The Nedut'en Talking Dictionary Project: A QuickTime Approach to Preserving and Teaching Native Languages

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Abstract: The Nedut'en Talking Dictionary Project used Apple's QuickTime digital television to create a series of computer programs to supplement and expand Native language Instruction in local elementary schools. The project field tested QuickTime as an appropriate technology to preserve and promote Native languages. The results have been promising. QuickTime is technically limited for such applications but the project contributed to the instruction and motivation of students. It also resulted in a heightened awareness of Native language programs In the local community.

Resume: Le projet du *Nedut'en Talking Dictionary a* utillse la television numerlque *QuickTime,* con^cue par Apple, pour creer une serie de loglciels pour accompagner et etendte la portee de l'enseignement des langues autochtones dans les ecoles elementalres reglonales. *QuIckTimea* ete utilise sur le terrain en tant qu'outile prtvllegle pour preserver et promouvolr les langues autochtones. Les resultats ont ete encourageants. Du point de vue technique, Qufckr/meest plutdt Unite pour ce genre d'application, mals le projet a apporte un contribution valable a l'enseignement et a la motivation des etudiants. Les communautes autochtones bcales ont pris conscience de ('existence de tels programmes d'apprentissage des langues autochtones.

> When a language dies, the world it described is dismantled too — place name by place name, custom by custom, saga by saga. (Wright, 1988, p.38)

In 1982, a government survey detailed the predicament of aboriginal languages in Canada:

> ...of the 53 distinct aboriginal languages still spoken in Canada, only three are predicted to survive (Cree, Ojibway, Inuktituk). The remaining 50 languages are moderately endangered, with several verging on extinction. (Foster, 1982, p. 12)

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That forecast may have been premature. Fueled by a resurgent pride, many of Canada's First Nations are displaying a new interest in their cultures and are attempting to rescue their languages before they disappear. The government survey did recognize one B.C. First Nation that may have the numbers to reverse the trend.

> ...the estimated number of speakers of First Nations Languages in B.C. is fewer than five thousand per language. Only the Carrier have 5,000 speakers, which gives that language a chance for survival. (Foster, 1982, p. 5)

The goal of the *Nedut'en Talking Dictionary Project* was to develop a series of computer aided language learning (CALL) programs to supplement the Carrier language instruction program in the elementary schools of Burns Lake, B.C. Native people in this area speak the Nedut'en dialect of the Carrier language. The objective was to provide an environment in which students could hear and practice speaking the Nedut'en dialect without the direct involvement of a language instructor.

The basic program produced by the *Nedut'en Talking Dictionary Project* was the talking dictionary. Running on a Macintosh Ilsi computer, the dictionary combines digitized voice recordings, still photographs, and motion video. Students look up words in English or Nedut'en, listen to the correct pronunciation of Nedut'en words and sentences, read and hear translations, and record and listen to their attempts at speech. All this is carried out in a highly visual environment that uses digitized photographs of cultural objects, activities, and ceremonies.

A second program, the Nedut'en Phonetic Library, was developed to teach Nedut'en pronunciation. Students can select, listen to and practice the correct pronunciation of the 41 phonemes in the Nedut'en dialect. A "talking head" video shows a language instructor correctly pronouncing the phoneme.

Plans are now being made to develop a third component of the programs, computerized language games that will encourage students to practice the Nedut'en dialect in a variety of interesting ways. These games and exercises will use the language database created for the talking dictionary and provide a motivational context for using it.

The three program components were designed as "shells" that can be modified to incorporate any language.

BACKGROUND

The Carrier People

The Carrier are the aboriginal inhabitants of central British Columbia. Their traditional 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, B.C. Linguistically, the

Carrier are related to the other Athapascan speaking peoples of northwestern Canada and Alaska. The Carrier language has several distinct dialects of which Nedut'en is one. Nedut'en speakers, sometimes called the Babines, originally lived on the shores of Babine Lake, the largest natural lake in British Columbia. In 1822, the Hudson Bay Company established Fort Kilmers near the north end of Babine Lake to trade with the Nedut'en (Morice, 1906). Since the 1950salarge portion of the Nedut'en People, now called the Lake Babine Band, has moved to the town of Burns Lake, B.C. The availability of jobs, schools, and medical facilities has been the main motivator behind this migration.

