A Constructivist Study of
Developing Curriculum
to Teach Internet Information Literacy
to Navajo High School Students

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AUTHOR'S ACKNOWLEDGMENT

Appreciation of independent investigation of truth "so that the world of humanity may be saved from the darkness of imitation and attain to the truth," ('Abdu'l-Baha', 1978, p. 298) forms the philosophical basis for this thesis.

I am grateful for the contributions of the students, my collaborating teachers, and for the administrative support of the school.

I am extremely grateful to my husband, one of my collaborators. His support extended beyond personal encouragement to assistance in developing the study. His willingness to contribute knowledge, efforts, opinions, and support of the research were extremely important to both working with students and writing the thesis. My thanks extend to my daughter and son-in-law, parents and siblings, who were supportive of the work I did.

My appreciation of the assistance, support, and endorsement of my advisors is profound. They suggested material to read, provided excellent notes to improve my writing and were personally encouraging.

I hope this thesis provides insight into the important work of teaching Native American high school students to be successful in the information age.

ABSTRACT

This thesis reports the results of a school year long study, 1999-2000 that examines the development of a curriculum for teaching Navajo/Dine' high school students Internet information literacy. Lessons were constructed through observation of student responses and formal discussions with teachers over the course of the project.

There are three phases of the study. The initial phase identifies effective content and delivery modalities. I established eight principles for teaching Navajo students. These are: culturally relevant content, wholistic learning, choice in projects, visual learning, personal relationships between teachers and students, developing feelings of competence, teaching essential information to functioning in dominant society and giving opportunities to work cooperatively.

The second phase implements the findings of the first. I developed eight mini-lessons: *Thinking about the assignment, Navigation and browsing on the Internet, Exploring with the Internet, Note taking and collecting information, Evaluating resources, Preparing to present, Reference lists and Evaluating research skills.*

A student self-assessment was administered to participating students during the third phase. The final

report of the study indicates students who participated in

three sets of Internet information literacy lessons

expressed more confidence in their abilities to use the

Internet in their class work than those who had taken one

set of lessons.

CHAPTER ONE: INTRODUCTION

Hypothesis

If an Internet Information Literacy curriculum is established teach to Navajo high school students, then the students will be able to incorporate current, accurate, interesting, complete, and meaningful information into their coursework, because the instruction on utilizing the Internet as a search domain for course-related inquiries will teach them to identify the need for information, locate information by browsing and exploring, consume information by reading, forming opinions, and taking notes, evaluate and collect information that corresponds to the focus of their investigations, prepare graphic organizers and outlines about the information found, document the information used by citing references according to the appropriate methods, share the interesting details of the information found in writing or speech, and reflect on their personal information use process for the purpose of improving that course of action.

Background

This thesis examines the outcome of a school-year-long inquiry by myself, a public high school librarian in an

isolated location on the Navajo Reservation. The subject under investigation is the development of a curriculum for teaching students in that school, skills for locating, organizing, gathering, evaluating, and presenting information found on the Internet. All the students are Navajo.

The location for the study is a small rural high school on the Navajo reservation. There were approximately 275 students in grades nine through twelve. This school is located in an extremely isolated location. It is over fifty miles from the nearest hospital, grocery store, or police station. The importance of the teaching methods employed and of teaching Navajo high school students to use the Internet to do research will be established.

I did this work because I thought it was important for the students to learn to make use of the Internet in an academic way. I observed students using the Internet for recreational purposes such as logging onto chat rooms and locating information related to hobbies and personal interests. I felt that, given instruction and guidance, the students would also enjoy using the Internet to support their academic work and have a more complete understanding of its potential as a source of information. The complexity of Internet navigation and observation led me to believe

that students would not learn the needed skills without instruction.

Three events ensued that motivated me to begin and complete this thesis. These were: 1) my Library Practices Practicum, 2) the literature I had read on the future of the process of library research processes, as I noted in the Literature Review of this thesis, and 1) my daughter and her friends' experiences as freshmen in college.

My daughter and her friends found that Internet navigation and searching were essential skills for university classes during their first year of college, in 1997-1998. They came home on breaks and repeatedly told me they wished they had learned those skills in high school. The Navajo Nation is underserved with telecommunications resources (Smithson, 2000 & Di Giovanni, 2000); the Internet, on a 56K line, become available at their high school and the school involved in this study in April of 1997, the end of their senior year.

My Library Practicum supervisor suggested the topic of teaching Navajo students information inquiries on the Internet early in my Master's program. As the Head Librarian at Dine' College, she had observed students using the Internet for email and recreation. She thought they were not able to navigate on the Internet for academic

purposes. She, as others (E. Landau, personal communication, September 18, 1998) (Wishnietsky, 1993; Eisenberg, 2000), thought teaching students to use the Internet to support their academic preparation investigations is the most important work a school media specialist could do.

It is important to attempt to reach these teenagers in a responsive way because there are achievement gaps between majority and minority students at nearly all age levels and in all subject areas (Mullis, Dossey, Campbell, Gentile, O'Sullivan & Latham, 1994; Garrett, M.T. 1999). Perhaps the biggest reason for this disparity is that, while our student population has grown more diverse over the past several decades, individual schools have remained largely homogeneous (Wang and Kovac 1995). Native American students are an underserved group in terms of telecommunications, libraries, and educational funding (Smithson, 2000; Bruge, 1998 & Di Giovanni, 2000).

Many Native American children enter school with an eagerness and willingness to learn. It has been noted that after the fourth grade, their academic performance rapidly declines (Cummins, 1992; Sanders, 1987; Swisher, Hoisch, & Pavel, 1991) resulting in a 40% to 60% school dropout rate, the highest in the nation (National Center for Education

Statistics [NCES], 1991). I believe that the better Navajo students navigate the Internet, the more aware and able they will be to involve themselves in the information age.

My responsibility in this study is to be a catalyst for learning how to utilize the Internet academically: to create, adapt, assess and teach the lessons. The students' role is to master the skills I teach. This study includes teachers as active collaborators with the librarian in the efforts to polish the teaching modalities scrutinized in this study. Collaboration occurred during discussions between the teachers and librarian before and after the lessons. Before the lessons the discussions concerned the objectives of the library research assignments and afterwards we discussed the approaches that succeeded in facilitating the searching skills of the students and those that did not work.

Research Phases and Perspective

There are three phases of the study. Phase One occurred during the fall semester of 1999 and is represented in my discussion of the formative stage of the research. The second phase occurred during the spring semester of 2000 and represents the operative phase of the study. The summative, and third, phase of the thesis occurred during May and June 2000.

Resource-based projects (Bleakley & Carrigan, 1994) are variously named in education. Other names for resoruce-based learning include authentic-learning (Keefe & Jenkins, 2000), problem-solving (Eisenberg, 1992 & Svinicki & Schwartz, 1988) and Dewey style project-based to learning (Boydston, 1980 & Dewey, 1980). Carvin (2000) also supports this type of learning when he discusses the Multiple Intelligences theory of Gardner. Atwell (1987), Weaver (1991) and Short & Burke (1991) describe this type of learning project in discussions of authoring cycles and whole langugage learning.

Authors about information literacy discuss the stages of information use in terms of the importance of teaching search and use skils in the context of a classwork assignment that requires students to locate, consume, evaluate, and use information they find themselves. These writers include Rodrigues (1997), Todd (1995), Doyle (1992), Mann (1987 & 1993), Kuhlthau (1985, 1993 & 1994), Thomas (1999), Schwartz (1997), Gross & Kientz (1999), Stripling (1995), Pitts (1996), and Eisenberg & Berkowitz (1988 & 1992).

This approach to learning is constructivistic. In *Designing Instruction for Library Users*, Svinicki & Schwartz (1988) state, "learning will be better if active

responding is a part of the instruction" (p. 83). This means that the students must construct their own understanding of the subject not simply absorb the understanding of the teacher. The resources of the library and a librarian who is able to teach information literacy skills is essential for students to be able to search out topics and information of interest.

My term for learning from the library is inquiry-based learning. Inquiry-based learning is a method of teaching based on an assignment given that requires the students to explore the subject in order to create a product that explains what they have learned. Examples of inquiry-based projects completed during this study are: 1) an inclusive introduction to another country, 2) a research paper on an aspect of Native American literature or culture, 3) a term paper on a topic completely of the students choosing, 4) persuasive and informative speeches and papers, 5) biographical sketches of mathematicians and scientists, and 6) comparisons between census statistics and services available on the Navajo reservation.

During the first phase of the study I gave little input into the assignments during these pre-lesson collaborative discussions. After the formative evaluation

was complete I began to make recommendations about the assignments to the collaborating teachers.

During the formative phase of the study I delivered lessons at the request of the teachers. Some teachers did not request lessons and I observed the student behavior during these library sessions. During the operative phase I designed a series of eight mini-lessons (Atwell, 1987) that were delivered recursively as each group of students came into the library. All were instructed on these subjects at the point in their time in the library when the teacher and I deemed they were ready in our collaborative sessions.

The lesson titles consist of: *Thinking about the assignment, Navigation and browsing on the Internet, **Exploring with the Internet**, Note taking and collecting information, Evaluating resources, Preparing to present, Reference lists,* and *Evaluating research skills.* These lessons were taught to help the students understand the step-wise research process. The navigation of the Internet for the purpose of making meaning from the information found is to inform the student about a topic of interest in order for that the student is able to share the information with others.

The work of Carol Kuhlthau (1985, 1993a, 1994 & 1996) forms the basis for stages of library research taught. The

nine standards outlined in *Information Power* (1998) inform

the content of these teaching sessions. These standards

advance the ideas that students should become independently

information literate and that they contribute positively to

the learning community and to society.

The table below shows relationships among the titles

of the lessons, the stages of research and the educational

standards that informed the lessons.

Title of the lesson	Kuhlthau Stage of library research	ALA Standard
Thinking about the assignment	Initiation – discover the desire for information	Pursues information related to personal interests
Navigation and browsing on the Internet	Selection – identify and select the general topic to be investigated	Access information efficiently and effectively
Exploring with the Internet	Exploration – deal with feelings of uncertainty while locating quantities of information	Appreciates literature and other creative expressions of information
	Formulation - form a focus of understanding	
Note taking and collecting information	Collection – gather information pertinent to the focused issue	Strives for excellence in information seeking and knowledge generation
Evaluating resources		Evaluates information critically and completely

Preparing to present		Uses information accurately and creatively
Reference lists	Presentation – complete the search and share the findings of the search	Practices ethical behavior in regard to information and information technology
Evaluating research skills.		Recognizes the importance of information to a democratic society

Table 1.1: Relationships among Lindsey Internet Information Literacy Lessons, Kuhlthau Stages of Library Research and Educational Standards of the American Library Association.

The lessons on Internet navigation and using the Internet as a search domain were based on the work of Larry Lewin (1998). Some of his ideas that I incorporated into the lessons are: E sheets, teaching search terms and his suggested search engines. The Wheel Model of curriculum writing of (Nelson, A., 1994) is the pattern for the curriculum design. This model proposes that subjects be taught from practical, technical, conceptual, and creative perspectives. I chose this model because it was specifically developed for use with Native American students. In chapter two, I cover the details of the contributions of these and other professionals.

Rationale for the Methodology

The research methodology draws from Whyte (1991) who elaborates upon participatory action research. He states,

"The researcher involves some organizational
members as active participants in this approach
to research. Both the organizational members and
the researcher are assumed to want to develop
valid conclusion, to bring unique insights, and
to desire change." (p. 432)

Participatory action is combined with a constructivist

viewpoint that allows for a dynamic response to insights

that occur during the research process (Guba & Lincoln,

1989). The interactive research process of this study was

the revision of lessons over the course of the project.

This occurred through observation of student response to

the lessons and through discussions with students and

teachers. Adjustments were made in subsequent lessons to

reflect the insights gained.

The present study of curriculum development may be

classified as evaluation research. (Patten, 1997) Patten

describes this form of research as necessary to understand

the development of a program over time. The instructional

program is seen as a research treatment with independent

and dependent variables. The independent variable for this

study is the curriculum: content, methods, focus and

procedure. The dependent variable is the student

achievement: measured by learner involvement in navigating

the Internet for student location of information,

completion of the projects, and self-reporting of skill levels.

Program evaluation research differs from experimental research in three important ways. First, evaluation research is different from experimental research because it is applied research. Second, it is based on a needs assessment and, third, changes are made to the research treatment during the course of the evaluation.

Applied research is conducted to "influence the design of social programs" (Schutt, 1996, p. 34). A needs assessment identifies the problems to be addressed in the program as one phase of the research. Traditional experimental research does not allow for design changes during the experiment. In program research the adaptations are essential in the best interests of the success of the program, the ethical nature of research with human subjects and consideration of the needs of the human subjects to benefit from the program. According to Schutt (1996) ethical considerations include: the research should cause no harm and the benefits should outweigh any foreseeable risks (Guba & Lincoln, 1989).

The goal of developing curricula is to affect changes in the students' skills and understandings. The educator and librarian must strive to expedite the learning process.

The student should be successful in the outcome of the particular lesson and develop new skills and knowledge that he or she might transfer to other situations where information is needed. Thus, adaptations during the course of the study or research are an important aspect of an instructional program.

Outline of the Study

Phase One

The purpose of the initial phase, Fall 1999, was to identify effective instruction methods and appropriate content for teaching high school students to find and use information using the Internet as a search domain. This was followed by the development of a set of tentative lessons to teach students Internet information literacy.

During the initial phase I discovered the modalities by collaborating with teachers, conducting library instruction lessons for classes of students in the presence of their instructors, and observing the student behavior before, during, and after the lessons. Through the constructivist method of working recursively with the teachers and observing the students, I noted the elements of the lessons that were successful or less successful. I discussed these my observations of students with the collaborating teachers.

My role is to support the general curriculum rather than to teach library skills in isolation from meaningful projects. The lessons developed through my efforts to correspond to the objectives of the teachers. This evolved in collaboration and through discussions with each teacher, usually the day before scheduled sessions in the media center.

In total, I collaborated with eight teachers, conducted twenty-seven lessons for eleven classes and reached one hundred ninety-seven students during the developmental stage of this research. This was eighty-four percent of the student body.

The collaboration took the form of a least one discussion with each teacher who requested class time in the school media center. These discussions usually occurred when the teacher came to schedule library time for their classes and lasted from twenty to forty minutes. We conferred about the inquiry project the teacher was creating and about the elements of information literacy teaching that were suggested in the literature and that had worked with other classes.

I observed the student participation and involvement during the lessons and assessed the students' ability to perform the tasks taught in the lessons. I listened to

their verbalizations and evaluated their degree of interest as well. I recorded notes of these observations in a diary. After completion of assigned lessons I made observation of students to assess the their ability to complete the work assigned by their teacher.

Students have not been identified by name, but are labeled by a code that includes the class and student initials.

In December 1999, at the end of the fall semester, I completed a formative evaluation of the lessons. The most successful and least successful teaching techniques for each class were summarized, class-by-class. I determined these by noting recurrent phrases used by the students during their searches, the frequency and patterns of errors and successes in their searches, and by summarizing the students' affective responses during the lessons and during the work they completed for their assignments. I also noted the elements of assignments and activities that evoked the most responsiveness from the students.

From a longitudinal review of the most salient issue for curriculum were synthesized. These components are:

1. Students need choice of topics and partners to be receptive to the task of library research which causes many of them a feeling of uncertainty

2. E sheets (electronic note taking sheets) are very important tools when students are working in the electronic media
3. Visuals support verbal presentations and are necessary for teaching Internet navigation
4. Students need to work in a comfortable ZPD (Zone of Proximal Development) where the task is neither so difficult as to cause distress nor so easy as to be without challenge
5. Curriculum is in a constant process of creation.
6. Students need for the instructor to be aware of their previous knowledge and take that into account when developing lessons
7. There limits to teaching from the library. The librarian is not the primary instructor, has a limited time with each class of students and needs to impart lessons in a way that is interesting and promotes student practicing the skills taught
8. All teachers do not request or desire collaborative and cooperative work with the librarian
9. Native American content is important
10. Students need to understand the whole process of Internet research before the segmented tasks.
11. Students respond to personal involvement from teachers that promotes mutual respect, sincere interest in student topics and enjoyment of the process of learning
12. Students appreciate direct explanations of dominant culture methods, such as the format for a well-written term paper and the linear progression of computer logic

The review of applicable literature regarding Native American education, Internet inquiry and information literacy instruction in chapter two supports these findings.

Phase Two

In the second phase, during the spring semester of 2000, I put into practice improvements to the curriculum based on the December 1999, formative evaluation. This was

based on the lessons of the first phase. Before the second semester began, I discussed the December 1999 findings with the teachers who agreed to collaborate with the project during the spring 2000 semester. The feedback from these discussions enabled me to construct the lessons for the second phase. I designed a new focus and procedure for the lessons. The sequence was changed to include an overview of the library research process before teaching the individual inquiry skills. An additional curricular element was added: teaching students to use an electronic graphic organizer, called Inspiration (Chase, 1999 & Keiser, 1998), to plan their research more efficiently. Emphasis was placed on choosing topics and determining search terms. One goal of the spring semester lessons was reducing the time students spent on inquiry. Thus, the lessons were streamlined to more effectively focus instruction on the skills determined by student needs.

At this point, I began to make suggestions to teachers about team teaching modalities. New modalities were cooperative teaching and the use of an interactive Smart Board. I also suggested that teachers allow students choices, such as being able to choose group work partners and topics. I began to promote the understanding of student learning style needs.

Another important consideration for the second phase of the study appeared. This was the need to reduce the time the students spent in Internet investigation by helping them to become more efficient. This was necessary because the collaborating teachers desired more extensive lessons and more in-depth inquiry projects. There was an increase in the number of classes needing to use the school media center for student inquiry projects during the spring semester. During the spring semester of 2000 eight teachers brought fourteen classes to the library for seventy-five lessons.

Phase Three

At the end of the spring 2000 semester, seventy-four students who had received the research lessons participated in a summative evaluation. They were given a self-evaluation form on which they recorded an assessment of their own Internet inquiry skills. A copy of this form is Appendix A. The analyses of the data from the student self-assessments of their ability to locate information comprise the summative report. One important conclusion I drew from the summative phase of this study is students need multiple sets of Internet information literacy lessons to self-disclose a sense of comfort with inquiry-based projects.

I have determined that specifically structured instruction based on an on-going evaluation of student needs is required for students to increase their interest and efficiency in using the Internet and electronic media. I also found eight principles of Native American learning environments that support student growth. These will be presented and discussed in chapters two and five.

I believe the report of this study shows that Navajo high school students who participate in multiple series of lessons regarding Internet information literacy develop skills to determine their information needs and are able to locate, consume, organize, evaluate, document, and use current, accurate, interesting, complete, and meaningful information in coursework assignments.

CHAPTER TWO: REVIEW OF THE APPLICABLE LITERATURE

For this study it is important to consider the literature regarding Native American educational practices, adolescent education, learning styles, curriculum development, information literacy, collaboration between the librarians and teachers, and the Internet as a search domain. All these subjects inform the curriculum process and lesson content to instruct Navajo High School students to identify their needs for information, and how to draw on the Internet as a search domain to locate, understand, evaluate, and make use of information.

Extensive searches on NorthernLight.com, ERIC, EBSCO, the ALA website, on simple and mega search engines and from a variety of print resources lead me to believe that nothing has been written on this subject of teaching Native American students to develop information literacy or of teaching these students to use the Internet. Therefore I have undertaken to combine the work of researchers from the fields of Native American education and Information Literacy in this literature review.

This review combines information about teaching Native American students, the impact of learning styles on teaching, and curriculum design. Other topics include: information literacy, collaboration between teachers and

school library media specialists, research paper writing and Internet investigation. Instead of a meticulous review of all research in each topic, I discuss the research relevant to synthesizing a dynamically developing body of knowledge about how to train adolescent, Native American students to do meaningful research using the Internet as a research tool.

<div style="text-align:center">Setting and Perspective</div>

It is important for the reader to comprehend the context within which this study was conducted. The setting is that of a small rural high school on the Navajo reservation with approximately two hundred seventy-five students in grades nine through twelve. This school is located in an extremely remote location, over fifty miles from the nearest town with a library or bookstore. The importance of training Navajo high school students to exploit the Internet and the significance of the teaching methods selected to teach internet information literacy to Native American high school students will be established. Navajo isolation from libraries is reflected in distance from even the border towns such as Gallup, NM; Farmington, NM and Flagstaff, AZ. It takes five hours to travel from the east to the west of the reservation and three to four hours to travel from north to south. There are no public

libraries in this four thousand square mile area. The only

libraries are the school libraries. Most have outdated

books and few periodicals (Bruge, 1998). Teaching students

to locate and use information from the Internet improves

the resources available for coursework and class

assignments.

> "In 1946 three-fourths of the Navajo school-age
> population was out of school because of lack of
> educational facilities on the reservation. In the
> out-of-school group teenagers were growing to
> adulthood with no education at all…" (Thompson,
> H., 1975, p. 11)

This means that most of the grandparents of today's

high school students did not attend school at all. It was

not until 1974 that there were enough seats for all Navajo

school-age children to go to school. The parents of today's

adolescents went to school but very likely did not go

beyond 8th grade. Some of the students I teach are in the

first generation to graduate from high school.

The high school in this study was built as an Arizona

public school in 1973. This was over twenty years after the

elementary-junior high began to take pupils. Until 1973

teenagers had to go to boarding school or to live with

family members near reservation day schools to obtain a

high school diploma. In the first half of the 1970's no

public high schools were in operation less than sixty miles

away from the school in this study, such as those in Shiprock, NM; Chinle, AZ; or Kayenta, AZ. The other five secondary schools were even farther away. These educational institutions served an area larger than New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.

The boarding school era in Native American education began in colonial times and extends to the present day. The reservation day school began in the early 1930's. The aim of early Indian education was to civilize and Christianize the children with a deliberate and persistent effort made to erase the Native culture by separating them from their families.

