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ABSTRACT

Part of the North Slope Borough District, the two schools in the Inupiaq village of Wainwright, Alaska, began to take advantage of communications technology for teaching, administration, and staff training purposes in 1983. At that time, three teachers took a course offered by the University of Alaska via computer and audio-conference on the subject of using computers as communications tools. The teachers altered the increasing reliance of the schools on audio-conferencing for administrative and instructional uses. They began to use computers to communicate with supervisors in other locations, to teach math drills and practices, to teach science, and to improve research projects. However, the most interesting use of the computer was as a communications tool for instructional and administrative purposes. Using the computer and one of many electronic networks, students exchanged information with students in California; teachers exchanged information with other teachers and with supervisors; administrators sent notes regarding travel schedules, book orders, test scores, and evaluation procedures; and university instructors presented information about the academic consequences of computers. Wainwright teachers expected to expand computer use for the language arts program and social studies. Special education, staff training, and software use were key issues in the move to computer communications. (SB)

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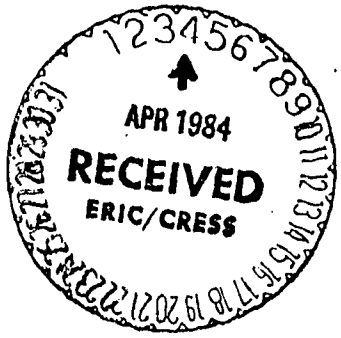




# "Let Your Fingers Do The Talking"

## Computer Communication in an Alaskan Rural School

Carol Barnhardt

[1984]



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#26 FTRW Thu Nov 18 07:29

Dear girls,
Hi. How are you doing? I'm fine. I am in fourth grade and my name is Tasi. I live in Tununak. What grade are you in? What is your name? We do division and spelling tests. Do you? Clara and Molly said hi. I know how to read. How about you? I am eight years old. Do you get homework? We do.

#84 FTDA Sun Oct 24 13:42

DEAR PENPAL,
my schools name is north pole elementary. i have lived in alaska all my life. most of the time i love living in alaska because there are no ugly bugs and snakes. i saw e.t., and we do have arcades. will i had better go now so.....by.
your friend....

#19 FATELECOM Wed Nov 24 9:44

I AM 11 YEARS OLD. I AM IN FIFTH GRADE AND I AM A BOY. I'M PART MEXICAN AND PART AMERICAN. WHAT ARE YOU? DO YOU HAVE A PET? DO YOU HAVE A BROTHER OR SISTER? WHAT SCHOOL DO YOU GO TO? DO YOU HAVE LOTS OF WORK? DO YOU LIKE BEING A PEN PAL WITH A BOY? WHERE WERE YOU BORN? DO YOU LIKE BOOKS?

WE ARE DOING FINE. WE DON'T HAVE IGLOOS IN CALIFORNIA. WE HAVE 30 KIDS IN OUR CLASSROOM AND WE ARE GOOD. WE WATCH TV AND WE PLAY OUTSIDE ON SATURDAY.
YOUR FRIEND FROM SAN DIEGO,

The above messages were sent to or from students in a rural elementary school in the community of Wainwright, Alaska. Although the messages themselves are not unlike those sent between students in many schools in the country, the medium of communication was quite different. Each of the above messages was sent via a school microcomputer which was linked by modem to a telephone.

Communicating via computer is one of the many ways in which computers are being used today in the arctic community of Wainwright. In this case study we will examine the processes involved in a situation where teachers, students and administrators begin to use microcomputers to extend the horizons of an isolated rural community.

Wainwright is not, in many ways, a typical rural American community, so it could be tempting to think that what's happening with computers in this small northern community of Eskimo people might not be relevant to what's happening in rural communities elsewhere. However, as this case study reveals, there are many connections that can be made between Wainwright and rural communities in other parts of the United States. The stark contrasts that exist in Wainwright provide an opportunity to focus on some kinds of issues that are often not readily apparent in a less isolated situation. As we look at the use of computers in the schools here and especially at their use as a communicative tool, it becomes obvious that some dramatic and important changes in schooling can and are occuring as a result of the introduction of the microcomputer.

## RURAL ALASKA AND WAINWRIGHT

With only three major urban areas in Alaska, and a half-dozen more which might be classified as small towns, the term "rural" is used in Alaska to describe approximately 175 "villages." Residents of rural Alaska (or "The Bush" as it is more commonly referred to) are primarily Alaska natives including Aleuts, Eskimos and Indians. Bush communities range in size from 20 people to 3800 people.

Most rural Alaskan communities are geographically remote from one another and from the larger urban areas of Fairbanks, Juneau and Anchorage. They are accessible only by airplane (when the weather is

accommodating), by boat (four months at the most between spring break-up and winter freeze-up), or in some instances by snow machine or dog sled.

It is only recently that communication facilities have become available and inexpensive enough to allow people to begin to bridge some of the physical distances between rural communities. The transition from communication via radio (usually operated by the school teacher) to communication via telephone has occurred in several villages just within the past few years, and there are still some communities which have only one village phone. However, with the recent launchings of powerful satellites, communication capabilites in Alaska have increased at an astonishing speed. There are some communities where people still cannot receive long distance radio transmission, BUT nearly every village in Alaska (162) now has the capability to receive television transmission, and many are linked to cable systems which allow them to receive 10 to 15 channels. The satellites are also responsible, of course, for the increase in the potential for computer communication.

## Alaska's Bush Schools

The majority of Alaska's rural schools are organized into districts called Rural Education Attendance Areas (REAAs). Some rural schools though are part of "Borough School Districts," and there are also a small number of schools that continue to be managed by the Bureau of Indian Affairs (BIA). Altogether, there are approximately 30 rural educaton districts, and these include about 220 elementary and secondary schools.

These schools are spread out over an area the size of one third of the continental United States. Enrollments in the rural schools range from 8 students (the minimum number) to 280 (the largest rural high school). The faculties in these schools vary in size from 1 teacher to 25 teachers. This year there are 92 rural schools that have one, two or three teachers; 73 schools with four to seven teachers, and 52 schools with eight to twelve teachers.

## Alaska's North Slope

One of the largest rural school districts in Alaska is the North Slope Borough School District. The North Slope Borough covers an area of 88,281 square miles (more square miles than in 38 of the states in the "Lower 48"), and it includes one of the richest oil fields in the world.....Prudhoe Bay. Barrow is the largest city on the North Slope with 2,539 people and it is located 441 nautical

miles north of Fairbanks. Since the passage of the Alaska Native Claims Settlement Act in 1971, the vote for Home Rule in 1973, and the opening of the Alaska Pipeline in 1976, Barrow, as seat of the borough government, has become the hub of political, economic and educational activities for all of the North Slope.

Wainwright which is located 90 air miles Southwest of Barrow is one of seven communities located in the North Slope Borough (there are no counties in Alaska.....just boroughs). This community of 400 Inupiaq Eskimo people is located on Alaska's northern coast on the edge of the Chukchi Sea and the Arctic Ocean. Wainwright, like the five other North Slope communities, is linked with Barrow in a number of vitally important ways.

