The Computers and Culture Project: A Multimedia Approach to the Preservation of Native History, Language, and Culture

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This article describes a project in which a group of secondary school students used computer and video technology to archive cultural information, language, and history of the Carrier of central British Columbia. The Computers and Culture project won a 1990 Asia Pacific Foundation Multicultural Award and a 1991 Northern Telecom Award for "outstanding use of information and communications technology as a learning tool for students." The project is presented as a model for other First Nations culture and language preservation projects.

Introduction

The "Name Receiver," dressed in traditional button blanket regalia and blue jeans, stands in the middle of the floor in front of the singer. The people sit quietly with their clans along the sides of the plywood building. They are sipping their coffee, awaiting the beginning of the age-old name-giving potlatch. Subdued at first, the singer begins to beat the painted skin drum in his left hand. The heart-beat rhythm of the drums builds in volume as he starts his story. He sings of territory and responsibility, of debts and gifts, of honour and disgrace, of insult and triumph. The rhythm transports the listener to a connection with others who have been part of that setting, extending centuries into a timeless past; to an ancient lodge on the forested shores of a prehistoric lake, to a world of oneness and harmony. Only one thing breaks the spell: the videocamera that sits on the edge of the floor recording the ceremony. It is a juxtaposition of the very modern and the very old. Here, they work together.

The Computers and Culture project was carried out at Lakes District Secondary School in Burns Lake, British Columbia during the 1990-1991 school year. Computer and video technology provided a unique way for Native people to preserve, nurture, and teach their culture, language, and history. The project was originally conceived as a computer course that would incorporate aspects of local Native culture. Seven Native and five non-Native students enrolled in the course. The students were a heterogeneous group aged 14 to 19 in grades 9 to 12. The skill range of the students was also very wide. The two general objectives of the course were to teach computer skills and to familiarize the students with the culture of the local Carrier Indians. These objectives were met as the students developed the *Carrier Culture Stack*, a computerized, videodisc-based, multimedia database of Carrier culture and history.

Background

The Carrier People

The Yinka Dene or Carrier are the aboriginal inhabitants of central British Columbia. They are of Athapascan origin. Their territory covers several thousand square kilometers, extending from the Skeena River on the west to the Alberta border on the east, north to Babine and Takla Lakes, and south to the town of Quesnel, BC. The Carrier speak four distinct dialects. One dialect group, the Nedut'een, were living on the shores of Babine Lake in 1822 when the Hudson Bay Company established Fort Kilmers for the fur trade (Morice, 1906). Since the 1950s many Nedut'een (now called the Lake Babine Band) have moved to the town of Burns Lake, BC. All but one Native student in the Computers and Culture project was from the Lake Babine Band.

The Burns Lake Community

Lakes District Secondary School is a small secondary school of 450 students and 30 teachers. It services Burns Lake, a town of 3,000 in the geographic middle of British Columbia. Approximately 20% of the school population is Native. Most are of Carrier origin but a few are Wet'suwet'en from the west. The forest industry is the economic mainstay of the Burns Lake community with contributions from ranching and tourism. Topographically the area is hilly but not mountainous, forested with pine and spruce, and intersected by many long, narrow glacier-carved lakes. Summer, when the lakes and forests attract fishermen and campers from around the world, is the main tourist season.

Multimedia

Multimedia is an increasingly common computer term. It refers to the ability of modern microcomputers to handle data in many forms. Originally, computers were simply "number-crunchers." They were used exclusively for calculating and storing numerical information such as bank records. Later, computers were used to manipulate and store characters and text. The word processor is the best example of this computer use. Recently, computers have been used to store and display graphics. The term *graphics* refers to pictorial representations such as diagrams, maps, charts, photographs, and most recently, digitized video images. Voice and music can also be created, stored, and manipulated by modern computers. During their short history, computers have graduated from simple calculating machines to systems that can create, store, and retrieve information in a multitude of forms. The integrated display of different kinds of data has given rise to the term multimedia.

Multimedia has another component. Although computers can store and display digitized video, this technology is still in its infancy. Instead of digitized video, current multimedia systems use videodiscs running on videodisc players attached to the computer for video storage and retrieval. Videodiscs are large plastic discs similar in function to the more common audio compact disc or CD. Instead of music, videodiscs store video images. Because videodiscs are flat, any image on a videodisc can be randomly accessed in a fraction of a second. This means that a computer loaded with an index can play video clips from the videodisc on demand.