Navajo children were not exposed to boarding school education until the first was built in Fort Defiance, AZ in 1883. That school was closed in 1959. Many Navajo teenagers still attend boarding schools in border towns such as Farmington, NM, Holbrook, AZ, and Tuba City, AZ. When I discuss this phenomenon with the parents I interviewed, who send their adolescent to boarding schools today, say that they are seeking the "best" education for their children. They describe "best" as being the education that will prepare their children to pursue careers and lives off the Navajo reservation. They feel that the only way for their

children to be able to get the education they need is off
the reservation (C. Kahn, personal communication, February
7, 2000; D. Yazzie, personal communication, November 1997;
M. Willie, personal communication, April 1999). As schools
are connected to the Internet and by that means to
resources outside the reservation it is possible that
parents will gain more trust of reservation schools and not
feel they must send their students away from home to get
the "best" education.

The literature indicates a majority of Native American
students do not succeed in the education system of the
United States. In fact as many as forty percent of Native
American students who enter the system drop out (McIntyre,
1996; Swisher et al., 1991; Brandt, 1992; Platero et al.,
1986; Wang et al., 1995). Many Navajo students report they
do not see a relationship between their lives and the
school experience (Indian Nations at Risk Task Force,
1991). The U.S. Secretary of Education's Indian Nations at
Risk Task Force found that Indian students are faced with,

> "an unfriendly school climate that fails to
> promote appropriate academic, social, cultural,
> and spiritual development among many Native
> students" (p. 7).

The adolescent students I have worked with in two high
schools on the Navajo reservation are very interested in

the Internet. They enjoy being able to email family and friends, locating information about personal interests, and now many of them enjoy using the Internet to locate and use information form schoolwork. I believe that access to Internet information helps them enjoy and feel more interested in school. Many students in the study made comments such as student 2.6 who said, "Being able to work on the Internet and have fun while doing it."

With the Internet they have access to the same information as any other high school students. I believe access to the Internet is an equalizer between urban and rural, rich and poor, and minority and majority students much as Carnegie's public libraries provided access to information to many underserved people in the last century. Many authors I read for this review would agree that connecting schools to the Internet is important and that locating information online is a basic skill for students to acquire (Senkevitch, 1995; Cotton, 1997; Benson & Fodemski, 1996; Bialo & Sivin-Kachala, 1996 & Di Giovanni, 2000).

Sometimes it seems that students must take on an anti-school identity and resist the assimilationist demands of the school in order to maintain a positive self-identity (Deyhle, 1992; Ogbu, 1987).

> "Schools have historically been used to suppress
> traditional cultures and to assimilate Indians
> into the dominant culture" (Reyhner & Davidson,
> p. 10). Reyhner indicates that it is "much more
> than building a curriculum around the local
> interests and culture of the learners. It must be
> understood in terms, not only of the traditional
> native culture, but also of its emerging
> identity, one that lives side by side with the
> mainstream culture" (p. 10).

The information on the Internet is universal. The students find considerable valid information on Navajo topics and other Native American nations, issues, and subjects are also easy to find. This Native American presence on the Internet is exciting to the students. I believe that it is also validating to their sense of identity.

The early curriculum of Native Americans education was acculturative & assimilative. (Adams, 1995; Cleary & Peacock, 1998; Garrett, 1999; Banks, 1997; Nelson, 1994; Reiff, 1996; Reyhner, 1994; Silko, 1997; Slapin& Seale, 1992) The educational experience for most Native American students was not affirming of their cultures. The goal was to force children to abandon their Native cultures and to adopt the culture of the dominant society. The harsh efforts at wiping out Native culture, described by Thompson (1975) and Adams (1995), did not work.

> "Despite federal efforts to assimilate Indians,
> to terminate their nations, and even to
> exterminate them, they have tenaciously and
> sometimes perilously held on to their distinct
> ways of life. Unfortunately, the American
> education system has, at times, participated in
> these harmful policies to the detriment of
> American Indians, Ben Nighthorse Campbell, quoted
> in the foreword of *Teaching American Indians
> Students* (Reyhner, 1992).

Beginning in the 1980's and continuing today many schools attempt to develop students who are bilingual. The expressed goals of these schools are to help students be successful in both their Indian communities and in dominant culture. (Cleary, & Peacock, 1998; Butterfield, 1994; Reyhner, 1992; Sorkin, 1978)

A primary ingredient of American Indian student success today is the ability to live successfully in both the American Indian culture and the majority culture (Cleary, & Peacock, 1998, p. 121-122). Because of the limiting effects of the Native American student achievement problems described in the introduction to this thesis, it is essential for all professionals teaching Native American learners to develop lessons that will maximize their success. There are three fundamentals to understanding Native American education. These essentials are the cultural influences, learning styles, and motivation to learn.

Native American Education & Learning Styles

Many writers maintain that Native American lack of success in school is an indictment of the American education profession (Thompson, 1975; Adams, 1995; McIntyre, 1996; & Banks, 1997). These authors address the need for educators to use a multiplicity of instruction methods to reach their students. The methods suggested visual approaches, holistic learning, a different sense of time, cooperative learning, cultural connections, different ways of showing respect, personal relationships between teachers and students, and developing a sense of competence in a step-by-step fashion before students must demonstrate that learning has taken place (McIntyre, 1996; Banks, 1997; Slapin & Seale, 1992; Swisher et al., 1991; Swisher & Deyhle, 1987; and Cleary & Peacock, 1998).

Early research into Native American education pointed out the need for opportunities for visual and holistic education (Swisher & Deyhle, 1987). As more researchers have studied Native American educational needs the themes mentioned above have arisen.

The Navajo Area Dropout Study (Brandt, 1992; Platero et al., 1986) was a very comprehensive study performed on the largest Indian reservation in the United States. It

showed that thirty-seven percent of students who planned to drop out were bored with school. Twenty-four percent of the school administrators reported students dropped out of school because they were not interested in education. The application of culturally sensitive methods of education can help the students be more interested in school. One example is NAL/LG who worked in the library and became proficient in the Internet investigation process. Her attendance improved from forty to over seventy-five percent when she became involved in the library research project in her Native American Literature class.

There are several cultural issues that impact on motivation to learn and effect the development of curriculum for teaching Native American students. These concerns are student anger at prejudice and efforts to assimilate Native Americans, different concepts of time between Native American and dominant cultures, the need for privacy for both praise and chastisement, generosity with possessions and efforts, direct eye contact is not respectful, humor is very important to good relationships, relationships between teachers and students need to be mutually respectful and the teacher needs to take personal interest in the students, and modes of inquiry are more often statements than questions.

One of the most important to accept and accommodate for is the anger many people feel as a result of prejudice and oppression (Anderson, 1988; Thompson, 1975; Cleary & Peacock, 1998; Szasz, 1977; Diamond, 1995; Silko, 1997; McIntyre, 1996; Slapin & Seale, 1992; Adams, 1995; Reyhner, 1994; Nel, 1994). These authors describe the history of Native American education that has attempted to eliminate their cultures and help the reader understand the reason for distrust and anger toward dominant culture. The school establishment is seen as part of the dominant culture rather than as part of Native American society.

A common Native American response to anger and to conflict is withdrawing, not saying anything, or just not showing up. I have experienced this from students who I had to correct for misbehavior around the computers in the library. One girl, who often came to use the computers before school, stayed out of the library for almost two weeks. When she returned I was friendly and we never discussed the incident. She came everyday for the rest of the school year. We did not discuss the problem but her behavior told me she was sorry and she knew from my behavior that there were no hard feelings. The importance of the relationship between students and teachers is

highlighted with this issue. The better the relationships

the easier it is to overcome the pervasive irritation.

> "Many American Indian people, who often find
> schools to be anxiety-provoking situations, are
> more apt to go into inactivity and to all of
> their senses to discover what is "proper, seemly,
> and safe" before acting with energy." (Cleary &
> Peacock, 1998, p. 32)

Because I teach skills the students are not sure are

important I see such manifestations of anger as an initial

response to lessons in the library occasionally. I help the

students understand the worth of the skills they are

learning. One way I make the library a safe learning

environment is to support students watching the search

process for a period of time before they try the skills for

themselves.

Students need to be given something they can be

successful at in small steps with small successes over a

period of time (Cleary & Peacock, 1998, p. 88). Many of the

researchers (Swisher, 1991; Nel, 1994; Reyhner, 1994; and

McIntyre, 1996) support the statement below.

> "The Indian way of behaving is: watch and
> observe before you act. Don't make a fool of
> yourself in front of the group because of the
> shame culture. Observe, and once you know what's
> expected, then act, but you never want to show
> off because it's not good taste to pound your own
> drum." (Cleary & Peacock, 1998, p. 31)

A manifestation of withdrawal from school that affects this study is low attendance rates. The low attendance rate affected my curriculum because many times students were not present for one or more of my lessons. I sometimes speak at cross-purposes with students because I am not aware that individuals had been absent. This led to misunderstandings and student retreat from the learning process. As I became aware of the problem of absenteeism I began to do reviews of the previous lessons so that I did not single out individuals for remediation. This improved my relationships with students.

The concept of time among Native Americans is that time is omnipresent (Cleary & Peacock, 1998; Nel, 1994; McInerney, 1995 and Sorkin, 1978). To many students this means that they have all the time in the world to work on a task. This is in contrast to the dominant culture linear concept of time and important deadlines. These different points of view on time lead to several disruptions of the school environment. The one that affected the study was the seeming inability to stay on task and get work done on time. Several attempts were made during this study to help students complete the assigned work. The most beneficial assistance is the use of Inspiration software to create

mind-maps with the computer (Inspiration, 1996). This is discussed in detail in chapter four.

Some students seem reserved and reticent to talk. This is another demonstration of the sit-back-and-study-the-situation approach to learning. Another aspect of this reserve is to need both praise and rebuff in private (Cleary & Peacock, 1998; Nel, 1993; Adams, 1995 and Slapin, & Seale, 1992). I found that students are more receptive to any personal comments in private. I observed students seem to act out more if reprimanded in public and to be less willing to do academic work if praised in public. A student in world history WH/JB was initially very resistant to the project to the point of having to be sent to the office by his teacher. After we had a private discussion about the assignment he came regularly and was willing to do errands for me.

The Navajo students I work with are very generous with their help of each other to the extent of doing work for each other without seeing anything wrong with the behavior. ALS/RH, a student in American literature and speech, often helped her friend who was a special education student rather than doing her own work. She indicated that helping her friend was more important than graduating on time. This generosity of spirit and belongings (Clearly & Peacock,

1998; Silko, 1997 and Garrett, 1999) is an aspect that makes working with these students enjoyable for me. It is important to build in opportunities to work collaboratively to allow them to practice this cultural value appropriately.

Not looking at people directly for any length of time is another cultural practice that requires understanding. (Cleary and Peacock, 1998; Adams, 1995 and Reyhner, 1994) Often students do not seem to be paying attention because of this looking away behavior. I have had to find other ways to assure that I have been understood instead of insisting that students look at me continuously.

Humor is very important in working with adolescents and this is especially true with Native American adolescents (Cleary & Peacock, 1998 and Garrett, 1999). An insult I have heard many times is "he can't take a joke." I have found that making fun of myself is especially important in putting students at ease with me.

> Many of the authors have noted the importance of a personal relationship between teacher and student. Deyhle (1992, p. 30) describes how students who experience "minimal individual attention or personal contact with their teachers" translate that into an "image of teacher dislike and rejection." (p. 30)

After reflection I believe personal relationships between students and teachers can best be categorized as mutual respect and appreciation. Students need to feel recognized, acknowledged, respected, and accepted for just who they are, not whom the teacher thinks they should or could be.

Students need to understand and feel that the teacher cares about their success and happiness individually (Cleary & Peacock, 1998; McIntyre, 1996; Nel, 1994; and Wang, & Kovach, 1995). "Caring nurturing are the most important elements in preparing a person for life…" (Aronilth, 1991, p. 74)

I have noticed this repeatedly in the students I teach. When they realize I care about them personally they attempt new activities they have avoided before. One example is a student, LIB/CT, who habitually wrote only one draft of papers assigned. She said she did not want to know about and correct her mistakes. She would turn in only one draft and wanted that one to be graded. I shared repeated versions of a report to the school board with her. She tried the multiple draft process subsequently, with good results.

Mainstream Americans ask questions to inquiry about a area of interest. American Indians sometimes come to

understand a subject by commenting and waiting for explanations, rather than by asking questions, "comments and observations are the same as questions and concerns" (Cleary & Peacock, 1998, p. 34). Once I began to say, "Does anybody have a comment?" at the point I used to ask, "Any questions?" I began to get more feedback from students. I have found that simple availability leads to discussions with students. They don't want to call attention to themselves by raising their hands or interrupting what I am doing.

I have found that it is important that I not be doing any other librarian's task during information literacy lessons. I have found that I need to practice status of the class (Weaver, 1992 & Short & Burke, 1991). I walk around and join student formal or informal groups periodically during the sessions for best communication and interaction. In terms of information literacy I propose making statements for investigation rather than questions for examination to accommodate for this Native American perspective on modes of inquiry.

Anderson (1988) is mentioned in almost all the bibliographies I reviewed on the subject of teaching minorities. He wrote about the needs of minority students. He indicates that teachers should to adapt their styles of

teaching to accommodate how the cultures of their students communicate, think, solve problems and behave.

I read Aronilth (1991 & 1994) to understand the Navajo philosophy of learning. He notes, "We learn mostly from the past, we are trying to prepare for the present; we are planning for the future." (1991, p. 62) He and others (Sun Bear, 1991 & Nelson, 1994) describe worldview from the four cardinal directions, east, south, west, and north.

	East	South	West	North
Traditional educators	Create interest in the minds of students by demonstration and illustration	Teach by talking students must strive to understand the teacher	Promotes self education to accomplish own goals and objectives	Presents exciting topics and storytelling
Goals of lessons	Understanding of the task	Develop and build a foundation	Working for success in life	Feeling good about endeavors
Aspects of Motivation	Ability to plan, implement, and think correctly	Faith, planning, discipline, resolve	Love, social development, identity, support	Interest, desire, enthusiasm, hope,

Table 2.1: Comparison of Teaching and Learning needs from a cardinal directions or medicine wheel point of view.

According to Aronilth (1994) Navajo learning is shaped by the individual's desires. It is important to have personal relationships and understand student motivation in order for the teacher to make learning applicable to the student. When I specify the connection between the skills I teach and the students succeeding in the dominant culture,

the students pay attention and work hard. This was an important understanding I gained in the second phase of the study.

An element of meeting cultural needs proposed by *Continuous evaluation of Native education programs for American Indian and Alaska* is "authentic work" (Nichols, 1991). This term describes tasks that students consider meaningful, valuable, significant, and worthy of one's efforts. By this standard, students master essential tasks instead of recalling basic facts.

> "This style of learning is well suited to many tribal groups that respect an individual's ability to learn from experience, without constant supervision and correction" (Nichols, 1991).

Teachers who give their students real audiences and real purposes for writing will help their students develop the ability to decontextualize, or demystify, their thoughts by giving them real people to have in their minds while writing (Cleary & Peacock, 1998, Garrett, 1999). I find I must teach students to decontextualization or to demystify the academic content they present about the information they have found. They have to articulate experience and information so that those out of the context, away from where they physically are, will understand what they mean. In the case of students

presenting their findings from their searches, it means communicating what they have found to others who have not been exposed to the information.

I think that we who teach Native American high school students need to teach them to do academic activities in ways that are acceptable in dominant culture. In terms of information literacy I often explain the linear logic of Internet websites, keyword and Boolean search processes (Rodrigues, 1997; Todd, 1995; Wishnietsky, 1992, 1993 & Kessle, 1992).

Motivation is defined as giving a reason to act. (Encarta, 1999) Some Native American students may have failed for so long in school that they will be initially resistant or even feign boredom rather than turning out to be enthusiastic student. They may be irresponsive for some time even to the most relevant curriculum. One cannot expect instant miracles with students who have had a history of disenchantment with school (Cleary & Peacock, 1998, p. 206). Maybe saying "no" to doing a worksheet is the only power a student has. As human beings, we all need to feel some sort of power and ownership in our life (p. 207). Classrooms that adopt active, project-based experiential learning address learning from all angles and all learning styles (p. 164).

In their discussion on learning styles Cleary and Peacock (1998) suggest that overgeneralization is risky. By that they and others (Woods, 1997; Reiff, 1992; Swisher & Deyhle, 1987 and Gollnick, 1991) seem to be saying that there is not one learning style for Native Americans. They do agree that there are Native American students who need learning environments as described in this literature review.

<div align="center">Curriculum Development</div>

A mismatch occurs when the students' culture is more global, holistic, and field dependent than the experiences at school (Anderson 1988).

> "Schools in general have expected learning styles to be more analytical or field independent, and some learners whose styles may be more relational, global or field dependent/sensitive have not done well in our schools" (Swisher 1992, 76). We need to understand, adjust for, and respect individual learners and their cognitive styles (Reiff, 1996).

Reiff, Cleary & Peacock, and Swisher describe Native American students as global or field dependent learners who have strengths in summarizing, comparing, and remembering by visualizing concepts in their entirety. They are apt to be distracted by irrelevant cues instead of being able to pay attention to the details of the subject being learned.

The following suggestions should benefit those students who

might have the nature of field dependent learners.

Field dependent students need:
1. To learn concepts in context with visual cues rather
   than in isolation from the larger picture.
2. Help separating important information from less
   important details by understanding the background and
   purpose of the task, predicting outcomes of the
   process being learned, and explaining their answers to
   questions.
3. Help organizing material, with outlines and summaries
   of new information and integrating new concepts with
   previously learned material.
4. Instruction on mind mapping, webs, note taking, or
   paraphrasing to organize and analyze various topics.
5. Modeling, guided practice, personal examples, stories,
   and anecdotes to understand the individual aspects of
   the skills.
6. Group activities promote cognitive as well as
   affective learning: brainstorming, group
   investigation, simulations, peer teaching, and think-
   pair-share (Reiff, 1996).

The 4MAT (McCarthy, 1987) system of curriculum design

is based styles of perceiving and responding to information

experiences and global and analytical viewpoints of

learning. Learners experience and take in information by

feeling or thinking and respond to that information by

either watching or doing. Feelers perceive experiences

concretely while thinkers perceive experiences

conceptually. Watchers process information reflectively

while doers process their information actively. (p. 26-29)

The steps of the 4MAT system of curriculum are:
1. An experience that provides a reason to learn the
   material to be presented

2. Students reflect on that experience to develop personal motivation to learn
3. Lesson on the content and or skills
4. Integration of past experiences and knowledge into the material presented
5. Examine and formulate thoughts and feelings about the concepts presented
6. Work with concepts and skills learned
7. Students "add something of themselves" by using the resources and procedures
8. Students make an verbal, written and/or graphic presentation of their learning (McCarthy, 1987)

I think this progression is an effective method of teaching. It seems to accommodate all types of learners and helps them learn to work in ways that are comfortable to their learning, processing and viewpoint styles, at least during portions of the learning process. It also gives students exposure to styles not their own, which can help them extend their natural capacities.

"The essential nature of curriculum and instruction is the activities of the classroom (Walker, 1990; Short & Burke, 1991; Goodman, 1986).

Short and Burke describe (1991) *Intuitive curriculum* (emphasis theirs) as arising out of what we feel is right and comfortable. As the learners and teacher participate in planned learning activities, tension arises out of unfulfilled needs. This leads to an awareness that the curriculum must be adjusted and a new curriculum is envisioned and written. They indicate that much of this

process happens on an intuitive or unexpressed level and the teacher simply adjusts the curriculum to meet the needs of the learners in the environment. This concept of intuitive curriculum describes the process of the first phase of this study. I tried many approaches to teaching information literacy content and added both content and changed approaches based on my observations of students and discussions with students and teachers.

Short and Burke (1991) suggest that the learners should be intentional, or deliberate, in the choice of the topics to explore. They describe an "authoring cycle" that is applicable to teaching information literacy. The key components of this cycle are choice, personal intention, collaboration, and invitation to take the subject deeper. The intuition is in the area of knowing the topics that will excite and engage the learners and the planning is in keeping the process going.

Curriculum is what students and teachers do in the classroom. For Short & Burke it is also the teacher preparation and student homework done outside the classroom. Many researchers into curriculum design would agree with the approach to creating curriculum described in the following two paragraphs (Weaver, 1994; Atwell, 1987; Goodman, 1986; Tharp, 1982; Rogers, 1998 & Nelson, 1994).

The beginning of the curriculum building process is thinking and research to plan the lessons. The execution of the lessons, the classroom activities and interaction between teachers and students are considered curriculum building as well. Demonstration of the material learned leads to the assessment of learning and to understanding the effectiveness of the lessons. Finally, the curriculum is revised based on the intuitive and formal assessment of the results of the lessons.

The purpose of curriculum is to give students the tools they need to deal effectively with the world. The teacher instructs, facilitates learning, and helps students to persevere through risks associated with learning. Most of all, the teacher motivates students to learn by sharing her or his passion for the subject and for learning.

The *Teaching for Understanding Guide* (Blythe, 1998) describes a cycle of teaching. Her model starts with a topic that will generate exploration and study. Her definition of such a topic includes a requirement that the subject be interesting to both teacher and student. This seems important, as part of a teacher's effectiveness is a passion about the subject, especially in secondary school. Another feature of her model is ongoing assessment, not assessment only at the end of a project. Projects often

fail because formal feedback is offered only at completion,

or the time line for the project is too long without being

broken into sub tasks. Blythe has an elaborate form that

could be useful in planning a unit but seems excessive for

planning day-to-day lessons.