Wainwright

Wainwright is a place of extremes.....both natural and man-made. It has harsh long dark winter days when temperatures drop to 40 below with wind-chill factors far below that, and warm breezy days in summer when the sun never sets and temperatures climb to the sixties. The residents live in houses that range from large pastel-colored $200,000 pre-fabricated two-story structures to small one or two room, grey, weather-beaten wood frame buildings. Large four-wheel drive trucks travel next to snow machines along the few miles of street-light lit roads in Wainwright. Students and teachers go to school in buildings equipped with modern and sophisticated plumbing systems yet return home each day to use Alaskan "honey buckets" (five gallon cans lined with plastic bags).

Nearly all of the Eskimo people of Wainwright depend upon their subsistence lifestyle as a major source of food. They are hunters, fishermen and whalers, and even today, there are approximately ten active whaling crews in Wainwright. There are three small stores in town which stock staples and snacks, but fresh fruits and vegetables are seldom available. The almost legendary Bureau of Indian Affairs ship, "The North Star," continues to deliver food and other supplies once a year in the fall, and barges bring in supplies for a short period in the summer when the ice pack is out. Some people supplement with food from Barrow, Fairbanks or Anchorage.

Most residents of Wainwright are Native Alaskans. Teachers and construction workers are the primary representatives of non-natives.

Travel to or from Wainwright is accomplished in ways that would seem unconventional to most non-Alaskans. In order to get in or out of the village one has to fly on a small plane to Barrow (although occasionally some folks still make the trip by snow-machine following

old dog-sled trails along the coast). There is no building at the airplane landing strip, so villagers wait until they hear the sound of a plane's engine and then hurry to the airstrip to catch the Twin Otter, a 12-seater mail plane that comes three times a week, or they catch one of the smaller chartered planes that come and go regularly. In an emergency, a Borough-owned, small twin-engine jet will fly residents directly to Fairbanks or Anchorage. A roundtrip flight from Wainwright to Barrow costs about one hundred dollars and a continuation on to Fairbanks or Anchorage costs two to three hundred dollars more.

In this community full of ironies, it does not seem incongrous that computers are slipping into the lifestyle of the people with little difficulty. The idea of using computers for instant communication while at the same time relying on a three-time-a-week mail plane for delivery of other goods and messages will probably not jolt the people in Wainwright nearly as much as it might the people of some other community. These Arctic residents now live in a world of obvious contrasts, and computers provide the potential for an interface between the old and the new. In Wainwright the past and the present intermingle on a daily basis, and perhaps it is this ever-present juxtaposition that will allow people here to be more accommodating and open to computers than people elsewhere.

Alak High School and Wainwright Elementary School

There are two schols in Wainwright....Alak High School, named after one of Wainwright's special citizens, and Wainwright Elementary School. At present the schools are in two different buildings, separated by a quarter of a mile. However, a new elementary school which is nearly complete, has been built to adjoin the existing high school.

The high school and new elementary school, like schools in several villages in Alaska, are large modern facilities. The seventeen million dollars spent on the new elementary school includes a very complex physical plant designed specifically for arctic conditions. It includes such features as an immense storage tank for water, a powerful generator for electricity, and massive refrigerated pilings that keep the building off the permafrost. It also includes a four lane stainless steel swimming pool, special shower and locker rooms, one-way observation mirrors for the early childhood classrooms, and a student lounge area with large windows that provide a clear view of vast areas of northern tundra and sea ice. The seventy-five students (7-12) in the high school will attend school in comfortable rooms designed for both vocational and academic classes.

Teachers in Wainwright

There are five full-time teachers in the Wainwright High School. They are responsible for teaching language arts, history, home economics, mathematics, science, bookkeeping, physical education and industrial arts. One teacher also has counseling responsibilities, and a sixth teacher is committed full-time to directing recreational activities after school and in the evenings for the community. The elementary bilingual instructor teaches one high school typing class and the principal has responsibility for the high school Talented and Gifted Program. With fifty-two students in the high school building (twenty of these 7th and 8th grade students), the average high school class size is about ten students per class. The junior high students spend most of their school day in a self-contained classroom in the high school building. They leave their room to attend home-economics, shop, and physical education classes. Sports are an important part of schol in Wainwright and all teachers have some coaching responsibilities.

The elementary school has five teachers and each one has a full-time instructioal aide. Four teachers are in classrooms with two grade levels (Early Childhood and Kindergarten, First-Second, Third-Fourth, Fifth-Sixth), and the fifth is a special education teacher who works with children from Early Childhood through 8th grade. A local Eskimo man teaches an Inupiaq language class for children in grades K through 6 each day. Elementary class sizes range between fifteen and twenty students.

Teachers in Wainwright, like those in many rural Alaskan communities, spend an average of two years teaching in one loction. Alaska's rural schools have always faced a problem of high teacher turnover, and it is only within the past few years that the situation has begun to change. More native Alaskans are becoming certified teachers and are staying in their own communities, while non-native teachers from "Outside" are staying longer as a result of the depressed education job market.

Most of the teachers in Wainwright today are teaching couples with children of their own. Some are new to Alaska (several are from the Northwest area of the United STates), and a few have taught in other areas of the state. Only the principal and his wife have been in Wainwright longer than two years.

The instructional aides in the elementary school are all native people whose home is Wainwright. Many have been on the staff several years, and as one teacher remarked "it is often the aides who provide the stability from year to year."

## Communication Technology on the North Slope

Since the seven schools in the North Slope Borough School District are spread out over an area that stretches 650 miles from east to west and 225 miles from north to south, communication between the schools and each other, and between the schools and the central office has always been a challenge. The recent upgrading of the old telephone system and the increase in the number of telephones (many people now have phones in their own homes) has been responsible for some remarkable changes on the North Slope. Telephones have not only changed the speed with which communication can occur, but they have made possible other kinds of communication. The technology responsible for the telephone (a household item so commonplace in most homes today that its presence is taken for granted) has paved the way for the audio and computer conferencing that now occur daily in the North Slope Borough School District.

Conferencing occurs for a wide variety of reasons since all village schools are dependent upon the people and the resources of the central office in Barrow. Central office people provide administrative support and coordinate the following kinds of services: purchase of supplies; preparation of a district wide curriculum; child study teams which travel from site to site; hiring and orientation of teachers; purchasing and repair of equipment; scheduling of sporting events; workshops and in-service training; student testing and evaluation; preparation of a district wide newsletter; school board information; and intradistrict sports and tournaments in Barrow. Travel by plane between people in the central office and the villages still occurs on a regular basis but not to the same extent that was necessary in the past.