Language Instruction Program

The Lake Babine Band has about 3000 members. Most elders and middle-aged band members still speak or understand the Nedut'en language. Among school aged children, however, the number of Nedut'en speakers is low. The goals of the Native language instruction program in the Burns Lake School District are two-fold. One goal of the program is to strengthen the language skills of Native children by exposing them to the Nedut'en language at school. For non-Native students, the goal is language familiarization and cultural awareness.

Computer Assisted Language Instruction

The field of computer assisted instruction (CAI) has existed almost as long as computers themselves. In the area of second language instruction, a subdivision of CAI known as CALL (computer assisted language learning) has developed. CALL programs are designed to enhance language instruction. Three approaches are discussed here: drill and practice, artificial intelligence and multimedia microworlds.

Fjarly CAI was based on Skinnerian operant conditioningprinciples and often followed a drill and practice format. This approach to CALL has some merit as memorization of vocabulary is an unavoidable requirement of learning any second language. Modern drill and practice CALL programs can incorporate a full range of multimedia and videodisc features (Alien & Eckols, 1989).

An artificial intelligence (AI) approach to CALL relies on the computer's potential to "understand" natural language. Farghaly (1989) describes a program in which student and computer communicate in a dialogue. The computer can "understand" the student's inquiries and respond to them. Such a system is dependent on the computer's ability to process natural language, a goal that has been achieved in only very restricted knowledge domains. A simpler AI program is described by Nyns (1990). He describes a reading tutor that uses an on-line dictionary and a phrase parser to help students understand the meaning of reading passages. While the AI approach to CALL has promise for the future, it is too complex and too experimental for teachers wishing to use computers for second language instruction now.

Seymour Papert (1980) advocated the creation of computerized "microworlds" that would help students with the task of assimilating new material into existing mental structures. Papert's microworld was that of

Newtonian physics, a world in which the student could explore the laws of motion. Some CALL programs seek to create a similar microworld of language, a world in which a language can be explored in a "real-life" situation. Such programs often make extensive use of multimedia to create a realistic language environment.

Gay and Mazur (1989) describe a multimedia program in which the student takes an airplane flight. Along the way the student can interact with other passengers, watch typical air travel scenarios, eavesdrop on conversations, examine databases, and create stories about the characters. All this time the student is using and learning Spanish.

Marini et al (1991) created a multimedia environment called "Around the House" to teach vocabulary. Using it, students can explore a house and its contents in five different languages. Zooming graphics, text, andaudio recordings add to the realism of the experience.

Teaching phonics has also received a multimedia treatment (Marini & Federici, in press). The "CALL Phonetics Project" helps the student acquire pronunciation skills with the help of graphics and voice recordings.

The last two articles provided a starting point for the *Nedut'en Talking Dictionary Project.* Native language content and QuickTime digital video was added to the basic idea of a multimedia microworld in which students can explore vocabulary and pronunciation.

Computers and Native Languages

Little evidence was found that computers have been used to teach Native languages, but some work has been done using computers for language preservation. A recent account in Canadian Geographic (1992) relates the attempts of one linguist to computerize 20,000 words of the Halq'emeylem language spoken by the Sto:lo people of southern B.C. Given the availability of microcomputers it is likely that computerized language preservation projects, of varying degrees of sophistication, are under way in other localities.

QuickTime and Multimedia

The term multimedia has been used to describe the data handling capabilities of current computers. As computers became more sophisticated, the kinds of data they could process and store changed dramatically. Originally, computers processed only numbers. When characters became a common type of data, word processing was born. Later, graphics and sound were added to the computer's repertoire. The latest type of data to be processed by computers is digital video.

The implementation of digital video has taken two directions (Yager, 1991). I.B.M. and Intel have developed special digital video interactive (DVI) hardware. Apple has taken the software route. QuickTime is system software that incorporates digital video into applications running on any Macintosh computer. Digital video is available to all Macintosh users in a standardized, easy to use, and cheap form.