Nelson (1994) studied Dine' philosophy with a group of

Navajo college students and created a curriculum tool for

holistic lesson planning. She uses the wisdom of the

Medicine Wheel of Native Americans and specifically the

Dine'. Some principles of the her wheel approach are

1. The four cardinal directions are central to the wheel.
2. People begin in the east when using the wheel.
3. Wheels have divisions that are multiples of four.
4. Each point on the wheel must be addressed to achieve balance.
5. A clockwise motion around the wheel is important.
6. By attending to each point on the wheel, a person can move into the center of a circle, which is an integration of all the energies combined. This creates power and strength. (Nelson, 1994, p 27)

Direction	Skills	Definition	Examples
East	Practical	Learn Concepts	Navigation of Internet
South	Technical	Develop Concepts	Stages of Inquiry
West	Conceptual	Comprehend Concepts	Searching for Information
North	Creative	Synthesize Concepts	Present Information

Table 2.2: Wheel Model of Teaching Information Literacy
(Nelson, 1994)

She suggests that cooperative groups and independent

work are both effective classroom activities for teaching

Navajo students. For her the most profound way for Native

American students to express learning is through art.

Nelson describes the process of incubation as the creative

recombination of information in memory to create insight

(Nelson, 1994). Applying the concept of incubation to the

curriculum created in the study was accomplished by helping

students stay on task and complete the various stages on

time. In this way the students had time to think about what

they had learned and creatively present the information

they found in their searches.

Rubin (1983) describes the effective teacher having

these characteristics: knowledge in subject area, verbal

ability, good educational background, ability of read with

skill, positive expectations and attitudes, good planner,

knowledge of motivational techniques.

The principles that are described by Goodman (1986) that

have being on teaching information literacy are:

1. Integration of language and content in the curriculum
   to maximize opportunities for pupils to engage in
   authentic speech and writing events while they study
   the content material that is interesting to them.
2. Students have choice because it is useful,
   interesting, or fun. They create activities that are
   their own - not just school work or to please the
   teacher
3. Involves pupils in planning and gives them choices of
   authentic, relevant activities with productive studies

In terms of curriculum, it is important to note that

what the teacher focuses on is what the students focus on.

John Dewey was the founder, in the United States, of the authentic education movement (Boydston, 1980). He says arts and literature represent the keys, which will unlock to the child the wealth of social capital, which lies beyond the possible range of his limited experience (p. 77). Access to the Internet is essential for Navajo reservation students as many fields of knowledge are outside the direct encounter of these students. Dewey describes the Library as the center of the school and of the learning process (Dewey, 1980). Repeatedly John Dewey refocuses educators' attention to the needs of the child (Dewey, 1980). It is no accident that he needs to be so explicit about this focus. Many teachers I have personally come into contact with still think teaching is about teachers, when it really is all about children.

Weaver describes a plethora of activities to help student to think and to develop their literacy skills: 1) demonstration, 2) guided participation, 3) individual practice, and 4) performance. All these activities apply to information literacy classes as well (Weaver, 1991).

Another curriculum skill incorporated into this curriculum is that of the mini-lesson. This is the 10 to 20 minutes lesson that is followed by independent work, reading, writing, researching or discussion. The teacher

informally interacts with students while they are doing independent and small group work. This interaction with students is called status-of-the-class method of interaction with the students. Atwell (1987) describes mini-lessons as an opportunity to share personal knowledge, create a communal frame of reference, and create opportunities for students to do their own searches and to teach by modeling. The teacher ceases to be the center of attention. Instead the subject, topic or material becomes the focus. Mini-lessons are teaching methods that work well with secondary students. The status of the class format gives the teacher a more intimate, and most likely more fulfilling, relationships with his students.

Vygotsky formulated the concept Zone of Proximal Development (ZPD). Knickelbine (1996), Moll, (1989) and Goodman (1992) have expounded upon it. Good teachers know when an activity is too easy or too hard for an individual student or a group of learners. Understanding the concept of flow or ZPD will help teachers plan appropriate activities to keep students motivated and keep them from being overwhelmed.

The patterning process of critical thinking is a response to stimulus from our environment. There are two types of stimulus: Each is associated with chemical

changes in the brain that control our emotional responses and our integrative, conceptual thinking: Distress - causes fear and set off "fight or flight" response, interferes with thought even to the point of shutting it down; Eustress - generates curiosity and stimulates our engagement with our surroundings - stimulates critical thinking (Critical Thinking and Literature-Based Reading, 1997). "A high level of anxiety inhibits learning" (Alexander, 1988, p 406).

In developing the Internet information literacy curriculum, it was important to take these theories of ZPD and stress into consideration. In fact one principle of this type of curriculum is not to overwhelm students. In developing scope and sequence for Internet information literacy skills instruction the following are essential to success: avoid overload, transfer the Internet navigation and search skills to other subjects, teach the skills across the grade levels, teach umbrella or overview skills, and go slowly. (Brandt, 1989, p 100)

If the material is within the learner's ZPD then the learner is most likely to make meaning and be able to go on. If not then the distress of the situation may cause the process of learning to shut down.

One important aspect of any Internet information literacy program is the selection of topics that students can feel an affinity for, or in other words, that are real (Brandt, 1989). The process of reading the information from the Internet and responding to such information is the development of critical thinking. The ability to think critically leads one to academic success. One could also argue that this critical thinking leads a student to success in any endeavor in life. Therefore, the use of Internet and real information literacy experiences helps to create a society of thinkers that can deal with any changes that they might have to deal with in their lifetime. I believe that this is the type of education that Dewey envisioned.

Information Literacy

Information literacy instruction is a specific type of curriculum that is influenced by the standards of the American Association of School Librarians. These standards were created in cooperation with the Association for Educational Communications and Technology. These were published in 1998 and can be found on a link from the American Library Association website, www.ala.org.

Standards-based curricula are programs of study based on content standards as identified by experts in the field.

Content standards identify what students should know and be able to do. Performance standards indicate the level of achievement expected for each content standard in the curriculum. (Glatthorn, A.A., 1998) The information literacy standards inform the lessons designed for this study (AASL & AECT, 1998). There are nine standards described on the ALA website (ALA, 2000) and in the book *Information Power* ((AASL & AECT, 1998). These standards define the abilities students need in the information age. The standards fall into three categories. These categories are Information Literacy, Independent Learning, and Socially Responsibility. The text of these standards can be found in Appendix B. of the study.

Authentic learning experiences are recursive. The learner jumps around, skips steps, and comes back to earlier moves. Learners work their way flexibly through the learning process. They activate their prior knowledge, acquire new knowledge and actively process the knowledge to construct meaning. They organize information and knowledge with their own strategies. If students cannot represent their new knowledge, they have not fully understood it. The process moves to its conclusion by solving a problem in a social context; evaluating that solution; and communicating and demonstrating that knowledge. This process describes

the way students learn and use information literacy for inquiry-based projects.

"Research should be fun rather than a grind and one should believe in its relevance and value," (Keen, 2000). The authentic process of making meaning from information located on the Internet is fun according to the students. "That it was fun. And you find lots of things like pic, info, and others," says student 1.3 in this study. Student 1.19 wrote, "Well, it was good and fun because I always learn more."

Loertscher & Blanch *(1997)* summarize the research in the Information Literacy movement in their online article *The Information Literacy Movement of the School Library Media Field: a Preliminary Summary of the Research.* They repeatedly reference the work of Kuhlthau (1985, 1988, 1989, 1993a, 1993b, 1994, 1996a, 1996b, 1999) and Eisenberg (1988, 1992a, 1992b, 2000) as making important contributions to the field of information literacy in schools. In addition to the AASL & AECT standards for student learning, these authors focus on the what students know and are able to accomplish when conducting inquiries for inquiry based projects. Their conclusions are that there are four major areas of outreach for professional library media specialists. These are "basic literacy

(reading), collaboration with teachers (resource-based teaching and resource-based learning), information literacy and enhancing learning through technology" (Loertscher, D. & Woolls, B., 1997, p. 19). They describe the role of the library media specialist as an information professional essential for schools using the inquiry method. They further describe "school libraries as the foundational elements of the constructivist philosophy (of education) and fully prepared library media specialists are key personnel of a successful program to restructure education." (Loertscher, D. & Woolls, B., 1997, p. 19)

One comment essential to my study is the importance that Loertscher (1996) attributes to the consumption of information. By this he means time should be spent reading, viewing and listening to information. He indicates that too many students jump over this step. After the information is located they rush to create the product of the project or assignment. He indicates that this step is missing from the information literacy stages of other authors. I discovered that students need assistance with understanding the information they find. There is workshop time incorporated into the sessions in this study is for consuming information.

The content of the original curriculum for the information literacy lessons of the study were based on the stages of library research described by Carol Kuhlthau (1985). As I continued to read her work I realized that her focus on the affective nature of the search for information is appropriate. I watch students progress from anxiety to a stand still to enthusiasm as they choose a topic, pick a focus and begin to find information interesting to them. Not all students encounter the same level of anxiety or enthusiasm, but most do experience these emotions during their searches.

The Kuhlthau's Information Search Process (ISP) (1985, 1988, 1989, 1993, 1994, 1996, 1999) may be thought of as occurring in six stages: Initiation, Selection, Exploration, Formulation, Collection and Presentation. Her research has revealed that people experience the process of information seeking holistically as interplay of thoughts, feelings and actions. Kuhlthau's studies (1993b & 1996b) were among the first to investigate the affective aspects, feelings, during information seeking along with the more commonly studied cognitive and physical aspects. One of her more surprising findings was "the dip" after a search had been initiated during the exploration stage (1993b).

Kuhlthau (1985, 1988, 1989, 1993, 1994, 1996, 1999) identifies six stages; Initiation, Selection, Exploration, Formulation, Collection and Presentation. The names of the stages represent the primary task at each point in the process. The purpose of the Initiation phase is to understand the assignment and begin to look for a subject of inquiry. Selection is to choose the topic of the investigation. During Exploration the student locates information about the subject of the assignment. After adequate information is found the student can Formulate a focus for further inquiry. Then information is Collected to begin to create a product to demonstrate learning in the project. The end product of the assignment is the Presentation.

The sequence of tasks is recursive and asynchronous rather than linear, as the process proceeds from initiation to completion of the project. Students work among the tasks rather than applying the same energy and time to each of them. This is especially true of the choice of topic and focus. Often students choose a topic, locate information about the topic and decide that there is too much or too little information to continue. They then go back to the task of choosing their subject of inquiry (Kuhlthau, 1985, 1988, 1989, 1993, 1994, 1996, 1999). The Duke library's

website (Hull et. al., 2000) also notes the asynchronous nature of the library research process. For many library researchers, the search process is linear, beginning with choosing a topic and ending with citing sources. For other library users, the process is not so straightforward.

It is very important for students to not be left to proceed through this process alone. They need the support of adults, the teacher and librarian, and the other students to persevere and overcome the "uncertainty" encountered (Kuhlthau, 1993a, 1994, 1996, 1999). The zone of intervention, based on Vygotsky's zone of proximal development (Goodman, 1992; Wood & Wood, 1996), is another of her concepts (Kuhlthau, 1996b). The information specialist needs to observe the students, develop relationships, and provide help when the students indicate they need it. With my subjects, need is not often indicated by direct questions. Instead, need is indicated by body language and comments such as, "this is boring", "there's nothing on my subject", or "I'm going to change my subject."

I found the constructive philosophy of the pattern of inquiry is valid (Kuhlthau, 1985, 1988, 1989, 1993a, 1993b, 1994, 1996, 1999). I added two phases, preparation and evaluation. The preparation stage is to help the students

understand the information they find and organize their

thoughts about their subjects. Because the school has an

inquiry learning philosophy it is important for the

students to regularly improve their investigation skills.

The evaluation phase is important to the discovery of the

skill levels of the students and to help them apply what

they learn about the process in their reflections.
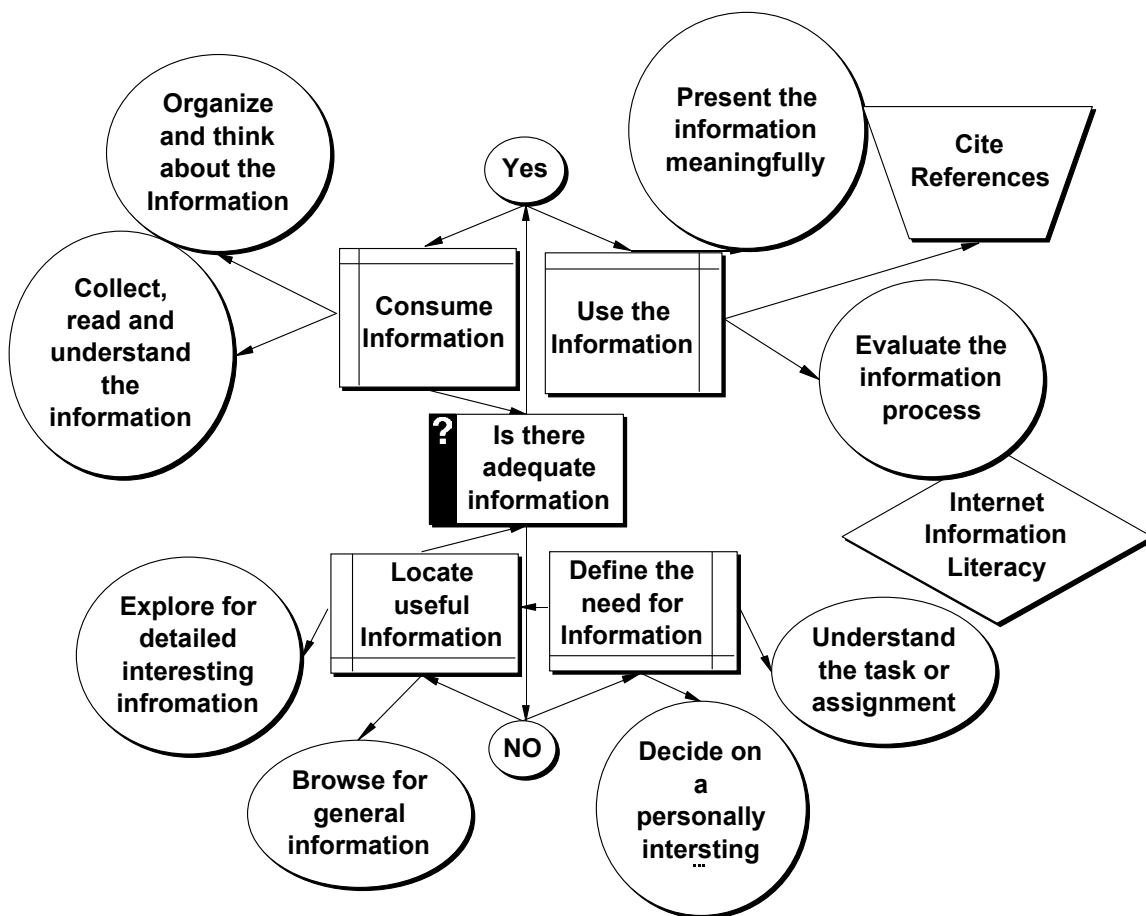
Table 2.3: Graphic Description of the Lindsey Internet
Information Literacy Investigation Steps

The Big 6 Skills approach, (1988, 1992, 2000) produced

by Eisenberg and Berkowitz, is another of the prime

strategies for information literacy found in the
literature. An online overview of this problem solving
approach indicates that the six basic steps are Task
Definition, Information Seeking Strategies, Location and
Access, Use of Information, Synthesis, and Evaluation. Each
step has two components, commonly referred to as the
"little twelve." This curricular tactic is similar to the
4MAT approach in that each step includes both a process and
a content aspect. It involves thinking about the problem
and acting on the thoughts. This method does include a
component of engaging the information by reading, hearing,
and viewing the material.

The Big Six (Eisenberg & Berkowitz, 1988, 1992, 2000)
is an information literacy curriculum, an information
problem-solving process, and a set of skills, which provide
a strategy for effectively and efficiently meeting
information needs. There are suggestions on teaching the
stages and techniques on the website, www.big6.com. One of
the similarities between the lessons I teach and this Big 6
curriculum is the use of a computerized brainstorming or
idea generating software.

The assignment organizer, on the website at
http://www.standrews.austin.tx.us/library/Assignment%20orga
nizer.htm, is a useful tool for more advanced or students

with a higher need for structure. I have not insisted on

its use, but have suggested organizational methods for

students doing longer projects.

The principles of teaching the Big 6 Approach

(Eisenberg & Berkowitz, 1988, 1992, 2000) include

understanding how the explosion of information available on

the Internet creates the need for students to become

information literate.

An information literate environment engages students

in active, self-directed learning activities. Teachers need

to facilitate learning by looking for resources to enrich

the learning environment. Teaching in a resource-based or

inquiry-based way creates a coaching role for the teacher

or librarian and places the students in the center of their

own learning. This is another way to describe authentic

learning experiences. The Mankato Schools have an online

Information Literacy Curriculum Guideline at

http://www.isd77.k12.mn.us/resources/infocurr.

Many information literacy practitioners and

researchers have proposed stages of the research process

and constructivist philosophies of curriculum development

for information literacy teaching. (Pitts, 1996; Druce,

1990; Bleakley & Carrigan, 1994; Caspers & Davidson, 1997)

Library media specialists "should bring their knowledge of

research, teaching methodology, curriculum development, learning theory, and instructional development to the process of teaching." (Pickard, P. W., 1993) The literature goes further in applying the terms instructional leader and instructional innovator to the library media specialist (Bleakley & Carrigan, 1994).

<div align="center">Internet Information Literacy</div>

Pitts (1996) conducted research related to information-related problems of teenagers. Many teenagers do not have the prior learning needed to seek, find, use, and communicate information to solve problems they face. This lack of information use experience implies the importance of teaching thought processes and techniques of information investigations on the Internet to adolescents. Finally, the Pitts research (1996) highlights students' prior learning and skills affects and interacts with new learning. Teachers and library media specialists must develop strategies to identify prior learning and address it within the Internet information literacy learning lessons.

Left to chance, the opportunities presented by the new Internet technologies will elude the same groups who have been underserved by the computer revolution. Inclusion of these groups will not happen automatically, and exclusion

will have dramatic consequences for both individuals and society (Neuman, 1990). To bring opportunities for equity to life in the day-to-day business of the school, someone—the school library media specialist—must exercise awareness, commitment, leadership, planning, and careful implementation of a process model of teaching information literacy. Without such a catalyst, equitable participation by all students will be an illusion (Neuman, 1990).

Introducing technology into the learning environment has been shown to make learning more student-centered, to encourage cooperative learning, and to stimulate increased teacher/student interaction (Bialo & Sivin-Kachala, 1996). Holloway, Doyle and Lindsay (1997) say, "Information literacy is best thought of as verb, a way of doing information." They translate this notion of a verb into the area of telecommunication. Information literacy in telecommunications is achieved when learners know when to use on-line resources, how to access information competently, how to evaluate information for accuracy and significance, and how to use this information to communicate effectively. Learners who are able to conduct inquiries with telecommunications, the Internet, have life long skills to meet the challenges of the information age (Holloway et al., 1997).

As online information literacy skills become increasingly important in this information-rich society, these skills will become vital to children as well as to adults. "There is no longer any question that knowing how to seek information electronically will be an essential skill for all individuals," (Aversa & Maneall, 1989, p. xiii). Eleven years later this idea has proven to be true.

Understanding how learners interact with and use the unique capabilities of each medium's format is essential to understanding the effect of media on learning (Kozma, 1994). This is a joint responsibility of teachers and school library media specialists.

Gross & Kientz (1999) focuses on the creation of authentic learning through collaboration of teachers and teacher-librarians. Collaboration is not to be confused with either cooperation or coordination. While cooperation and coordination may represent appropriate stepping stones toward collaboration, neither carries the same degree of commitment to a common mission and comprehensive planning (Gross & Kientz, 1999).

For librarians to become instructors and to collaborate with teachers they need to learn about ourselves and others, about new and emerging technologies and about the processes of teaching and learning. (AASL &

AECT, 1988) Thoughtful learning demands collaborative planning and teaching between the library media specialist (the process specialist) and the classroom teacher (the content specialist). Therefore, not only must teachers and library media specialists collaborate, but they must teach each other their own areas of expertise (Stripling, 1995). Collaboration with teachers is an area of public school librarianship that needs investigation and development. (Lynch, M. J., 1995; Haycock 1995; Stripling, B. K., 1995; Van Deusen, J. D. & Tallman, J. I., 1994; Wolcott, L.L., 1994; Wolcott, L.L., 1996; Gross, J. & Kientz, S., 1999).

CHAPTER 3: METHODOLOGY OF THE RESEARCH

Background of the Research

This study traces the development of a curriculum for teaching Navajo/Dine high school students to develop skills for gathering, evaluating, and using information. The focus of the curriculum is on the student's skills for locating information on the Internet. The hypothesis is: If an Internet Information Literacy curriculum is established teach to Navajo high school students, then the students will be able to incorporate current, accurate, interesting, complete, and meaningful information into their coursework, because the instruction on utilizing the Internet as a search domain for course-related inquiries will teach them to identify the need for information, locate information by browsing and exploring, consume information by reading, forming opinions, and taking notes, evaluate and collect information that corresponds to the focus of their investigations, prepare graphic organizers and outlines about the information found, document the information used by citing references according to the appropriate methods, share the interesting details of the information found in writing or speech, and reflect on their personal information use process for the purpose of improving that course of action.

Terminology

Important terms to this study are: Internet

Information Literacy, Curriculum, Navajo, search domain,

and inquiry-based projects. Internet information literacy

is the process of investigating and using information from

the Internet in class work. Curriculum is both the content

and the teaching methods used to teach. The Navajo people

are Native Americans who live in the southwest part of the

United States. Their reservation is largely in northern

Arizona and extends into southern Utah and the northwestern

section of New Mexico. They are the largest group of Native

Americans with a rich culture and history. A search domain

is a location where information can be found using known

methods. During inquiry-based projects students search for

information to learn about subjects and topics and complete

a set of objectives set by the instructor.