### Audio Conferencing

In order to improve the communication between the central office and the school sites, and as a means of cutting down the expenses involved in travel to villages, the North Slope Borough School District has begun to rely more and more upon audio conferencing for inter-village planning. Use of the audio conference as a quick and cheaper means of communication has occurred all over Alaska at an astonishing rate within the past year, and these conferences are now used by Alaskans in a wide variety of ways. People talk with legislators, take university classes, plan regional and statewide programs, or confer with visiting experts. Educators use audio conferences for planning curriculum, doing in-service training, making administrative decisions, conducting job interviews and for conducting school board meetings.

The audio conferencing network that allows people to "hook-up" with one another was established by the Alaska legislature in 1980 as part of a statewide network that would provide educational telecommunication services. The LearnAlaska Network includes audio conferencing, instructional television and computer services and is available for state-funded educational agencies. Since the audio system is shared by school districts and by the University of Alaska, it is available for people of almost all age, grade and interest groups. LearnAlaska pays nearly all of the in-state long distance phone charges for state-funded educational agencies, though other education-related groups may use the system if they pay toll charges. It is used both for administrative purposes and for direct instruction.

With 110 rural communities now having the equipment that will allow several people at one site to participate in a group audio conference with people in one or more other sites, the audio conference has become an almost commonplace occurance for many Alaska residents, particularly those in rural areas. The equipment is simple. It consists of a convener (a small brown box) with a speaker and a set of microphones which participants activate when they want to talk. The convener and microphones are hooked to one another and to the telephone by phone line jacks. Although it is possible to participate in an audio conference with just a telephone, it is not practical if several people are participating from one site and most people find it uncomfortable to hold a telephone for an extended period of time.

The assistant superintendent of instruction for the North Slope Borough School District indicated that "at first people were reluctant to participate in audio conferences, but now they're enthusiastic about it. We're able to do much of our planning with audio conferences." She stated that the district is hoping to use video conferencing soon as a means of allowing students in some of the small high schools to participate in more specialized classes currently being offered only in the larger high school in Barrow.

## Computers in the North Slope Borough School District

Computers are uppermost in the minds of most educators in the North Slope Borough School District. Those who "know" computers are continually experimenting with new and improved ways to use them, while the novices are beginning to feel more and more uncomfortable about their state of computer illiteracy. Some of the staunchest detractors have now resigned themselves to the fact that computers are not just a passing fad. Speaking "computerese" provides

credibitilty in many educational settings today, and in the North Slope, as in school districts elsewhere, even a small amount of computer knowledge can guarantee a teacher immediate status with co-workers and supervisors.

The administrative staff of the school district is actively supporting and coordinating the purchase and use of computers for each of the seven schools. A decision was made early on that all computers purchased for instructional use would be Apple Microcomputers. With the same kind of computer in each of the seven schools, the district felt it would be able to more adequately supply recommendations for software, arrange for repairs, and provide in-service training programs. (Apple computers have been adapted by nearly every school district in the State of Alaska.)

The central office employs people on a part-time basis to travel to the village schools to present workshops on the educational use of computers. They also have plans to maintain one complete, functioning Apple microcomputer in Barrow which would be available as a loaner to village schools in case one of theirs suffers a serious breakdown. In the Barrow High School, a computer literacy class is now being offered, and in the soon-to-be-opened new high school, a very sophisticated computer, which will run the physical plant and do administrative work, is housed in a specially designed central control room.

## Computers for Communication?

At the present time, computers play only a minor role however in facilitating communication between the central office and the schools on the North Slope. Only the special education staff communicates with one another via computer. There are many instances now in which a computer electronic mail system would be more desirable than the postal mail system and in almost all circumstances, it would be less expensive than audio conferencing or actual plane trips to the various school sites. Computer conferencing would be especially useful in rural areas because it allows for a great deal of flexibility. It does not require participants to be physically present at the same time, it allows for an ongoing and continual dialogue among a small or large number of participants, the transmission is instant, and the format allows for discussion of several topics at once. In most of the village schools, the hardware is already in place (computer, modem and telephone) and software could be purchased at a minimal cost.

Although computer conferencing could provide a very useful complement to personal visits, the postal system, telephone calls and audio

conferencing, many people seem reluctant to become involved in what is perceived as a new and somewhat radical way of communicating. The reasons for this hesitancy are varied. Computers still seem just too technical for some, while for others, the inability to type is a complicating factor. For some people, the reluctance is economic. It is interesting to note that the state's Learn Alaska Network pays the tab for the long distance phone charges involved in audio conferences, but they do not pay for phone charges involved in computer conferencing, which would of course, be much less.

However, most people's reluctance to use a computer to communicate is probably generated by the fact that it is an unfamiliar medium for communication. Many years ago the general public reacted with suspicion and distrust with the arrival of the telephone, and in recent years we have seen similar reactions to audio conferencencing. Increased communication via computer is certain.....the transition and acceptance time may just be a little longer than anticipated by some.

## ED 493 - "Microcomputers for Teachers"

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#10 FFRT Fri Oct 15 13:11

<for Greg or anyone else in Wainwright>
Just got the registration sheet and
it shows Greg registered just fine, so
please ignore my earlier question.
Ron

#38 FATELECOM Sat Oct 23 11:01

From: TCN268
On: 23 OCT 1982 At: 13:14
To: TCN086
Subject: MESSAGES FROM UCSD, ED 395 STUDENTS

Hi, it's another beautiful day in Southern California. How cold is it there? Are the caribous migrating now? Can they make it over the pipeline? How are the polar bears and the walruses? We don't see many of these critters around these parts.

---

One of the most interesting and unusual uses of the computer as a communicative tool occurred in the Fall of 1983 when three Wainwright teachers participated in a University of Alaska eduation course (ED 493) through the medium of computer and audio conferencing. It was through this class that I was able to establish a relationship with the Wainwright teachers that led to my visit to their school, even though we had never conversed with one another in person. - Since the class, "Microcomputers for Teachers," played an important role for some of the teachers in their way of thinking about the use of computers in a rural school, I will describe the class in some detail.

"Microcomputers for Teachers" was developed as an upper division education course at the University of Alaska in Fairbanks. It was first offered as an on-campus course in the summer of 1982 and it was then made available to both on and off-campus students in the Fall semester. The course was designed to prepare teachers to: set up an Apple microcomputer; prepare, copy and print files; connect an Apple microcomputer with the large host computer at the University of Alaska (UACN) or with The Source using a micromodem (The Source is a national consumer data bank and mail system); send messages using an electronic mail system; use a word processor; and incorporate word processing into a language arts curriculum by participating in an exchange of student-prepared computer messages.

In order to sign up for the class a teacher was required to have available an Apple II Plus microcomputer, one disk drive, a monitor, a 16K RAM expansion board and a Hayes Micromodem II and of course, a telephone. (The word processing and communication software used in the course required this particular equipment.)