What do multimedia computers have to do with Native culture? Simply that cultural information can be collected in a variety of forms, entered into a computer,

and stored on a videodisc. Students can retrieve that information on demand. The resulting collection of cultural information is a multimedia database with the search and retrieval features of a computer and the audiovisual impact of television.

Project Description

Equipment

The following computer and video equipment was used during the Computers and Culture project. The manufacturer, developer, and/or copyright holder is shown in parentheses.

Computer Hardware
8 Macintosh Plus computers (Apple Computer, Inc.)
a selection of floppy and hard drives
Imagewriter printer (Apple Computer, Inc.)
Scanman hand-held scanner (Logitech, Inc.)
MacRecorder (Farallon Computing, Inc.)
Computer Software
Microsoft Works [integrated software] (Microsoft Corporation)
SuperPaint [graphics software] (Silicon Beach Software)
HyperCard (Apple Computer, Inc.)
Video Equipment
Pioneer LD V4200 Laserdisc Player (Pioneer Video Corporation)
color video monitor
Sony EVO 9100 video camera [borrowed] (Sony of Canada, Ltd.)
Sony EVO 9700 video editor [rented] (Sony of Canada Ltd.)
tripod
video lights

Roles of Teacher and Students

The role of the teacher in the Computers and Culture project was not that of a content expert who lectured to students and evaluated their subsequent performance. The teacher was cast in the role of guide, coach, facilitator, and project supervisor rather than that of instructor. Instead of being a delivery vehicle and an assessment instrument, the teacher involved the students in planning the final product, assigned particular tasks to individual students according to their capabilities, and monitored the assembly of information into the *Carrier Culture Stack.*

The role of the student was not to memorize information and practice skills taught by the teacher and ultimately pass a test. Each student was a specialist with different skills, abilities, and responsibilities. Each student was a member of a project team, a team of specialists that in the end produced the *Carrier Culture Stack.*

Time Line

The Computers and Culture project passed through several phases during its 10-month life span.

Computer skills training. Students spent the first four months (September 1990 to December 1990) learning basic computer skills: computer operation, word processing, computer graphics, simple multimedia programming using the HyperCard computer program. They also learned to use computer peripherals such as scan-

ners and videodisc players. HyperCard was taught because it would ultimately be used to create the framework for the *Carrier Culture Stack*. Because the organizational principles that are structurally inherent in HyperCard were used to organize information in the project, a brief description of HyperCard is in order. (For a complete description of the HyperCard program see Goodman [1988].)

The basic component of a HyperCard program is called a card. A card is analogous to a 3x5 index card on which information has been entered. A group of cards is called a stack and would contain a collection of information related to a particular topic. Figure 1 shows the elements typically found on a card. The textual information on this card has been typed into a field. A number of fields can be created on a single card. They can be positioned at any point on the card and sized appropriately. The font, style, and size of the text can be changed as well as the general appearance of the field. Graphics can also be included on a card. In this case, the map of BC was drawn directly with the computer mouse, but a scanner can be used to digitize pictures. The cards in a stack can be displayed by repeatedly pressing the forward arrow on the keyboard. The cards in the stack will be shown one at a time, on the screen, in the order that they were created. *But* the real power of HyperCard comes from the use of buttons. Buttons are spots on the screen that are linked directly to other cards. Selecting a button leads the user directly to a related card. In this way the sequence of the card display can be altered. Indeed, it can be put under the control of the user. Properly labeled buttons allow users to move through a stack in a sequence of their choice. They can go directly to the information they want. In Figure 1, a button labeled "Find out more" is located at the bottom of the card and if selected would display more information about the North by Northwest Tourist Association. Alternately, the user might want information about another region and could select the "Pick another region" button. Buttons can also be programmed to play selected segments from a videodisc.

Although each student received computer instruction, not all skills were mastered by all students. Part of the philosophy of the project was that students would specialize. Some became HyperCard programming experts, while others became graphics specialists, and still others excelled in video production. The *Carrier Culture Stack* was the result of the teamwork of many specialists.

Information gathering. By January 1991 the focus of the project shifted from computer training to collecting and processing information. The four stages of information gathering, analysis, organization, and data entry occurred simultaneously between January and June 1991 as students worked independently on a series of cultural subtopics.