Rationale

Teaching is essential to our society as a method of

socialization. The Internet is a phenomenon in more than one

way. It is a marvel of inventive technology. The Internet is

also is having a profound influence on both education and on

our culture. Members of the education community, students

and teachers, need to learn to locate information on the

Internet effectively and efficiently to be successful in the

information age. I did this study to develop valuable

instruction means for teaching my students locate of information strategies for inquiry-based projects. I selected this study because it was interesting to me, because my reading and practicum led me to believe Internet navigation and exploration techniques are vital skills for high school pupils to learn, and because my students, who live in an extremely isolated community on the Navajo reservation, want, as well as, I believe, need to be able to proficiently explore information on the Internet.

<div align="center">The Research Method</div>

I chose a program evaluation - participatory action – constructivist (Whyte, 1991) approach for this research because it best suited the examination of curriculum development.

<div align="center">Program Evaluation</div>

The program I evaluated is the influence the curriculum has on students as well as student effect on curriculum. The participatory action is my direct involvement with teachers and students and by applying knowledge gained while in the research process. The curriculum is made relevant through the invested interests of it users or is grounded in the process of its construction. The constructivist approach includes the participation of the research subjects having influence over curriculum design. In other words, curriculum is an emergent social research action rather than a fixed investigative treatment.

Participatory Action

The participatory action study of social phenomenon places me, as librarian, in a dynamic role with both teachers and students. I am a participant in the teaching and learning process rather than an observer of the interaction between teachers and students. I collaborate with teachers to create the lessons, teach the lessons, adjust the lessons to respond to what I learn about teaching library and Internet exploration skills, and interact with students on a personal basis. For Whyte (1991), participatory action research is applied research that allows the researcher to develop a better perception of social phenomena and apply that understanding to the observable social fact being studied. A main feature of participatory action research is the involvement of organizational members actively in the research design. An assumption of this method of research is that both the organizational members and the researcher want to develop valid conclusions, to bring unique insights to the issue being studied, and both desire to change that social experience.

Constructivist Approach

In this study the teachers are the organizational members who are actively involved in the research process, development of the curriculum. The change we both desire is an improvement in our students' ability to conduct

inquiries on the Internet effectively. The curriculum that evolved from this study would not have occurred without the active collaboration of teachers in planning the lessons.

In the constructivist approach, the notion of involving research subjects and others in the design lead to constructivist inquiry, which uses an interactive research process, focused on gradually developing a shared perspective on the problem being evaluated. (Guba & Lincon, 1989, p. 42-44) The problem of this study is how best to write a curriculum that will be structured enough to be useful and flexible enough to meet the needs of teacher and students in four grades and across high school academic departments. The research method of constructivist research enables me to apply what I learn to the continual development of the research design, the curriculum. Curriculum must be an ever-growing social phenomenon.

The consensus the teachers and I worked toward were both the focus of the lessons I taught and the procedure in which those lessons were given. We also evolved agreement on the class work the teachers assigned. Thus, we gradually developed a shared perspective on the curriculum. The program evaluation method of research reports on the implementation and effectiveness of such a social project. This method is also called evaluation research. The project

or program that is evaluated in this study is the development and effectiveness of the lessons to teach Navajo/Dine high school student Internet information literacy.

Theoretical Concerns

"While elements of a program evaluation resemble experimental work, there are some major differences. Evaluation research projects are usually applied research, based on needs assessment, and the treatments are usually subject to changes during the course of the evaluation." (Patten, M., 1997, p. 23)

Applied research is conducted to "influence the design of social programs" (Schutt, 1996, p. 34). Curriculum is a social program because it involves the exchange of ideas between students and instructors. I applied the findings of the collaborations with teachers and observation of students to decisions about how to modify the curriculum.

Each time a curriculum is delivered the lessons are redesigned to be compatible with students' needs and instructor's knowledge. Curriculum is a social program in a state of ongoing development determined by the students and teachers involved, the instructional needs of those students, and the emerging knowledge of the instructor.

Therefore, applied research is an appropriate methodology for investigating curriculum development.

A needs assessment is nonexperimental research in which we try to determine the needs of those who will be served by the programs. The study's first phase was the needs assessment portion. I collected information during the course of the program through discussions with the collaborating teachers and observations of students to assist me in the process of modifying the curriculum.

Traditional experimental research does not allow design changes during the experiment. In program research the adaptations are essential in the best interests of the success of the program, the ethical nature of research with human subjects, and consideration of the needs of the human subjects to benefit from the program.

According to Schutt (1996) ethical considerations include: the research should cause no harm and the benefits should outweigh any foreseeable risks (Guba & Lincoln, 1989). Short & Burke (1991) discuss the iatrogenic, or unintended effects of teaching. One significant element that can lead to an iatrogenic effect is wrong use or ignoring of culture.

As I learned strategies that were effective I used them more frequently. The methods that did not seem to work

were not used again. The formation of my curriculum included documented Native American learning styles (Cleary & Peacock, 1998; Swisher & Deyhle, 1992; and Reyhner,, 1994) and Navajo culture components (Aronilth, 1991 & 1994).

<center>Procedure in this Study</center>

This curriculum was grew specifically so that the teachers and I to be more effective teaching the students to do inquiry-based projects. This type of project is an essential component of the interdisciplinary curriculum of the high school. The teachers and I processed our impressions of the lessons after each session was completed and again when each project was finished. We used these impressions to make decisions about how to modify the lessons.

The needs assessment for this study is an attempt to apply findings from the literature regarding Native American learning environments and to observe the students' involvement and response to those academic approaches. I established eight principles that seemed to be essential to teaching Internet information literacy to Navajo high school students in my library. These are: culturally relevant transitions and content, wholistic learning, choice, use of visuals, personal involvement with teachers,

feelings of competence, to know when information is essential to functioning in dominant society and to have opportunities to work cooperatively.

The lessons changed over the course of the study. In terms of sequence they changed from being scheduled at the beginning of the inquiry project to being spread over the course of the project. Skills are taught, as they are needed. The content of the lessons has also changed. The objectives of technology and information literacy remain the same. There are still lessons on the technology of the Internet and word processing. The addition of the Inspiration helps the students connect linear and non-linear thinking and to process the information more personally. Critical thinking becomes more practical.

The information literacy training includes choosing a topic and focus for the inquiry, looking for contrary as well as supportive information, collecting that information, and using the information to present a point of view either in writing, orally or both. This depth of the content grew as I interacted with the students. Some students had two or three sets of lessons over the course of the school year and they demonstrated greater levels of proficiency with both the technology and the process of exploring for information.

Students indicated that they could locate information better at the end of the year than they could in the fall. New concerns are indicated in the student reflections.

<u>Variables</u>

"A variable is a trait or characteristic with two or more categories. The cause or independent (stimulus or input) variable effects or causes changes in the dependent (response or output) variable." (p. 11)

The independent variable for this study is the curriculum. The categories of this independent variable are the collaboration of teachers and the scope, sequence and modalities of the lessons.

The dependent variable for is the knowledge and understanding the students gained from the lessons. The characteristics for this variable are ability to navigate the Internet, to make E sheets and Inspirations diagrams, to find information that is useful to their inquiries, to present information that corresponds to the assignment, and to complete their assignment on time.

<u>Phases of the Research</u>

This thesis reports the work of the entire school year, 1999-2000. It is an exploration of valid and useful curriculum methods to teach Navajo/Dine high school students to demonstrate information literacy using the Internet. There are three phases to this study. These are the

formative phase, fall semester 1999, the operative phase, spring semester 2000, and the summative phase, May and June 2000.

The formative phase is referred to by each of the following terms: Phase One, first semester, fall semester, and first phase in this thesis. It occurred during the fall 1999 semester of the 1999 – 2000 school year. This was from August to December of 1999. A purpose of the first phase was to determine the learning needs of the Navajo/Dine high school students coming to the library for information literacy lessons. The constructivist approach was initiated for the development of the curriculum. During this phase lessons of the curriculum were shaped by trying suggestions in the literature, observing the results of the lesson, discussing the lesson with the primary teacher, and adapting the lesson for the next time it was given. As there were multiple classes coming to the library for inquiry based projects and many of the teachers were receptive to the collaborative process, most of the lessons were given and adapted at least three times. In December 1999 the complete results of the formative phase were summarized in a formative report to be found in Appendix B.

During the operative phase, called: Phase Two, spring semester 2000, second phase, and second semester in this study the overall results of the formative phase were applied. This second phase occurred during the spring, 2000, semester of the 1999-2000 school year. This was between

January and May of 2000. The purpose of the second phase was to apply the results of the formative report. The lessons of the second phase had an organizational order to follow based upon the formative evaluation as synthesized in collaboration with the teachers. I continued to apply what I learn to the lessons given to various classes through out the semester.

The final phase, the summative phase, occurred during the last two months of the school year, May and June of 2000. The activity of the summative or last phase of this study was administering and evaluating a written questionnaire, see Appendix A. The feedback form was given to students and teachers who attended lessons during the operative phase of the study. At the end of the school year, I tabulated and analyzed the data and completed the summative report. This summative report brought the study to an end and is located in see Appendix C.

<div align="center">Limits and Obstacles</div>

This study was limited by seven factors. Four of these obstacles to success were eliminated or improved during the school year. The four obstacles that are improved are: the Internet was extremely slow, the students having poor Internet navigation skills, my newness to the school, and the school having no electronic organizer was available. The three obstacles that continue to need adaptation are

the low reading level of many students, numerous students being absent habitually, and my not being the primary teacher of the classes who came to the library.

Slowness of the Internet

The slowness of the Internet was the problem that was the most troubling to the students and to me. Because this problem was so disturbing to the students I helped them initiate a campaign to improve our Internet speed. They wrote letters to the communications company and got a strong positive response from the president of the company. The school is involved in several technology grants. Through one of those grants the speed of the connection is being improved by a satellite connection during the summer of 2000.

Lack of an electronic organizer

The library lacked an electronic organizer during the first semester. Inspiration was purchased, taught, and used during the second semester. Student 1.21 wrote, "What I liked and never tried before was the web (Inspiration). It was helpful, I thought of it like an outline kinda(sp), my group members thought the same way too."

Need to Form Collaborative Relationships

Because I was new to the library the teachers and students were slow to use me as a collaborator. As the

instructors saw the results of the lessons for Internet information literacy they became increasingly interested in collaborating with me on inquiry projects.

The Librarian is not the Primary Teacher

I am not the primary teacher and that means that I was challenged to create personal relationships with students. I portray ability and caring at the beginning of each series of lessons. I insist that teachers attend the lessons and supervise students while their classes are working in the library. I was fortunate that all the collaborating teachers were very supportive of my instruction. When I have to, I deal with behavior problems immediately. I had two behavior problems that needed interventions beyond a gentle word. After students had a few classes with me in the library the entire student body seemed to know my rules and were respectful. My rules are very basic: no eating or drinking in the library; do the assigned work quietly; call my attention to any equipment problems; and ask questions about anything. I encourage students to include me in their investigations and at the end of the school year I had good relationships with most of the students.

Students Lacked Basic Internet Navigation Skills

The students lacked basic Internet navigation skills. The students' self reports indicate they think their abilities improved over the course of the year. Students participated in one to three sets of Internet information literacy lessons. When they participated in three sets of lessons they indicated the most ability with the standards of the curriculum. Student 3.3 says, "I learn how to go into the Internet more and what to go through when I'm doing a research."

High Rate of Student Absenteeism

Students are often absent. The average attendance rate is eight-two percent. The school is making efforts to improve attendance. I include reviews, individual discussions, and after-school assistance to overcome this attendance problem.

Students have Poor Reading Skills

Over fifty percent of the students had an elementary reading level in the fall of 1999. The lessons on note taking and Internet navigation included strategies for reading. Most of the work to overcome the poor reading levels happened in one-to-one interactions with students.

Student Population

The population selected for this study is the students of the high school brought to library by teachers in classes for inquiry based learning projects.

These resource-based projects are five classes doing a World History project of presenting information about other countries; two classes of Native American Literature doing term papers on various Native American subjects, three classes doing biographies of twenty century scientists, three classes preparing informative and persuasive speeches, two classes presenting biographies of medieval mathematicians and a number of other classes doing projects.

These resource-based projects are an integral part of the school's curriculum with all teachers doing such projects at some time in the year. Thus, students came to the library from a wide range of curricular areas: art, chemistry, earth science, math, world history, world history, American literature and speech, journalism, Native American literature, literature and composition and woodworking shop.

All the students in the study are enrolled in a public high school located in an extremely remote area of the Navajo reservation in Arizona. The school is in Northern Arizona, near the Four Corners, where New Mexico, Arizona,

Utah, and Colorado meet. The nearest town with a library is over one hour away and off the reservation. There are reservation towns within sixty miles away of the school but there is no public library system on the Navajo reservation. The only library for the nation is in Window Rock, over one hundred-twenty miles to the south.

All students in the study are Navajo.[1] Few of these students have computers at home. On average, two students from each class have a computer at home. Only twenty-five percent of the population of the Navajo nation has phone service at home (Smithson, 2000 & Di Giovanni, 2000). To have Internet access at home the students would need to have a phone at home and the financial ability to pay long distance charges for all Internet connections. These students are extremely underserved. The exposure to the Internet at school is most likely their only opportunity to access the World Wide Web.

During the school year 1999 – 2000, there were two hundred-eighty students enrolled in the school. Of these, about two hundred-fifty attended at least one lesson in the library. Seventy-four students from eight classes completed the assessment questionnaire during the last of school.

Data Collection

[1] Native American group in this study refer to themselves as Dine', which means The People. Navajo is the term applied by dominant culture.

This thesis reports the work of the entire school year, 1999-2000. Different forms of data collection were collected at each of the stage of the study. Data was collected in journal notes of student observations and teacher collaborations, as reflections on the lessons given, and through the self-assessment of information literacy skills done by the students at the end of the school year.

The outcome of the first phase was a Formative Report, written at the end of the semester, to summarize the findings of the initial phase. This report was written as a summary of the journal notes. These notes documented the discussions with teachers, including the planning sessions and the reflections on the effectiveness of the lessons. They also included observations of student responses to the various teaching techniques I used in the lessons.

The result of the second phase was a curricular approach to teaching Navajo/Dine high school students Internet information literacy skills. This was written based on the lessons given during the second semester. It reflects the results of theses lessons, which were developed as a result of the formative report. In collaborative discussions with teachers I evaluated the content and process of the lessons and developed the curriculum that concludes this study. This curriculum is documented in the report of the second phase in Chapter four.

The data of the final phase was collected from a self-assessment questionnaire given to individual students. The questionnaire had three sections. On the first section students indicated in which classes they had Internet information literacy lessons. The second part asked for student responds to sixteen probes concerning ability to locate, understand, organize and utilize information found on the Internet. These probes were reflections of the nine standards of *Information Power* (ALA, 1998).

Question	#
Choosing a topic that is interesting to me is very important to me	1
I can get information from the Internet	2
I can find information that is useful for my research	3
I know when information is good enough for to help my research	4
I find ways to locate information that is interesting to me personally	5
I enjoy doing research on the Internet	6
I know when I have found the best information	7
The freedom to find information is important to me	8
I feel more able to plan my research	9
I will get my research done on time	10
I know how to make a reference list	11
I work with my group to find the needed information	12
I work with my teacher to find the needed information	13
The lessons about doing research were helpful to me	14

Table 3.1: Self-assessment Questionnaire Probes
Summative Phase, Spring 2000

The third part was four optional essay questions. This encouraged students to write about what they had learned in

their own words. Teachers gave students extra credit for answering the questions: 1) How would you describe your ability to do research? 2) What have you learned about doing research on the Internet? 3) What did you like best about the Internet research lessons? 4) What could be done to improve the lessons about doing Internet research?

Analysis of Data

The data is analyzed and reported in three reports. The reports are the formative report, the curriculum report and the summative report. The formative and summative reports are summarized in Chapter four. More details of those reports can be found in Appendix B and Appendix C. The curriculum report can be found in Chapter four.

Formative Phase Report

The formative report documents the initial efforts to establish an Internet Information Literacy curriculum for Navajo high school students. The formative report has two foci. The first focus summarizes what I had learned about the process of implementing the curriculum through collaboration with eight teachers, instructional techniques, and creating curriculum. The second focus documents information on the progress toward the ultimate goals of having the curriculum in a form that could be shared with others. The lesson titles are discussed. See Appendix B. for the details of that report.

Operative <u>Phase</u> <u>Report</u>

The curriculum report documents the instruction of utilizing the Internet as a search domain for course-related inquiries will teach them to identify the need for information, locate information by browsing and exploring, consume information by reading, forming opinions, and taking notes, evaluate and collect information that corresponds to the focus of their investigations, prepare graphic organizers and outlines about the information found, document the information used by citing references according to the appropriate methods, share the interesting details of the information found in writing or speech, and reflect on their personal information use process for the purpose of improving that course of action.

Eight educational needs of Navajo high school students for an effective learning environment are discussed in this report. These educational strategies formed the core of the methodologies of this curriculum. They are documented in the literature and were found to be effective in teaching Navajo secondary students. They represent the major contributions this study makes, to the understanding of relevant curriculum development, and specifically, to improved implementation of an Internet skills curriculum in a Navajo setting.

This curriculum was agreed upon between the teachers collaborating with me during the second semester and myself. The students come to the library for sixteen sessions to do inquiry. There are eight mini-lessons on important aspects of the inquiry process. The titles of the lessons are: *Thinking about the assignment, Navigation and browsing on the Internet, Exploring with the Internet, Note taking and collecting information, Evaluating resources, Preparing to present, Reference lists and Evaluating research skills.* See Chapter four for details and the appendix D. for sample lessons.

<div align="center">Summative Phase Report</div>

The outcome of the final phase is a summative report on the final data, gleaned from the self-assessment questionnaires, and the implications for lessons on Internet information literacy for the school year 2000 – 2001. A summary of the summative report is in Chapter five of the thesis and in the appendix C. The summative report documents the students' abilities to incorporate current, accurate, interesting, complete, and meaningful information into their coursework.

CHAPTER 4: CURRICULUM REPORT

"Students need to understand their world and to learn strategies to act on their world." (Cleary & Peacock, 1998, p. 213)

Overview

During Phase One of this study, fall of 1999, I observed many students coming to the library expressing a desire to use the Internet but knowing limited strategies for getting information for class work. These students could not navigate web pages and could not locate information by using search engines. The terminology was unfamiliar to the students. Their basic Internet activity was to locate a web page about sports and music personalities using Yahoo or the URL line and printing off pictures.

The school reform process adopted by the school is one of resource-based, project-oriented education. The students need to learn to locate information, both in print and electronically, to make resource-based education effective. Because the print media in the library is somewhat dated, with an average age of 1983, and because the students demonstrated a high interest in the Internet; I thought that the Internet would become the search domain of choice

for completion of inquiry for the projects. I was proved

correct as Phase One progressed. From the beginning of the

first semester the students eagerly tried to access

information for class and were very receptive to

suggestions and offers of help.

Formative Curriculum Report

This report describes the results of the first phase

of the study to determine the best curriculum for teaching

Internet information literacy to Navajo/Dine high school

students. This phase occurred during the fall semester of

1999.

This section includes work I did: 1) to collaborate

with eight teachers, 2) to distill instructional techniques

and methods that are the most effective for Internet

research lessons for Navajo High School students, and 3) to

create a curriculum that relates the stages of research to

the process of doing that research on the Internet.

Collaboration With Eight Teachers

This summary, about my work with over two hundred

students from ten classes and eight teachers, is written in

chronological order based on the date the research projects

were initiated. I discussed the findings in this section

with the collaborating teacher indicated. These eight

colleagues helped me learn important aspects about Internet information literacy instruction for my curriculum.

Collaboration One

The work with Bob F., who teaches Earth Science, taught me about the importance of visual cues when teaching students to navigate on the Internet. I learned that students need clear, concise, sequential instructions supported by visual cues such as projection of the computer screen and Internet browser to successfully navigate on the Internet and locate information for an assignment.

Collaboration Two

My work with Kathy S., who is the Math teacher, showed me the importance of electronic note taking sheets, E-sheets (Lewin, 1997). I did Internet navigation lessons and taught the students to use a specific website. I made paper worksheets for the library skills lessons. These were easily lost and hard to manage in the small space when three students work at one computer. I began to question the paper worksheet as a useful tool and to search for an alternative.

Collaboration Three

The third teacher I collaborated with was Mary V., the Fine Arts instructor. Working with her began my belief that choice is an important aspect to teaching adolescent Native

Americans. There was too little choice in her assignments and too little guidance from the teacher for the students to act enthusiastically about finding the information in the assignment.

Collaboration Four

Working with David S. and his students, from Language Arts class, taught me that direct instruction is needed for students to be able to complete projects in the library. He brought students to the library but did not request any involvement from me. He gave the students only three days to choose a topic and to do the investigation. There are twenty-seven students in the class assigned to do persuasive speeches. Fourteen students did the speech and only seven did the required visual display. From my experience with this class, I became convinced that more than three days and instruction is needed for students to find useful information on the Internet and to feel confident about their investigation process. David S. and I discussed the lack of student success with this library event and decided I would provide lessons when his classes came to the library in the future.

Collaboration Five

Mike L., another Language Arts teacher, brought all his classes for Internet instruction. The creative writing

class did not have a resource related project and were less attentive than the other groups. I came to understand that students need a strong curricular connection for them to understand the reason for research training. Internet information literacy is not a skill to be taught in isolation of an authentic assignment.

During three lessons with Mike L.'s classes I taught Internet navigation (Bash, 1998; Todd, 1995; Nelson, 1996), library research stages (Kuhlthau, 1994; Thomas, 1999; Schwartz, 1997; Pitts, 1996), and search engine (Benson, 1996; Arcellana, 1998) lessons before the student Internet investigations began. In reflection I determined this approach was too much information in too short a period of time because students did not implement the stages approach to locating, evaluating and using information (Svinicki & Schwartz, 1988). My current plan is to teach mini-lessons about each stage. I believe this is more meaningful as the students want to start their Internet investigations as soon as possible.

