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**IQYAX:
A CASE STUDY INVESTIGATION OF THE
EFFECT OF AN ONLINE
TRADITIONAL UNANGAN SEA KAYAK MODEL COURSE
ON SELF-ESTEEM OF FIVE ADOLESCENT STUDENTS**

by

Michael Livingston

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy in Instructional Design

In the College of Education

Idaho State University

May 2015

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COMMITTEE APPROVAL

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March 16, 2012

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RE: Your application dated regarding study number 3604M2: Iqya-x: A Multiple Methods Investigation of Self-Esteem in an Online Traditional Unangan Sea Kayak Model Course

Dear Mr. Livingston:

I have reviewed your application for revision of the study listed above. The requested revision involves changes to the protocol and consent form by interviewing students who have completed the on-line course.

You are granted permission to conduct your study as revised effective immediately.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

Submit progress reports on your project in six months. You should report how many subjects have participated in the project and verify that you are following the methods and procedures outlined in your approved protocol. Then, report to the Human Subjects Committee when your project has been completed. Reporting forms are available on-line.

Please note that any further changes to the study must be promptly reported and approved. Contact Patricia Hunter (208-282-2179; fax 208-282-4529; email: humsbj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

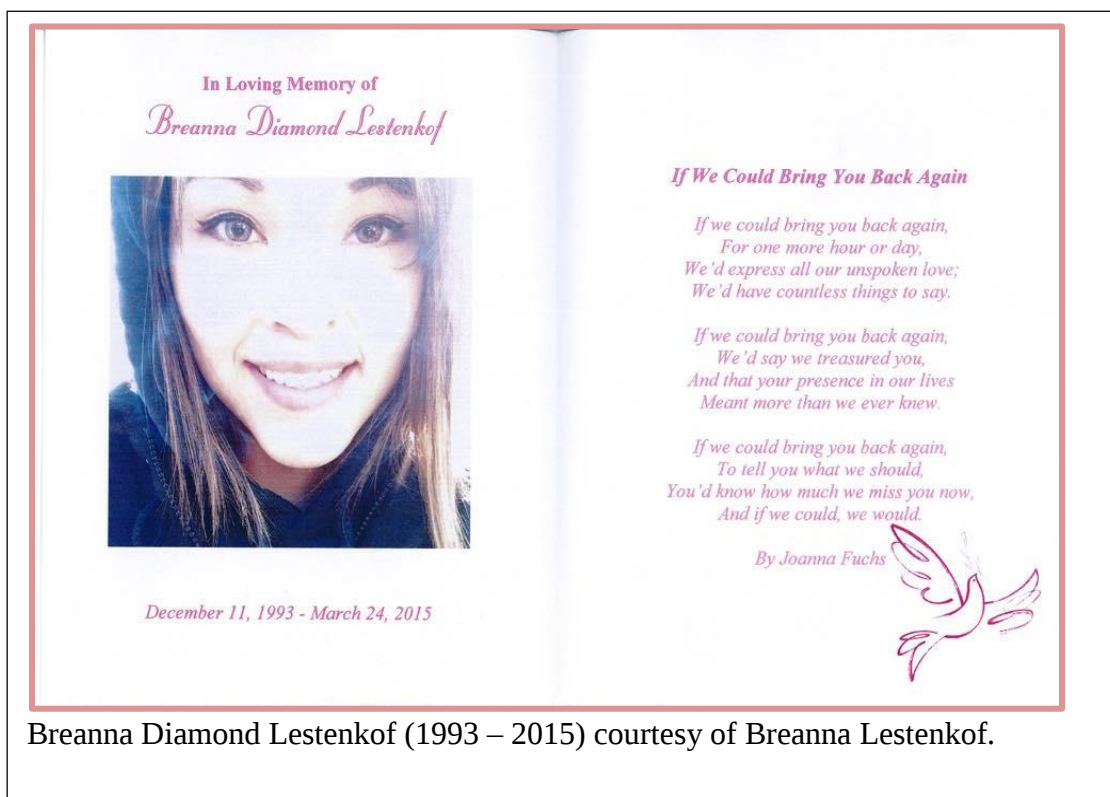
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Dedication

This doctoral dissertation on model Aleut sea kayaks and Aleut self-esteem is dedicated to **Breanna Diamond Lestenkof**. Memory eternal.

"If we could bring you back again...
We'd express all of our unspoken love...
We'd say we treasured you...
And that your presence in our lives...
Meant more than we ever knew..."

(Joanna Fuchs)



Acknowledgments

I would like to acknowledge my major academic advisor, Dr. Jane Strickland of the Department of Organizational Learning and Performance at the College of Education at Idaho State University. Without Dr. Jane Strickland's patience and optimism, this dissertation would not have occurred.

I would also like to acknowledge the members of my doctoral dissertation committee, Dr. Dotty Sammons, Dr. David Coffland, Dr. Kate Reedy, and Dr. Chris Loether. Their input and advice provided invaluable insights. Their kindness and encouragement pulled me through rough waters. I would also like to acknowledge the members of my Instructional Design Expert (IDE) committee, AS, SM, and JW. Their oversight as instructional design experts made significant differences in this project. In addition, I would like to thank the members of my Subject Matter Expert committee, OPLG, BB, and JP. Without their input as instructors at Aleut culture camps, this model iqyax project would not have been even keeled.

Acknowledging one's ancestors is a strong component of ancient Unangax cultural values. I proudly acknowledge my mom, Annabelle Elsie Livingston-Donaldson who always encouraged me to "study hard" as well as her parents, Ann Marie Levshakoff (daughter of Steven Levshakoff and Xenia Chemiswosky) and Carl Donaldson (son of George Donaldson and Madelene Matrona) whose fishing vessel the "F/V Hustler" lifted him up and brought him down during that perpetual deadly chase for nourishment from Alaska's bountiful oceans.

I must also honorably acknowledge my dad, Robert Lee Livingston, who encouraged me to help others, and also his parents, Guy Livingston (son of George Livingston and Mary Peter McFadyen) and Julia Clingan Slaten (daughter of Mae Clingan and Isome Slaten) – proud farmers of wheat, corn, and potatoes from the Midwest Plains to the hills of Scotland. I also acknowledge with love other members of my family tree including Gary & Carol; Caleb & Sharon; Hope, Lewis, Grey, Ian, and Lachlan; Scott, Alena, Scott, Laresa; Sam & Gert; Marjy, Marie & Ernie; Grant; Richard; Jennifer & Erik; Helen & Stan; and, Nancy.

I need to acknowledge the many teachers, professors, and mentors who inspired me over the years including Bob & Margaret Halliday, Drs. Bob & Dorothy Jones, Chuckie Jones, Tony Littau, Ray Hudson, Dr. Dennis Demmert, Dr. Doug Veltre, Drs. Bill & Karen Workman, Dr. Rachel Mason, Dr. David Yesner, Dr. Diane Hanson, Dr. Aron Crowell, Dawn, Dr. Skip Lohse, Dr. Al Strickland, Dr. Shane Moulton, Dr. Jerry White, Dr. DeWayne Derryberry, Drs. Sue & Corey Schou, Dr. Ralph Baergen, Pat Hunter, Verla Negus, Lundy Facer, Donna Plant, Karin, Happy, Candace, and Dawn. Your support and encouragement made this a great journey.

I would also like to tip my hat to my doctoral colleagues Clark, Christian, Joachim, Paoshi, and Vinny. I would like to thank all of the anonymous students, parents, and teachers who helped this project in Alaska, Idaho, Virginia, and Arizona.

I would like to acknowledge my Aleut instructors including Anfesia Shapsnikoff (Atka), Phil Tutiakoff (Unalaska), Bill Tcheripanoff (Akutan), and Sergie Sovoroff (Nikolski). I need to acknowledge my Alaska Native law enforcement brothers and sisters especially Chief Charles G. Anderson of Kodiak; VPSO Ronald Eugene Zimin of South Naknek (1950 – 1986); and, Chief Walt Monegan of Nyac - brave warriors on many fronts during challenging times.