The question of how and where to collect the information needed to complete the *Carrier Culture Stack* required careful consideration. In the end, information came from several first-hand sources including student interviews of parents, elders and Native spokespersons; guest speakers in class; and Native cultural events. Where possible, students recorded these events on videotape.

Early expectations were to use existing written information where possible, but it was found that there was scarce written material about the Carrier people. And because little of this material was written by the Carrier themselves, it ranged from very cold and ethnographic at best (Donahue, 1975; Mohs, 1974; Rafferty, 1975; Richards, 1981), to derogatory and dated at worst (Jenness, 1977). In the end, written source material was used for noncultural topics only, such as the climate, wildlife, vegetation, and topography of central BC.

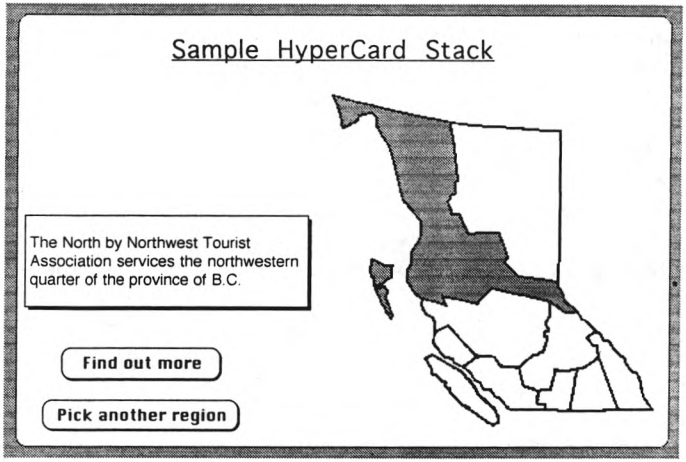

Figure 1. Sample HyperCard stack.

Hi8 videotape was the medium of choice for collecting information. Because it is a visual medium, video comes closest to capturing the essence of the original event. Second, the final *Carrier Culture Stack* would include a videodisc, so videotape was required. The Hi8 video format was chosen because of its quality and relative economy. Hi8 is the lowest grade of videotape suitable for converting to videodisc. (A glossary of terms associated with video, including Hi8, Betacam, and WORM videodisc, is found in the appendix.)

The Yinka Dene Language Institute, the educational wing of the Carrier government, made Hi8 video equipment available to the project. The Lake Babine Band, one of the 14 Carrier bands, employed two students to do a videotaping project in the summer of 1990 and made those videotapes available.

Information analysis. The information collected was analyzed. This was the most tedious process in creating the *Carrier Culture Stack.* Students watched hours of videotape and consulted many books and reports while recording factual statements on 3x5 index cards. They produced hundreds of cards detailing Carrier culture and history.

Information organization. After producing the 3x5 cards, the next stage was to organize them. This was done on four large bulletin boards: a map, a calendar, a time line, and a chart of cultural categories. These bulletin boards covered the four walls of the classroom. Each card was stapled to the appropriate bulletin board. Information related to territory was stapled to the map. Information related to the cyclical nature of traditional Carrier life was stapled to the calendar. Historical facts were stapled to the time line. Information about particular aspects of the culture was stapled to the cultural categories chart. Cultural categories often required further organization. For example, the social organization category was eventually subdivided into several subtopics including "clans," "potlatches," and "modern government."

Data entry. Once a small section of a bulletin board was completed, individual students were assigned the task of computerizing that information. Using HyperCard they created a small database called a stack. They entered the data in an

appropriate form: text, maps, diagrams, or scanned images. Finally, they created a menu system to make this information accessible.

As each stack was finished, it was passed to two students who incorporated these small stacks into the larger *Carrier Culture Stack*. These two students were responsible for proofreading and correcting the information passed to them. They also linked the smaller stacks into the total structure and menu system of the *Carrier Culture Stack*.

Figure 2 shows the finished Main Menu of the *Carrier Culture Stack* and the six choices available to the user. Except for *Introduction* and *Language* the other four selections contain the information organized on the four bulletin boards mentioned earlier. Selecting any item from the Main Menu leads to a submenu for that selection. The following is a brief description of the material stored in each section.

Introduction (see Figure 3). Here the user can locate background information about the Carrier people or information about the *Carrier Culture Stack* and its producers. Each student has included a picture and job description in this section.