Students were challenged by search term selection. I worked individually with students to help them determine search terms to use in their searches on the Internet. Working on vocabulary development was an unexpected element. As a component of search term development the

students and I looked words up in dictionaries and

thesauri. Search terms was not a formal part of my initial

lessons but students were more able to do browsing after

the teacher and I worked together with them on this

process. I believe I ought to include search terms as a

component of the second semester lessons.

I was not able to teach the students outlining as I

planned because of the lack of time and resources. I will

include that in the curriculum for this semester. Some

students had difficulty organizing their thoughts. I plan

to teach the Inspiration (1996) software program that turns

mind maps into outlines during the second semester[2].

Many students did not provide citations on the

information gathered. The teacher and I decided the

students needed more information about reference lists.

Collaboration Six and Seven

Andrew W., a Social Studies student teacher created a

world history project. I gave two lessons on Internet

navigation and information location. Many of the students

had trouble "getting into" the project. They complained

about being assigned to teams and about not getting to

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[2]I used this program in my student teaching, during the
Spring of 1999, and students found it very useful for
planning a project and displaying their ideas.

choose the country they studied. The supervising teacher Peter B. and Andrew W., and we recognized that choice of subjects and teammates might have improved the students' attitudes about the projects. Peter B. indicated he would do the project again in the second semester and that we would test methods of providing students with choice of country and teammates.

Collaboration Eight

Another math teacher, Jeff D., brought the students to the library with no discussion with me before his project began. He had an excellent plan but the students did not have enough time or planning to execute the design. I learned to approach teachers as soon as I hear that a project is planned.

Instructional Techniques And Methods

Visuals

Karen Swisher & Donna Deyhle (1992) have discussed the importance of visual learning for Native American students in their article *Styles of learning and learning of styles: educational conflicts for American Indian / Alaskan Native youth*. My experience supports the findings of these authors and others mentioned in the article. The importance of a visual component to lessons was evident in the session I gave to the subject students. Without a strong visual

component the students I work with have less ability to attend to the lessons or to follow directions.

Important electronic visuals I employed were a projection of my computer display, an image of Internet navigation, and a Power Point presentation of the stages of research. With these large displays of my computer screen the students were able to stay on task, to follow the verbal instructions while I was teaching them to navigate on the Internet, and to complete the assignments more successfully than when I tried the same type of lesson without the projected image. I believe a projected computer screen is an important tool to use when training students to perform complicated tasks that require ability to follow directions on a computer and to become successful in doing the same task independently.

I have used the Power Point program in two ways. I have shared some that I prepared prior to the class. I have also created some during the lessons, much as a teacher uses a white board, as a method to keep notes about my subject matter.

I tend to be extemporaneous in my presentations. A visual presentation helps stay on track with synchronous processes. Including ordered visuals with my presentations is especially important when the skills I am teaching build

on the skills already presented and when I need to go over

the same target information from various perspectives to

diverse levels of student experience, possibly several

times.

As I worked with individuals I discovered websites and

information that should be shared with the other students.

When this happened I created Power Point slides on the spot

for the purpose of informing the entire class.

E-sheets

Using a paper work sheet for the Internet

instruction was more successful than when a teacher

tried to get the students to navigate the Internet

with no written instructions. However the paper work

sheet still required the students to input the desired

URLs manually and to take notes by hand. Both of

these features lead to mistakes, the loss of paper,

URLs being input incorrectly and difficulty managing

the space around the computer. Many students did not

take notes or complete the paper work sheet.

The E-sheet is an electronic note taking or work sheet

(Lewin, 1997). It is stored on a floppy disk. E-sheets can

be printed but most of the students use theirs to keep

notes and information needed for their papers and speeches.

The disks are kept in the library to minimize problems such

as loss or damage to the disk. As a result students are able to get their work done when computers were available in either the library or the computer lab.

The objective of such a tool is multifaceted. By copying from an E-sheet prepared by the teacher the students make fewer mistakes inputting URLs to browsers. The students are also able to copy from the Internet and paste information onto their E-sheets.

I have to give credit for the idea to Lewin (1997). His workshop workbook, *Making effective use of the Internet to enhance your classroom instruction,* (1997) helped me extend the idea of the E-sheet for Internet use by my students. I continue to expand this technology as an instructional tool, a tool to support browsing, exploring and collecting information from the Internet, organizing the information gathered and preparing the presentation of the material.

Student Choice

Students do more timely, in-depth and comprehensive research on topics, with teammates, and about foci they personally select. The classes I worked with that allowed students freedom had the best completion rate and the most activity that was on task while in the library.

The following are areas of choice that I have seen

offered that seem to motivate students to get involved in the investigations. When student have choice and freedom in the topics they study, they express interest in the assignment and do a better job than when they are not afforded the opportunity to choice their topic of research. By better I mean that they complete the work, demonstrate a depth of understanding and express enthusiasm about their work. If the teacher must set the topic then the students need to be able to choose their focus of research.

Students also appreciate choosing whom to work with or the option not to work with anybody. Some students like to use both print and electronic material; some choose only one or the other. The more choice the teacher can offer the students the more likely the students will be motivated to participate in the project. High school students are remarkably capable of ignoring a project if they are not interested.

Student choice helps the student function within his or her "Zone of Proximal Development". The ZPD is the,

> "distance between the actual development level as determined by individual problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Wood & Wood, 1996).

Social context and support can lead to mastery of skills in advance of what a student can do independently. It allows the students to stretch but not feel broken, by providing enough support in the learning process. I think that the opportunity to select partners and topics is a form of social as well as cognitive support for students.

Creation of Curriculum

I chose to create curriculum in a circular process (Svinicki & Schwartz, 1988; Nelson, 1994) of planning, executing the plan, evaluating the effects of the interaction with the students and then re-planning. This cycle of presentation and evaluation promotes the development of multiple methods of instruction (lesson plans) for the subjects taught. Thus my repertoire for that subject is expanded. This process allows me to be flexible and remain relevant in my work with a variety of groups. Based on my literature research I have developed the eight stages of research and incorporated them into my curriculum. I adapted this list from my reading about library research. (Kuhlthau, 1985; Kuhlthau, 1994; Thomas, 1999; Schwartz, 1997; Pitts, 1996)

The best process for my students is to present the skills by describing them, demonstrating them, giving students time to practice the them and finishing by

discussing the theory (B. Bush, personal communication, February 24, 2000) (Nelson, 1994; Szasz, 1977; Reyhner, J., 1994).

Operative Curriculum Report

This report about the second phase of the study will discuss how I met both the learning environment and content needs of the students in my lessons.

In this chapter I will briefly recapitulate the eight general learning environment needs of Native American high school students. Then, I will discuss the standards and objectives that inform the content of the curriculum. The specific needs of the sample students on the Navajo reservation, related to teaching them to acquire information for resource-based learning projects are covered in the sections that discuss the lessons that comprise this curriculum.

Critical Elements in Teaching Native American Students

In the course of this study I found eight education needs for Native American teenagers. These are holistic learning, culturally relevant content and process, choice in projects, visual learning, feelings of competence, opportunities to work cooperatively, personal involvement with teachers, and specific information about how to succeed in dominant culture.

Holistic Learning

Holistic learning means understanding the big picture of the material to be learned. I used several methods to accomplish this goal. An overview of the entire information seeking process is one of the holistic approaches I have used in my curriculum. Anther example is demonstrating the entire process of building an Inspiration graphic before asking students to begin creating their own. The entire curriculum is written in a holistic way. To help students integrate Internet information literacy skills into all their information investigations I include practical, technical, conceptual and creative aspects of identifying, locating, organizing, evaluating, and utilizing information.

Culturally relevant content and process

I use an example of investigation about Navajo culture, to show how the parts of library research lead to the whole process of information literacy. This approach is both holistic and culturally relevant. It seems to be the most engaging approach I have used to meet this need for culturally relevant content and process. I also brainstorm with teachers to develop a cultural connection in the inquiry-based projects. An example of this is the requirement in the world history project to investigate the

indigenous people of the countries being studied. When I need to help students decide on a topic I discuss Native American issues as a jumping off point. Students do not always choose to investigate Native American subjects but the discussion of them seems to spark their imaginations.

Choice In Projects

Choice of topics and project partners help the students to have a sense of control over their learning. Giving students as many options as possible, including choice of method of demonstration of learning, helps them to be motivated to work on the projects. The teachers and I have tried to build student choice into the assignments. Some of the selections we offer are subject, visuals to use in presentation, buddies to work with on the project, resources to use for inquiry, methods of presentation, and which members will impart the group's investigation.

Visual Learning

Visual learning imparts information directly and supports the verbal presentation. Visuals are effective in keeping student attention. Another benefit of a visual is the way students strengthen their initial exposure to the information by referring to the visual. Two examples are the print and electronic visuals I use. Examples of print visuals are a large display over my desk that describes the

stages of inquiry, posters that have the following titles; *Levels of Internet searching, Elements of a first-rate paper, Reference lists, Time line for the current assignment,* and *Rubric of an excellent presentation.*

During the first phase of the study, I created and used several Power Point presentations to support the lessons. At the beginning of the second phase I was offered a new computer lab, which I accepted. This set up included new equipment and software for presentations. With this new set up I was able to arrange the computers more appropriately for group learning. I placed the computers in such as way that three students could sit around each computer and all students could see a "smart board". This "smart board" is an interactive projection screen that displays a computer screen. The screen also can be written upon. The notes can be saved to the "smart board" program. One feature of this program is a display of all the pages in a presentation. The students frequently refer back to pages of interest they want to review. These interactive smart board presentations are particularly useful for class specific material. The permanent print visuals are more useful for universal information.

One benefit of visuals I discovered was the promotion of students being less dependent on the teacher for

information. They are able to access information

independently and repeatedly. During the second phase I

became a critical thinking partner, not just a resource for

basic information because of the visuals in the library.

Many of the rough drafts of the visuals were developed in

collaboration with students and refined for permanent

display.

Sense Of Self-Competence

By providing students small successes at each step of

the process the learning environment promotes feelings of

competence for students. I learned that lessons done in

correspondence with the phase of investigation that the

students are experiencing were more effective than those

done only at the beginning of the project. I could provide

gradual success by providing information and demonstrating

skills at the time the students needed them.

Having the students write reflections periodically

helps them to understand what they have learned, to

discover what they need to work on next, and to stay on

track with the timeline.

The addition of the Inspiration graphic organizer

training, to develop electronic mental webs, also helped

the students succeed at each stage of their investigations.

This software provided a method to develop outlines in a

non-linear fashion with visual prompts. I believe the success of this technology was the ability to combine visual, holistic, and collaborative thinking. Many times the students work together and say they really like the method because, "It is fun." Some students who were not engaged in the project became involved once they learned the skill of operating this computer program.

Cooperative Learning

Students enjoy and do well with cooperative learning. They operate in a higher "zone of proximal development" because of support from their peers. Each of the group members has individual skills that shore up the other members. I have observed students doing peer teaching about such library research methods as computer skills, Internet searching, and location of information in print media. Each teacher has his or her own methods of arranging groups. Some assign membership, some allow absolute freedom of membership and others promote casual groups. Informal joint effort is spontaneous and meets an immediate need. This informal exchange of help also promotes a feeling of competence.

All students benefit from this cooperative process. The more capable student's skills are reinforced and the learner gains new skills. Thus all students operate at a

higher level than any could do alone. Adolescents need a sense of belonging. Formal and informal groups support togetherness with an academic focus. They will congregate any way. My belief is that they can meet both social and academic needs by being allowed to work together (Wood & Wood, 1996). This is not to say that all their work should be in conjunction with others. The students should work together in such a way as to support their learning.

The literature (Cleary & Peacock, 1998) promotes self-selected teammates. The researchers postulate that teenagers do a better job with self-selected groups. The teachers and I discuss this aspect of projects with each assignment of library exploration.

Information about Dominant Culture

Teaching students specifically about success in dominant culture is very important and is appreciated by the students. The content in these lessons where this principle applies is the format to an acceptable paper. Before I began to directly tell them about conventional formats for writing they turned in papers that were very hard to understand. Papers written during the second semester were easier to follow. Other examples of information the students need are vocabulary definitions and linear thinking.

Personal Involvement with Teachers

Personal involvement from the instructor helps calm student fear. Many learners experience fear of the unknown when faced with a large inquiry project. By giving needed skills, knowledge, and reassurance the teacher helps the students operate in a "zone of proximal development". This means they can operate comfortably in an area in which they do not have much previous experience.

Incorporating Standards Into The Curriculum

Basic information literacy (AASL & AECT, 1998) includes the ability to access information efficiently and effectively, to evaluate information critically and competently, and to use information accurately and creatively. Once a student is able to access, evaluate and use information they need to become independent learners by pursuing information related to personal interests, appreciating literature and other creative expressions of information, and striving for excellence in information seeking and knowledge generation. After students are independently information literate they need to contribute positively to the learning community and to society. These students recognize the importance of information to a democratic society, practice ethical behavior in regard to

information and information technology, and participate

effectively in groups to pursue and generate information.

Numerous mini-lessons to cover the subjects of these

standards were designed for the study. Sufficient time was

built into the curriculum for the students to apply the

skills taught. The students' continual interest and

independent use of information literacy skills demonstrate

the value of the curriculum and its design as presented in

this study.

The constructivist aspects of these lessons revolved

around the following principles. First, there is a focus

and procedure of lessons to follow. Second, the specific

examples I demonstrate depended upon the content of the

course in which the students are enrolled. Third, I

carefully observe and do a Know, Want to know & Learn (KWL)

activity with the students to determine elements of the

mini-lessons to either eliminate or to expound upon. This

KWL activity determines the Knowledge the students already

have, what they Want to know and what they Learn. Fourth,

as the students practice the skills taught, I observe for

students who need extra personal attention or tutoring.

Last, I circulate among the students to answer questions

and often include the solutions to problems they encounter

in the lesson the next day. I adapt the instruction to the

needs of the teacher, the students, and to assure the
students gain the skills and knowledge identified in the
standards.

Objectives of the Curriculum

The objectives of this course of study were written to
be specific enough to give the students a concrete sense of
the skills needed to locate information without help, both
now and in the future. In order for them to be independent
with locating and using information from the Internet they
need to be able to perform the skills delineated in the
objectives. The objectives include broad categories of
technology and information literacy.

Students will be able to:
1. Navigate, browse, explore and collect information they
   seek from the Internet
2. Locate, evaluate, cite, and use information of
   interest to them from the Internet
3. Follow the steps of library investigation by choosing
   topics of interest, personalized foci of examination,
   organize and present the information found and
   evaluate their own ability to conduct library research
4. Complete personal information inquiry projects in a
   timely way by bringing the project to a chose and
   organizing the material they have found.

Subjects and Progression for Sixteen Library Sessions

I have found that sixteen sessions over the course of
three weeks in the library are optimal. Less than sixteen
sessions leads to inadequate time for students to locate
information or to incomplete their assignments. More than

sixteen sessions seems to leads to socializing, lack of attention to the project and socializing rather than collaborative work and completed assignments. The sixteen ninety minute sessions involves twenty-four hours in the library, less than four of which is instruction. The other twenty hours is for individual and cooperative inquiry, organizing of information and preparing the speeches and papers of the resource-based projects.

Day one	Thinking about the assignment
Day two	Navigation and browsing on the Internet
Day three	Student workshop
Day four	Exploring with the Internet
Day five	Note taking and collecting information
Day six	Student workshop day
Day seven	Evaluating resources
Day eight	Student workshop day
Day nine	Student workshop day
Day ten	Preparing to present
Day eleven	Student workshop day
Day twelve	Student workshop day
Day thirteen	Reference lists
Day fourteen	Student workshop day
Day fifteen	Presenting research / Due date for papers
Day sixteen	Evaluating research skills

Table 4.1: Lessons and Workshop Days for
Sixteen Sessions in the Library

Overview and Procedure of Lessons

The lessons include computer skills, the stages of locating information, vocabulary and skills specific to locating information on the Internet. The final day is an opportunity for students to assess their skills and to give me ideas for skills to be taught in future lessons. This

session is between one and two weeks after the library sessions are completed.

During the first phase of this study, the technology skills lessons focused on navigation of the Internet and the basics of word processing. As the students become familiar with these technology skills they were more receptive to information literacy instruction. Several of the students were involved in more than one class that came to the library for lessons. These students acted as teacher assistants when they were involved in a second set of lessons.

Navigation lessons included URLs, Links, Bookmarks, and using the go, back, and forward buttons. Other technology lessons concerned electronic note taking sheets, called "e-sheets", and copying and pasting between word processors and browsers. I demonstrate a variety of simple and mega search engines and help students to choose at least three to try independently. The first session demonstrates navigation of the Internet with the students following the demonstration in groups on the student computers. Each student has the opportunity to navigate on the Internet, as we rotate the student in charge of each group several times.

During the first phase, the information literacy lessons revolved around an adaptation of Carol Kuhlthau's

stages of library research. She postulates six stages (Kuhlthau, 1994). The first lesson was a scavenger hunt to teach Internet navigation. There was a lesson presenting the stages and another on search engines. After the search engine session, the students were to work on the computers in small groups, pairs, or alone. The teacher of the class and I assisted the students on an as needed basis.

After the formative evaluation, performed in December 1999, I changed the makeup of these lessons. I learned that the students needed smaller bits of information and more time to practice using the new skills and information. They also needed lessons in conjunction with the stage they were working with.

In Phase Two there were several changes to the curriculum. I taught an additional technology component, Inspiration software (Inspiration, 1996). This is an electronic graphic organizer that is very effective in teaching the students to think about their inquiries, presentations, and projects. Now I focus additional attention on students making decisions about their topics. To help students with information searches I do mini-lessons on search terms and keywords.

To help the students understand the path of the information location process I include a general idea of the search process more briefly than during the first semester.

The overview I present is an example of what a very good paper or presentation would look and sound like. I use the subject of Navajo culture and demonstrate how I personalize the topic, locate information on the Internet, organize a paper, or verbal presentation when that was the assignment of the class, assess my sources, cite my sources and self-evaluate my outcome. I briefly touch on all the stages of library research, Internet browsing, exploring and collecting, and what I hope to accomplish with my exploration. I define terms as I go along and have numerous visuals. These included graphic organizers, lists of terms, examples of a reference citations, and samples of search terms. Some of the visuals are print and some are electronic. One of the students' favorites is a picture of me as a young girl in a kimono. I grew up in Japan and this picture helps them to know me as a person.

The spring, 2000, presentation is a more effective overview than the one in the fall semester 1999 because the spring lessons met more of the criterion for lessons to reach Native American teenagers. The picture of me as a young girl in Japan was part of initiating relationships with the students, had a larger variety of visuals that emphasized all the major points of the lesson, connected with the culture of the students, taught to a variety of learning styles and provided a more holistic approach to the lessons rather than the overfull approach I employed by only doing three ninety minute lessons during the fall.

During each semester I provided lessons on selecting topics. The lessons on topic selection, of phase one, were given about the same weight as other stages of the library research process. I found the students expressed that they liked to have free choice of topic selection but indicated they were insecure about actually choosing one. During phase two I gave extra weight to the topic selection aspect of the library research process.

Throughout both semesters I worked with students individually when they indicated receptivity to adult involvement in their work. I am considerate of the students' desire to work alone, with other students or to include teachers and librarians. I believe this deliberation promotes a good relationship with my students.

Just as it is important to investigate information with increasing intensity and focus when using print media, it is essential to begin by browsing, move on to exploring and eventually collect information from the Internet. This is an example of making meaning from information in a holistic way. There are different Internet techniques for each of these types of searching. There are different web resources for each type of searching. The purposes, methods, resources and techniques for each are the elements of various lesions in the curriculum. Instead of presenting these techniques at the beginning of the students' investigations, I spread the lessons out over the time the students were in the library. This allows me to match the search methods to the stages of

investigation the students are experiencing, increasing the relevancy of the curriculum. Details of searching techniques can be found in the sequence section of this chapter.

To help the students plan their searches, organize their information and prepare the outlines for their presentations and papers I teach the students to do Inspiration (1996, 1998, 1999) graphic organizers. The first activity is to create a web of the assignment. The second activity is to add information obtained while exploring on the Internet. The last activity is to complete the graphic organizer with the main points and the subtopics they want to present. The software can then turn the web into an outline. This outline can be copied into a word processing document. With an outline already prepared the students can begin writing.

Inspiration is a visual learning tool that seems to help a great number of students move through the inquiry process and finish their work. Some students still indicate that they have difficulty completing work on time. However the teachers report a higher percentage of students completing the assignments during the second phase than were able to complete assignments during Phase One.

As was noted in the literature review concerning locating information on the Internet, not all web sites and web resources provide accurate and appropriate data. I do a lesson on how to determine that the most accurate information has been found. I investigated, evaluated, and

selected web resources to assure the library subscribes to the most authoritative resources available.

By collaborating with teachers so that I understand the assignments and doing some investigation on the associated subjects for each class I am prepared to help the students in their studies.

A skill critical to resource selection and evaluation is citing references. I introduce the issue in the overview and expand upon it in later lessons. I have found students appreciate the repeated instruction about "giving credit to the authors". How to write a citation is an area of concern for many students and the repeated lessons and visuals reassure the students needing to write reference lists. I have a permanent display in the library to both remind the students to complete reference lists and to give them examples of how to do this important task.

Sixteen Sessions in the Library

The lessons follow a similar pattern: 1) the purpose of the lesson, 2) the content elements of the lesson, 3) the activities of the lesson, and 4) the practice component of the lesson.

Day One: Purposeful Thinking About the Assignment

On the first day the lesson is called *Thinking about the assignment*. The purpose of this lesson is to help the students form a personalized and holistic sense of

direction for the assignment. The objective is for them to learn to choose topics they will enjoy enough to spend considerable time investigating and become aware of what they need to learn.