A Macintosh II computer is needed to capture and play QuickTime movies. The computer must be running System 7.1 that includes special QuickTime extensions. To input video signals, a video-digitizing card must be installed in a computer expansion slot. The computer can then be connected, via the video-digitizing card, to a video source like a camcorder, VCR, videodisc player, or antenna. To capture, compress, and edit the movie, the computer must be running video processing software. Video still frames can be captured using the same hardware/software configuration. The addition of a flatbed scanner makes digitized photographs accessible. Image enhancement software can be used to retouch digitized photographs and video stills. After capturing and saving the compressed movie or still picture to a hard drive, it can be played back within compatible application software like *HyperCard*.

HyperCard is Apple's multimedia software. Structurally, the basic unit of a *HyperCard* program is called a card. A card is analogous to a 3x5 index card on which information can be recorded. A collection of cards is known as a stack. Simple linear or complex branching systems can be devised to lead the user from one card of information to another within a stack. The multimedia aspect of *HyperCard* lies in the information on a card. It can be text, diagrams, maps, sound recordings or, using QuickTime, digitized video and still pictures. *HyperCard* gives the instructional designer control over the sequence of instruction and medium of instructional delivery, two vital aspects of instruction that are critical to the success of the student.

METHOD

Hardware and software used in project

* computer *Macintosh Ilsi 5/80 with math coprocessor*	(Apple Computer Inc.)
* video-digitizing card: *VideoSpigot card*	(Supermac)
* video capture/processing software: *Premier*	(Adobe Systems)
ScreenPlay	(SuperMac)
* image enhancement software: *Photoshop 2.0*	(Adobe Systems)
* flat-bed scanner: *600ZS ScanMaker*	(Microtech)
* photo compression software: *PICTCompressor*	(Apple Computer Inc.)
* multimedia software: *HyperCard 2.1*	(Claris Corporation)

Creating the Dictionary Stack

The purpose of the dictionary was to provide an environment in which students could hear and practice speaking words in the Nedut'en dialect.

Step 1: Selecting words: Seventy-five Nedut'en words were selected for use in the dictionary. These words were selected because they form the basic vocabulary of the Nedut'en language program in Burns Lake elementary schools. The words fall into broad categories like colours, numbers, animals, weather, time, food, and clothing. Each word, its English equivalent, a Nedut'en sentence using the word, and an English translation of the Nedut'en sentence were written on special forms developed for the project.

Step 2: Selecting pictures: A picture was selected to match each of the seventy-five Nedut'en sentences. Most of the pictures were family photographs and some were still frames taken from home videos. An effort was made to keep the pictures culturally relevant by selecting those depicting traditional activities like salmon fishing and moose hide preparation. An attempt was made to use local, recognizable people. In reality, the picture selection and sentence construction process was reciprocal. Often a sentence was constructed to match an exceptional picture. Occasionally a photo was taken to match a critical sentence.

Step 3: Recording audio: Two Nedut'en language instructors read the words and sentences of the seventy-five dictionary entries onto audio tape. For each entry they would read the Nedut'en word, the English word, the Nedut'en sentence, and the English sentence.