Cultural analysis (see Figure 4). In this section can be found information on traditional ways of preparing food, dressing, traveling, and dancing, along with information about the ancient and modern forms of Carrier government. The Land Claims section contains several minutes of video where tribal officials discuss local land claim issues.

Time line (see Figure 5). This selection displays a 200-year time line with highlighted points. Selecting any point on the time line gives historic information of importance to the Carrier.

Annual cycle (see Figure 6). Here the user can find information on the fishing, hunting, and gathering cycles of traditional Carrier life. All are presented as pie charts showing the time of year for the activity and include a description.

Territory (see Figure 7). This section contains a variety of information including two dozen graphs of precipitation and temperatures, descriptions, and scanned pictures of wildlife, and a unique map that allows the user to take a self-directed video tour of the area.

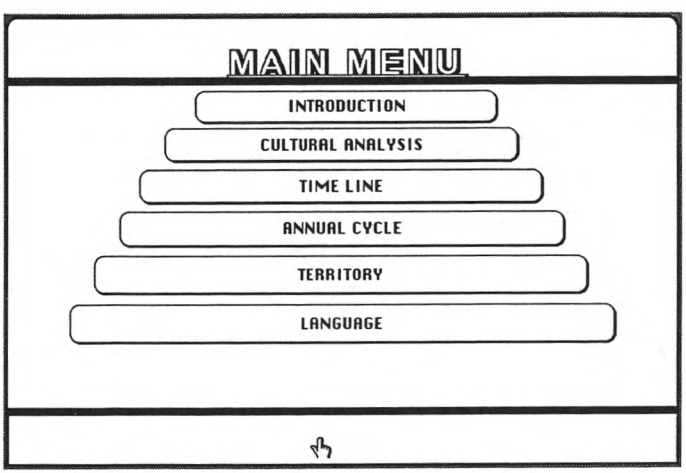

Figure 2. Main menu.

Language (see Figure 8). This section was never fully developed. It was meant to be a demonstration of a "talking dictionary" that could be developed using a computer and sound digitizer. The dictionary user selects an English word and the computer responds by "saying" the word in the Nedut'een dialect of Carrier and displaying a corresponding picture. The voice is not computer generated. What the user hears are actual digital recordings of students saying the words. At present, this process requires too much computer disk space, but in the future it will be a practical, economical way of archiving Native languages.

Of course videodiscs can also be used to archive languages. A videodisc "talking dictionary" has been developed for the Nak'azdli/Tl'azt'en dialect of the Carrier language (Yinka Dene Language Institute, 1991).

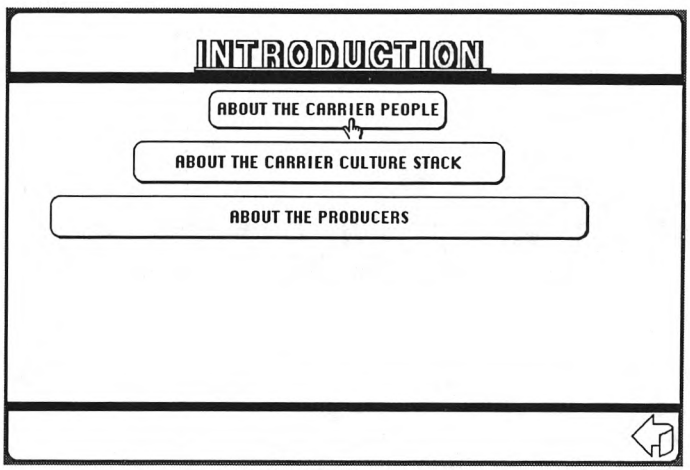

Figure 3. Introduction menu.