Each student received an initial packet in the mail which contained written detailed instructions for: setting up an Apple computer; reading files on disks; and "logging on" to the University Computer Network or The Source mail system. They also received a set of four floppy disks which contained among other things the class syllabus, detailed instructions for using the word processing program and the printing program. After receiving the first postal mail package, all communication between class members and the teacher occurred during the weekly one and a half-hour audio conferences and through the medium of ongoing computer conferencing. There were no face-to-face class meetings although students assembled in a particular site obviously saw and intereacted with one another during the audio conferences.

Having an Apple II microcomputer in my own home with a modem and a private telephone line (a situation more difficult to come by in urban Fairbanks than in rural Alaska) allowed me to participate in

this education class with far more ease than would have been possible had I only had access to a computer at a public school or at a University during regular working hours.

Seventeen students, representing five rural communities and Fairbanks, enrolled in the course. These students included the three teachers from Wainwright, teachers in the interior of Alaska and teachers from the Southern panhandle area of Alaska. Students were spread across four time zones and many hundreds of miles. By using available technology, this course allowed the teachers in these rural areas access to University classwork, an option not often available when one lives up to 500 miles and $340 airfare dollars away from the nearest campus.

The software used in this course was prepared at the University of California in San Diego at the Laboratory for Human Cognition. It was adapted for use in Alaska by Jim Levin from UCSD and Ron Scollon from the University of Alaska. The main components of the software include a micromodem program which permits one to log on, prepare messages off line and send messages to others via UACN or The Source; a "Typo" program which allows several options for printing; and a word processing program called The Writer's Assistant which is easy enough for elementary aged students to learn, but powerful enough to handle most word processing need of adults. It has the added advantage of having a trace file which allows teachers to examine each student's individual writing and editing process and obtain an ongoing record of that process. All programs are in Pascal. Since the word processing and micro-modem programs were also being used by teachers and students in the San Diego area, it was possible for messages to be exchanged between classrooms in San Diego and classrooms in several communities in Alaska. This exchange is now occurring on a regular basis with elementary-aged students in several communities sending information on computer disks via the "Computer Chronicles," an electronic newsletter managed by Margaret Riel of the University of California at San Diego.

During the fall semester, I traveled to three of the ED 493 rural sites and visited with students who were enrolled in the course. All of them were excited about the potential for the use of computers for communication and about the possibilities for using computers in their language arts program, but several expressed frustration with some of the logistical problems encountered in this trial course. Some problems arose because the software used in this course was still being field tested; some were caused because people didn't have the proper equipment to begin with (but they didn't realize it), a few people had occasional telephone problems or access problems with the sometimes crowded University of Alaska Network, and some were concerned about the costs of the long distance telephone calls.

The cost of participation via the computer varied from site to site. In the large communities of Fairbanks and Sitka there were no long distance charges involved beause the University computer system has call-up ports in those locations, but in the villages the cost of the connect time varied from $4.60 (per half-hour in the evening) in Fort Yukon to $10.65 in Wainwright. Some teachers paid these charges willingly, just as they would the cost of textbooks or car expenses involved in commuting to an on-campus University course, but others felt that someone else (the school district or the University) should pay the phone bills.

There were several options for sending and receiving information and the phone charges varied with the choice one made. Since information can easily be prepared off-line ahead of time, much class information could be transmitted with just a small amount of long distance phone time. Even reading of the class mail could be done quickly by simply copying it to a disk and then reading it carefully later. By preparing one's messages ahead of time, one-half hour a week of telephone time was adequate for participation in the ongoing class computer conference, and if more than one person was involved per site, the costs could be shared and kept to a minimum.

There was agreement among the students that this kind of course should continue to be offered in the future with some modifications. They suggested that more communication occur in the first couple of weeks via the postal mail system or with the use of a telephone hot-line so that questions about using the computer and accessing the mail system could be answered quickly. Once they felt comfortable with the mail system though, they recommended using it as the primary means of communication with the audio conference as a supplement.

What did rural teachers like most about the course? 1) They liked having access to other teachers all over the state; 2) they liked having access to University faculty and to coursework; 3)they liked the fact that the coursework was tailored to the needs of their rural situtions; 4) they liked the fact that the "turn-around time" for questions or assignments was very quick via computer as compared to some of the more traditional mail-only correspondence courses; 5)they felt that computer correspondence was less threatening than formal letter writing and in many ways they found it more similar to oral communication than other forms of written communication; 6) they were pleased with the idea of having a real audience and a viable communication network for their students; 7) they were pleased that the language arts activities encouraged by this kind of communication were consistant with the goals of the Alaska Writing Consortium which is an outgrowth of the Bay Area Writing Project, with which many rural teachers are involved; and 8) all who had on-site visits by a

university staff member enjoyed and learned from them, though there was no consensus on how essential these visits were in terms of their success in the class. All of the students and the instructor agreed that participation in this kind of course required a high level of motivation and a greater time committment on the part of both the students and the instructor than is required in traditional on-campus courses.

## Computers For Teaching and Learning in the Classroom

In the following pages I will discuss specific teachers in Wainwright and how they used computers in their classroom. I will describe teachers who were enrolled in the microcomputer class and other key people that I met during my time in Wainwright and in the district office in Barrow. These descriptions will illustrate some of the problems and promising practices that are typical in many rural schools now attempting to incorporate computers into the daily school experiences of students, teachers and administrators. The stories of the individuals will provide some specific information on hardware, selection of software, training for teachers, maintenance and scheduling problems, but primarily they will highlight the use of the computer as a communication tool.

### Sandi - Special Education Teacher

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#4 FTFD Thurs Oct 21 10:32

The child study team will arrive earlier than expected. We will need housing for two people. They'll spend three days with you.

Are the IEPs ready for the new students?

#75 FTCA Thus Jan 06 14:13

To Sandy, Steve and Greg in Wainwright:
Just a note to confirm dates and times. I'll be flying to Barrow on Sunday the 16th and will spend the night there. Will fly to Wainwright on Monday and will arrive about noon.

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An enthusiastic special education teacher with daily access to an Apple computer, a supportive district special ed director (who also happened to be a computer buff), and the excitement generated by participation in a University distance delivery course on computers, all helped to provide fertile grounds for some interesting computer developments for Sandi, the special ed teacher in Wainwright.

Sandi and her husband Steve were spending their first year as teachers in Alaska, after teaching for several years in Idaho. This was Sandi's first year as a special education teacher, having taught in regular classroom situations previously. Her caseload was comprised of students from pre-school through eighth grade and included a wide variety of children ranging from those with learning disabilities and speech problems, to children enrolled in the talented and gifted (TAG) program.

Sandi arrived in Wainwright to discover that because special education funds had been used to purchase two of the school's three Apple computers she would have one available to her on a full-time basis. However, with no training at all in the use of computers she was in a quandary in the beginning of the year about how to best utilize it. The only formal training she had was a one-day in-service workshop provided by a person from the district office in Barrow. However, due to equipment breakdowns, lack of time for individual assistance and little opportunity for hands-on experience with the computers or with the software, Sandi and other Wainwright teachers felt that the workshop did not meet their needs.