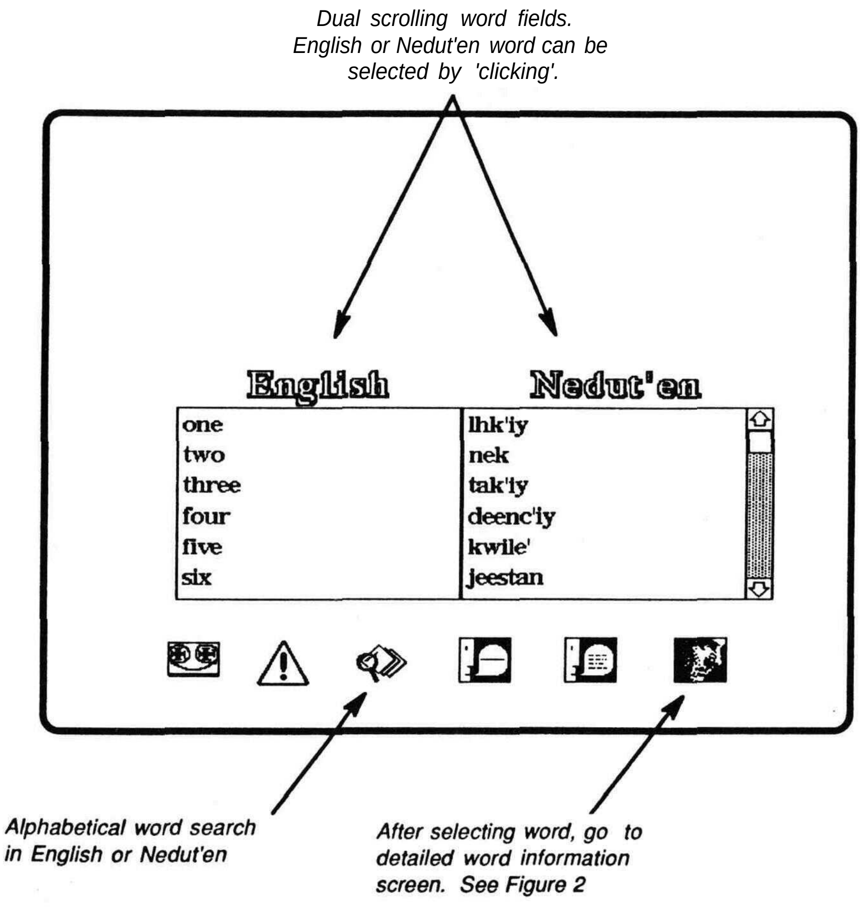
Step 4: Digitizing audio: The recorded audio tape was played into the microphone jack of a Macintosh Ilsi computer running *HyperCard.* The audio palette of *HyperCard* was used to digitize and edit the four sound components of each dictionary entry. The four components were saved as sound resources to the main dictionary stack. Average size of the four audio resources for one word was 120 K. Steps 3 and 4 could have been combined if the built-in computer microphone had been used.

Step *5: Digitizing photographs:* Each photograph was scanned into the Macintosh Ilsi computer using a *Microtec 600ZS ScanMaker* flatbed color scanner connected directly to the computer's SCSI port. The file was then loaded into *Photoshop* for touch-up and resizing. The resulting PICT file was then compressed *nsingPICTCompressor* and saved to the folder containing the main dictionary stack. Each picture file was 50-60 K in size.

Step 6: Digitizing still video: Still video frames were captured from videotape and digitized using the frame-grabbing capabilities of the *ScreenPlay* program. The hardware configuration consisted of a Macintosh Ilsi computer with a *VideoSpigot* card installed, connected to a VCR. As with the digitized photographs, the digitized still frames were touched-up and resized using *Photoshop.* The resulting PICT files were 60-70K in size and were saved to the folder containing the main dictionary stack without further compression.

Step 7: Writing the Talking Dictionary stack: The dictionary stack that tied these audio and visual resources together was written with *HyperCard 2.1.* The user sees the screen in Figure 1 first. By scrolling the word lists, the user can select a word in either English or Nedut'en. An alphabetical search option is also available. Part words can be used. Once a word has been selected, the face icon in the lower right corner of the screen calls up the word screen in Figure 2. This screen shows the words, text of the two sentences, and their corresponding picture. Clicking on the "talking stick" or speaker icons plays the text in Nedut'en or English respectively. The recorder icon activates a floating pallet with which the user can record his/her pronunciation attempts and play them back. Several teacher controls are hidden on both screens. These features allow the teacher to change visual aspects of the screens and add new words to the dictionary.