I would also like to thank the Aleut culture camp directors who have helped me over the years including Millie Chuluulux, Vince, Carla, Dimitri, Della, John, Debbie, and Becky B. I would also like to thank many inspirational Aleut culture camp instructors including Mary Bourdukofsky, Okalena, Edna, Peter D., Lydia, Ethan Qanglaagix, Sally, Mitch, June, Wolfgang, Crystal & Bill, Moses, Josephine & Tim, Richard, Aquilina & Phil, John P., Peter Lind, Jim & Shawn, Beckie B., Marc, and many others. From the Pocatello region, I would like to thank Drue, Johanna, and Randy'L for their support and encouragement. I appreciate the leadership of Stanley & Christine, Thomas, Alvin & Peggy, Bill S., Sean, Liza, and Marvin. To the Aleut soldiers who protected and served in World War I and World War II including those often unrecognized Alaska Territorial Guard warriors – thank you for protecting and serving our country.

I would also like to acknowledge the kind Yup'ik particularly Frank Andrew Senior, Noah Senior, Bill & Mary Ann, without whose assistance in providing hides, the two-hatch iqyax would have sunk; and for Ethan for letting me win that qayaq race at the Alaska Native Heritage Center – I needed that win. I would like to acknowledge the world-class iqyax paddlers including Anders (Norway), Justine (Wales), and Sarah (England) who stand as extra ordinary long distance role models for the rest of us mortals. I need to acknowledge some kayak experts who have encouraged my research long term including George Dyson (Belcarra Park), Dr. Richard W. Zimmerly (Ontario), and Derek C. Hutchinson (South Shields). I would like to thank LH, DH, JB, AD, ET, RC, ES, and ES. Finally, I need to acknowledge the fine medical staff at the Alaska Native Medical Center, especially Katherine, Charles G. Anderson, Ted, Gary; and, Dr. Angelica, Dr. Elizabeth, and Dr. Daniel who saved my life, making the completion of this dissertation possible.

I need to acknowledge that, despite the attempts by myself and others to create an impeccable project, there are mistakes and errors in this dissertation. Dozens of references and hundreds of pages of literature review could have been added. Perhaps the supreme acknowledgment lies in the knowledge that the foundation that the Unangax people have endured some tough times over the past few centuries; that the Unangax people are survivors who thrive despite the challenges; and, that the Aleut culture camp

instructors work day and night to help youth learn about Unangax cultural history and to be proud of their rich heritage. It is my hope that future researchers will continue to build on this foundation established by elders such as Anfesia Shapsnikoff and Sergie Sovoroff integrating ancient and modern technology to share ancient ways in a captivating manner with a wide audience.

Anfesia Shapsnikoff, my Aleut basket weaver instructor my first year of high school on Kodiak Island, encouraged us that, if we have something to say which can improve the quality of life in our village, to not be afraid to stand up and speak, to make our voice be heard, to share our ideas and collaborate with others, to meet regularly with others while instructing Aleut crafts so that ancient ways are not lost forever (Hudson, 1992; Shapsnikoff & Hudson, 1973).

I need to acknowledge the expert assistance I received from Idaho State University's Instruction Technology Resource Center including Michael, Lydia, and Ryan; and, ISU's library staff including SJ, LMK; from ISU's Student Success Center, and many others. From ISU's Human Subject Committee, I would like to thank Dr. Ralph Baergen and Pat Hunter. Thank you for your kind and professional support.

I would like to thank the amazing Aleut people who have been supportive of my educational research projects over the years in the following communities: Cold Bay, King Cove, False Pass, Saint Paul, Saint George, Unalaska, Sand Point, Beklofski, Akutan, Sanaak, Nikolski, Pauloff Harbor, Atka, Port Heiden, Unga, and Nelson Lagoon. I would also like to thank the kind Alaskans in the following communities: Chignik Bay, Kodiak, Anchorage, Nutchek, and Cordova.

I would like to thank my many friends from the Alaska Native Heritage Center including Annette, Steven, Beckie, Loren, Marge, Paul, Cindy, Yaari, Eleanor, Ed, Casey, Kyle, Laura, and others.

I would also like to acknowledge the inspirational work of Willie Hensley, Maligiaq Johnsen Padilla, Dr. Gordon L. Pullar, Dr. Oscar Kawagley, Dr. Ray Barnhardt, and Dr. Paul Ongtooguk.

Finally, I know there are many wonderful friends whose names I have forgotten to acknowledge as part of this educational research project. Know that I will regret not publicly acknowledging your invaluable contributions to this project. Perhaps you will forgive me and allow me to tell you thanks in person. From the bottom of my heart, Qagasaakung! Thank you!!

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LIST OF ABBREVIATIONS

ADDIE	Analyze, Design, Develop, Implement, Evaluate
APIA	Aleutian Pribilof Islands Association
CSI	Cooper Smith Inventory
CHQ	Cultural Historical Quiz
CMS	Course Management System
IDE	Instructional Design Expert
ISU	Idaho State University
ITRC	Instructional Technology Resource Center
MOODLE	Modular Object-Oriented Dynamic Learning Environment
RIO	Reusable Information Object
RLO	Reusable Learning Object
SME	Subject Matter Expert
TUSK	Traditional Unangan Sea Kayak

ABSTRACT

The purpose of this study was to analyze, design, develop, implement, and evaluate an online iqyax (traditional Alaska sea kayak) model course. To investigate the effect of an online iqyax course on adolescent self-esteem, the researcher created an online course with a series of four reusable learning objects (RLOs) containing 28 reusable information objects (RIOs) with step-by-step directions for building the deck, hull, and superstructure of the model kayak with modules presenting sea kayak history and culture.

This study sought to identify differences in student self-esteem, cultural-historical content knowledge acquisition, attitudes relating to building the 1/6th scale model kayak, differences between quality of models built, and instructional design compliance. This research project consisted of a Control group of traditional face to face students (n=6) attending Aleut culture camps, and an Experimental group of online students (n=5).

The Coopersmith Self-esteem Inventory was used to measure student self-esteem before and after attending the model kayak course. A researcher created historical-cultural quiz was utilized to measure content knowledge acquisition. After the class, online students were interviewed to gain insights into levels of self-esteem. The researcher used a Subject Matter Expert (SME) panel to validate module content. An Instructional Design Expert (IDE) panel was consulted for validation of the Instructional Design (ID) process.

Analysis of the data collected in this study indicated that self-esteem in both the Control (face to face) group and Experimental (online) group increased. The Control

group scored higher on the cultural historical quiz. Student interviews indicated that face to face students enjoyed high levels of satisfaction whereas the online students experienced frustrations in building the model kayak hull. The subject matter expert panel rated the model kayaks produced by the face to face students as meeting standards whereas two of the model kayaks produced by the online students did not meet standards. The instructional design expert panel, utilizing the modified Delphi technique, provided high levels of instructional design compliance for each of the five phases of ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model in the creation of the model Unangan sea kayak reusable learning objects (RLOs).

Keywords: ADDIE, baidarka, instructional design, iqyax, kayak, Unangax, self-esteem.

CHAPTER I: INTRODUCTION

Problem Statement

Unangax culture was more negatively impacted by 18th century Russian colonizers than any other Alaska Native indigenous peoples: “Aleuts suffered a massive population loss and a Russian presence they could only have loathed... Aleut culture was devastated” (Veltre, 1990, p. 178). When British Captain Cook sailed through the Aleutian Islands in 1778, he noted how the Russians took weapons and children from the Aleuts who were in a “state of Subjection to the Russians” (Beaglehole, 1967, p. 1142). Although these authors did not use the specific term “self-esteem,” these harsh conditions affected how the Unangax people felt about themselves.¹

Unangax pride, strongly connected to the self-reliance, plummeted under Russian domination (Veniaminov, 1984). Unangan kayak builders, once some of the best in the world, declined dramatically in quantity and quality in the 1700s and 1800s (Veniaminov, 1984). The Unangan sea kayak, the “preeminent North American skin boat” (Hudson, 1992, p. 6), virtually disappeared from the Aleutians (Robert-Lamblin, 1980).

