1983 through 1985.

2. Several in-service staff development classes were offered to all teachers in the Council Bluffs School System. They included introductory topics, BASIC, SUPER PILOT, word processing, data base, spreadsheet, utility programs, and curriculum implementation. The classes were eliminated or added as teacher and principal responses indicated further needs.

3. One model that was used consisted of a hands-on approach to enable teachers to become competent users of microcomputers. This class provided opportunities for first time users to become comfortable with microcomputers. It stressed familiarity with the Computer Curriculum Guide and software packages. This class will need to be revised on a

continual basis to keep pace with the training level of the teachers.

4. While only 13 percent of the elementary teachers have taken this class, the evaluations confirmed that they felt it was meeting their needs and was a worthwhile experience. Informal observation of their classroom behavior upon completion of the class, indicates an increased use of microcomputers for classroom activities.

5. Elementary teachers who have taken the district classes do not have the same level of training that new teacher graduates possess.

6. Continued teacher training will be needed and should be dependent on teacher need and request. Technological developments will need to influence course development.

7. The nature of the in-service needs of elementary teachers in Council Bluffs are varied, but center on basic usage. These needs are controlled by the kinds of technology available. In the manner these needs appeared in the past three years, they will continue to change with future developments.

## RECOMMENDATIONS

Based on the research and the conclusions drawn from that research, the following recommendations can be made.

1. The Council Bluffs Community School District will need to continue their efforts in providing microcomputer experiences for their students. This includes purchasing microcomputer hardware and software that reflect new technological developments.

2. Surveying teachers to determine their microcomputer in-service needs should be continued. Course developments should reflect the needs

expressed by the teachers as well as those evidenced by the technological and educational communities.

3. The In-Service Model used by the district should be monitored in relation to needs expressed by the teachers and with regard to information appearing in the journals and conference presentations. The model will need to be upgraded to include new technological developments. Teacher training microcomputer courses offered by universities and colleges for both undergraduate and graduate training require 45 class hours that provide a background in current topics of instructional computing. The district course should more closely resemble these required courses.

4. Participant evaluations of the in-service class should be continued. These evaluations should be monitored for indications of changes needed in topic and structure.

5. Systematic follow-up of the teachers who take the classes should be formulated. An objective measure of changed behavior needs to be devised. Observations by principals of the teacher and/or students would be one method. Checklists of activities presented and skills accomplished could be included. This data should influence future training sessions.

6. The Curriculum Guide should be revised on a continuing basis. Data from the teachers and implications of new technology should govern the revisions.

7. Courses will need to be developed that present new technological developments even though they may not be indicated as needs by the teachers. Needs are often not realized until after the fact.

The new technology that allows a complete encyclopedia to be stored on a single disk will need to be addressed. The role of the microcomputer in robotics is another topic that seems to be gaining interest. The course developers will need to stay current in the areas of technological developments.

8. Future course offerings should include increased use of the microcomputer as a problem solving tool. Data-base structures can provide opportunities for students to understand organizational patterns. This background leads to using the power of microcomputer on-line searching. Courses will need to include techniques for modem usage and establishing bulletin boards within the district and with other districts.

The technological revolution has just begun. The schools are involved in preparing students to function in the world of tomorrow. Students who have a strong foundation in the basics of "readin, ritin, and rithmetic" should have the opportunity to use the microcomputer to its fullest advantage.

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# APPENDIX A. MICROCOMPUTER UTILIZATION SURVEY

# MICROCOMPUTER UTILIZATION SURVEY

## PRIOR TO 1982, MARCH 1982, DECEMBER 1982

Type of microcomputer in use. _____
(Memory) _____

Number of micros. _____

Number of teachers using daily _____
weekly _____
occasionally _____

Approximate number of minutes used per day. _____

Student use:
- a. Number of students _____
- b. Before school _____
- c. After school _____

Rank of usage:
- Drill & Practice _____
- Simulation _____
- Writing Programs _____
- Tutorial _____
- Games _____
- Record Keeping _____
- Enrichment _____
- Others _____

Teacher use:
- a. Departments _____
- b. Commercial or homemade software _____
- c. Rank of usage
  - Drill and practice _____
  - Simulation _____
  - Programming _____
  - Tutorial _____
  - Games _____
  - Record Keeping _____
  - Enrichment _____
  - Other _____
- d. Other uses needed _____
  _____
- e. Is completely accessible to all teachers _____
  How can it be accessible _____

# APPENDIX B. COMPUTER PROJECT FOLLOW-UP SURVEY

COUNCIL BLUFFS COMMUNITY SCHOOLS
Office of the Consultant for Mathematics and Science

Computer Project Follow-Up Survey

One of the phases of the computer Project is to conduct an evaluation at the end of the first semester. Please fill out the questionnaire as thoroughly as possible.