Figure 1.
Nedut'en Talking Dictionary: Main Menu

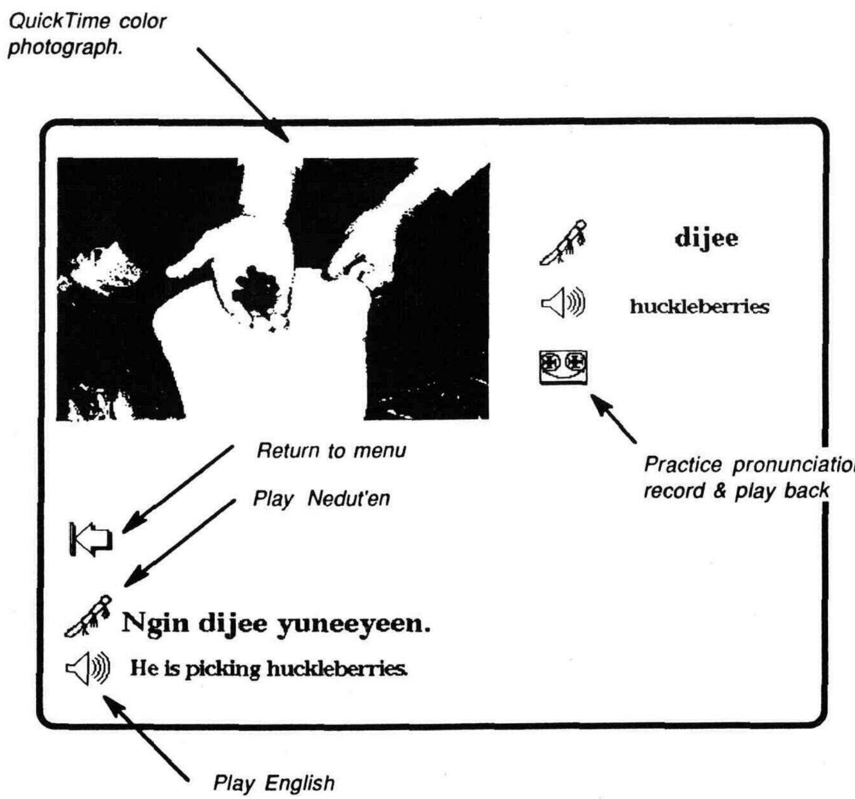


Creating the Phonetic Library Stack

The purpose of the phonetic library was to provide an environment in which students could hear and practice the individual sounds of the Nedut'en dialect.

Step 1: Selecting phonemes and words. The Nedut'en dialect has the 41 phonemes (Patrick & Tress, 1991). A reference word was selected for each phoneme. Most reference words contained the target phoneme in the initial

Figure 2.
Nedut'en Talking Dictionary: Typical Word Screen



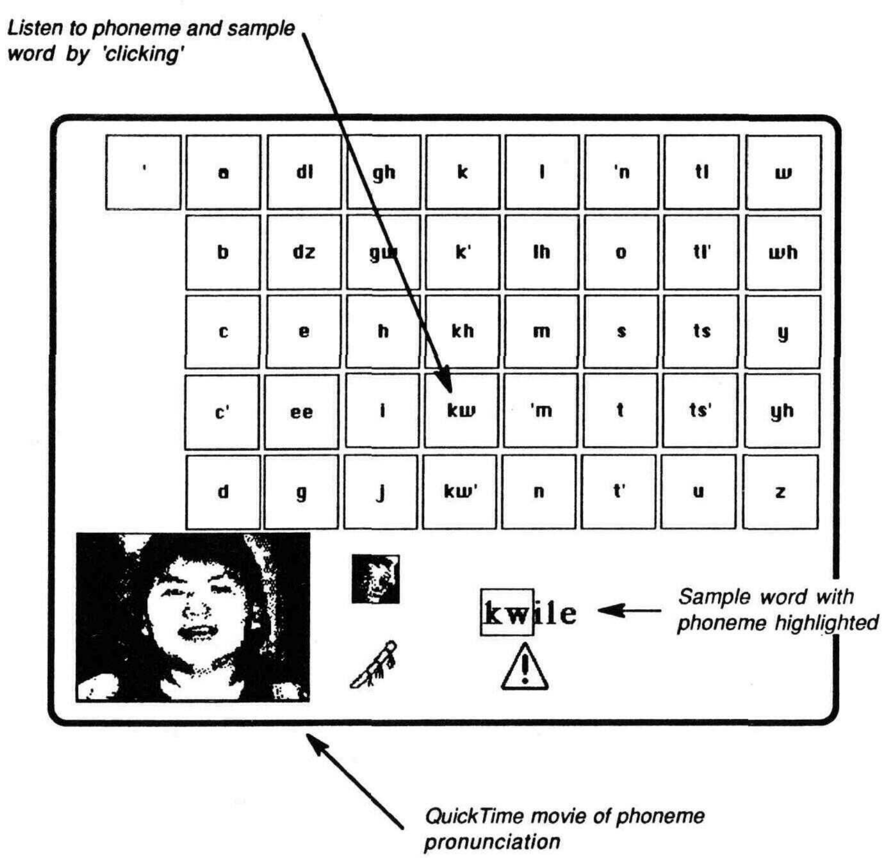
position. Some Nedut'en phonemes never occur in the initial position and words with the target phoneme in the medial or terminal positions had to be used.