Sandi's use of the computer during the first half of the year then developed primarily from information supplied by her special-ed director Sam, in Barrow, and from ideas generated in the University class in which she was participating. She also used some of the Milliken Math and MECC software because it was in her classroom when she arrived. However, since there was no documentation with any of the MECC disks, she felt that she was often not using it appropriately or to its full potential.

Her interest began to revolve around the use of the computer as a communicative tool. Through the instructions supplied in the University course and through a great deal of persistance, she and her husband Steve, along with Greg, the third teacher enrolled in the course, were able to hook up Sandi's Apple computer to a phone which was located in a room down the hall from the special-ed room. Although the school had all the necessary pieces of hardware for setting up a communication system and for using the class software, the problems in the initial set-up were caused by the lack of some of the not-so-obvious peripheral pieces of equipment (i.e. simple connectors and a "Y" plug for the telphone). Of course, these things

were obvious afterwards to both the teachers and the University instructor, but at the time, these minor problems caused delays and were frustrating to all involved.

Sandi (and Steve and Greg) began to use the computer as a way of communicating with the campus-based instructor and with other students who were enrolled in the University class. They also used it as a means of exchanging letters between their students and other elementary students in California. The exchanges that occurred among elementary students in Alaska and between the students in the University class were easy to accomplish because all of the participants were using the same network with which to communicate (the University of Alaska Computer Network). The exchanges with the students in California were somewhat more time consuming because the participants there were using The Source, as their network. Therefore, the class instructor had the responsibility of transferring the pen-pal exchanges from The Source to UACN. This is not a complicated task but it does involve one more layer in the exchange process. None of the teachers taking the class chose to join The Source although for some of them the actual connect time charges would have been less than their charges for using the phone to call UACN. Students indicated later that they were reluctant to pay the $100.00 sign-up fee charged by The Source because they weren't sure at that time if it would be worthwhile to them or not. Since then however, several individuals and some school districts have purchased subscriptions to The Source or to one of the other large computer networks.

Later in the fall, Sandi's special-ed director in Barrow, Sam, set up a communication system (via the national GTE Telenet System) which allowed teachers in each of the seven village schools to communicate directly with his office via the computer. Sandi was very excited about this expanded use of her computer and she began to use it several times a week to exchange messages with the special-ed office in Barrow. Most of her communication was of an administrative nature and related to an exchange of information about materials, test scores, student files and scheduling of visits (e.g. When will the psychologist arrive? What kind of housing do you need for the child study team?). She found this system easy to use and since there was no expense involved for her, she used it frequently. At the time of my visit, the exchanges were only between Sam (or someone else in his office) and individual special-ed teachers. There was no communication among the seven teachers themselves.

Sam and his staff were also in the process of training each of the special-ed teachers to computerize all of their records for the students in special education classes. They were using software which was developed specifically for the North Slope Borough Special

Education Program. They had a disk for each child in special education which included very detailed information about the child and several pages of goals and objectives. Each child's Individual Evaluation Plan (IEP) was to be, computerized. Sam indicated that in fact "the use of computers and the purchase of them was prompted and justified by the huge amount of paperwork necessary in special education."

In addition to improving record keeping with computers, Sam also had a keen interest in developing the potential of the computer as a communicative tool. Besides communicating with individual teachers, like Sandi, Sam also used Telenet to receive news from the "Special Ed Network" (a division of Telenet) and to correspond with people in the special education department at Arizona State University. Sam indicated that in the future he hopes to develop a software curriculum which will assist special-ed teachers in meeting the goals and objectives for each child. His primary focus has been on administrative work and communication.

Sandi quickly became "hooked" on the value of her frequent computer communications with the special education office in Barrow. She used her local North Slope network more often than the University network for several reasons: 1) it involved communication with only one other site so there was not an accumulation of mail to read through; 2) all of the messages were related to each other and dealt with the same topic; 3) the information being shared on this network related directly to her job; 4) she was familiar with the people that she was communicating with; and 5) there was no need for concern on her part about the costs involved in using this system.

In order to use any communication system one not only has to feel comfortable with the purpose and the software of the program, one also needs easy access to the hardware or equipment. This was sometimes a serious problem for Sandi because the only telephone in her building (a building close to but separate from the elementary school) was located in a room separate from the special-ed room. This room was also used by other people, and their uses often took priority over the computer phone hook-ups. For instance, when the dentist came to Wainwright, he set up a temporary dental office (complete with a large portable dental chair) in the "telephone room." This precluded any use of the computer with the telephone for over a week. The arrangement with the phone in a room separate from the classroom also meant that the computer had to be moved often. This was difficult for Sandi to do alone because the cart that held the computer, printer, monitor, etc. was large and very awkward to move through a hallway alone.

How did Sandi's students use the computer? Not very much. There were

only a few programs available and she didn't feel that many of these were appropriate for her special education students. She did use some of the math software for the Talented and Gifted Program, but indicated that both she and her students usually regarded their twenty minutes on the computer as "game playing time." However, towards the end of the school year a small number of students did use the computer to prepare information which they submitted to the student newspaper, "The Computer Chronicles."

There are several reasons that Sandi didn't use the computer more with her students: lack of software, lack of time, difficulty in moving the computer, etc. However, the primary reason for not using it more was because Sandi herself needed time to become familiar with it. She needed to assess its potential assets and deficiencies before she could appropriately integrate it into her curriculum. She was not interested in using a new educational device simply because it "was there." The time she spent using it to communicate with Barrow and with people in the University class provided her with an opportunity to become familiar with the computer as a functional and meaningful tool. Her exposure to the computer was quite different than for most teachers, and consequently, she has some very interesting ideas about how she will use the computer with her students in the future. She is familiar with it as a tool for word processing and communication and has plans to have her students use it in putting together a newsletter. She also hopes to continue to exchange news with students in California and in other parts of Alaska via "The Computer Chronicles" and to explore other networking possibilities. She also participated in a sequel University distance delivery course entitled "Educational Software."

What accounts for Sandi's persistence and enthusiasm in using the computer? She is personally an energetic person who is willing to put a lot of extra time and effort into learning about something new. But at the same time she has had enough teaching experience to cause her to be cautious about not using a new tool unless she is convinced that it will do a job better than the way it is now being done. In addition, she is working in the area of special education, a field which both allows and forces people to think in terms of alternate ways of teaching and learning. Special-ed teachers have the advantage of working with smaller numbers of children, they have more opportunity to experiment, they do not have to standardize as much as regular classroom teachers; and in addition they often have more funds available for purchase of materials. It is likely that Sandi will impart her enthusiasm and knowledge about comuputers to her students and this will eventually lead to some innovative and exciting computer projects for special education children in Wainwright.

Steve - The Junior High Teacher

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#18 FATELECOM Tue Nov 16 21:08

greetings from the teeming metropolis of wainwright. greg, sandi and i have been really enjoying this class.

we are originally from south central idaho and are in our first year in alaska. sandi teaches special education while i teach core (7th and 8th graders). we would be happy to communicate with any of your students.