In the 1990s, educators began creating Aleut culture camps to increase cultural pride (APIA, 2012), but these events are held for only one week a year and target a

¹ For additional background information, see *An Aleut Bibliography* (Wood & Jones, 1975). See also Berreman, 1954; Dyson, 1986; Laughlin, 1980; Shapsnikoff & Hudson, 1973; Veniaminov, 1984.

relatively small number of students. In addition, these culture camps can cost over \$50,000 (Lindley, 2010). Culture camps involve transportation and housing that, in the Aleutians, rely heavily upon fossil fuels, the skyrocketing cost of which is "...killing rural Alaska" (Kohler as cited in Bauman, 2010) and may affect budgets of future Unangan instructional events.

In addition, a paradigm shift occurred when younger learners began turning to the Internet for instructional resources (Prensky, Digital natives, digital immigrants, 2007) so "today's students think and process information fundamentally differently from their predecessors" (p.2). Unangan youth spend more and more time on the Internet (Letts, 2004) just as their counterparts around the world. Finally, Unangan instructors seek collaboration for constructing online courses (Livingston, Strickland, & Moulton, 2009).

Self-Esteem in Alaska Native Online Instruction.

This research project sought to investigate student self-esteem in online instruction of 1/6th scale Traditional Unangan Sea Kayak (TUSK) with integrated cultural/historical content and with input from subject matter experts (SMEs). In addition, data related to knowledge acquisition of the integrated cultural/historical content was gathered and analyzed. Guidance was sought from Subject Matter Experts (SMEs). In general, SMEs are people who have spent thousands of hours learning deep levels on one particular topic, gaining insights not yet visible to novices (Bransford, Brown, & Cocking, 2000). This definition fits the Unangan traditional values, which encourage seeking expert advice (Veniaminov, 1984). In addition, educational researchers engage SME panels to assist in research guidance or evaluation (Gall, Gall, & Borg, 2007).

Educational theorists urge researchers to choose SME panelists wisely based upon demonstrated expertise (Bransford, Brown, & Cocking, 2000). A panel of SMEs was selected from Aleut culture camps instructors. A panel of IDEs was selected from instructional design professors at Idaho State University (ISU).

Purpose of the Study

Multiple methods research combines qualitative with quantitative research, allowing for a more balanced picture of the topic of investigation (Patton, 2002). Multiple methods studies (sometimes termed mixed-methods) provide the opportunity for deployment of qualitative interviews to narrow the focus of subsequent quantitative analysis (Frankel & Wallen, 2009). For example, in this research project, students were interviewed to identify categories of self-esteem. The Coopersmith self-esteem instrument was employed to gather quantifiable data. Thus, utilizing broad view qualitative techniques and narrowed focus quantitative techniques, the self-esteem of students attending model iqyax courses was examined, the results combined, and then interpreted. See Figure 1.

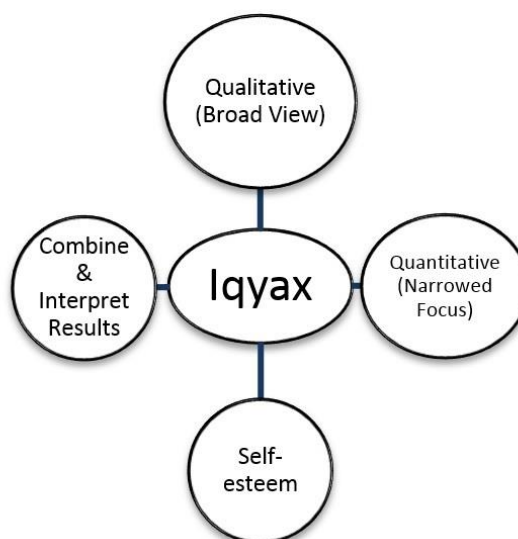


Figure 1. Graphic representation of multiple methods research design displaying broad qualitative view, narrowed quantitative view, the role of self-esteem, and results combined.

Self-esteem Defined

Self-esteem is defined as the “evaluation which the individual makes and customarily maintains with regard to [self]: it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes [self] to be capable, significant, successful, and worthy” (Coopersmith, 1967, p. 5). Self-esteem and one’s beliefs in their capability to accomplish tasks are interconnected (Schunk, 2008); people with high self-esteem confront more complex problems with higher rates of success. People with low self-esteem are “marked by lack of faith, expectations of failure” (Coopersmith, 1967, p. 251). Coopersmith developed a self-esteem inventory for adolescents that Peterson and Austin (1981) found “possesses enough reliability and validity to recommend their use in research” (p. 3), particularly when coupled with

observations made in the academic, social, home, or general setting. The Coopersmith Self-Esteem Inventory will be further discussed in Chapter II.

This project sought to investigate changes in adolescent self-esteem during an online model kayak class. Identifying learner characteristics (such as beliefs about how well they can perform) may serve as a cornerstone of designing effective instruction (Kemp, Morrison, & Ross, 1999).

Research Questions

The following research questions were presented for this proposed multiple methods investigation into online traditional Unangan sea kayak (TUSK) model construction:

1. Is there a difference in self-esteem in performing specific tasks related to building the 1/6th scale Unangan sea kayak model between those students in an online section and those in a traditional (face to face) section as measured by the Coopersmith Self-Esteem Inventory?
2. Is there a difference in Unangan kayak cultural history content knowledge acquisition among those learners who received online instruction and those who received traditional (face to face) instruction as measured by a researcher-created achievement instrument?
3. What are the results of an interview of adolescent students attending a first-time online Unangan iqyax model class related to self-esteem?
4. Is there a difference between the 1/6th scale Unangan sea kayak model produced by students in an online section and those in a hands-on section as measured by a researcher-created rubric?
5. What is the instructional design evaluation compliance level for each of the five phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model in the creation of Unangan sea kayak RLOs, as measured by a modified Delphi Technique?

Research Design

Within Alaska Native cultures, young people learn traditional skills by spending many hours politely watching, attentively observing, and carefully listening as elders work on their daily tasks (Kawagley, 1995). Traditional Alaska Native instruction requires elders to pull tools from their tool box to provide the instruction which youth require to survive in a complex world involving changing environments (Barnhardt & Kawagley, 2005; Dirks, 2004). Similarly, multiple methods investigators have several tools in their toolbox they can apply to changing situations as needed (Patton, 2002). Multiple methods investigators might choose qualitative research techniques to investigate cases to gain deeper understandings of a phenomenon through a process of observing people working in their natural environment (Merriam, 1998). Qualitative research "...reflects... an embrace of more naturalistic ways of knowing that typify non-Western cultural perspectives" (Gall, Gall, & Borg, 2007, p. 305).

Qualitative research designers often begin their projects knowing in general which direction they will head, but without presumptions of where their voyage will take them, waiting until they have completed their journey (Bogdan & Biklen, 1998), providing the opportunity to look in their 'rearview mirror' to reflect about where they traveled, what they learned, and what it may mean. This research project investigated differences in effectiveness of online Alaska Native instruction compared to traditional face to face instruction. That aspect of qualitative research was documented during the face to face, traditional culture camp experience through recorded interviews.

While the researcher is an experienced teacher of culture camps, including the instruction of building 1/6th scale Aleut sea kayaks, the transference of this to a final

online module was unique. Therefore, documentation of this experience from an emerging instructional designer's viewpoint was important prior to the refinement and implementation of the online module.

The scope of this proposed research project looked at differences in effectiveness of online Alaska Native instruction (both cultural/historical knowledge and model building) compared to traditional face to face instruction. Figure 2 depicts the research design.