I focus on helping the students get started on the assignments, by helping them choose a subject so that if the first one does not work out they can keep looking. I find it is important to help the students understand the assignment, specifically if the assignment is descriptive or persuasive. They need to understand if they are to explain and illustrate the subject or to prove and defend a point of view about the issue.

The two elements of the lesson are: the overview of the library research process and the teacher's expectations. The activities of the class are: 1) Know, Want to Know, Learn, (KWL) (Ogle, 1986 & Schmidt, 1999) to determine what the students already know about the process of library research on the Internet, 2) teaching Inspiration's basic techniques, (Chase, 1999) 3) developing a web (with Inspiration) of what each student or group of students believe are the elements of the assignment. The KWL informs me about areas of strength and weakness for each group of students. This knowledge helps me adjust the

scope of the lessons. The student workshop aspect is to create the Inspiration and save it to a disk.

Day Two: Navigation and Browsing on the Internet

On day two the lesson is called *Browsing and navigating on the Internet.* The purpose of the second lesson is to help the students find an interesting element to explore. I teach them to choose a topic and to find general information. The goal of this stage of the investigation is to make sure there is enough general information for the students' inquiry. I promote the discovery of a large number of references and starting the Internet examination ASAP. Because of insecurity and ambivalence many students procrastinate about starting the assignments. This lesson is conducted so the students can determine the exact focus of their assignments early in the investigation period.

The elements of the lesson are: staying on task to finish the project on time, basic Internet navigation, and the purpose of browsing. Class activities are: 1) a guided whole class guided effort of developing a timeline, 2) use of online resources for browsing, such as encyclopedias and directories, 3) navigating a website and gathering information from that site, and 4) copying and pasting information between the Internet and a word processor.

The workshop element of this assignment is for the students to skim for information from the websites. I tell them to discover at least five important elements of their subject. The other feature of this workshop is the students to make electronic or paper notes of possible resources for further exploration.

Day Three: Student Workshop

The third day is a *Student Workshop* day. The purpose of this workshop day is to continue the work of the first two lessons. I circulate and work with the students individually. My focus is on the Internet investigation process. The teachers also work with the students. The teachers concentrate on the content of the information the students are finding.

Day Four: Exploring Ideas Via the Internet

For the fourth session, called *Exploring with the Internet,* the purpose is to find information and data on websites. The elements of the lesson are: forming inquiry questions, developing search terms and locating information with search engines. The focus is to find information that is personally interesting and important to the evolution of the assignment.

For some students an important aspect of this stage of inquiry is forming inquiry questions. Because Native American students have difficulty forming questions (Cleary

and Peacock, 1998) I try to help them form a specific description of their inquiry. The development of search terms helps with this process. I promote curiosity about the subject, suggesting they search for any and all information relevant to their topic and point of view. We discuss finding ways to make the assignment interesting to themselves and to their readers. I demonstrate ways to state a personal point of view about a topic, using the Navajo culture example of the overview.

Online resources I demonstrate for exploring are search engines, mega search engines, electronic periodicals (I subscribe to Electric Library, elibrary.com), and electronic databases (such as Facts on File, facts.com).

Students follow a demonstration of: 1) accessing and using a variety of search engines, and 2) search term exploration, and 3) electronic note taking sheets for efficiency.

The workshop aspect of this lesson is to select a minimum of three search engines to use for this assignment and to take notes on the five or more subtopics they have chosen to investigate.

Some of the teachers have the students write a reflection, outlining their focus, point of view and most interesting aspects of their subjects, at this point.

Day Five: Note Taking and Collecting Information

The fifth lesson is *Note taking and collecting information*. In this class the purpose of collection of information, such as recording information and giving credit to the sources of information, is discussed. In addition I talk about the importance of investigating the entire subject and forming a focus for the talk or paper, that will be the product of the inquiry. I teach the students to keep notes that clearly have bearing on their topic and point of view. I remind them to keep notes that both support and oppose their viewpoint, especially for persuasive speeches or papers.

The resources for collecting information are either paper-and-pencil or electronic. I promote the use of E sheets and Inspirations for note taking.

Many students print off extensive amounts of Internet information without reviewing it critically. They need strategies for making meaning from material printed from the Web. This lesson provides a few such approaches, such as highlighting, noting subtopics and recurring terms, and making note cards by cutting and pasting. I work with individual students to add to the note taking process over the next two weeks of their time in the library.

The other aspect of this lesson is to teach the students to cite the references, for the information they use in their investigation and products. The ease of plagiarism from the Internet requires that students be taught the ethics of citation as well as the techniques.

Activities of this lesson are: 1) plagiarism and citation, 2) taking notes from Websites using E sheets and Inspiration, and 3) making and using e sheets (electronic note taking sheets) with a word processor and/or Inspiration.

The workshop aspect of this class is to make notes on the major subtopics of their subject. These notes can be in any form covered in the lesson.

Day Six: Student Workshop

Day six is a *Student Workshop* day to continue the work of lessons four and five. I circulate and work with the students individually. I help them search, take notes and make Inspirations. The teachers work with the students regarding the subject matter and the completeness of the information found. One concern at this point is the students find adequate information to complete the assignment. My focus tends to be on the investigation process. The teachers concentrate on the content of the information the students are finding. Often we have to help

students overcome frustration from either not finding enough or finding too much information.

Day Seven: Evaluating Resources

Evaluating resources is the topic for the seventh day. There are three purposes for this lesson. These are to eliminate resources that are irrelevant and / or invalid and to determine if sufficient information has been found on all aspects of the topic. I teach the students to assess websites. I suggest they weed out the sources that are immaterial or unsound. Also, I recommend they determine what additional information they need to cover their assignment completely.

I demonstrate reading a website and locating the important features to assess accuracy, including last date revised, author or webmaster, and content related to information found previously. Next I return to my Inspiration about Navajo culture to demonstrate what information I have found that is accurate, inaccurate, valid and invalid. I consult with the students to determine what information I have to present and what additional information I need to obtain.

Day Eight and Nine: Student Workshop

Days eight and nine are both *Student Workshops* days to continue the work of any of the previous lessons. I

circulate and work with the students individually. I help them search, take notes, write citations, determine what information is still needed, and make Inspirations. The teachers work with the students regarding the subject matter and the information needed to complete the assignment. Often both of us are working with students to help them understand the material they have found. This is one way that we overcome the obstacle of many students having poor reading levels. Taking a personal interest in the investigation of individuals or groups helps the students to allow me to help them with reading and making meaning from text.

Day Ten: Preparing to Present

To help the students determine what information they will present, speak or write about, I conduct a lesson called *Preparing to present* on day ten. I teach them to back up their points of view with information gathered. There are three elements to this lesson. These are: expanding the Inspiration they have used for this investigation, and writing an introduction, and a conclusion. The activities of the lesson are: 1) teaching the students to build a comprehensive Inspiration and to turn it into an outline, and 2) brainstorming with the

students to write introductions and conclusions, once again using my investigation of Navajo culture as an example. In augmenting the graphic organizer (Inspiration) I teach them the following principles: a) make sure that all points of the assignment are covered, b) arrange the information to present in a sensible order, c) include both personal opinions and insights, and present both information that supports and refutes the student's point of view about their topic.

There are three workshop aspects to this lesson. They include: 1) completing an outline from the Inspiration, 2) sketching an initial introductory paragraph to include a precise summary of the information found and a statement of the student's deductions and beliefs about the subject, and 3) beginning a strong conclusion to their thoughts.

Day Eleven and Twelve: Student Workshop

Days eleven and twelve continue this work on outlines, introductions and conclusions in *Student workshop* days. Students begin to write their papers and speeches during these workshop days.

Day Thirteen: Reference Lists

On the thirteenth day I give the students examples and demonstrations about writing *Reference lists*. I explain the format of a reference list, a list of Works Cited or a

bibliography. I give the required components of the citations orally, with handouts and posters. The format I suggest depends on the subject mater of the inquiry.

The activities of the lesson revolve around a demonstration of a reference list for the Navajo culture examination. To form a sample list I also show citations for websites and other resources I know individual students have accessed.

The workshop for this lesson is to create a reference list for the research done to date.

Day Fourteen: Student Workshop

Day fourteen is another *Student workshop* day. The purpose of this day is to finalize the paper or talk that is required by the assignment of the primary teacher.

Day Fifteen: Presenting Research

My recommended *Due date* is day fifteen. I suggest to the teacher that the paper or speech is due on the fifteenth day. Many of the teachers include me in grading the final product of the investigations. I have read papers, attended speeches and group presentations. I think this is an important component to the library research process, because it lends credibility to my lessons. It is very satisfying to read and hear the products of the student's time in the library.

Some teachers require three drafts. Our school has a computer lab that will accommodate an entire class. Thus, these teachers sign up for a week there, for typing. I strongly believe that investigation should be completed by the fifteenth day. If typing is built into the assignment the due date can be extended to day twenty.

Day Sixteen: Evaluating Research Skills

One week or more after the assignment is over I do a brief session with the students to assess their skills. This is called Evaluation Day, and designated day sixteen. I get their input about what more they think they need to learn to use the Internet smoothly for class assignments. I ask them to honestly evaluate their investigation process. Sample questions include: Did you start on time? Did you gather enough information? Are you happy with your result? What will you do differently next time?

During this study I did the formal questionnaire to accomplish the self-assessment process. I think that this should be an ongoing aspect of this curriculum.

Summative Curriculum Report

Overview

This report describes the results of the final phase of the three-phase study to determine the best curriculum for teaching Internet information literacy to Navajo/Dine

high school students. This phase occurred at the end of the school year, in May and June 2000, after a school year long examination of the subject. During school year 1999-2000 I collaborated with twelve teachers to develop the lessons. One hundred ninety-seven students came to the library for lessons from English, Native American Studies, Social Studies, Science, Art, and Math classes. One hundred and five lessons were given to the research subjects, in classes, over the course of the school year. Each class came to the Library to do the information inquiry for projects. Students took between one and four sets of lessons depending upon the coursework of the classes taken and the instructor teaching the class.

The purpose of the final phase is to determine what the students learned as a result of the Internet information literacy lessons. Student development of abilities is determined by the administration and analysis of a student self-evaluation survey. The survey is a questionnaire. The students assess themselves related to fourteen probes. These probes are based on the objectives of the curriculum, developed from the nine standards of the American Association of School Librarians and the Association for Educational Communications and Technology (AASL & AECT, 1998). The students rated themselves against

five possible responses: "yes", "sort of", "maybe", "a little", and "no". An affirmative reply is one that indicates the student feel confident about their abilities and is indicated by a "yes" or "sort of" response to the probes on the questionnaire. They were instructed to choose the response that most closely corresponded or "matched" their abilities and thoughts.

Seventy-four students of the students who participated in Internet information literacy lessons took the self-evaluation of their Internet searching skills. This sample is thirty-eight percent of the total students who took at least one set of Internet information literacy lessons. The questionnaire was administered during a week when the student attendance rate was forty-six percent.

Fifty-three of the students chose to answer four essay questions. This was an optional element of the self-evaluation that revealed some interesting statements. The dialect and misspellings are retained in the quotations from these essays. Each student who responded to the essay questions was assigned a number. This number identifies the student by the quantity of sets of lessons they attended, one to four, and by a numerical designation that represents the order in which the results were analyzed.

From the initial analysis of the data it became evident that the variable that was the most important was how many sets of lessons the students took. Thirty-five students attended one set of lessons, twenty-two students attended two sets of lessons, and fifteen students took three sets of lessons. Two students took four sets of lessons, which is too small of a sample to provide noteworthy information. The data from this group is not included in this report.

The analysis was to assess if the students abilities met the ALA standards. The criteria I established, for "meeting the standard", was seventy-five percent of the seventy-four students answering affirmatively, "yes" or "sort of" to the probe.

The students who took one lesson did not meet the criteria for eight probes. The students who took two sets of lessons did not meet the criteria for nine probes. The students who took three sets of lessons did not meet the criteria for one probe. I believe this shows that repeated lessons are necessary for mastery of the skills identified in the ALA standards.

<u>Analysis of Data</u>

Each of the probes and the response of the entire sample to the queries are explained below. Graphs

describing the responses can be found in the body of the report.

Each probe was written as a brief behavioral description of a standard (AASL & AECT, 1998). The probes were written at a low enough level for the students to read independently. The average reading level for the high school, as determined by the "Standardized Test for Assessment of Reading" (Advantage Learning, 1999), is 5.5, fifth year fifth month.

<u>Probe One</u>

The first probe concerns standard four; the students need to become independent learners by pursuing information related to personal interests (AASL & AECT, 1998). The first probe I developed for assessing the curriculum is: *Choosing a topic that is interesting to me is very important to me*. All the groups indicated an affirmative response to this probe.

Much of the literature indicates I read that adolescents and Native American youth, in particular, need to feel a sense of control over their lives and work (Cleary & Peacock, 1998; Reyhner, 1994; Swisher, 1992). My experience with the students of the sample was that they felt insecure about selecting topics. The data suggests that the students were more able to choose topics as they

took additional sets of lessons. One student, 2.15, wrote, "I don't really botter enufe to care about researching on the Internet, because what I research about is not useful to me and I don't see what am I gonna do with it in the future." Another, 3.8, recorded, "What I have learned working on the Internet is to find out what topic I'm doing and to go to some places I will get my information from it is easier than looking in the books."

Probe Two

I can get information from the Internet is the second probe. It reflects standard one, the ability to access information efficiently and effectively, to evaluate information critically and competently. This probe concerns both the technical Internet navigation skills and the critical thinking skills of locating information with search engines. All groups who took lessons expressed confidence in their ability to get information from the Internet. Eighty-five percent of the seventy-four students responded affirmatively to this probe.

For example, student 3.9 wrote, "There were many websites to look it up in. I found many information and it taught me at the same time when reading the words on the screen. I also mostly got the info from the internet." And, student 3.12 said, "I've learned it is easy and pretty

difficult too." "I've learned ways to find information that is helpful on the Internet through search engines," noted student 3.14.

Probe Three

The second and third standards inform probe number three, *I can find information that is useful for my research.* These standards indicate that the students will be able to evaluate information critically and competently and use information accurately and creatively. This probe looks at both the ability to get information and the ability to know that the information found is useful. This probe was also answered optimistically by over seventy-five percent of the sample. "[My abilities are] Good because I always find what I'm looking for maybe more," wrote student 1.19. Student 3.9, recorded, "What I like best was it had everything and it was easier way to get some important info."

Probe Four

The fourth probe is involves standard two. It is: *I know when information is good enough for to help my research.* It is another way to attempt to assess the students' abilities on this important standard on which

many of the rest of the capabilities hinge. This probe did not receive a confident response from the group who had only taken one set of lessons. However, all other groups and the entire sample did express confidence in this ability to know adequate information. For example, student 1.12 wrote, "On the internet I think I did ok doing the research. I look in many places that other people think it is a good place to look."

Probe Five

I find ways to locate information that is interesting to me personally is the fifth probe. It reveals standard four. This is a probe to determine how important the students feel choice is. It also looks at the students' abilities to persist in the searching process and the ability to take a personal interest in the investigations. The following two students indicated that many do find information that is personally interesting; student 2.13 noted, "The Internet gives me a lot of good information about my topic." Student 2.14 composed, "A lot of stuff interest me 2 the Internet. I loved that best. Because you fin what you need to fine, etc."

Probe Six

The fifth standard, having to do with appreciation of literature and creative forms of information, informs probe six: *I enjoy doing research on the Internet*. Appreciation includes enjoyment and affirmative reception. An important goal of this research is to foster such pleasure of the Internet as a creative form of information. This probe is an example of improvement in abilities with additional sets of lessons. Of the thirty-five students in the group who took only one set of lessons, just less than seventy-five percent registered a affirmative response. Affirmative responses to this probe increased to eighty-eight percent for the students who took three sets of lessons. Forty-six of fifty-three students expressed a sentiment similar to student 2.6, "Being able to work on the Internet and have fun while doing it." The increase from seventy-five to eighty-five percent in affirmative responses indicates student motivation and demonstrates the value of the lessons.

Probe Seven

The seventh probe concerns ALA standard number two, and is: *I know when I have found the best information*. This indicates the ability to evaluate the information found in the exploration process. Although the majority of the students were able to find information that was useful for

their investigations they were not confident that they knew when they had found the "best information". After two or more sets of lessons their confidence improved. The following quotation is representative of what students said who had taken one set of lessons. Student 1.21 wrote, "My ability on research is okay. Wouldn't say I'm really good. I still had problems, but it's getting better, I think." And student 1.8 wrote, "I would say I'm getting the hang of my ability to do research." Students who had taken three lessons were more likely to write something like student 3.8, "I can get my research done on time and I am doing it good so far. It is easy and fun."

Probe Eight

The freedom to find information is important to me is the eighth probe. It reflects standard seven. Such students recognize the importance of information to a democratic society. Student 2.2 answered, "The freedom" to the query about the best aspect of the research lessons. Only the group who had participated in three sets of lessons expressed an affirmative response to this probe. From review of the lessons I realized that little had been discussed about the freedom of information directly. Most students did seem to appreciate the school providing a means to obtain current information. Two examples follow.

Student 2.8 indicated, "You can go into many website and you learn different things about what you research." Student 2.9 wrote, "The Internet gives a lot of ideas and details and pictures."

One-way students understand freedom of information concerns their being prevented from accessing a website. This happened several times while investigating controversial topics. Student 1.9 held, "The thing that needs to be improved so we can do Internet research would be to be able to find information without having it being blocked…" When students brought this to my attention I assisted them using my computer that does not have student blocking.

<u>Probe Nine</u>

Probe number nine was developed from the objectives of the second phase of the lessons. It is: *I feel more able to plan my research*. One student, 1.1, wrote, "What I have learned in this school is how to keep myself organize." This also reflects the first standard of efficiency in information location.

Because of the number of classes that need to use the library for inquiries, it is important for students to make the most of their time in the library. During the formative phase of this study I observed many to most of the students

procrastinating about getting started on their searches and about choosing topics. The objective evaluated by probe nine was implemented during the second phase do the study was specifically to help the students plan and develop their skills to use their time effectively. To that end this probe also reflected the first standard "access information efficiently and effectively" (AASL & AECT, 1998). Several students expressed an appreciation of the lessons on use of the organizational program Inspiration. The lessons were given to help the students plan their research. Student 1.21 indicated, "What I liked and never tried before was the web [Inspiration]. It was helpful, I thought of it like an outline kinda, my group members thought the same way too." However, this is another probe that received less than seventy-five percent affirmative responses.

Probe Ten

The tenth probe is an extension of the ninth. Responses to this probe had an even lower level of affirmative responses. It carries the issue of efficiency into time management issues. It is: *I will get my research done on time*. This probe is important to the students' being life long independent learners, an objective of the standards of *Information Power* (AASL & AECT, 1998), and to

the ability of the school to have an inquiry or reference based (Bleakley & Carrigan, 1994) curriculum. All groups of students expressed a lack of confidence in their ability to complete their assignments on time even though the collaborating teachers reported an improvement of completion of assignments. Reflecting the more positive comments, student 1.6, "It helped me a lot on how to do my research and plan to do it. It was good but a little boring!"

Probe Eleven

I know how to make a reference list is the eleventh probe. It reveals standard eight regarding ethical behavior in the investigation course of action. The groups who had taken three sets of lessons expressed an affirmative response to this probe. The other groups did not. I elicited no comments about this from the students who provided essay question responses, but questions about citations were frequently asked as each project entered the writing stage.

Probe Twelve

The ninth standard informs probe twelve, *I work with my group to find the needed information*. Student 2.6 echoed many others by saying, "I'm not that good at doing research

by myself, but if I work with other students I'm pretty fast at finding good information."

The purpose of this focus on group work is to assure students are able to generate and pursue information as members of a group and was promoted by the committee that wrote the standards because many of today's careers involve work that is done in groups (AASL & AECT, 1998)

All groups of students responded affirmatively to this probe. There were a very few students who independently answered in a negative fashion. Student 3.8 said, "What I like best was working with my group and I feel that the lessons were boring. I like to work on something more fun. But I don't know what else would be more fun."

Probe Thirteen

The thirteenth probe was also developed from the objectives associated with the standard nine and relates specifically to the eighth need of Native American students for personal student teacher relationships. It is *I work with my teacher to find the needed information*. This objective was chosen as an extension of probe twelve. Group work includes working with people in authority. Two examples of student awareness of teacher involvement are

the following. Student 1.20 said, "Knowing what to do and working with the teacher and ask questions." Student 1.21 wrote, "Have the teacher sit down with students and help them go over their topic."

Cleary & Peacock (1998) note that teachers need to work toward personal relationships with Native American students. This probe reflects the objective of personal relationships between students and teachers. As the students took additional sets of lessons they were increasingly affirmative regarding this probe. Students indicated that they would like even more teacher intervention. There are many Instructional Assistants, student teachers and Special Education Inclusion teachers in classes at this high school. The students are used to more than one teacher in a classroom. They see me as one of the teachers. I therefore took comments directed toward teacher behavior to include me.

<u>Probe Fourteen</u>

The lessons about doing research were helpful to me is the fourteenth probe. It was included as a general indicator to me about the overall usefulness of the lessons to the students. With the exception of the group who had taken two sets of lessons, all the groups of students respond in an affirmative way to

this probe. This includes the response of all students.

Summary of Self-Evaluation Probe Results

One of the most frequent negative comments from students about the lessons concerned the speed of the Internet. As noted before, in the discussion of the obstacles, the speed of the school's connection was improved during the summer after the study. The following are some of the students' comments about how to improve the lessons. 2.3 "Make the lessons a little storter to remember." 3.14 "maybe a little more info on how to use the internet to find a little more info aboot some tape of research." 3.4 "Explain more ways and shortcuts," came from a student who admitted not paying attention to the lessons. 1.12 "Just like you said to make the search go faster and easier to do for others who do not real know how to use it. … you should talk a little slow and clear." I am happy to report that most of the students expressed strongly positive statements: 1.15 "Nothing I guess! It was all good." Or 2.7 "That Mrs. L. taught us well."