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Steve, Sandi's husband, taught the seventh and eighth grade students in Wainwright. Twenty-five junior high students spent the majority of their day in his self-contained classroom which was located in the high school. All of the students went "out" for PE, shop, and home-ec, and a few of the students worked with another teacher for some language arts activities. However, Steve was responsible for the basic junior high core curriculum (language, reading, social studies and math) and he found it a challenge to work with that many junior high students when they represented such a wide range of abilities.

His interest in computers developed several years ago when he was doing statistical work as a graduate student. He signed up to take the University of Alaska computer class because "computers are the wave of the future.....I'm personally interested in them and don't want to be left behind.....and, our school has ordered eight more Apples for next year."

Steve had one portable computer available to him for part of each day and he used it primarily for drill and practice exercises in math. He used math software that was at the school when he came (primarily Milliken products) but was anxious to order new software for next year. Sometimes his students used the computer right in his room, but he preferred to have them use it in the library, which was adjacent to his classroom. He found that when students used the computer within his classroom it was often distracting to other students and to the teacher. He is toying with the idea of placing a second monitor in his classroom so that he would be able to determine if a student needed assistance when he was working on a computer outside the classroom.

He intends to use a computer full time next year and is looking for some good programs to help his students improve their reading rate and comprehension. He has been actively involved in helping the school choose new materials and has used his university class network connections to help him choose a one semester course in computer literacy for next year. He is also interested in taking further university coursework via the computer but is anxious to work out an arrangement in which the school district will help pay for the telephone charges incurred in such a venture.

Greg - Fifth/Sixth Grade Teacher

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#20 FATELECOM Tue Nov 16 21:13

from greg in wainwright. as i sit here
thinking about what to write i am
listening to a 30-35 mph wind blowing
with a chill factor of about -50!!
.....i would be most happy to
have my students write to any and all
who would like to correspond. please
excuse this lack of organized writing,
but i think my brain froze up walking
over here!

Yours truly

#40 FSGK Thu Dec 09 18:41

Please tell your students thanks for the
wonderful letters. All the students in the
Mental Gym enjoyed them very much. They did
not know that it got that cold there and they
can not imagine what yit feels like to be that
cold. They never heard of muktuk and have never
tasted caribou and whale meat. I hope you will
send more letters.

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Greg was the third member of the Wainwright group to participate in the field-delivered microcomputer course. He taught a class of twenty fifth and sixth grade students in the elementary school. It was Greg's first year in Wainwright, but not his first year in Alaska as he and his wife had taught for several years in the Lower Yukon River area.

His interest in microcomputers stemed from both a personal and a professional desire to learn more about them. He was enthusiastic about the potential use of computers for education in Wainwright but since he did not have regular access to a computer this year, he was able to use it only on a limited basis.

He used the computer himself in after-school hours to participate in the ED 493 computer-conferences, and he also transmitted several letters that were written by students in his class.

Greg's eight years of experience with native Alaskan children have provided him with some interesting ideas on how computers might best be utilized in a classroom of 5th and 6th grade Inupiaq students. He feels that "perhaps the biggest value of computers will be to motivate and in some instances, reward students." He has found that several of the teaching techniques and methods that he used elsewhere just don't seem to be working for him here, and he's hoping that he may find a way to use computers to help improve the schooling experience for his students. "Keeping students interested through fifth and sixth grade may help to curtail the high drop-out rate that currently exists in the high school." He indicated that many students in Wainwright have not traveled to communities outside the North Slope area and therefore their views of the world are often quite different than those of other children. He thinks that computer communication with other children and adults would be useful and beneficial for his students.

Al - The Science Teacher

Al, the high school science and bookkeeping teacher, has had about twenty-five years of teaching experience.....most of it in rural Alaska. Although this is only his second year in Wainwright, he has taught elsewhere in the North Slope Borough. It is apprent to even a casual observer that this science teacher knows the Arctic well....and appreciates it. His students' projects revolve around the arctic community of which they are a part. They study caribou migrations, the movement of Arctic sea ice, patterns of polar bears, northern oil and mineral deposits, and at the present time several of his students are involved in a complex study of the uses of whales in Wainwright.

Al was the only teacher in the school system who had been involved in formal workshops on the use of computers in education. Last year he attended two one-week workshops, sponsored by the State Deparment of Education, in Fairbanks and Anchorage. He stated that both workshops provided him with meaningful experiences and lots of good ideas.

While discussing the workshops, he commented that: "the instructors were flexible, and that was crucial to the success of the workshops because these days the range of knowledge of teachers is really diverse. Being there for a whole week was good because we had enough time to review software AND ask questions."

Al had spent a lot of time thinking about software. He had just purchased eighteen hundred dollars worth of computer programs for his science classes (with the support and approval of the district office in Barrow) but wasn't really satisfied with what he'd received for that much money. He finds that he is often dissatisfied with much of the commercial software and he would like to see more money spent on training teachers to use self-authoring programs. He feels that approximately "one-third of the pre-programmed material we buy is inappropriate." He would like to see a software review network developed within the state which would allow him to stay in touch with at least a dozen people who have similar kinds of interests. "I feel that most computer catalogs are snow jobs and are too numerous for any one person to wade through anyway." He also suggested that one representative from each school be present when computer company sales people come to district offices to present their products.

In addition to using prepared software for his science classes, Al and his students were involved in a project in which they were gathering local scientific data which they planned to put on disks. They intended to submit this information to data banks or share it directly with other students. Their current project involved research on the historical, social, and cultural use of whales in their own community. The impetus for this project developed from the following series of events and circumstances.

Last year several Wainwright highschool students traveled to Southern California. They visited with students and teachers in a 4000 student high school located in a high socio-economic region. During their stay, they went to Sea World and saw the famous killer whale "Shamu" and also learned about the tourist industry's current economic interest in whales (both captive whales and those that pass naturally close to the Southern California coast on their migration routes). Since the Wainwright students were from one of the few communities in the world where whales are harvested for subsistence, there was much interest in sharing information related to whales and whaling. There was also room for much misinterpretation about Southern California's desire to "Save The Whale" and Northern Alaska's need to "Eat The Whale." Teachers from each location decided that they would try to involve their students in projects that would allow them to learn more about their own and other communities' uses of whales.

This year the Wainwright students did research on the local use of whales, and put their information on computer disks which they plan to exchange with students in California. Al's science class had access to the school's one floating computer and although all the students did not actually enter information on the computer, it was a group project that reflected the work of all the students. The class was aware that their finished product could be of value to several different groups of people and they were seeking ways to distribute this information via computer.