Group	Pre-Treatment	Treatment	Post-Treatment			
	Self-Esteem Inventory		Self-Esteem Inventory	Cultural Historical Quiz	Survey & Interview	Product Assessment
Control (Face to face)	0 ₁	X ₁	0 ₂	0 ₅	0 ₇	0 ₉
Experimental (Online)	0 ₃	X ₂	0 ₄	0 ₆	0 ₈	0 ₁₀
Key: 0 _x = Observation of self-esteem, post-test, post-interview, product-assessment X ₁ = Traditional face to face instruction X ₂ = Online instruction						
Figure 2. Multiple methods research design.						

Keys to success in qualitative research include flexibility (capability to adapt to rapidly shifting conditions), reflexion (capability to stop and reflect about what has been occurring), and the ability to see emerging themes and patterns (Merriam, 1998). Even though not the primary focus of qualitative research (Miles & Huberman, 1994), basic quantitative data was collected and analyzed in this project. Multiple methods utilizes qualitative research and other methods of viewing phenomenon to gain insights (Patton, 2002). Smith (1999) encouraged researchers to investigate data from multiple viewpoints to peel back layers imposed upon indigenous peoples by colonizers.

The primary application of this educational research project was to determine if online TUSK instruction is equivalent to traditional face to face instruction in terms of

students' product (model kayak frames), cultural/historical content knowledge, and self-esteem.

To establish a baseline for historical/cultural knowledge of model kayak construction, a representative group of targeted participants from both groups were administered a post-test; the results were compared.

The researcher employed the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional model as a blueprint for mapping the goals, objectives, content, and delivery of this online course. The researcher utilized a modified Delphi technique with SME and IDE input to evaluate efficacy of course design and implementation.

Limitations

Educational research often has limitations, or areas of weakness, that may affect the results and are beyond the control of the researcher (Creswell, 2005). Limitations in multiple methods research generally include restrictions on the capability of generalizing findings to entire populations; temporal limitations (both in terms of collection of data and subsequent reading of thick descriptions); and, needs for researchers to have training in ethics, interviewing, and observation skills (Frankel & Wallen, 2009; Merriam, 1998; Patton, 2002).

This research included the following limitations:

Prior knowledge can have a strong impact on pretest and posttest results (Gagne, Wager, Golas, & Keller, 2005); for example, prior knowledge of model building can have a strong impact on product created in this class. Students who have built model kayaks in the past may find this class easy (perhaps even boring); whereas, students

who have not previously built model kayaks may find this class challenging (perhaps even frustrating).

The sharing of information by participants in the face to face course or the online course was beyond the control of the researcher.

Researcher bias can affect results (Borg, 1963). In this project, the researcher was the instructor in both the control and the treatment groups. Bias may result due to observer expectations (McMillan & Schumacher, 1997).

Treatment diffusion may occur during communication between the control and experimental groups (Creswell, 2002). In this research, diffusion may have occurred among generations when a parent or grandparent learned of the model kayak project and wanted to assist a descendant. Respecting elders by passing on cultural knowledge is a strong component of Aleut values (Lestenkoff, 2003).

Delimitations

Delimitations are specific actions that researchers take to constrain limitations within their research (Creswell, 2005). This research project included the following delimitations:

(1) Purposeful non-probability sampling was used to select subjects (Merriam, 1998) with the goal of "...discovering what occurs, the implications of what occurs and the relationships linking occurrences" (Honigmann, 1982, p. 84, as cited in Merriam,

1998, p. 61) during online TUSK instruction. Thus, results may not be generalized to all students in a population (Creswell, 2002).

(2) Selection criteria and a list of desirable characteristics were developed to select subjects for both the control group and the experimental group (Merriam, 1998).

(3) Any findings will not be generalized and will be applicable only to the targeted participants (Borg, 1963).

(4) TUSK model kits were created and supplied to participants with some of the woodworking (cutting, drilling, or shaping) pre-fabricated to minimize the effect of disparities amongst students' woodworking skills.

(5) The building of TUSK models is a labor-intensive instructional event that requires students to quickly learn to work with a variety of wood working tools and hands-on motor skills. Instructing hands-on skills may present challenges in an online environment (Gagne, Wager, Golas, & Keller, 2005).

(6) Treatment diffusion was constrained through surveys and interviews that focus on identifying relatives or friends who have built traditional sea kayaks in the past. Students were encouraged to respectfully limit the amount of assistance provided by relatives or friends.

Definitions of Terms

The following definitions are provided for edification purposes within this educational research project.

ADDIE Model: ADDIE (Analyze, Design, Develop, Implement, and Evaluate) is an acronym referring to the five parts within the instructional systems design process (Gagne, Wager, Golas, & Keller, 2005).

Alaska Native: Descendent of an original inhabitant of Alaska generally divided into three groups: Aleut, Eskimo, or Indian (Arnold, 1976); but some consider these terms offensive because they were coined by colonizers and therefore more ancient indigenous terms are preferred such as Unangan, Alutiiq, Inupiat, Yupik, Tsimshian, Tlingit, Haida, or Eyak (Carlson, 1995).

Aleutians: Traditional territory of the Aleutians, the southwest end west of Port Moller on the Alaska Peninsula and the Aleutian Islands (Veniaminov, 1984).

Aleut: Descendant of the original inhabitants of the Alaska Peninsula and Aleutian Islands; the name is Russian in origin (Veniaminov, 1984). Please note that, in this paper, the more ancient term *Unangan* (see *Unangan*) was used for consistency.

Baidarka: The Russian word for an Unangan sea kayak (Dyson, 1986). There are many spelling variations on this word including “bydarki... bidarky... badarka”.

Coopersmith Self-Esteem Inventory (CSI): An inventory “designed to measure evaluative attitudes toward the self in social, academic, family and personal areas of experience” (Coopersmith, 2002, p. 1).

Culture: “Beliefs, values, and attitudes that structure the behavior patterns of a specific group of people” (Merriam, 1998, p. 13).

Delphi Technique: A technique for analyzing data to determine priority of needs by having a panel of experts winnow through data sets several times until they have agreed upon the choices (Kemp, Morrison, & Ross, 1999) at an 80% level of consensus.

Frame Construction: The Unangan sea kayak consists of two basic parts: (1) the frame constructed from thin pieces of wood lashed together; and, (2) the waterproof skin (Dyson, 1986). This research project focused on the model frame construction and not on sewing on the waterproof skin due to traditional practices established over the past decade at Unangan culture camps in which skins have not been sewn onto the model kayak frames to leave the wood working exposed.

Indigenous Peoples: A network of people who were targeted by colonizers with goals of subjugation as well as depravation of property and cultural resources (Smith L. , 1999).

Iqyax: Unangan name for sea kayaks in the Aleutians (Geoghegan, 1944). Spelling variations include *iqya-x*, *iqyaX*, *iqyaax*, *ikyak*. The full size iqyax is about 18 feet long, about 18 inches wide, and about 12 inches deep, covered with sea lion hides.

Multiple Methods Research: Combinations of several methods of research including quantitative and qualitative research (Frankel & Wallen, 2009).

Qualitative Research: Methodical inquiry focused on experience of people in their natural environment achieved through observation or informal interviews with goals of gaining deeper insight into the insider's viewpoint (Miles & Huberman, 1994).

Self-esteem: The extent to which a person sees him/herself as “capable, significant, and worthy” (Coopersmith, 1967, p. 5).

Skin: The waterproof covering for a full-size iqyax, traditionally sewn from Steller sea lion hide (Veniaminov, 1984); model sea kayaks are covered with sea lion intestines or seal throats (Hudson, 1992). Full-size skin-on-frame kayaks of the 21st century are often covered with a skin of eight-ounce nylon coated with a two-part urethane (Brinck, 1995).

Three Eras of Unangan Sea Kayak History: For purposes of this research project, the three eras of Unangan sea kayak history are as follows:

- (1) Ancient Unangan era (circa 10,000 years ago until 1741);
- (2) Russian Aleut era (1741 until 1867); and,
- (3) American Aleut era (1867 to present).

TUSK model: For purposes of this paper, a Traditional Unangan Sea Kayak (TUSK) is a 1/6th scale model of a full size Unangan sea kayak; the model is three feet long, three inches wide, and one inch deep (Livingston, 2004).