School _____

1. Total number of 5th grade math teachers = _____.

2. Total number of 5th grade students = _____.

3. How many 5th grade students have participated in an activity on a computer? _____

4. What is the average number of times that each 5th grade student has used a computer? _____

5. How much time does a 5th grade student work on a computer at any one time?

___ a. Less than 10 min. ___ b. 10-15 min.

___ c. 15-20 min. ___ d. 20 min. +

6. Fifth grade teachers began using computers with their students on approximately what date: _____

7. Is additional software needed? ___ yes ___ no

If yes: In what areas and topics:

area: _____ topic: _____
area: _____ topic: _____
area: _____ topic: _____

8. How would you rate the current software: (circle one)

Milliken Math: excellent - very good - good - poor - very poor

DLM : excellent - very good - good - poor - very poor

Others (list):
_____ excellent - very good - good - poor - very poor

_____ excellent - very good - good - poor - very poor

_____ excellent - very good - good - poor - very poor

9. How many computers are in your building? _____

10. How many computers are available for teachers/students to use? _____

11. How are your computers set up for teacher/student use?

___ a. Lab situation. (Teacher/students go to lab.)

___ b. On carts - sent to individual rooms.

___ c. Other (please explain) _____

_____

12. Do you have an adequate number of computers? ___ yes ___ no

If no; how many more do you need for your building? _____
If no; how many do you plan to buy in the next year? _____

13. Are any teachers using the computer for record keeping/utilities types of activities? (i.e., grade books, etc.) ___ yes ___ no

If yes, how many? _____

14. Please indicate (a) the number of teachers using computers with their students at each grade level and (b) how they are using it; and (c) the approximate number of students involved?

| | (a) | (b) | | | (c) |
|---|---|---|---|---|---|
| | # of teachers | whole class | small group | selected individual | # of students |
| Kindergarten | | | | | |
| 1st grade | | | | | |
| 2nd grade | | | | | |
| 3rd grade | | | | | |
| 4th grade | | | | | |
| 5th grade | | | | | |
| 6th grade | | | | | |

15. Has a schedule been developed so that teachers have access to computers on a regular basis? ___ yes ___ no

If yes, please describe (or attach) your building schedule:

_____
_____

16. What is your reaction regarding computers in the classroom?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| detrimental to education | not needed | of some value | worth while | very beneficial |

17. How do your students feel about having computers in the classroom for student use?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| detrimental to education | not needed | of some value | worth while | very beneficial |

18. How do your students feel about the opportunity to use computers for part of their educational experience?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| detrimental to education | not needed | of some value | worth while | very beneficial |

19. The potential value of computers in education is:

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| detrimental to education | not needed | of some value | worth while | very beneficial |

20. Is more in-service needed for your staff? ___ yes ___ no

If yes; what type of in-service is needed? _____

_____

...and what would be the best way for us to provide it? _____

_____

Other comments:

Please return to Ed Propst by January 25, 1984.
Thank you for your help.

# APPENDIX C. QUICK SCREEN SURVEY -- TEACHER FORM

QUICK SCREEN SURVEY

COUNCIL BLUFFS COMMUNITY SCHOOLS

COMPUTER UTILIZATION SURVEY - TEACHER FORM

NAME:_____ SCHOOL:_____
GRADE/SUBJ:_____ DATE:_____

As part of the evaluation of the elementary computer program, data is being collected to determine the level and type of usage of computers by teachers, students, and administrators before the implementation of the Elementary Computer Curriculum Guide and after the first year of use. Your input is very important in helping us get the most accurate picture of what is happening and what should happen in our schools.

Please fill in all areas that apply.

1. Do you have access to a computer:

   a. for classroom use? yes _____; no _____
   b. for you use: yes _____; no _____

2. How much computer training have you had?
   a. none _____
   b. district sponsored workshops/classes
      1. How many have you taken? _____
      2. When was the last one taken? _____
   c. college classes (other than Marycrest-included in b) _____
   d. other _____

3. Do you feel you need/want additional computer training?
   yes _____; no _____

   If yes, in what areas? _____

4. Would it be beneficial to you to have someone trained in computer usage to work with you in your classroom to assist you in setting up your computer education program?

   yes _____; no _____; not sure _____

5. How many students do you have in your class/homeroom? _____

6. How often do your students use computers in your classroom?
   _____ a. daily
   _____ b. weekly
   How many times? 1 ___; 2 ___; 3 ___; 4 ___
   _____ c. monthly (# of times _____)
   _____ d. not scheduled - get them when I can _____

7. Do all students get to use the computer? yes _____; no _____
If not, which ones do not use it? _____

8. How many times does a student get to use the computer during the year? (estimate) _____

9. How much time does a student normally spend on the computer at any one time? _____

10. Do you ever do demonstration lessons using the computer with the class or small group? yes _____; no _____

11. How do your students feel about having computers in the classroom/ lab for students to use?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| detrimental to education | not needed | of some value | worth-while | very beneficial |