They were also interested in using the school computer to help them with their actual research. It is always a challenge in Wainwright, as it is in all rural schools to provide students with resource personnel and libraries that are adequate, particularly in some of the more specialized areas of science. There were funds available in Wainwright to bring one biologist up in the spring and there were also some funds available for the purchase of more science books. These are of course useful, but Al suggested that what would be even more desirable would be funds and a working system which would allow students and teachers to have daily or weekly access to a group of "experts" via the computer. At the present time, he knew of nothing that would preclude this kind of an exchange between the school in Wainwright and people in the University of Alaska's Institute of Arctic Biology (as an example). The necessary hardware was all in place for this kind of a network, and the only cost involved would be that of a long distance call to Fairbanks.

It is likely that there are many teachers in both secondary and post-secondary institutions that are anxious and willing to see this kind of cooperative effort take place, but all are aware that it will require a redefinition of what constitutes a legitimate use of funds by both groups, and even more importantly, it will require the institutions to cooperate.

There is also nothing that would prevent schools like Wainwright from connecting right now with some of the large databases that are available. For instance, Lockheed's Dialog network service offers the New York Time Data Base to schools at a special rate of $15.00 per hour. This alone would provide students with an extensive data base and an excellent research tool. Several other large educational databases can be accessed through Bibliographic Retrieval Services (BRS). These include the School Practices Information File (SPIF), ERIC, Resources in Computer Education (RICE), and several others including Exceptional Child Education Resources, Psychological Abstracts, Vocational Education, Bilingual Education and Dissertation Abstracts. In addition, the 10-million-word, 22-volume, 31,500-topic World Book Encyclopedia is also currently available through CompuServe, and it is even automatically updated, at no cost to the

subscriber, four times a year.

Al was also the bookkeeping teacher and was in the process of setting up a plan which would allow an integration of his school curriculum with the real bookkeeping business of Wainwright. The local native corporation had recently purchased a microcomputer for business purposes and was in need of assistance in learning to use it efficiently. An arrangement had been made between local native officials and school personnel that would allow one of the high school bookkeeping students to participte in a work/study arrangement with the corporation. The school planned to purchase the software and teach the student to use it to do bookkeeping and accounting for the corporation.

We see by these examples instances in which the Wainwright school is developing its curriculum in a way that is harmonious with local interests and concerns. We also see examples of ways in which modern technology is being used to enhance some of the local traditional concerns such as subsistance and native corporate land claims issues. Even in remote communities like these on the North Slope of Alaska, it is possible to find ways in which computers can be used to help make schooling more interesting, meaningful and useful for both the students and for the community.

Dave - The Principal

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#62 FATELECOM Fri Nov 13 16:24

Dear Principal,

Greetings from Field School. We are a small school with 300 students. We have four programs here at Field. Special programs include a Children's Center, a State Preschool, and a class of Severely Handicapped students. These days the emphasis is upon basic skills. However, we try not to neglect other disciplines. Our hope is to develop disciplined and logical thinkers who have wide interests. We would appreciate hearing from you and would like a description of your school.

Yours truly,

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Dave, the principal of both the elementary and secondary school, has been in Wainwright longer than any of the other teachers. He and his wife came to Wainwright seven years ago after teaching for the Bureau of Indian Affairs in the southwest area of the United States. This is his second year as principal.

Although Dave has supported individual teacher's efforts to use computers, he is very cautious about his recommendations for computer use with students in Wainwright. He indicated that "my concern is overuse - especially with our students who need so much work in communicative skills. I encourage lots of student/teacher interaction and computers would depress that. Computers are passive like TVs and therefore could be detrimental to interaction." He also stated that it was "unrealistic to think of using computers here like they are used in other places.....we have different kinds of problems ..... we just don't have normal classrooms situations here." "For these reasons I would rather not use, than overuse the computer."

Dave does not want to force computers on his staff next year. He feels that his staff used them appropriately this year and indicated that even though each teacher will have a computer in his or her classroom, "there will be no administrative pressure to require any teacher to actually use the computer." "The use of computers is dependent on staff interest and some staff members have no interest at all.....I will encourage their use but not force it....computers will get used only when the instructors are ready. I hope that we will be able to offer a computer literacy course for both elementary and high school students next year, and I would also like to single out students and let them work on given programs of their own interest." Dave is hoping that "growth in computers will happen spontaneously with no artificial force.....I want to see students enjoy computers through discovery and enjoyment."

Dave himself used computers in his capacity as the teacher of the Talented and Gifted Program for the high school. He felt that the second special-ed computer "saved our TAG kids." The students worked individually for about 45 minutes each day on programs like the Milliken reading comprehension program and also with programs that would help prepare them for college boards and for the SAT. He hopes that with the arrival of the new computers he will be able to have one in the school office for both secretarial work and for statistical analysis of student test scores.

## Terry - The Inupiag Teacher, and Some Students

Terry, the Inupiaq teacher has had no experience with computers, but was very interested in learning more about them so that he could incorporate them into both his Inupiaq language classes and into his typing classes. He taught Inupiaq classes to all of the elementary students for 30 minutes each day and also had the responsibility for teaching typing to high school students. Terry was excited about

being able to do word processing with his typing students, but was even more enthused about the fact that there is a "chip" now available that will allow his students to do word processing in their own Inupiaq language.

Through informal conversations with students in both the elementary and high school I was able to discover that ALL the students I spoke with knew something about computers and although most of the them had not had an opportunity to actually work or play with computers themselves, nearly all were excited about the possibility of having more computers in their school next year. Most students knew that the local corporation had a computer, and they also knew that one local family had a VIC 20 in their home. They seemed to sense that many people would be using computers in the near future and that it was important to learn about them.

## Let Your Fingers Do The Talking

Computers were used in the Wainwright school system by students, teachers and administrators. In some instances, they were used only minimally and unimaginatively, whereas in other situations they were used purposefully and creatively as a tool for communication and language arts. Since there are an abundant number of school studies that provide information on some of the more familiar educational uses of computers (i.e. drill and practice, tutorial, programming, simulations), I will not focus on those issues here. As a matter of fact, people in Wainwright made very little use of computers in what would be considered "standard" educational ways. What emerged as the most interesting use of technology in the Wainwright schools was the use of the computer as a communicative tool for instructional and administrative purposes. Students, teachers and administrators alike, began to discover one of the most powerful and useful applications of the computer for small schools in rural America.

In this final section I will review some of the actual and potential uses of the computer as a communicative tool in Wainwright and examine some of the educational issues and implications of computer communication for rural schools.

Although people in Wainwright did not intentionally design this year as one in which various people would experiment with the computer as a communicative tool, the situation did evolve into an almost experimental year in which a small number of adults and children in the school in Wainwright did particiate in projects in which the

computer was used to communicate. People did a lot of "talking" across the miles this year by typing messages on their computers. These messages conveyed a wide range of information.

Students exchanged information on food, classroom activities, families and TV programs; teachers shared information about computers, weather, curriculum and "bush politics;" university instructors presented information about the social and academic consequences of computers in rural settings; and administrators sent notes about travel schedules, book orders, test scores and evaluation procedures.