Unangan: The more ancient term for the original inhabitants of the Aleutian Islands and southwest Alaska Peninsula (Veniaminov, 1984). There are several variations of this term such as *Unanga-x*, *Unangam*, *Unanga* with some variations denoting singular/plural or other relationships (Bergsland, 1997); however, to increase readability in this paper, the word *Unangan* was utilized throughout this paper.

Unangan Culture SME: For purposes of this project, an Unangan culture Subject Matter Expert (SME) is one who has been recognized as an expert on the topic of Unangan culture; for example, one who has been chosen by Unangan culture camp directors to teach traditional topics (language, hats, dance, drumming, or kayak construction or use) at Aleut summer culture camps.

Unangan Sea Kayak: A full-size kayak, approximately 18 feet long, 18 inches wide, and 12 inches deep with a light wooden frame covered by a waterproof skin (Brinck, 1995); also called iqyax.

Unangax: Plural or possessive of *Unangan*.

Significance of the Study

Virtually no educational research has been conducted on Unangan online instruction. Furthermore, little research is available addressing interfaces between Alaska Native traditional research and Western technology (Barnhardt & Kawagley, 2005) resulting in a dearth of insight into integrating indigenous peoples' ways into modern instruction (Smith, 1999). Colonizers often gained control over indigenous peoples through differences in technology, such as bows and arrows versus pistols and rifles (Diamond, 1999). Unangan endured over 125 years of oppression under harsh Russian dominance and endured decades of belittling by American officials during the 1800s and 1900s, including mocking use of the skin sea kayak (Berreman, 1954; Laughlin, 1980). Indigenous peoples in the 21st century select tools like online technology to resurrect and revitalize ancient instruction (Nelson, 2008). If Alaska Native instructors learn how to effectively design online instructional web sites, they may use modern technology to recover and revitalize ancient techniques.

The purpose of this research project was to design, develop, implement, and evaluate an online module that provides instruction on building a TUSK while gaining an appreciation for the cultural and historical context in which the Unangan sea kayak evolved over hundreds of years.

The researcher in this project had the following research goals:

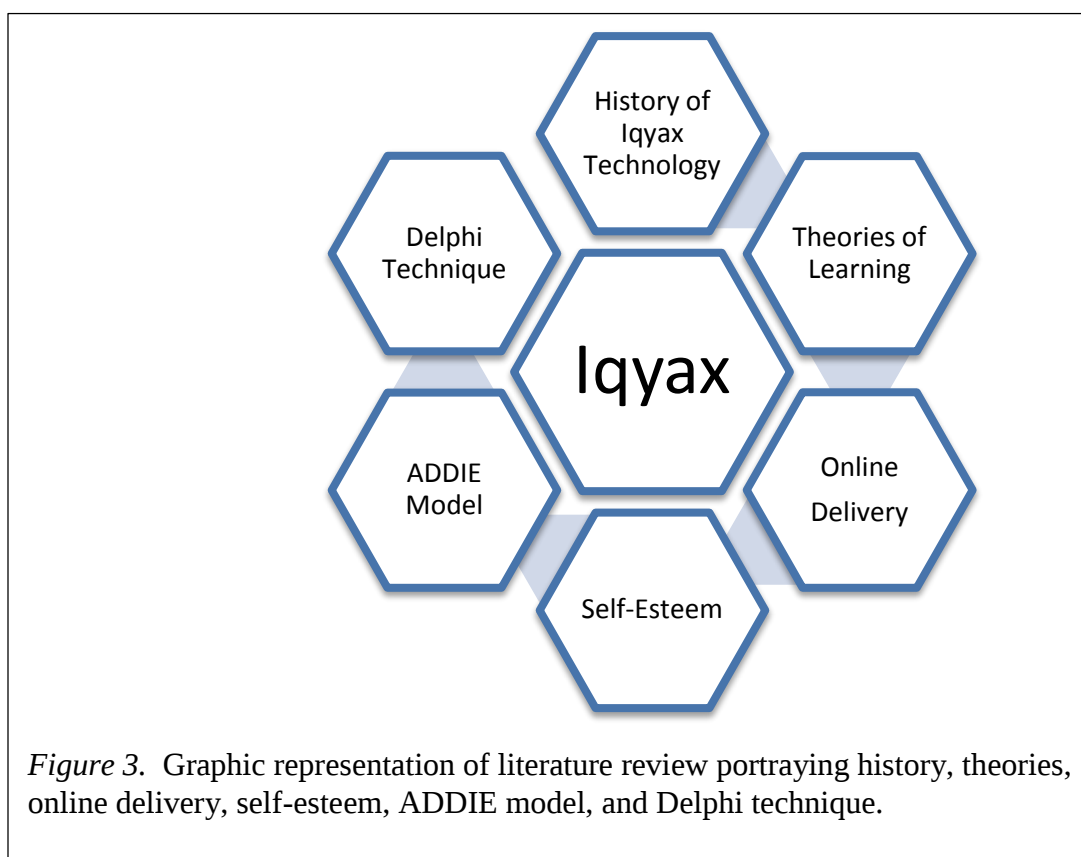
1. To insure that the online instructional TUSK course meets standards established by the long tradition of culture camps;
2. To gather and present data which indicate students' product and content knowledge achievement in the online TUSK instructional unit;
3. To investigate potential differences in student self-efficacy in the TUSK online instructional environment as compared to the traditional face to face environment.

Thus, if online Unangan instruction is equivalent to traditional face to face instruction, culture camp instructors may effectively use online courses to bolster other traditional topics (e.g., basket weaving, language, drumming, dance, song, bentwood hunting visor carving, or skin sewing). Aleut instructors may be able to utilize online instruction to assist students in getting prepared for culture camp, to reinforce what students learned during culture camp, or to provide instruction otherwise unavailable. Students around the world interested in ancient Aleut ways can study and practice throughout the year without the barriers associated with access.

Closing these instructional gaps may increase the quantity and quality of traditional Unangan instruction online, thereby increasing the chances of ancient Unangan instruction flourishing in the 21st century. Finally, online Unangan iqyax instruction may serve as a template for fostering online instruction amongst other indigenous peoples whose ancient ways have also been compromised by colonizers.

CHAPTER II: REVIEW OF LITERATURE

This multiple methods research project sought to investigate effectiveness of multimedia rich online instruction during a model kayak class as well as changes in adolescent self-esteem. This literature review will briefly examine (1) the history of technological changes affecting kayak building performance in the Aleutians; (2) theories of learning; (3) online delivery; (4) self-esteem; (5) the ADDIE model of instructional design; and, (6) the Delphi Technique as potential tools for assisting the design of effective online model kayak instruction. Figure 3 portrays a graphical representation of the literature review, beginning at the top with the history of technological changes affecting iqyax and then proceeding in a clockwise direction to theories of learning and so forth. This representation is portrayed in more detail in a literature review graphic in Appendix A. (See Figure 3.)



History of TUSK Technology

This synopsis covers TUSK technology during three eras spanning 10,000 years: the ancient Unangan era, the Russian era, and the American era.

For the better part of 10,000 years, Unangan have built sea kayaks that increased in quantity and quality (Arima, 2003; Laughlin, 1980) utilizing tools made from volcanic rock and driftwood collected from the beach. The light wooden kayak frames were tied together with sinew and covered with sea mammal hides sewn together with a waterproof stitch (Hudson, 1992; Steinbright, 2001).

Technology resources from within Unangan communities were devoted towards improving the quality of TUSK construction for people living in the *ulax* (semi-

subterranean dwellings made of driftwood and covered with dirt) who depended on sea kayakers for supplies, protection, and spiritual needs (Dyson, 1986; Laughlin, Heath, & Arima, 1991). To know how to build, use and maintain a sea kayak in ancient times brought a great deal of pride to Unangan youth who eagerly awaited their opportunity to prove their capabilities to provide and protect with honor (Brinck, 1995; Coon, 1971; Dirks, 2004; Dyson, 1986; Hudson, 1986; Laughlin, 1980).