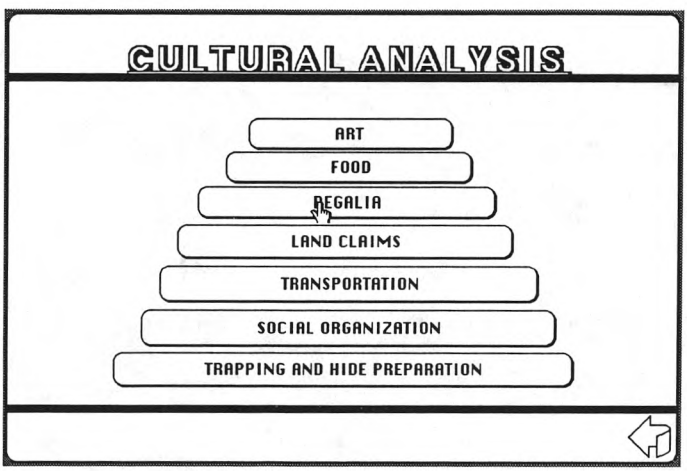

Figure 4. Cultural analysis menu

Videodisc production. In April 1991 the videodisc was produced. One half hour of video segments was selected from the original videotapes used in the project. These were edited to a single Hi8 master videotape, which was sent to a post-production company where it was rerecorded in Betacam format and a music sound track added. The Betacam tape was then sent to the videodisc production company where six WORM videodiscs were produced (see Appendix for a glossary of video terms). For a complete explanation of low budget videodisc production see Wilson (1991).

Video linking. The final stage of the project occurred in late May and early June 1991. It involved linking the various segments of the videodisc to appropriate points in the *Carrier Culture Stack.* This was a two-stage process. First, a student was assigned the task of indexing the videodisc. This involved watching the

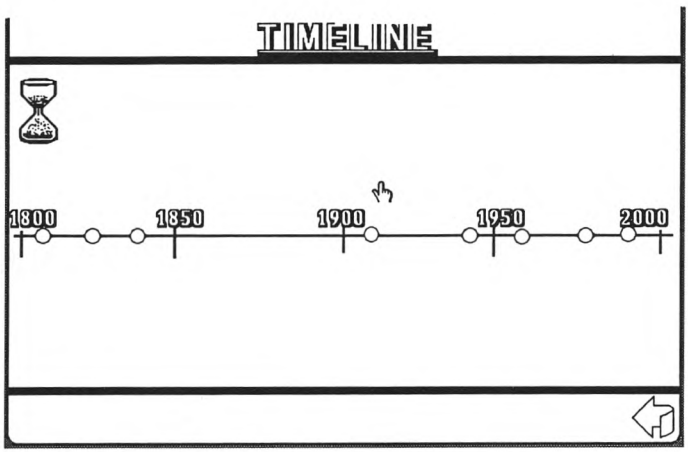

Figure 5. Timeline.

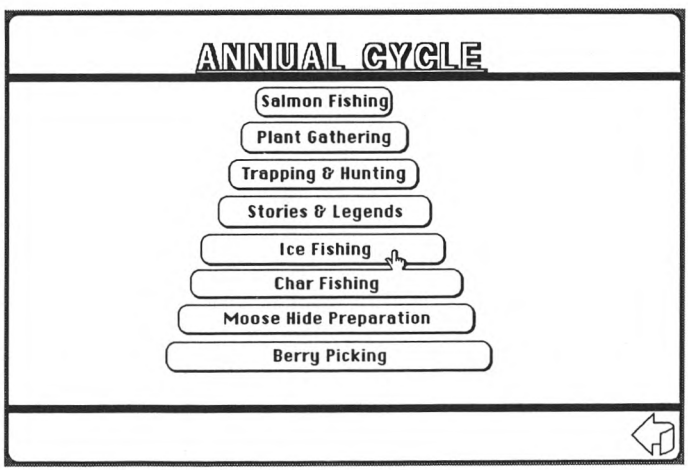

Figure 6. Annual cycle menu.

videodisc, making notes about the content of each video segment, and recording its location on the disc. Location information included the beginning and ending frame numbers of the video segment. These data can be read from the video screen as the videodisc is played. With this information the second phase could be completed. Buttons were created at appropriate points in the *Carrier Culture Stack*. These use the beginning and ending frame numbers determined during the indexing process. When a user selects one of these buttons, the associated video segment is displayed.

For example, if a user is reading about preserving salmon, buttons can be selected that play video clips about cutting the fish, drying fish heads, and many other aspects of salmon preparation. See Figure 9—Sample video buttons.