12. How do your students feel about the opportunity to use computers for part of their educational experience?

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| do not like them | hesitant | take it or leave it | like it | eager to use |

13. Estimate the percent of your students that can do the following:
_____ a. know the parts of a computer
_____ b. can boot a system
_____ c. can run a program
_____ d. know home row key positions
_____ e. have had some experience with word processing

14. How familiar are you with the Elementary Computer Curriculum Guide?
___ very familiar; ___ somewhat familiar; ___ need more training

15. What software have you used with students, what subject and how effective do you feel it has been?

| | Software | Subject | How Effective | | |
|---|---|---|---|---|---|
| | | | Good | Fair | Poor |
| a. | _____ | _____ | ____ | ____ | ____ |
| b. | _____ | _____ | ____ | ____ | ____ |
| c. | _____ | _____ | ____ | ____ | ____ |
| d. | _____ | _____ | ____ | ____ | ____ |
| e. | _____ | _____ | ____ | ____ | ____ |
| f. | _____ | _____ | ____ | ____ | ____ |
| g. | _____ | _____ | ____ | ____ | ____ |

16. What types of software do you feel are needed for use in your classroom? (type, subject or concepts)

    a. _____
    b. _____
    c. _____

17. Do you have a computer in your home? yes _____; no _____
    What type? _____

18. Do you use a computer for your own school use? yes _____; no _____
    If yes: What type(s) of activities: _____
    _____
    What software do you use? _____
    _____

19. How many of your students have computers in their homes? _____

20. What reservations/concerns/fears do you have regarding computer utilization in education? _____
    _____

Thank you very much for your time and effort in filling out this survey. Please return the completed form to Ed Propst by March 21, 1986.

# APPENDIX D. COMPUTER UTILIZATION SURVEY -- BUILDING FORM

COUNCIL BLUFFS COMMUNITY SCHOOLS

COMPUTER UTILIZATION SURVEY
BUILDING FORM

SCHOOL: _____ DATE: _____

As part of the evaluation of the elementary computer program, data is being collected to determine the level and type of usage of computers by teachers, students, and administrators before the implementation of the Elementary Computer Curriculum Guide and after the first year of use.

Please fill in all areas that apply.

1. Number of computers and printers in your building:

| | | computer | printers |
|---|---|---|---|
| for general classroom | = | | |
| for special education | = | | |
| for Chapter I | = | | |
| for office use | = | | |
| other _____ | = | | |
| TOTAL | = | _____ | _____ |

2. By the end of the 1987-88 school year our goal is to have a total of _____ computers and _____ printers in the building.

3. Please indicate how computers are physically arranged in your building by indicating the approximate percentage of time in each setting.

   a. computer lab _____
   b. Individual rooms _____
   c. media center _____
   d. other _____

4. Do you currently have a building level computer advisory committee to help with computer education in your school? yes _____; no _____

   a. If no, do you have plans to create a building level computer advisory committee? yes _____; no _____

   b. Who should be on a building level computer advisory committee?

   _____

5. How familiar are you (principal) with the Elementary Computer Curriculum Guide?

   _____ very familiar; _____ somewhat familiar; _____ need more training

6. Do you use a computer in your office? yes _____; no _____

   If yes; for what function(s)?_____
   _____

   If no; do you have plans within the next year to put a computer in your office? yes_____; no _____

7. What type of training do you or your secretary/clerk need in the area of computers?
   a. _____
   b. _____
   c. _____
   d. none _____

8. What type of training do your teachers need over the next two years?
   a. _____
   b. _____
   c. _____

9. Other comments: _____
   _____
   _____

_____
(signature)

Thank you for your time and interest in filling out this survey.
Please return your completed survey to Ed Propst.

# APPENDIX E. STAFF DEVELOPMENT EVALUATION FORM

# Staff Development Evaluation Form



Date: Course Instructor:

Name of Course:

1. How would you compare this staff development course to courses taken at a college or university?

| of less value | of equal value | of greater value |
|---|---|---|
| _____ | _____ | _____ |

2. Do you feel you have become a better teacher as a result of this course?

| Yes | Uncertain | No |
|---|---|---|
| _____ | _____ | _____ |

3. Do you feel this course was worthy of credit for certification renewal purposes?

| Yes | Uncertain | No |
|---|---|---|
| _____ | _____ | _____ |

4. Why were you enrolled in this course? You may check more than one.

   a. _____ Because I really wanted to learn.

   b. _____ I had a particular problem to solve.

   c. _____ To use credits for recertification.

   d. _____ To satisfy a requirement or give me credits I need.

   e. _____ My administrator(s) suggested I go.