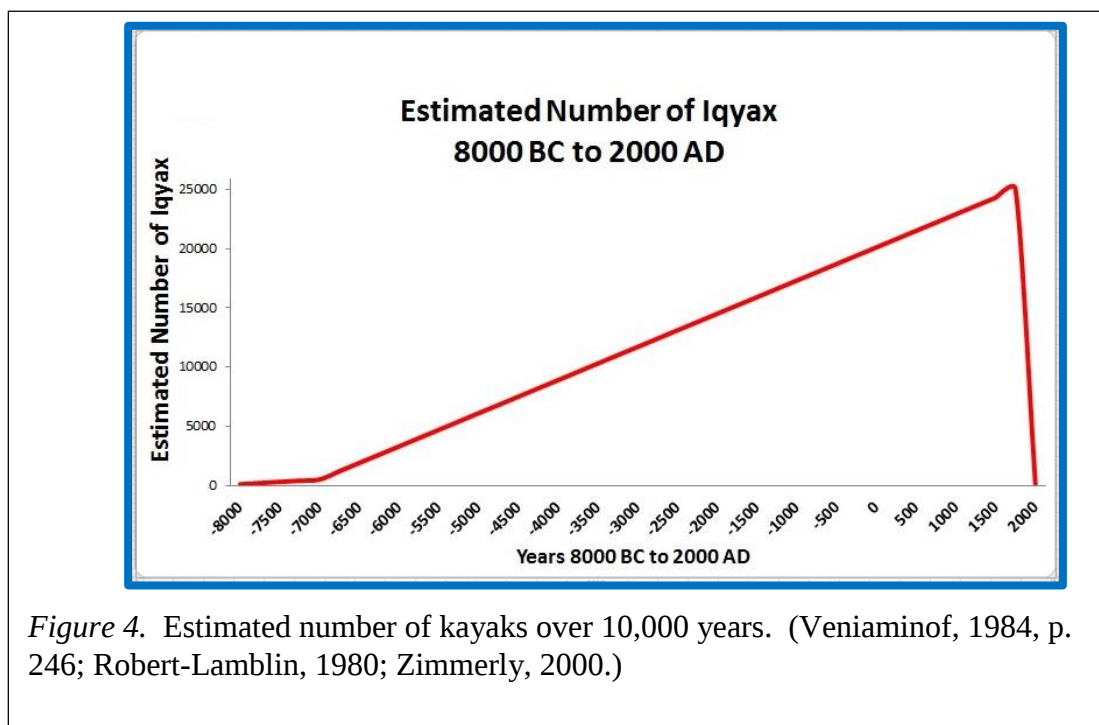
The arrival of Russian and European explorers in 1741 brought technological changes to the Aleutians including rifles and steel tools (Ford, 1966) which ultimately negatively impacted TUSK construction as well as Aleut self-esteem (Berreman, 1954). The first explorers were quickly followed by Russian *promyshlenniki* (ruthless fur hunters) who enslaved Unangan to hunt sea otter (Lantis, 1970). Beginning in the 1760s, the quantity and quality of Unangan iqyax declined dramatically (Veniaminov, 1984).

The present-day education of children is not a bit better than the former training... the art of hunting animals... is somewhat worse... the very mastery of baidarka travel – to be an expert in pushing off and landing and so forth – is becoming much inferior (p. 192).

The quantity and quality of the iqyax took a significant hit when the US government outlawed the hunting of sea otter in 1911, likely sparing the sea mammals from extinction, but significantly decreasing the need for Unangan iqyax whose population tapered off to nonexistence by the 1930s (Hudson, 1992). At the same time, American technology such as “radio, movies, and magazines” (p.10) caught the attention of Unangan youth while traditional stories became so boring to younger generations that they nodded off into slumber (p. 10).

In the 1930s, under withering criticism by white Americans of Unangan traditions, the iqyax was jettisoned while the expensive wooden dory was espoused, resulting in “decreased community identification and loss of traditional controls” (Berreman, 1954, p. 105) and further decreases in Aleut self-esteem. By the 1950s, Unangan had virtually stopped using traditional sea kayaks (Shapsnikoff as cited in Hudson, 1994).

By the 1990s, no ancient Unangan sea kayaks remained in the Aleutians (Robert-Lamblin, 1980; Zimmerly, 2000). Estimates of aboriginal Unangan population estimates vary from a low of 12,000 to a high of 80,000 (Veniaminov, 1984); the graph in Figure 4 portrays an estimate of the number of iqyax over the past 10,000 years with the numbers increasing over the centuries until an estimated high of 25,000 around 1700 AD and then declining rapidly to zero by the 1950s. (See Figure 4.)



Due to encouragement from Unangan elders such as Sergie Sovoroff, interest in learning how to build iqyax began increasing in the 1970s and continues in the 2010s, especially during Unangan culture camps (APIA, 2012; Hudson, 1986; Shapsnikoff & Hudson, 1973). Technology utilized during the construction of an uluxtax (two-hatch Unangan kayak) during the *Qayaqs and Canoes* project at the Alaska Native Heritage Center in 2000 included digital photographs, digital video, the publication of a 125-page book and award winning 56-minute video.

Language is an important component of TUSK construction and use (Bergsland, 1991), and 21st century technology such as teleconferences and the internet has been utilized by individuals and organizations for instructing the ancient Aleut language, Unangan Tunuu (APIA, 2012). Figure 5 shows the estimated number of Aleut sea kayaks between 1710 and 2010 beginning with 25,000 in 1720, dropping rapidly until 1810 and then tapering off to zero by the 1950s with a slight uptick in the 2010s. (See Figure 5.)

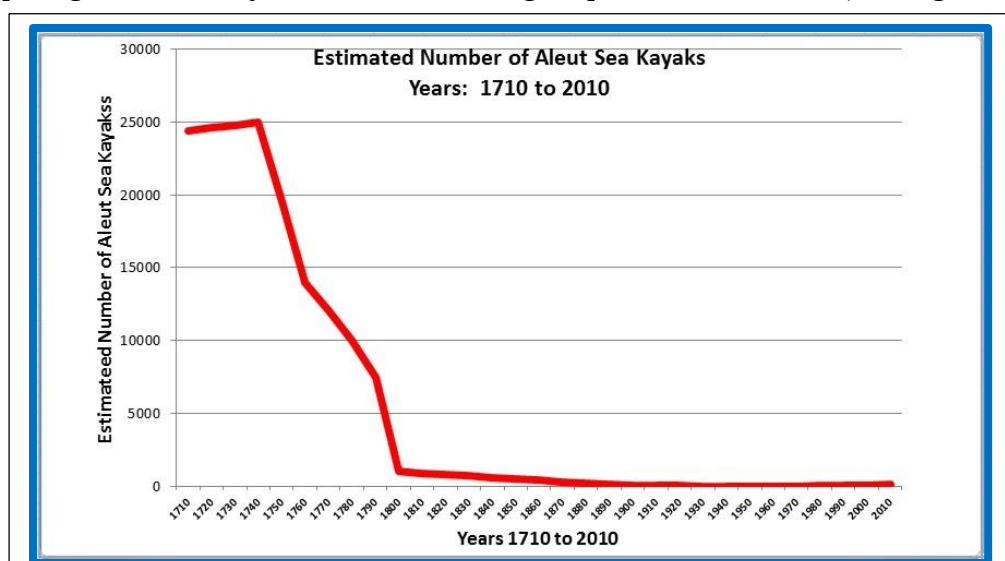


Figure 5. Estimated number of Aleut sea kayaks from 1710 to 2010 showing decrease over time showing rapid decrease from 1740 to 1800. (Veniaminof, 1984, p. 246; Robert-Lamblin, 1980; Zimmerly, 2000.)