Discussion of Results

Student skills

When seventy-five percent of the seventy-four students
who responded say "yes" or "sort of" to the probe I
consider that response to be affirmative.

Thirty-five students took one set of lessons about
doing information investigation techniques on the Internet.
This group is forty-seven percent of the seventy-four
students doing the self-evaluation of skills. There were
eight probes that this group indicated they did not feel
confident about. These are outlined in the chart below.

Probe	#	Standard	#	Affirmative response	Total
I know when information is good enough for to help my research	4	Evaluate information critically and competently	2	Yes 35% Sort of 34%	69%
I find ways to locate information that is interesting to me personally	5	Strive for excellence in information seeking and knowledge generation	6	Yes 45% Sort of 24%	69%
I know when I have found the best information	7	Evaluate information critically and competently	2	Yes 25% Sort of 26%	51%
The freedom to find information is important to me	8	Recognize the importance of information to a democratic society	7	Yes 35% Sort of 23%	58%
I feel more	9	Access	1	Yes 39%	65%

able to plan my research		information efficiently and effectively		Sort of 26%	
I will get my research done on time	10	Access information efficiently and effectively	1	Yes 30% Sort of 9%	39%
I know how to make a reference list	11	Practice ethical behavior in regard to information and information technology	8	Yes 30% Sort of 19%	49%
I work with my teacher to find the needed information	13	Participate effectively in groups to pursue and generate information	9	Yes 38% Sort of 22%	60%

Table 4.3: Thirty-five students who took one set of lessons did not meet the criteria for five of the AASL & AECT Standards and did not indicate an affirmative answer to eight of the study probes

Twenty-two students took two sets of lessons about doing information investigation techniques on the Internet. This group is twenty-nine percent of the seventy-four students doing the self-evaluation of skills. There were nine probes that this group indicated that they did not feel confident about. These are outlined in the chart below.

Probe	#	Standard	#	Affirmative response	Total
Choosing a topic that is interesting to me is very important to me	1	Access information efficiently and effectively	4	Yes 30% Sort of 39%	69%

I find ways to locate information that is interesting to me personally	5	Strive for excellence in information seeking and knowledge generation	6	Yes 37% Sort of 25%	62%
I enjoy doing research on the Internet	6	Appreciating literature and other creative expressions of information	5	Yes 50% Sort of 20%	70%
The freedom to find information is important to me	8	Recognize the importance of information to a democratic society	7	Yes 51% Sort of 21%	72%
I feel more able to plan my research	9	Access information efficiently and effectively	1	Yes 42% Sort of 21%	73%
I will get my research done on time	10	Access information efficiently and effectively	1	Yes 22% Sort of 21%	43%
I know how to make a reference list	11	Practice ethical behavior in regard to information and information technology	8	Yes 39% Sort of 31%	70%
I work with my teacher to find the needed information	13	Participate effectively in groups to pursue and generate information	9	Yes 45% Sort of 25%	70%
The lessons about doing research	14	To improve the lessons		Yes 38% Sort of 30%	68%

were helpful to me					

Table 4.4: Twenty-two students who took two sets of lessons did not meet the criteria for seven of the AASL & AECT Standards and did not indicate an affirmative answer to nine of the study probes

There was little improvement between those students who took one set of lesson and who took two sets of lessons. The Table 4.8 below compares the two groups.

Probe number	Total affirmative responses for the students who took one set of lessons	Total affirmative responses for the students who took two sets of lessons
1		69%
4	69%	
5	69%	62%
7	51%	
8	58%	72%
9	65%	73%
10	39%	43%
11	49%	70%
13	60%	70%
14		68

Table 4.4: Comparison of the groups of students who took one and two sets of lessons

The group who took three lessons demonstrated considerable improvement over the other two groups. Fifteen students took three sets of lessons about doing information investigation techniques on the Internet. This group is twenty-one percent of the students doing the self-evaluation of Skills. There was only one probe that this group indicated that they did not feel confident about. The standard not met was number one, which includes the ability to access

information efficiently and effectively. Efficiency is

the focus of this probe.

15 Student who took 3 sets of lessons					
Probe	#	Standard	#	Affirmative response	Total affirmative response
I will get my research done on time	10	Access information efficiently and effectively	1	Yes 62% Sort of 7%	69%

Table 4.6: Fifteen students who took three sets of lessons did not meet the criteria for one AASL & AECT Standard and did not indicate an affirmative answer to one of the study probes

CHAPTER 5: CONCLUSION AND IMPLICATIONS

Findings Of Each Phase Of The Study

Formative Analysis

During the first phase, the fall semester of 1999, I learned three important ideas about what is needed when teaching location of information skills on the Internet with teenagers.

First, students need clear, concise, organized instructions supported by visual cues to successfully navigate on the Internet and locate information for an assignment. Second, students need to see a demonstration of the navigation of the Internet to be able to follow verbal directions. Demonstrations can be done with computer screen projection of the Internet browser. Third, to engender enthusiasm for inquiry project the teacher needs to provide choice of topics and websites for the student to investigate.

Students Need For Internet Information Literacy Lessons

From the lessons I taught during the first phase of the study, I became convinced that students do not learn to navigate the Internet, do not feel confident about their inquiry processes, nor are they able to locate and use useful information without instruction that includes determining search terms and organizing skills.

I understand a strong curricular connection for the lessons is required and that the Internet information literacy skills should not be taught in isolation. This connection promotes the students' understanding the reason for investigation instruction. During Phase One, I began to understand that students need adequate time to determine their specific interest in the assignment, to develop a focus for the assignment, and to gather enough information to support their point of view.

Working on vocabulary development was an unexpected bonus that grew meaningfully out of students' search term development. I did not include a lesson on search term finding in the original set of instruction I planned. Search terms were a challenge for the students. I taught search term generation spontaneously, as a response to individual student questions. They were able to do better browsing after the lessons on search terms.

Some students have difficulty organizing their thoughts. I was not able to teach the students outlining as I had planned. I include planning and outlining however in the curriculum for the second semester, spring 2000. I plan to teach the "Inspiration" (Inspiration, 1996) software program that turns mind maps into outlines electronically. I used this program in my student teaching, spring semester

1999, and found it very useful for students to organize their ideas and thoughts.

Many students had a difficult time finishing the projects and many did not provide citations to the websites and/or authors of the information gathered. The second semester's lessons emphasize time management and reference citation.

Visuals

For my students, visual cues are needed to support and enhance the verbal presentation. Verbal instructions alone are not easily understood. When students can follow the instructions visually they are more successful in following verbal directions. Examples of visual cues I use are: projections of the computer screen for Internet navigation and Power-point presentations about the research process.

Choice

Student choice to is an essential component of research education. I believe choice improves the chances that students will approach the inquiry in a state of "flow" and operate in the *Zone of Proximal Development* developed by Vygotsky (Wood, 1996). Examples of student self decision: topics, the focus of the examination; teammates, who they are and how many to work with; materials to use in the research, electronic or print.

<u>E-sheets</u>

I found E-sheets (electronic note taking sheets) (Lewin, 1997) are more effective than paper work sheets for instruction using computers. E-sheets are given to students on floppy disks. They are very effective as guides for navigation of the Internet and are helpful to help them organize the information they collect. Instead of having to type URLs into the location bar on a browser students can copy from the E sheet and paste onto the browser. URLs can also be copied from the browser and pasted onto a word processing document. This is especially useful for browsing. Later, while exploring, information can be copied from a web site and pasted onto a word processing document. Students create them to keep their notes and quotations collected from web resources.

<u>Teaching from the Library</u>

Usually students come to the library for only a few sessions. It is best for the Librarian to teach skills the students need to complete an assignment, rather than skills in isolation from an assignment. The primary teacher sets the deadline and the particulars of the assignment. When there is a collaborative relationship between them the librarian can have input into the objectives the teacher has.

This brevity of student contact requires the Librarian to have skills and approaches different from the primary teacher of a group of students in a semester or a yearlong course. The Librarian must establish credibility and get to know the students quickly. The lessons need to be brief with activities to practice the developing skills and to anchor the present needs of the students. That is why I have chosen the mini-lessons format.

I also realized I must help teachers understand the students' need for choice. I think that the connection to the Zone of Proximal Development (ZPD) may be a key to this instruction. There seems to be some resistance to this element of choice (Wood, 1996). Many teachers seem to desire control over all aspects of the learning situation. Young adult learners are very capable of helping to create the learning environment. Their input is essential to their productive involvement and enjoyment during the learning projects.

Internet Searching

I have done enough Internet searching to begin to understand how media (Kozma, 1994) influences each of my eight stages of research (Kuhlthau, 1994; Thomas, 1999; Schwartz, 1997; Pitts, 1996). There are dissimilar Internet sites and search resources for the three types of Internet

search: browsing, exploring and collecting (Rodrigues, 1997; Hord, 1995; Bash, 1998). The goals of each type of inquiry are distinct. E sheets are employed in different ways during each of these types of exploration as well.

Content of Lessons

Based on my literature study I developed eight stages of information investigation and incorporated them into my curriculum (Kuhlthau, 1994; Thomas, 1999; Schwartz, 1997; Pitts, 1996). These lessons were conducted in three sessions at the beginning of the time the students were in the library. The focus of the first session was Navigation of the Internet. The stages were taught in the second session. The third session focused on the process of Internet searching with search engines.

Stage	Name	Process
1	Browsing	Hunt for information to begin the assignment
2	Topic	Choose a subject that interests the writer
3	Explore	Select a center of attention for study
4	Focus	Delve into the subject to find a focus
5	Collect	Gather information to explain the focus
6	Organize	Outline ideas, point of view & information
7	Present	Develop the research & author's position
8	Evaluate	Review of the information location process

Table 5.1: Lindsey Stages of Internet Information Literacy

The three lessons include (Nelson, 1994):

Practical	Navigation on the Internet
Technical	Stages of Information Literacy
Conceptual	Searching on the Internet
Creative	Individually help students apply what they have learned

Table 5.2: Lesson Content during Phase One

I kept notes on the Web sites suggested for the lesson and other materials and resources and references utilized in the lesson.

Assessment of Student Abilities

I observe the students and help them correct navigation and search method problems as they arise; each lesson has an outcome to demonstrate how well they have mastered the process. There is an end assignment of some sort of presentation, verbal, written, visual, or some combination. Also there is a questionnaire of how all the stages were accomplished in their research process. The students complete this questionnaire in the last lesson of Phase Two.

I trust the student's processes. This means that at times they will not feel confident with previous steps as we progress with the mini-lessons (Atwell, 1987). I believe the progression through the lessons provides enough

repetition for most of them to "get it." My experience is that the students will get help by asking questions, working with peers, or staying after school for extra help.

In working with teenagers, I have learned that some will not see connections between the class assignments and their lives. Often they will not participate or complete the assignment if they do not see any practical reason for learning the Internet information literacy process or the content of the coursework. I try to help students make personal connections by discussing as many links as possible in my lessons. When I am working with students individually the interaction often focuses on how they can make the project personally important.

Curriculum Analysis

During the second phase, the spring semester of 2000, I adapted the lessons I taught, on Internet navigation, location, evaluation, citation and use of information, and planning resource-based projects, based on what I learned in the formative phase. I also adjusted the lessons based on the literature investigation I had done. A new book came to my attention, during the Phase Two, which helped me immensely in developing a curricular understanding of Native American students. This book is *Collected wisdom:*

American Indian education by Linda M. Cleary & Tom D.

Peacock, published in 1998.

Education of Native American Students

There are eight education situation needs for Native

American teenagers identified in the literature and

supported by this study. These are described in Table 5.3

below.

Educational Needs	How to Meet the Needs
Holistic learning	Teach elements within an understanding of the whole with authentic, meaningful activities
Culturally relevant content and process	Use cultural processes and information in lessons that confirm the culture of students
Choice in projects	Provide opportunities for students to make decisions about topics, partners, and methods
Visual learning	Teach using visuals, support presentations with visuals and permit visual displays of learning
Feelings of competence	Help students do well by creating opportunities for step-by-step success
Opportunities to work cooperatively	Promote acceptance of teacher aid and mutual support through formal and informal student groups
Personal involvement with teachers	Develop trusting, respectful, enjoyable relationships that validate students
Specific information about how to succeed in dominant culture	Teach students how to function in but not insist that they always use dominant culture practices

Table 5.3: Meeting the educational needs of
Native American students

Library Professional Standards For Information Literacy

Basic information literacy (AASL & AECT, 1998)
includes the ability to access information efficiently and
effectively, to evaluate information critically and
competently, and to use information accurately and
creatively. Once a student is able to access, evaluate and
use information they need to become independent learners by
pursuing information related to personal interests,
appreciating literature and other creative expressions of
information, and striving for excellence in information
seeking and knowledge generation. After students are
independently information literate they need to contribute
positively to the learning community and to society. These
students recognize the importance of information to a
democratic society, practice ethical behavior in regard to
information and information technology, and participate
effectively in groups to pursue and generate information.

Content of Curriculum

Computer Techniques

The technology skills lessons focus on navigation of
the Internet and the basics of word processing. As the
students become proficient in technology skills they are
more interested in learning to use the Internet for
information literacy. Navigation lessons include URLs

(Uniform Resource Locator), links, bookmarks, and using the

go, back, and forward buttons. Other technology lessons

concern electronic note taking sheets, called "E-sheets",

and copying and pasting between word processors and

browsers. I demonstrate a variety of simple and mega search

engines and help students to choose at least three to try

independently. I teach an additional technology component,

Inspiration (1996) software. This is an electronic graphic

organizer that is very effective in teaching the students to

think about their inquiries, presentations, and projects.

<u>Understanding The Investigation Process</u>

I use the subject of Navajo culture and demonstrate

how I personalize a topic, locate information on the

Internet, organize a paper (or verbal presentation when

that is class assignment), assess information sources, cite

references and evaluate my outcome. I briefly touch on all

the stages of library research, Internet browsing,

exploring and collecting, and what I hope to accomplish

with my exploration. I define terms as I go along and have

numerous visuals.

Searching on the Internet

Just as it is important to investigate information with increasing intensity and focus, when using print media, it is essential to begin by browsing, move on to exploring and eventually collect information from the Internet. There are different Internet techniques for each type of searching (Kozma, 1994; Cotton, 1997; Rodrigues, 1997; Bash, 1998) There are different web resources for each type of exploration. The purposes, methods, resources and techniques for each are the elements of various lessons in the curriculum.

The browsing lesson demonstrates the use of online resources for browsing, such as encyclopedias and directories. It also includes navigating a website and gathering information from that site. The lesson on exploring involves developing search terms and locating information with search engines and other web resources. The focus is to find information that is personally interesting and important to the evolution of the assignment. During the collecting information lesson I teach recording information and giving credit to the sources of information. I teach the students to keep notes that clearly have bearing on their topic and point of view. I promote the use of E sheets and Inspirations for note taking.

Sixteen Sessions on Internet Information Literacy

Students are scheduled to come to the library for fifteen days. The sixteenth day is conducted in the classroom. There are eight mini-lessons and eight days for students to practice the skills taught, to locate useful information, and to prepare their project papers and presentations. The titles and the days of the eight mini-lessons are: day 1) Thinking about the assignment, day 2) Navigation and browsing on the Internet, day 4) **Exploring with the Internet, day** 5) Note taking and collecting information, day 7) Evaluating resources, day 10) Preparing to present, day 13) Reference lists, day 15) Presenting research / Due date for papers, and day 16) Evaluating research skills.

<div align="center">Summative Analysis</div>

Overview

During school year 1999-2000 I collaborated with twelve teachers to develop lessons to teach Navajo/Dine' high school students to locate, evaluate and use information found with Internet navigation for resource-based projects. One hundred ninety seven students came to the library for lessons from English, Native American Studies, Social Studies, Science, Art, and Math classes. At

least one hundred and five lessons were provided to the

subjects over the course of the school year.

Discussion Of Results

The purpose of the Third Phase is to determine student

learning that resulted from the lessons. The students'

abilities were determined by the administration and

analysis of a self-evaluation survey. The data was analyzed

based on the number of sets of Internet information

literacy lessons the student had taken.

Student skills

Probes were written, in student level language, to

reflect behavioral descriptions of the AASL & AECT (1998)

standards. I interpreted affirmative responses, of yes or

sort of, to the probes of the questionnaire as indicating

the standards had been met. The students had an option to

give personalized self and lesson evaluations in answers to

essay questions.

The students who took three sets of Internet

information literacy lessons showed noticeably more

confidence in their ability to locate, evaluate, cite and

use information from the Internet than students who had

taken either one or two sets of lessons. The students who

had taken three sets of lesson met eight of the nine

standards. The students who had taken only one or two sets of lessons met only four of the nine standards.

Adaptable Curriculum

From the information gained during the Third Phase of the study, I gain awareness that students need repeated sets of lessons to become capable at the complicated skills of navigation, location of useful information and use of information in presentations and papers. The results of this study indicate that students need at least three sets of lessons to gain enough proficiency to express confidence in their ability to perform Internet information literacy skills. I believe this is true because, although they are exposed to the same information, they absorb only the data they believe they presently need. Spence Rogers (1998) indicates that students need twenty-eight exposures to information to become skilled using it.

In order to keep three or more sets of lessons interesting to myself and the students, I need to adapt each set of lessons to the interests, skill level, and needs of the students coming to the library for information projects. To sustain student interest I must have a multifaceted curriculum. This curriculum needs multiple assessment methods to evaluate the skills and needs of the students before and after each set of lessons and numerous

teaching strategies to impart the information and skills included in the AASL & AECT standards. My Internet information literacy curriculum will always be in a state of development.

The results of this study indicate that there is a continuing need for the development of lessons that teach Navajo high school students how to locate information to investigate subjects with the Internet and to present information found on the Internet. Comparing the results of the students who took one or two sets of lessons and the results of the students who took three set of lessons indicates that at least three sets of lesson is necessary for students to feel confident with all the standards and objectives of these lessons. There is clear benefit to more exposure to an adaptable curriculum to teach Internet information literacy.

From the Librarian's point of view, the challenge is to keep the lessons interesting and fun. I don't want to become repetitive and boring. I don't want the students to be able to predict everything I'm going to teach. I want to spark interest by introducing new content, new web resources, and to present the lessons in innovative ways.

To accomplish the above goals I think that I need to develop additional instructional approaches to deal

with the standards that have not yet been met by the majority of the students studied. One way to improve the lessons is to continue to improve my ability to make personal relationships with the students.

The objectives that need additional and improved tactics are: students will demonstrate the ability to:

1 Efficiently locate information
2 Evaluate information found
3 Personalize information to their own interests
4 Recognize importance of information to our society
5 Practice ethical behavior by acknowledging the authority that created the information
6 Plan inquiry projects and complete projects on time

For freshmen I need to include Internet navigation and electronic techniques such as E sheets, copying and pasting, and the linear logic of the Internet. I will also need to help them access search engines and to formulate search terms. These basic skills of information location are essential to the more advanced skills of evaluation and utilization of that information. Sophomores, juniors and seniors will need additional lessons on the standards not met and these critical thinking skills. The addition of roles for the advanced students will insure that I do not repeat information that most of the students already know.

The results of this final phase of the study make me believe that the lessons to teach information literacy to Navajo high school students need to be adaptive. By this I

mean that there cannot be one rigid scope and sequence for the curriculum that I teach from the library. I need to develop lessons for each class that are responsive to the needs of the students.

To be responsive to the needs of the students I will do a Know, Want to know, Learn (K-W-L) exercise or some other form of pre-evaluation that will help me understand the skill level of the current group. The exact activities of the lessons will only be written after I have information from the assessment. The span of the lessons will extend to seventeen days. This extra day will be to do the pretest of information literacy and Internet navigation skills.

Another change I will most likely make is group formation because of the importance of helping students make choices about what they are going to study. I think that the students should first choose the topic they want to investigate. Constructing formal groups by combining students who want to work on the same topic would help students focus more productively on their work than allowing groups found by friendship or by skill levels. This strategy is more responsive to the relevant needs of the students who work in groups. It also meets their need to choose their own topic. If a student group is formed by

friendship or as a heterogeneous skill group, the risk of one or two students dictating the topic choice is high and this leads to student disinterest.

Implications And Recommendations
For The Curriculum

I will continue my constructivist approach to curriculum development. Refection is critical for appropriate use of what I learned from this study. To include an assessment of student Internet and information literacy skills I will include an additional session at the beginning of each set of lessons. This seventeenth session will be conducted either in the library or the classroom a few days before the class comes to the library for an inquiry-based project. The purpose of the initial lesson will be to assess the information literacy skills of the students. I will continue to collaborate with teachers to achieve an understanding of the content of lessons during the students' time in the library. I will continue to teach mini-lessons and promote adequate time for students to practice the skills learned. I will continue to have the students do an assessment after the projects are complete to inform myself and the teachers about skills that need to be learned and aspects of the lessons and assignments that were effective.

Future lessons need to take into consideration the academic challenges that remained at the end of the study. The addition of videotaping the library lessons will create a set of video lessons that can be played for students who are absent or need to review the material given in previous sessions.

I think that I need to find additional ways to help students who have difficulties with reading comprehension. Because many students have difficulties with the vocabulary and paragraph structures of some website I have subscribed to supplementary web resources that are written at more simple levels for the next school year. I also plan to have more colored highlighters available to underscore sections of text visually. Collaborative work with reading specialists and teachers may develop further recommendations. Additional literature review in the area of reading strategies for non-fiction may also be helpful.

For returning students and teachers who think multiple sets of Internet information literacy lessons are not necessary I will need to explain the results of this study and provide new content and methods of instruction. The pre assessment session is needed to provide me with the opportunity to discuss the need for repeated lessons with the upperclassmen, sophomores, juniors and seniors.