Step 2: Recording and digitizing audio. The pronunciation of each phoneme and its reference word was recorded and digitized in the same way as the dictionary words and sentences described in Steps 3 & 4 of the previous section.

Step 3: Digitizing video. A camcorder was used to videotape the head and shoulders of a Nedut'en speaker while she pronounced 40 of the 41 Nedut'en phonemes. (The glottal stop (') makes no sound by itself.) The videotape was played into the computer via the video-digitizing card. Adobe Premier was used to edit this video segment into 40 QuickTime movies, one for each phoneme. These movies were compressed to 100-150 K each and saved to the folder containing the phonetic library stack.

Step 4: Writing the phonetic library stack. The phonetic library stack has one card (see Figure 3) that ties together the sound recording and QuickTime movies described above. The card is a grid with a Nedut'en phoneme in each cell. The user simply clicks directly on the phoneme. The reference word with the target phoneme highlighted in a box appears at the bottom of the screen and the computer plays the audio for the phoneme and the reference word. Clicking on the face icon plays the movie of the phoneme being pronounced by a language instructor.

Figure 3.
Nedut'en Phonetic Library



Classroom Implementation

Once completed, the talking dictionary and the phonetic library were transferred to two Macintosh LC II computers. The computers were placed in a primary school (grades K-3) and an intermediate school (grades 4-7) under the direction of a language instructor. A variety of strategies was used to introduce students to the computer and provide time for use. Group demonstrations and individual instruction were provided. Students were assigned specific times to use the computer and were allowed to use it in their free time. Computer access was also used as a reward. Individuals and small groups had access to the computer.

RESULTS

Pedagogically, the talking dictionary achieved its goal. It provided students with an alternate way of hearing and practicing the Nedut'en language. The most interesting aspect of the dictionary was the motivation it provided. Students were very interested in using it. This was partly due to the novelty of using a computer and partly due to the local nature of the program contents. Native students saw and heard people they knew, doing things with which they were familiar. One Kindergartner wanted to know, "How did Aunty Susie get inside the computer?"

One surprising aspect of the project was the way in which it increased awareness of the Native language program in local schools. The talking dictionary has been displayed at several school functions resulting in a newspaper article, letters to the editor, a 30% enrollment increase in Native language classes, and interest from several regional Native groups.

Technically, QuickTime was a disappointment. It provided excellent still pictures for the dictionary but the movies proved to be inadequate. A complete discussion of the technical limitations of QuickTime follows.

DISCUSSION

Technical Limitations of QuickTime

> "... QuickTime movies more closely resemble jerky postage stamps than fluid full-screen video." Frost, 1992, p. 158.

The video digitization process converts the analogue signal of television to a digital format that is compatible with computer processing. In North America, television signals conform to the NTSC (National Television Standards Committee) standards. Among other things this means a frame rate of 30 frames per second. This frame rate is high enough to make motion on a TV screen appear smooth and continuous. To digitize this analogue TV signal, the computer must code the location and color of each of the 640 x 480 pixels in a single frame. Thus, a single frame of full screen video can contain almost one megabyte of data and each second of video can be 30 megabytes in size! Capturing full screen video at 30 frames per second is a prohibitive task for QuickTime and cannot be done even on high-end Macintoshes like the Quadra.