However, Unangan youth in the 21st century (like Unangan youth in the 1920s) sometimes find Western technology more interesting than traditional skills (Hudson, 1992; Letts, 2004), spending more time immersed in environments such as the internet. Thus, closing these instructional gaps may involve integrating technology rich instruction into ancient Unangan ways while making curriculum available to wider audiences who cannot attend culture camps.

The overall trend of 10,000 years of Unangan kayak technology appears to be a long, steady increase in quantity and quality followed by a cascading plummet during the last three centuries with a slight upturn over the past three decades. The future direction of this upturn may depend on how Unangan instructors utilize multimedia rich technology to hold attention of new generations of sea kayakers.

Educational Theories Supporting Online TUSK

This multiple methods research project focused on developing instruction of traditional Unangan sea kayak (TUSK) in an online environment. Several educational theories support the concept of TUSK online including constructivism, connectionism, cultural-historical theory, and situated learning.

Western Constructivism. The foundation of the constructivism theory is that people construct or build their world of knowing through what they experience in the real world (Duffy & Jonassen, 1992). Founders of constructivism include Piaget, Vygotsky, Bruner, Lave & Wenger who share the perspective that “learners are active constructors of their own knowledge” (Gredler, 2005, p. 84).

Piaget asserted that, as children interact with physical objects within their world, they form a map, a “schema of behavior... the equilibrated system formed by the various

physical movements in near space” (Piaget, 1960, p. 119) that assists children in beginning to construct their thoughts and intellectual world. In the older Alaska Native cultures, as children interacted with model kayaks, they formed a schematic image how the parts of the kayak were assembled, how the skins were sewn on, and how the kayak was used for fishing, hunting, and other activities (Laughlin, 1980; Zimmerly, 1977).

Bruner’s (1966) theory of instruction asserts that societies invent education to adapt to changes in information and other conditions which “give opportunities to the teacher in each succeeding generation” (p. 23) to construct more effective instruction beyond the capabilities of previous circumstances. Bruner (1960) encouraged educators to exercise the power to creatively invent, to adapt to constantly moving targets, to integrate technology teaching tools, to “revamp [teaching material] in such a way that the... powerful ideas ... relating to them are given a central role” (p. 18).

Bruner (1960) also saw a need for integrating animation into the teaching process using media such as “films, TV, micrographic film, film strips, sound recordings... *devices for the vicarious experience* [italics in original]” (p. 81) for people who cannot be present to experience the event themselves. Ancient Unangan also enjoyed animation and theatrics (Desson, 1995); thus, this educational project proposed to integrate rich media, such as digital video and animation. Prensky (2007) noted that if educators want to design instruction that gains the attention of students born in technology-rich decades of the 1990s and 2000s, by asserting that if they “*really* want to reach Digital Natives, they will have to change” (p. 4); integrating technology-rich instruction into curriculum gains the attention of younger learners.

Instructional designers are “waking up to the view that building learning in the 21st century using the structures and strictures of the 20th century is a wild and reckless gamble that all too often fails” (Heppel as cited in Prensky, 2010). Students in the second decade of the 21st century want to be “respected, trusted, have their opinions count, want to create, using the tools of their time...want to work with their peers on group work ... (and prevent slackers from getting a free ride)... want to make decisions and share control... to cooperate and compete...want an education that is *real*” (Prensky, 2010, pp. 2-3).

Alaska Native Constructivism. Western constructivism and Alaska Native constructivism share several themes. For example, Piaget’s writings parallel Tutiakoff’s (as cited in Hudson, 1986) discussion “on making a model baidarky” (p. 328), describing how the first boat was merely an object, such as a log in the ocean, with which the ancient Unangan interacted but found difficult to control. However, after thinking about the wood and the water, after “watching, listening, thinking about something for a while... we actually try it ourselves” (p. 332) until a sea kayak was constructed which brought great satisfaction to the builder, kayaker, and community.

One basic concept of traditional Alaska Native constructivism is designing instruction with the goal of guaranteeing success for new students because in ancient communities the survival of the community depended on success of younger generations (Dirks, 2004; Kawagley, 1995). Thus, complex learning tasks in both the online course and the traditional face to face course was broken into smaller, simpler steps that new students can accomplish to build student self-esteem before moving on to more difficult tasks.

Success in Alaska Native constructivism is enhanced through teamwork, accomplishing goals that built up the community rather than the individual, positive feedback, visualization techniques by watching experts demonstrate complex techniques several times, and confirmation that new learners can exhibit basic skills before being advanced to more difficult levels with a variety of instructional formats that adapt to learner characteristics (Barnhardt & Kawagley, 2005; Dirks, 2004; Kay, 2007; Nelson, 2008; Pullar, 1997; Shapsnikoff & Hudson, 1973; Veniaminov, 1984).

For example, during the development of the online model kayak class, students were asked if they can capture, compress, and submit digital photographs. If they responded in the affirmative, they were asked to perform these basic tasks necessary for an online course. If they could not perform these tasks, they were provided with additional instruction and assistance. In addition, quality control is an important factor in ancient Unangan sea kayak instruction (Laughlin, 1980); sea kayaking poses potential risks that must be addressed during early learning. If the students do not carefully mark the correct locations for the rib holes on the gunwales, then the rest of the sea kayak frame will be built out of line.

This TUSK model project sought to integrate construction of the sea kayak model into classes in which students (both traditional and online) built their own 1/6th scale model, a three-dimensional schema of the full-size kayak, complete with all of the various parts (gunwales, thwarts, ribs, stringers, keelson, cockpit, deck beams). This TUSK model project also sought to integrate film and animation into the online component. Through the process of building the model, the students created not only their own model to take home, but also a mental map of how their ancestors built the light

wooden frame. This mental map was enhanced by seeing full-size kayaks paddled in the Aleutians, either in person for the face to face students or through videos for the online students.

Like Western youth, Alaska Native students want to be actively involved in their education, learning how to use the latest available technology to create dynamic instructional material (Dirks, 2004; Guthridge, 2006; Hudson, 1992; Shapsnikoff & Hudson, 1973).

Connectionism. Thorndike's (1931) theory of connectionism supports this concept of trying different avenues until an intelligent satisfactory connection is achieved, "The 'try, try, again' method, with gradual selection of a suitable response by the satisfaction it brings" (p. 166) rests as a foundation of human learning. Thorndike asserted that first attempts at learning are often difficult and clumsy, but connecting those attempts to satisfying rewards often results in "growth in number, speed of formation, delicacy and complexity" (p. 167).

Tutiakoff pointed out that Unangan learn from interacting with the real world, through watching what others have constructed, a process which "help us learn easier and faster – then we specialize" (p. 332). The schema, the map of the Unangan iqyax, began simply, perhaps first with a log which was unwieldy, later with two branches spread apart on a seal skin. Before too long, the schema or blueprint of the skin kayak was imprinted on the minds of indigenous people through the subarctic and Arctic (Zimmerly, 1977) and grew in its complexity over the years. By the 1800s when Russian Orthodox priest Veniaminov (1984) arrived in the Aleutians, the Unangan iqyax had become increasingly complex, "It seems to me that the Aleut baidarka is so perfect of its kind that even a

mathematician could add very little if anything to improve its seaworthy qualities” (p. 272).

Thorndike’s (1916) theory of connectionism rests on the assertion that people connect events to the response that they receive, “The original basis of the wants which so rule ... the world is the original satisfyingness [sic] of some states of affairs and the annoyingness of others” (p. 50). In other words, when people take actions for which they receive satisfaction, they are more likely to repeat those actions in the future. On the other hand, when people take actions for which they receive annoyance, they are less likely to repeat those actions in the future.

Ancient Unangan societies had their forms of satisfiers for those who performed well and those who did acted against community standards (Lantis, 1970). Unangan sea kayakers who performed heroic acts were praised within the community in many forms including public songs that were sung for generations. In addition, proud nicknames were awarded to those who took heroic actions to protect the community such as “The One Who is a Strong Kayaker” or “The Sea Kayaker Who Slew the Invaders” (Bergsland, 1998; Veniaminov, 1984). Unangan people who violated common rules such as communal secrets were ostracized, sent out of the villages to live on their own, or harshly punished, including executions (Veniaminov, 1984).