Early in the fall of each school year I will ask freshman English teachers to collaborate with me on a resource-based project. These learning experiences include the eight mini-lessons described in this thesis with an strong focus on basic technology and information location. As the school plans to continue this resource-based project method of learning it is important for freshman students to learn Internet information literacy skills to be prepared for future inquiry-based project done in other classes.

Summary

The students sampled for this study gained fair information literacy skills after only one set of lessons. The majority of students who receive three sets of lessons met all but one of the standards for information literacy established by the American Association of School Librarians and the Association for Educational Communications and Technology in 1998.

The content of the curriculum needs to be adapted to reflect what the students have learned. One way to adapt the lessons is to do some form of needs assessment before each class begins their inquiry for information in the library. These needs assessments should evaluate technology, basic information location and critical

thinking skills. The pretest needs to be developed before the next school year.

The scope of the lessons may need to be adapted as well to reflect the increased speed of the new Internet connection and the addition of the pretest.

Conclusions

I believe the report of this study illustrates that Navajo high school students who participate in multiple series of lessons regarding Internet information literacy develop skills to determine their information needs and are able to locate, consume, organize, evaluate, document, and use current, accurate, interesting, complete, and meaningful information in coursework assignments.

An Internet Information Literacy curriculum has been established teach to Navajo high school students, at the school of this study. Students who have taken three sets of Internet Information Literacy lessons express an able to incorporate current, accurate, interesting, complete, and meaningful information into their coursework. The instruction utilizes teaching strategies that are compatible with the needs of Native American students and the Internet as a search domain. Students are taught, within the context of course-related inquiries, to identify the need for information, locate information by browsing

and exploring, consume information by reading, forming opinions, and taking notes, evaluate and collect information that corresponds to the focus of their investigations, prepare graphic organizers and outlines about the information found, document the information used by citing references according to the appropriate methods, share the interesting details of the information found in writing or speech, and reflect on their personal information use process for the purpose of improving that course of action.

I have determined that specifically structured instruction, based on an on-going evaluation of student needs, is required for students to increase their interest and efficiency in using the Internet. I also found eight principles of Native American learning environments that support student growth. These are holistic learning, culturally relevant content, students being able to exercise choice within the projects, support of visual learning styles, developing self-confidence with a step-by-step approach, promoting formal and informal cooperative learning, sharing information about dominant culture practices and teachers developing personal trusting and respectful relationships with students.

In conclusion, the curriculum for information literacy is a dynamic growing form of social interaction with students that is informed by the standards of the profession of library information science, the growing skills of the students and the changing character of the Internet.

Appendix A

Summative Phase Data Collection Sheet

Please indicate all the classes in which you had research lessons this
school year.

( ) American Literature and Speech
( ) 9th grade English
( ) Another English class
( ) American History
( ) World History
( ) Another class

Please rate yourself by the following scales. Compare your current
skills with those you had before you were in the training classes this
school year. Circle the answer that best matches what you think.

Choosing a topic that is interesting to me is very important to me	Yes	Sort of	Maybe	A little	No
I can get information from the Internet	Yes	Sort of	Maybe	A little	No
I can find information that is useful for my research	Yes	Sort of	Maybe	A little	No
I know when information is good enough to help my research	Yes	Sort of	Maybe	A little	No
I find ways to locate information that is interesting to me personally	Yes	Sort of	Maybe	A little	No
I enjoy doing research on the Internet	Yes	Sort of	Maybe	A little	No
I know when I have found the best information	Yes	Sort of	Maybe	A little	No
The freedom to find information is important to me	Yes	Sort of	Maybe	A little	No
I feel more able to plan my research	Yes	Sort of	Maybe	A little	No
I will get my research done on time	Yes	Sort of	Maybe	A little	No
I know how to make a reference list	Yes	Sort of	Maybe	A little	No
I work with my group to find the needed information	Yes	Sort of	Maybe	A little	No
I work with my teacher to find the needed information	Yes	Sort of	Maybe	A little	No
The lessons about doing research were helpful to me	Yes	Sort of	Maybe	A little	No

On another sheet or on the back of this sheet please answer the
following 4 questions.

1. What you have learned about doing research on the Internet?
2. How would you describe your ability to do research?
3. What did you like best about the Internet research lessons?
4. What could be done to improve the lessons about doing Internet
   research?

APPENDIX B

Information Literacy Standards

<u>Independent Learner Standards</u>

Standard 1: The student who is information literate accesses information efficiently and effectively.

Standard 2: The student who is information literate evaluates information critically and competently.

Standard 3: The student who is information literate uses information accurately and creatively.

<u>Independent Learning Standards</u>

Standard 4: The student who is an independent learner is information literate and pursues information related to personal interests.

Standard 5: The student who is an independent learner is information literate and appreciates literature and other creative expressions of information.

Standard 6: The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.

<u>Social Responsibility Standards</u>

Standard 7: The student who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society.

Standard 8: The student who contributes positively to the learning community and to society is information literate and practices ethical behavior in regard to information and information technology.

Standard 9: The student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information. (AASL & AECT, 1998, p. 8-9)

APPENDIX C

Titles and Content of the Lessons of the Formative Phase

1. Introduction to Internet Navigation – e sheets, URLs, scanning for specific information, navigating on the Internet, locating, copying and pasting information from a web page – navigation of Internet navigation projected and followed by students working in small groups to navigate a web scavenger hunt

2. Introduction to Research – understand the stages of research, the assignment, and the purpose of research – lecture with Power Point and cooperative activities for defining the terminology associated with these stages

3. Tools for Browsing, Searching and Collecting – search terms, web encyclopedias and indexes, getting ideas about the assignment, web sites, web articles, perseverance, skimming, asking questions about the topic, gathering data to support your topic and focus – demonstrated through projection of the computer screen

APPENDIX D
Charts describing the results of the Summative phase

35 students who took 1 set of lessons
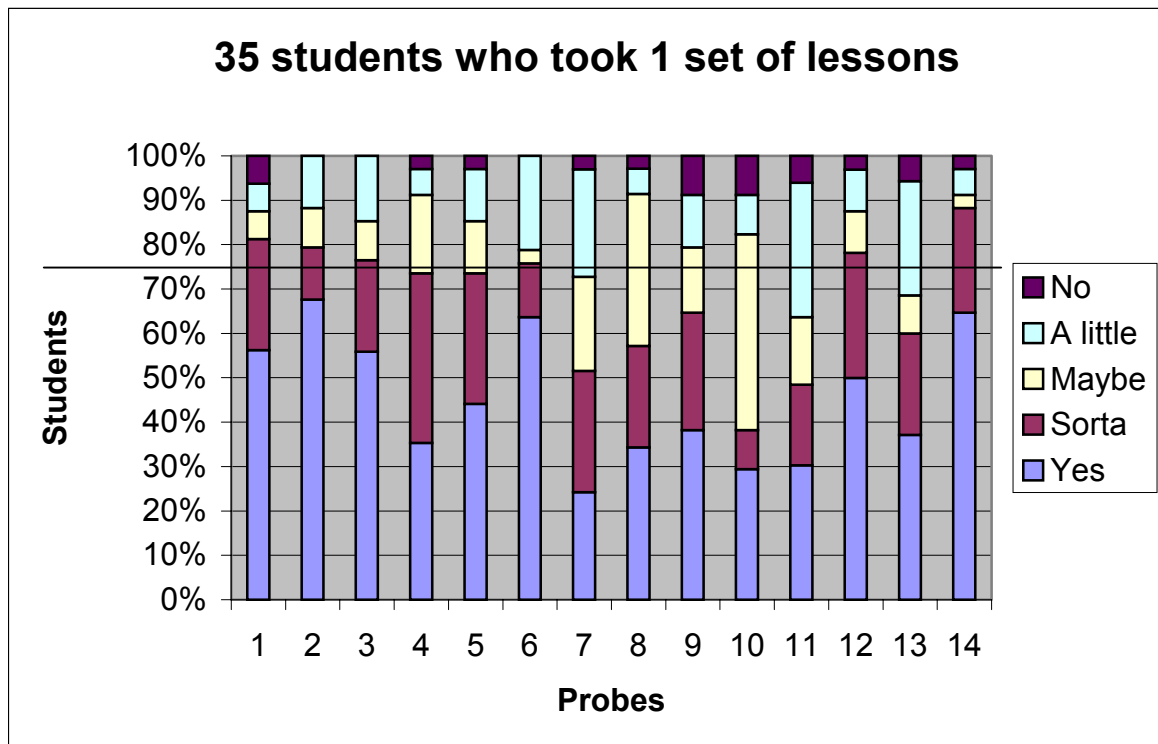
Graph 4.1: Thirty-five of Seventy-four Students
took one set of Internet Information Literacy lessons
–
Horizontal line indicates 75% of the students-
Confidence in the ability to perform the skill described in
probe of the questionnaire is an affirmative answer of
"yes" or "sort of"

22 students who took 2 sets of lessons
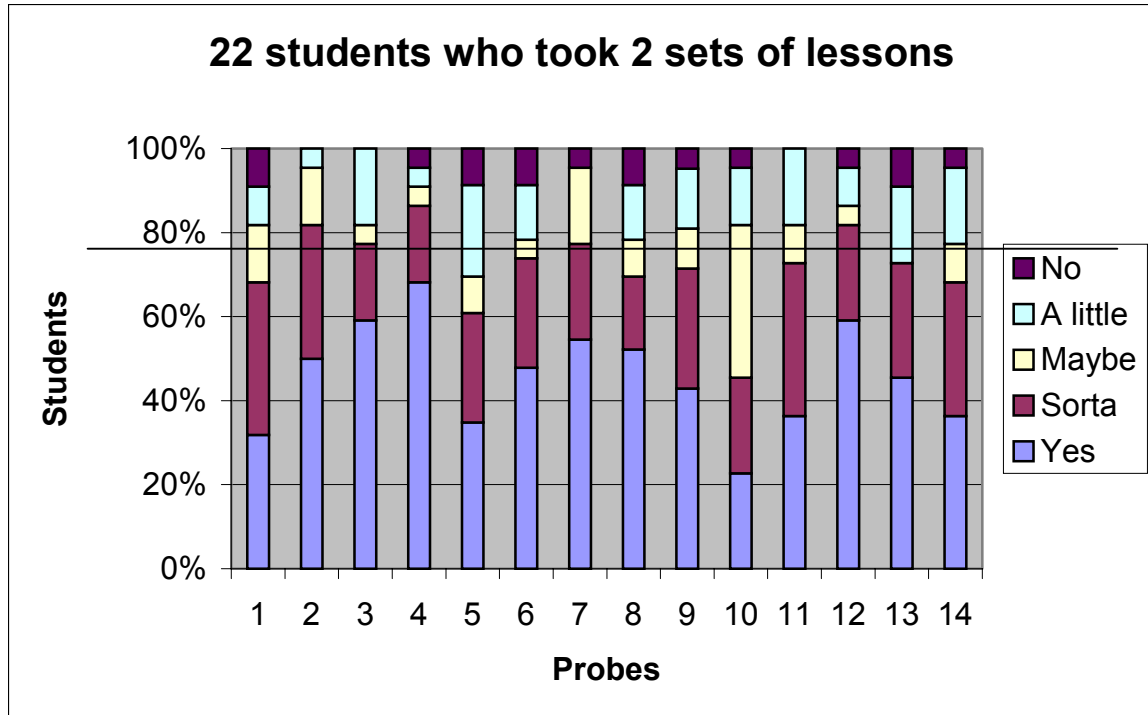
Graph 4.2: Graph 4.1: Twenty-two of Seventy-four Students
took two sets of Internet Information Literacy lessons
–
Horizontal line indicates 75% of the students-
Confidence in the ability to perform the skill described in
probe of the questionnaire is an affirmative answer of
"yes" or "sort of"

15 students who took 3 sets of lessons

Graph 4.3: Fifteen of Seventy-four Students
took three sets of Internet Information Literacy lessons
–
Horizontal line indicates 75% of the students–
Confidence in the ability to perform the skill described in
probe of the questionnaire is defined as an affirmative
answer of "yes" or "sort of"

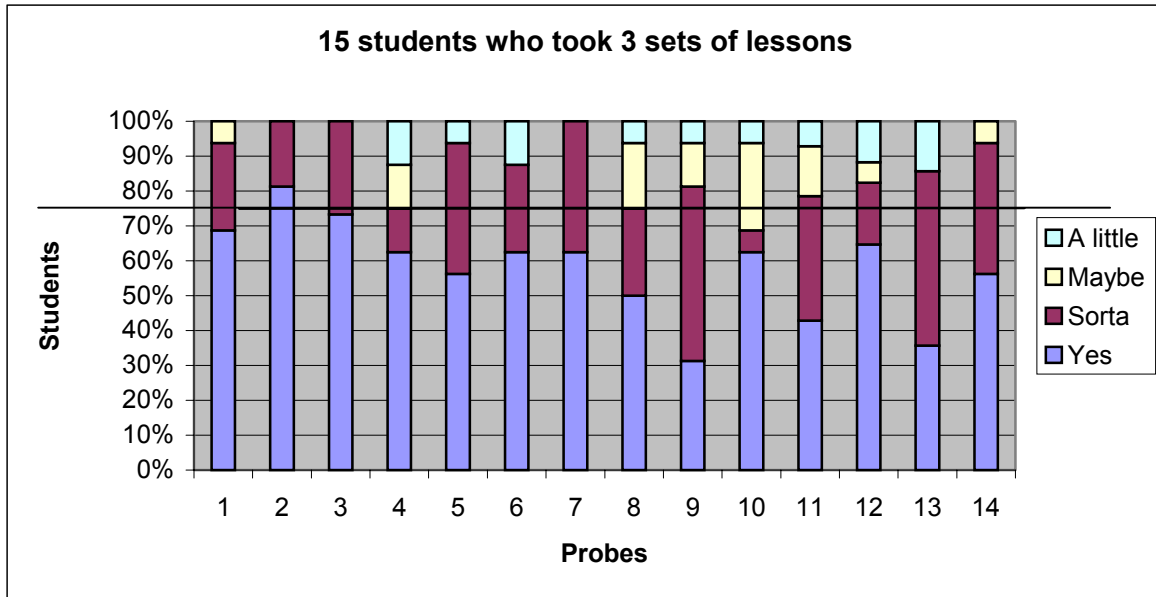**All students who took lessons**

Graph 4.4: Seventy-four Students
took Internet Information Literacy Lessons
–
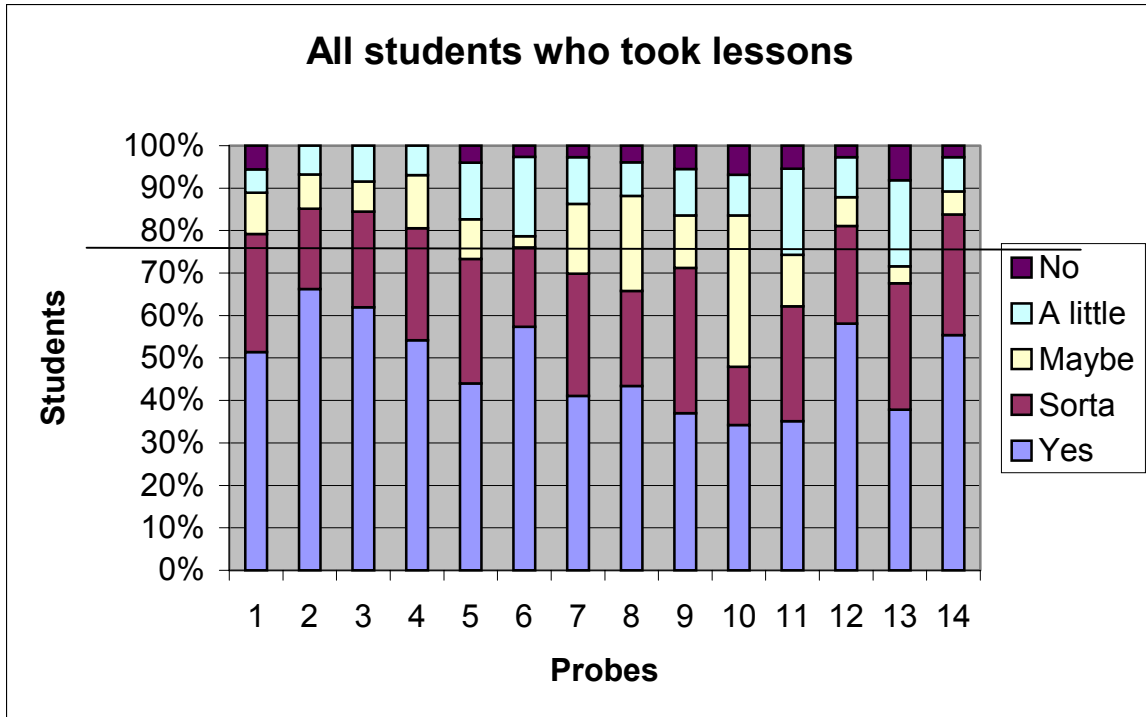Horizontal line indicates 75% of the students-
Confidence in the ability to perform the skill described in
probe of the questionnaire is defined as an affirmative
answer of "yes" or "sort of"

Appendix E

Lindsey Internet Information Literacy Curriculum

<u>Effective Investigation on the Internet
with Navajo High School Students</u>

<u>Students</u>

Grades 9, 10, 11, and 12
Fifteen to thirty in small groups

<u>Class</u>

Any class doing a project that requires inquiry
90 minute class periods

<u>Goals</u>

The student who is information literate is an independent
learner who contributes positively to the learning
community and to society.

<u>Outcomes</u>

Students will be able to:
1. Access information efficiently and effectively
2. Evaluate information critically and competently
3. Use information accurately and creatively
4. Pursue information related to personal interests
5. Appreciate literature and other creative expressions
   of information
6. Strive for excellence in information seeking and
   knowledge generation
7. Recognize the importance of information to a
   democratic society
8. Practice ethical behavior in regard to information
   and information technology
9. Participate effectively in groups to pursue and
   generate information

Assessment

Students' demonstration of the above abilities will be
demonstrated in:
1. The assignment designed by the collaborating teacher
2. Observation of student behavior during lessons
3. Portfolio
    a. E sheets
    b. Inspiration Graphics and Outlines
    c. Print outs from the Internet
    d. Photos and Maps
4. Questionnaires

Resources

Proficiency with the following technologies:
1. Computer Screen Projection Capability
2. Inspiration Software
3. Microsoft Word – Word processing
4. Netscape Internet Browser
5. Power Point Presentation
6. Research Inquiry Process
7. Search Engines and other Online Resources
8. Smart Board Projection is most advantageous

Lesson One

Day One   Thinking about the assignment
Demonstration: Overview of the process using Navajo Culture
                 Inspiration software
                 Copying and pasting between Internet and
                 word processor
Discussion: The elements of the assignment
Activities: Clarifying your understanding of the
                 assignment using Inspiration technology
                 Determine a focus for your presentation
Assessment: Demonstrate the ability to open, use, & save
                 with Inspiration and Word E sheets
                 Write a statement of your inquiry
                 Determine what research is needed

Lesson Two

Day Two   Navigation and browsing on the Internet
Demonstration: Internet navigation by locating information
                 about Navajo culture

```
Discussion:     Linear nature of Internet navigation
Activities:     Browsing on the Internet
Assessment:     Demonstrate use of the Netscape Navigator
                Definitions of Internet Terminology
                Develop 4 or 5 search terms for the subject
                Save content of general information found
                from Online Resources
                Save general 5 to 7 URLs to an E sheet
```

Lesson Three

```
Day Four
Exploring with the Internet
Demonstration: Use of search engines to locate Navajo
               information
Discussion:    Use of Search Terms
Activities:    Searching for Information and determining if
               enough information can be found to support
               the topic
Assessment:    Locate and save information from Online
               periodical resources
               Attempt searches on 3 search engines
               Locate at least 7 to 10 sites on each
               Evaluate sites for usefulness
               Save a minimum of 15 URLs for further study
               Collect information needed for the
               bibliography of the project
```

Lesson Four

```
Day Five        Note taking and collecting information
Demonstration:  Note taking with highlighters
                Review of copy and paste
                Making own E sheets
Activities:     Locate information important to the
                assignment and presentation, answer the
                question – do I have enough information?
Assessment:     Read and highlight sections of information
                found that is important to the assignment
                Write notes from that information piece that
                support your point of view and statement of
                research topic
```

Lesson Five

```
Day Seven       Evaluating resources
Demonstration:  Reviewing a resource found on the Internet
                about Navajo culture
```

Discussion: Importance of locating dependable
                 information
Activities: Evaluate the use of resources found for use
                 in the presentation of the assignment
Assessment: Select a piece of information found during
                 searching
                 Compare it to the other information found to
                 timeliness, source of the information,
                 accuracy, appropriateness to the assignment,
                 and suitability

Lesson Six

Day Ten   Preparing to present
Demonstration: the elements of an excellent term paper
                 using the information gathered about Navajo
                 culture
Discussion: Term paper writing from a dominant culture
                 point of view
Activities: Prepare to write the presentation
Assessment: Create a graphic organizer
                 Copy Inspiration outline to a Word document
                 Sketch introduction and develop conclusion

Lesson Seven

Day Thirteen   Reference lists
Activities: Information for a reference list
Demonstration: Write a list from the previously found
                 information on Navajo culture
Discussion: Importance of giving recognition to the
                 authors of information found by citations
Assessment: Write examples of four citations for
                 materials found to date
                 Determine what other information is needed
                 and additional citation information needs to
                 be located

Lesson Eight

Day Sixteen   Evaluating research skills
Activities: Discuss the purpose of the evaluation and
                 review the purpose of the lessons
Assessment: Answer a questionnaire about the lessons
                 and student abilities to conduct Internet
                 research

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