## The Computer and Language Arts

People at local, district and state levels are now talking about ways in which to expand the use of rural schools' computers for communicating. One of the most promising uses discussed is the incorporation of the computer as a more integral part of the language arts program in the classroom. National programs such as the "Quill Microcomputer Writing Project" have proven that a computer in combination with quality software can provide a strong motivation for children to read and write. Teachers are finding that children have far more incentive to write if they have a real audience and if they have a way to do rewriting more easily. Using a computer to communicate with students in distant places or to even send messages within one's own classroom, school, or community provides these kinds of incentives.

Thus, the computer does have the potential to respond to the current national concern about literacy because it has the capacity (if used correctly) to: prompt students to write more because they see a real reason for writing; and 2) encourage students to do serious rewriting and editing because there is less time and energy involved when this process is done on a computer. Even an elementary student's final product can be error free, readable and professional looking.

As a spin-off to the goal of providing a more meaningful writing program, these links with distant people, places and communities provide a basis for developing more relevant social studies curriculum.

Computer communication appears to provide a medium for interaction that is somewhere between informal face-to-face communication and the highly literate language of schools. This alternate medium might prove beneficial for many children in rural and/or minority settings.

## Related Issues: Special Education, Training, and Software

In addition to gaining some understanding about the advantages and disadvantages of using computers to communicate, our knowledge of computer use in Wainwright also offers us some perspectives on other issues that will be important for rural schools to consider when implementing a computer program.

The special education program in Wainwright is probably fairly representative of special education programs in many schools. It appears that there are many factors that both cause and allow teachers to function differently in these programs. These include: smaller numbers of children; more flexibility in scheduling; non-standard curriculums; specific kinds of record keeping; individualized instruction and in addition, there are special funds which are often available to special education teachers for the purchase of equipment or programs. These factors can provide a climate which makes both special education teachers and their students more receptive to using computers. We would be wise to examine more carefully some of these special education characteristics in an effort to determine whether or not some of these would be just as appropriate in our "regular" classrooms.

The other important issues that surfaced in Wainwright involved teacher training programs and selection of software. Nearly all teachers and administrators agreed that there was a real need for immediate training for teachers in the use of computers for education. There was also agreement that this training should be more than a one day in-service and all agreed that it should include "hands-on" experience. Since the State Department of Education, the local districts and the University are all involved in offering and developing training programs now, it appears that the biggest challenge at this point is simply to work toward a coordination of efforts. It also seems apparent that those schools that have had the most successful programs in computer application have had a "computer buff" in residence. Several schools have been fortunate enough to have on their staff someone who is willing to work after hours, buy extra software and equipment with his/her own money and who is open to experimenting and to learning from students.

Teachers have also expressed frustration with their lack of knowledge about purchasing software, and they have indicated in no uncertain terms that they feel that some of the most expensive educational software presently on the market is of extremely poor quality. They are looking for some way in which they can become familiar with software without having to actually purchase it first. The state has recently subscribed to EPIE (Educational Products Information Exchange) which will provide reviews of educational microcomputer

software and hardware. This service will help to get information to the state and district level, but the problem of distribution to individual teachers still remains. Several teachers stated that they would like to see a network established that would allow them to share information with one another about the kinds of software that they have found most appropriate for rural Alaska schools.

## The Computer as a Resource in Rural Schools

In most small rural schools resources available to students and faculty are naturally limited. Microcomputers now have the capacity to provide many resources which were previously not available. Any rural school today that has a computer is capable of offering a wide variety of coursework to its students in either self-contained packages (i.e. the Plato Series); or with the addition of a modem (a small investment after the purchase of the computer itself) schools can offer interactive classes by linking up with people or institutions in other places. These "links" can provide: access to large educational data bases; access to a wide variety of resource people (scientists, children's authors, etc.); or access via electronic mail to another classroom of students.

For teachers, a computer network can offer access to university coursework while at the same time it can provide a vehicle by which rural teachers can share academic and social information with one another. A network could also be used to meet teachers' urgent need for a means of exchange of information on computer software.

The administrative duties of a principal or of people in a small rural district office could be changed considerably with computers. Rural schools can become less dependent upon larger outside institutions as they find themselves increasingly able to process and handle by themselves many kinds of administrative responsibilities. Schools will be able to conduct and analyze more of their own educational research. Computer networks will allow small schools to become far more independent.

In addition to providing almost unlimited access to outside resources, computers send and recieve information with greater speed than telephones and at a cheaper rate. They are less expensive than audio conferences and they do not require that the other party be present when the message is sent or received. Since nearly all of the schools in rural Alaska have at least one computer, the biggest expense has already been taken care of. And it is also important to remember that a microcomputer consumes a very small amount of energy.

As we begin to construct our educational networks, we will need to carefully consider the implications of our actions. Computer communication is indeed a powerful tool, BUT it can be powerfully good or powerfully bad. Despite all the advantages cited above, there are a myriad of reasons why schools have not leapt immediately into the existing communication networks.

Schools are almost always conservative, cautious institutions that follow rather than lead in societal adaptations. Computer communication is no different than past adaptations and thus the important question to ask ourselves now is: "Are the problems the schools are facing as they begin to implement computer communication based on problems that are technical or social in nature?"

Some problems are indeed technical. The telephone system in some places in Alaska is not yet adequate to handle an additional load, and in some circumstances, additional satellite capabilities would be necessary for a smoothly operating network. However, the majority of problems are usually based on a hesitancy to implement change. Even in those situations where people cite financial constraints as the reason for not communicating via computer, one discovers that the major problem is actually the difficulty that comes with reallocating funds. It is difficult for people to justify spending school money on invisible kinds of resources. Spending money for phone time seems harder to explain than the purchase of new library books. Visible realities are always safer than invisible ones.

The social constraints are usually less obvious. Communicating via computers often requires that people reorganize their idea of school systems and of the actual process of teaching and learning. Computers have the capability of providing nearly everyone with equal access to information, and therefore they can help to redistribute power in an institution. They have the potential to allow students, teachers and small rural schools to become more independent and self sufficient, but if used in the opposite way, they can cause an additional accumulation of power at the central level. Computers can and will continue to be, a useful tool for decentralization.

Successful communication networks will also depend upon the cooperation of district, state and federal institutions. Presently the artificial barriers that have been established by various bureaucratic organizations have precluded the organization of a network that would allow districts to share information and to purchase equipment that is compatible. Larger agencies will need to take on a coordinating and supportive role as small schools move to establish the kinds of networks that are most appropriate for their

needs.

Computer communication is inevitable. Any kind of communication is best accomplished when people are actually together, but it is simply not possible, particularly in isolated areas. People in rural areas now have the opportunity to gain even more from this modern kind of communication than do people in urban settings, but they also have more to lose. We are at a crossroad in the process of developing educational networks, and we need to be certain that the networks we develop will help to enrich and diversify the schooling process rather than limit and control it.