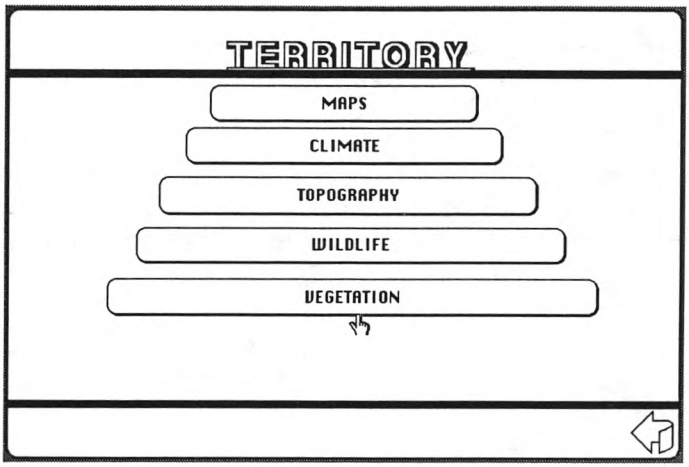

Figure 7. Territory menu.

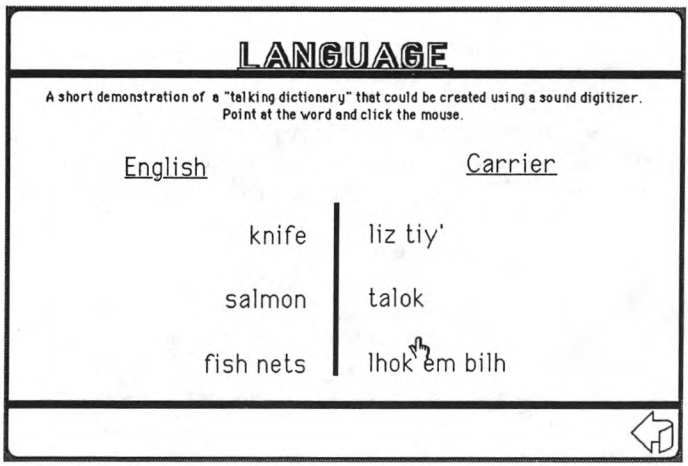

Figure 8. Language menu.

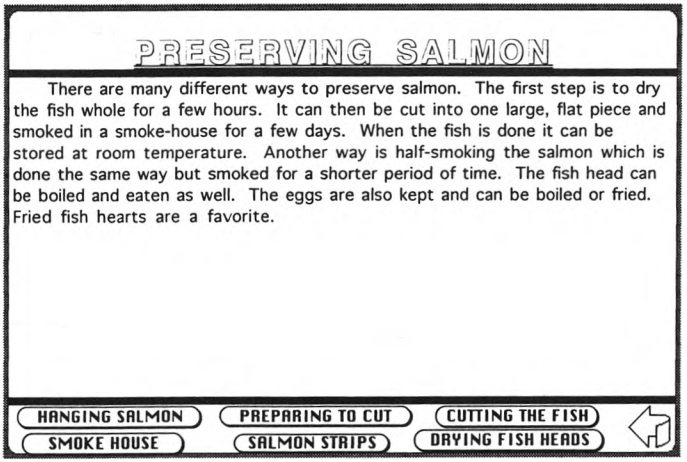

Figure 9. Sample video buttons.

Use of the Carrier Culture Stack

The *Carrier Culture Stack* is currently being used in the libraries of several local schools as an electronic reference book. Students can use it to locate information about the Carrier people.

Discussion

The impact of the Computers and Culture project must be viewed from two perspectives: the value of the process the students went through during the project, and the value of the product that they produced.

Impact of Process

At the very least, students in the Computers and Culture project learned many useful multimedia skills. These ranged from word processing and computer programming to video and multimedia production. If the students received no other benefits, this alone would be significant. Being computer literate and functional in a computerized work place is a significant goal for all secondary school students today.

Students in the project gained first-hand experience in analyzing, organizing, and presenting large amounts of information. This is a skill of increasing importance as society experiences the full impact of the Information Age. John Naisbitt (Naisbitt & Abundane, 1990), Alvin Toffler (1980), and other futurists have been expressing the opinion that an ever-accelerating global economy fueled by information is producing a future that will be very different from the past. Students must be taught to deal with information. They need to know how to find it, how to organize it, and how to express it. The Computers and Culture project taught these skills.

Students in the project worked in a real-world environment where they were judged not on their ability to memorize information and pass tests, but on their ability to produce something of value for the school and community. *Restructuring* is a word that is currently in vogue in education circles. Borrowed from the

business community, it refers to changing the form of the educational system to make it more responsive to the needs of students and society. One recurring aspect of restructuring has been the advocacy of work experience programs as a way of weaning students from the school culture. Work experience exposes them to the demands they will confront in their adult years. The Computers and Culture project was structured more like a work environment than a school one. The teacher was cast more in the role of a manager and the students in the roles of specialist workers. What mattered was not that students pass tests, but that the group produced a significant, worthwhile product. That is the goal of any business.