To effectively digitize video, file sizes must be reduced, therefore some compromises must be made. Smaller screen sizes dramatically lower the size of QuickTime movies. QuickTime supports screens as small as 160x120 pixels (I/16 of a full screen). A single frame of this size is only 57 K. The cost of smaller screens is small movies that are difficult to see.

Lower frame rates also can be used to reduce the size of QuickTime movies. Capture rates of 10-12 frames per second are more typical than 30 frames per second, thus reducing movie size 50-70%. The cost of lower frame rates is a jerky movie that doesn't flow smoothly.

Finally, movie compression can significantly reduce the size of movie files. QuickTime performs both spatial and temporal compression. Spatial compressors examine the pattern of colors in a frame and reduce the amount of space required to store this information. For example, if a frame has a large area of a single color it can be stored more compactly if only the location of the edges is stored rather than a pixel by pixel record of the entire colored area. Temporal compressors examine sequential movie frames for areas like backgrounds that are not changing and then record only the changes rather than a complete pixel by pixel record of each frame. While compression savings are unpredictable because they depend on the content of the movie, reductions of 90% were not uncommon in this project.

Compression can cause problems because data density is not consistent throughout a movie. In parts of a movie where frames consist of large areas of one color and little change is occurring from frame to frame, the computer has little difficulty displaying at a high frame rate. But, when the frames become more complex and considerable change is happening from frame to frame then QuickTime will skip frames. The cost of data compression is a movie that may flow smoothly in some spots and jerk dramatically in others.

One final problem: Sound and pictures are not necessarily synchronized in a QuickTime movie. This can be a critical problem when using a "talking head" movie to show proper word pronunciation as was done in this project.

So why use QuickTime at all? Is it really worth all this trouble to get small jerky movies without sound synchronization? The answer is yes, if certain limitations are observed.

- Use small screens, and keep movies short. Both measures will reduce the processing load and result in better quality movies.
- Use still pictures when possible. Don't forget that QuickTime supports still pictures and movies. The color and resolution of a still frame can be excellent and often a still picture can convey the message as well as a movie.
- Lower frame rates are perceived differently depending on the subject. For example, lower frame rates have less "apparent" effect on movies of machinery than on movies of people talking. This is probably because much more information is being conveyed by the face of the speaker and any information loss is critical to understanding. Experimentation is

needed to find what will work.

- Computers with fast CPUs and large amounts of RAM work best for QuickTime video. Remember, they are also the most expensive. Watch for new hardware and software to improve digital video dramatically in the next few years.

Given all its limitations, QuickTime is adequate for present use and promises to be even better in the future.

Pedagogical Aspects of QuickTime Talking Dictionaries

The talking dictionary approach to supplementing Native language instruction has several immediate benefits and has the potential for many more.

- Supplementation and expansion of instruction
  The dictionary was originally developed to supplement and expand Native language instruction. With only two qualified teachers, language instruction was spread thin. The talking dictionary provides a stand-alone teachingunit that can be used independently giving students more access to language instruction.
- Non-Native teacher support
  The talking dictionary gives non-Native teachers the option of incorporating Native language instruction in their classrooms. There is no substitute for live instruction but many, if not most, schools in Canada that enroll Native students do not have a Native language program. In some extreme cases there may not be any Native speakers left or those that do speak the language may be unwilling or unable to teach it. Programs like the talking dictionary can be used to fill the gap.
- Non-teacher support
  The dictionary can support non-teachers attempting to teach a Native language. In many places, Native language instruction is carried out by elders or other speakers who do not have teacher training. The talking dictionary can provide one source of instruction based on sound pedagogy-
- Learning styles
  Much has been written about learning style and its influence on Native learners (Journal of American Indian Education, Special Issue on Learning Styles, 1989). Because of its audio/visual, self-paced nature the talking dictionary may be a better "fit" with Native learning styles than traditional classroom approaches. Such a suggestion is speculative at this point but may be worth further investigation.
- Audio-visual language archives
  If Native languages in Canada are on the verge of extinction then simply archiving them is a reasonable goal. Multimedia is ideal for such projects because it combines the search and retrieval capabilities of a computer with the audio-visual impact of TV.