5. Did the staff development course fulfill your expectations?

| Yes | Uncertain | No |
|---|---|---|
| _____ | _____ | _____ |

6. Did the staff development course give you any new insight?

| Yes | Uncertain | No |
|---|---|---|
| _____ | _____ | _____ |

7. Was the staff development course of interest to you?

| Yes | Uncertain | No |
|---|---|---|
| _____ | _____ | _____ |

8. Would you recommend the staff development course to others?

| Yes | Uncertain | No |
|---|---|---|
| _____ | _____ | _____ |

Form developed by DPI
#6979

# APPENDIX F. IN-SERVICE COURSE DESCRIPTION

# IN-SERVICE COURSE DESCRIPTION

A fifteen hour in-service class is presently offered to teachers in the Council Bluffs Community School District. The class meets in blocks of three hours for five days. During the summer this covers a one week period with classes usually meeting from 8:30 - 11:30 a.m. The school year schedule consists of three hour blocks held over two and a half weeks with meetings on Thursday, Tuesday, Thursday, Tuesday, and Thursday evenings from 6:30 - 9:30 p.m. This class has been taught three times. Following is a description of the class.

## Day 1

### Introductory Activities

Introduction of the instructor with background information regarding career placement and training. Include any personal microcomputer related incident that will place participants at ease.

Have class members share information about themselves, their jobs, and their computer background.

Handle registration materials.

### Lecture

Cover definitions of hardware and software using demonstration techniques. Use Ditto 2 from the Guide for discussion purposes.

Discuss disks and their care (Ditto 1). Show a disk that has been cut to expose the inside, one that is warped, and one scratched from improper handling.

Demonstrate booting the system. Have everyone participate by booting their machine. Discuss difference between warm and cold boots stressing that warm boots are easier on the machine than turning it off and starting over. Point out that sometimes there is no alternative but to turn it off. If this is necessary caution about waiting at least ten seconds before turning the machine back on.

Introduce the Curriculum Guide at this time. Discuss the district philosophy and the arrangement of the Curriculum Guide. Plan to cover the specific objectives, activities, and suggested resources for kindergarten and first grade. Teachers of all levels need to be aware of the total scope and sequence of microcomputer skills expected of the students.

Break

Preview Software

Monitor proper booting techniques. Encourage experimentation with different pieces of software. Have materials available for all teaching levels. Encourage peer help. As problems arise, use them to demonstrate ways of avoiding future pitfalls. When one person becomes particularily excited about a software program, let them share the information with the whole group.

Day 2

Review proper booting techniques.

Answer questions.

Continue with the Curriculum Guide by discussing the objectives, activities and resources presented for second and third grades.

Demonstrate a group microcomputer presentation by using MECC Lemonade Stand. Have the class be the students, with the instructor "running" the computer. The instructor calls on individual students for answers to the questions that appear on the screen and then enters the information. With this program the class can be divided into teams and group decisions can be made for running a Lemonade Stand. Stress the importance of reading the directions the first time through a new program and then choosing the menu option to skip them during future uses of the program. The teams can then be challenged to "play" Lemonade Stand for a given period of time (i.e., one week), keeping records of sales, costs, and profits and then compare records at the end of the time. This should demonstrate uses beyond drill and practice. Suggestions can be made for using other programs like Taxman, Bagels, Hurkle, or Oregon in similar manner.

Break

Preview Software

Monitor proper techniques. Encourage people who are having trouble finding materials. Encourage peer help and sharing.

Day 3

Review proper booting techniques. Answer questions. Discuss Curriculum Guide material for fourth and fifth grades.

Demonstrate usage of problem solving software as a large group presentation. Sunburst materials such as Incredible Laboratory, King's Rule, and The Factory work well. This type of demonstration should point out the need to teach certain software uses rather than just having the students insert a disk, run the program by trial and error keystrokes, and miss the real value of the program.

Demonstrating with children can be advantageous.

Break

Preview Software

Continue monitoring. Less encouragement and help will be needed.

Day 4

Review booting techniques. Answer questions. Discuss guide materials for sixth grade.

Introduce MECC Keyboarding software. Have the participants work through a lesson in the same manner as students would. Discuss and demonstrate other keyboarding materials.

Discuss word processing and its implications for students and teachers. Introduce MECC Writer. Have the participants work through a sample lesson that covers the capabilities and limitations of this word processor.

Discuss and demonstrate other printing utilities such as, MECC Puzzles and Poster, Crossword Magic, and Print Shop. Allow time for individual use of these programs.

Preview Software

Encourage the teachers to use the utilities for the preparation of materials to be taken back to their classrooms.

Day 5

Review booting techniques. Answer questions. Continue demonstrating word processing materials. Look at Appleworks.

Discuss and demonstrate grade book materials.

Preview Software

Encourage them to make specific lesson plans for software usage in their rooms.

Evaluation and Cleanup

Fill out evaluation forms. Return software to proper place.