Native students were cast in the role of content experts, a new and positive experience for them. To spend 12 years attending classes in a school system that largely ignores the Native student's history, language, and culture must be a negative experience for these students. In the Computers and Culture project Native students had far more knowledge of their culture than the non-Native students. They became a primary source of the information that went into the *Carrier Culture Stack*. Native students had the community connections, the parents and grandparents, who could supply the information they did not have themselves. Perhaps for the first time in their lives they had knowledge that others valued.

While the Native students benefited from being content experts for the project, the non-Native students benefited from gaining a knowledge of local Native culture that they had previously lacked. They began to develop a genuine curiosity and interest in Carrier culture. It is hoped that they acquired not only knowledge, but also a deeper understanding of the Native people with whom they lived, worked, and attended school.

Cooperative learning is another aspect of the school restructuring mentioned above. The rationale behind cooperative learning is the observation that adults do very little in life that is not dependent on the cooperative efforts of a group. If this is true of adult life, then cooperation is something worth teaching in school. While the Computers and Culture project was not intentionally structured to teach cooperative skills, it did provide Native and non-Native students with the positive experience of working together to produce something in which they could all take pride. This experience also provided an opportunity to reduce prejudicial attitudes on both sides.

Local Native community involvement with the Computers and Culture project could have been improved. Formal ties with the local bands, Native education groups, Native school personnel and parents were good. A wider involvement of the general Native community would have increased the credibility and validity of the final product. Involvement of the Native communities is essential to the success of projects such as the Computers and Culture project.

Impact of Product

The *Carrier Culture Stack* is currently being used in local school libraries as a source of information about Native culture. It will be a legacy of the Computers and Culture project that will benefit teachers and students in the future.

The cultures of Canada's First Nations may appear to be dying as the elders pass away and younger people adopt the international mass culture of rock and

roll, video games, and blue jeans. The *Carrier Culture Stack* will not stop this, but it will preserve some aspects of the past.

Ignorance can cause prejudice. The local non-Native population is largely ignorant of the past and the traditions of the Native people with whom they share a town. It is hoped that the *Carrier Culture Stack* can be one vehicle to combat this ignorance.

Conclusion

Technology continues to evolve and to make multimedia easier to work with. The technology used in the Computers and Culture project is not state of the art. It has been available for at least 10 years; during the last two or three years it has become inexpensive and readily available. Multimedia developments at Apple, Intel, and IBM (Yager, 1991) are beginning to deliver the next generation of technology that promises to make multimedia production even cheaper and easier.

The Computers and Culture project and the lessons learned while completing it could serve as a model for similar undertakings. Other First Nations could use multimedia technology to preserve cultural information, language, and history. Although the Computers and Culture project was carried out in a school, such a setting is not required. A community environment would be better, an environment where Native people of all ages could work together to document their past. In the process, they would help ensure its survival. With the help of multimedia, Native communities could tell their stories. When they do, they should make these resources available to schools so that Native and non-Native students can learn about Canada's Native peoples first hand.

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Appendix: Video Glossary

These descriptions are not exhaustive, but are simply meant to explain some terms that may be foreign to the general reader.

Hi8 video format: 8 mm has now become the most popular video format for home camcorders. These camcorders are small, light, and are a technological improvement over the older VHS models. The videotape used is approximately the size of an audiocassette. Hi8 video is a further improvement on the 8 mm standard. Cameras are more expensive but still within the range of the home user.
Betacam video format: Betacam is a video format of high enough quality to be used for broadcasting. TV news cameras are typically Betacam format.
WORM videodiscs: A commercial videodisc is created by first producing a master videotape and then using this master videotape to produce a master videodisc. The master videodisc is then used to stamp out copies. The costs involved in producing the master videodisc are high, but this may be offset by the fact that the copies are cheap. If enough copies are made, then the total cost per copy, including the mastering costs, is low.
If a small number of videodiscs are needed, then the WORM process is cheaper. WORM stands for W(rite) O(nce) R(ead) M(any). In this process, the master videotape is used to directly create a videodisc using a laser beam. The cost of each copy is high but for a small number of videodiscs this is the cheapest method to use.