- Cultural promotion
  Native culture is inextricably woven into the words and pictures used in the dictionary. Students, especially non-Native students, are exposed to Native culture as a by-product of using the dictionary.
- Motivation
  The talking dictionary motivates students to learn. Native students do not normally see their culture and language showcased in local schools, especially on a computer. This heightened interest may be a short-term novelty effect, but it would not be difficult to develop computerized language games that maintain the motivation. The third component of the *Nedut'en Talking Dictionary Project* will develop some of these activities.

Technology and the Larger Cultural Context

The *Nedut'en Talking Dictionary Project* attempted to apply modern multi-media technology to preserve and promote something very ancient - the language of one of Canada's First Nations. From this project and others (Wilson, 1992) several guidelines for the successful application of technology to Native language and culture have become obvious.

- Native people must be involved in production. It is their culture. They are the experts.
- Costs must be kept low. This is possible because multimedia is based on microcomputers and home video equipment, both of which are relatively inexpensive.
- The level of technical expertise required must be kept low. Multimedia on a Macintosh computer is easy to create. QuickTime has complicated the situation but promises to get easier.
- As an educational tool, the multimedia database must be interesting to use. It has the advantage of combining the best features of every medium.

In summary, QuickTime was found to be adequate for creating computer assisted Native language learning programs since its limitations can be avoided. It is one of several technological tools that can be used to preserve and promote Native language and culture.

REFERENCES

Alien, B.S., & Echols, S.L. (1989). IMPART: A prototype authoring system for interactive multimedia vocabulary tutorials and drills. *Canadian Journal of Educational Communication, 18(3),* 207-220.

Farghaly, A. (1989). A model for intelligent computer assisted language instruction (MICALI). *Computers and the Humanities, 23(3),* 235-250.

Foster, M.K (1982). *Canada's first languages. Language and society*. Commissioner of Official Languages. Minister of Supply and Services. Ottawa, Canada.

Frost, Mark. (1992). *The dawn of QuickTime: Video-digitizing cards*. MacUser, 8(10), 158-184.

Gay, G., & Mazur, J. (1989). Conceptualizing a hypermedia design for language learning. *Journal of Research on Computing in Education,* 23(2), 119-126.

Journal of American Indian Education. Special Issue on Learning Styles. August, 1989.

Linguistic rescue mission for the Sto:lo. *Canadian Geographic, 112(2),* 8.

Marini, Z.A., & Federici, C. (in press). A hypermedia approach to the learning and teaching of phonetics. *Language Teaching Strategies.*

Marini, Z.A., Mitterer, O.J. & Powell, A.R. (1991). Toward a desktop system for effective computer-aided language learning. *Canadian Journal of Educational Communication., 20(3),* 171-187.

Morice, A.G. (1906). *The history of the northern interior of British Columbia* [1660-1880]. Smithers, B.C.: Interior Stationery, 1976 reprint.

Nyns, R.R. (1990). An expert system in computer assisted language learning. *Computers & Education. 15(1-3),* 99-103.

Papert, S. (1980). Mindstorms: children, computers, and powerful ideas. New York: Basic Books.

Patrick, D. & Tress, S. (1991). *Nedut'en (Babine) bilingual classroom dictionary*. Vanderhoof, B.C.: Yinka Dene Language Institute.

Wilson, J. (1992). The computers and culture project: A multimedia approach to the preservation of Native history, language, and culture. *Canadian Journal of Native Education, 19(1),* 7-19.

Wright, R. (1988). Beyond words. Saturday Night, April 1988, 38-46.

Yager, T. (1991). Information's human dimension. *Byte, 16(13),* 153-169.

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