This TUSK model project proposed to connect satisfiers to students who performed well and annoyances to students who did not perform well in the form of feedback on cultural/historical tests and photographs of woodworking on the 1/6th scale model (in other words, if the student’s work did not meet expectations, photographs of how their work should look). The goal was for all students to complete the model kayak

to the best of their ability while also learning about the culture and history in which the iqyax developed.

Cultural-historical theory. Whereas Piaget focused in the individual aspects of constructivism, Vygotsky (1978) integrated social dynamics, asserting that “higher psychological functions... [are of]... sociocultural origin” (p. 46) and that the history of human behavior is “born from the interweaving of these two lines” (p.46). Vygotsky also urged educators to gain a deeper appreciation of the people with whom they are working by researching “their prehistory, their biological roots, and their organic dispositions” (p. 46), including their language, tools, signs, and symbols.

This TUSK model project sought to integrate Vygotsky’s cultural-historical theory by weaving ancient Unangan prehistory into the course including ancient tools (pump drill, hand drill, bow drill), ancient language (Unangan names for the kayak parts), and traditional values (e.g., respecting elders).

Situated learning. Situated learning occurs during conditions in which novices are provided the opportunity to sit on the sidelines to watch as experts within the community construct cultural objects or perform social rituals (Schunk, 2008). Thus, situated learning approaches the norm of many Alaska Native instructional styles in which youth are expected to politely and attentively observe elders as they perform their daily activities in real-world situations (Kawagley, 1995). The theory of situated learning includes the concept that “mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community” (Lave & Wenger, 1991, p. 29).

This project has its roots in what might be described as situated learning. Within the Unangan culture, youth learn through observing elders performing a wide range of skills such as sewing the waterproof stitch into the rain coat; building the wooden frame of the sea kayak; or gathering mollusks from the beach (Spaulding, 1995). In the early 1900s, Aleuts such as Shapsnikoff, Tcheripanoff, and Sovoroff watched their parents as they performed rituals in Atka, Akutan, and Nikolski, later moving from the sideline to the center, as they became culture-bearers (Hudson, 1992).

This long history of situated learning continued in the late 20th century when this researcher began apprenticing under Sergie Sovoroff in 1978 and was chosen in 2000 to lead the creation of a two-hatch Unangan uluxtax as an expert kayak builder (Steinbright, 2001). Furthermore, this project may promote new students to move from apprentices to experts in the field of traditional Aleut instruction in both face to face format and online delivery to a global audience.

Self-esteem and Indigenous Students

Self-esteem and the belief in one's capability to accomplish complex tasks is a foundation of social cognitive theory which originated in the 1950s when educational theorists found that learning can occur merely through observations without immediate action (Schunk, 2008). Social learning theory aligns closely with Alaska Native instruction in which youth are expected to quietly observe and pay attention without action (sometimes even without speaking) as a sign of respect to elders (Guthridge, 2006). Educational theorists espousing social cognitive theory asserted that people "...act in accordance with their beliefs about their capabilities and the expected outcomes of their actions" (Schunk, 2008, p. 78).

While researching Sioux early childhood education, Erikson (1937) observed that indigenous spirituality is incorporated into building self-esteem after youth are “strong in body and sure in self” (p. 153), they learn techniques to “project the source of obedience, shame, and guilt into the supernatural” (p. 153). Later, while researching Yurok education in northern California, Erikson (1943) reported the role that “small dugouts [boats] made of the bark of bull pines” (p. 289) play in building self confidence amongst the Native American youth. Adults are chosen as teachers based upon “...special skills in...paddling through dangerous waters” (p. 289). Building self-esteem in youth involves accomplishing increasingly difficult tasks while conforming to traditional customs focused on harvesting fish as they arrive in streams to spawn for the Yurok, a people who “...sees, catches, eats, and talks salmon” (p. 257).

Beliefs are an important component of self-esteem and indigenous research in which “unity of spirit and purpose” (Smith, 1999, p. 110) is a desired goal, often unaddressed in Western research. Unangan worldviews involve multiple approaches; for example, wood used for building iqyax is classified as soft or hard (Bergsland, 1959), and these terms may extend beyond physical characteristics into spiritual meanings in which the iqyax becomes a living being (Bergsland & Dirks, 1990).

Additional multiple worldviews are woven into ancient Unangan views involving three dimensions: celestial bodies, earth’s surface, and subsurface regions (Veniaminov, 1984). The integration of Alaska Native worldviews into instruction may reveal techniques for weaving ancient techniques and beliefs into modern technology to create a strong, resilient fabric (Dirks, 2004; Kawagley, 1995; Nelson, 2008; Smith, 1999).

Self-esteem and Aleut Adolescents. For thousands of years, humans have wrestled with the perception of self-esteem first as hunter/gatherers and later as farmers (Diamond, 1999; Coon, 1971). Perceptions of Aleut self-esteem indicate higher degrees of control over long periods of time prior to 1741, followed by lesser control during the 1800s, with some control regained during the late 1900s and early 2000s (Berreman, 1954; Hudson, 1986; Reedy-Maschner, 2010; Veltre, 1990; Veniaminov, 1984). For example, in 1741, German scientist Steller (1993) noted the Aleuts of the Shumagin Islands were a healthy, vivacious, independent, and fearless people. Yet, in 1933, five naval officers sailing from Japan to Great Britain found Aleuts in the western Aleutian Islands “absolutely dependent” (p. 55) on the non-Aleut trader and store owner for “...tinned foods... all repairs to their boats and houses” (p. 55).

One indication of low self-esteem is destructive behavior (Coopersmith, 1967) towards inanimate objects or living beings (self or others). Veniaminov (1984) noted that, prior to Russian arrival, the Aleuts did not engage in self-destructive behavior, but, after Russians began decimating the population, large numbers of Aleuts were willing to jump off cliffs to avoid harsh treatment.

In the 20th Century, goals of Aleut leaders concerning changes in adolescent self-esteem during Aleut culture camps were succinctly stated by Philemonof (as cited in Bartz, 2010), “It is our hope... [to] instill in many of our kids... to be proud of your culture, your history and your language” (home page). Philemonof and McKeown hope that “...kids leave camp filled with both memories and memorabilia, singing the songs of their ancestors” (Bartz, 2010, p. home page).

In this proposed study, questions focused on perceptions of self-esteem of adolescents attending an Aleut sea kayak model course in traditional face to face settings as well as those participating in online instruction of model kayaks. Adolescence, that time span between puberty and adulthood, is an “important transitional phase... a crucial formative period...” (Bandura, 1997, p. 177). As adolescents transition from life within their family out into the wider community, they must “master many new skills...” (p. 177) which help bolster concepts about self, bolstering success in future life events.

In ancient Aleut villages, physical and social training exercises were designed to build self-esteem to prepare youth for hazardous activities such as hunting from sea kayaks (Laughlin, 1980) because survival of entire communities often depended upon successful harvests from the sea initiated by Aleut youth in sea kayaks.

A large portion of the rapidly changing society in the 21st century is the digital habitat, “technology-enabled communities of practice have proliferated, and the field of technology for communities has exploded” (Wenger, White, & Smith, 2009, p. xi). This project sought to test the waters for the potential of online Aleut instruction which may lead to the building of self-esteem in students while, at the same time, increasing a sense of online community within the global Aleut world. One way to achieve this aim within indigenous communities may be instructional design that incorporates the active engagement of youth into the design, development and implementation of online instruction.

Coopersmith Self-Esteem Inventory. Coopersmith (1967) noted that self-esteem has “pervasive and significant effects” (p. 19) on a person’s personal, social, and psychological well-being. People with high self-esteem are “happier and more effective

in meeting environmental demands” (p. 19), whereas people with low self-esteem endure “withdrawal from other people and consistent feelings of distress” (p. 19). Based upon theoretical foundations set down by James (1890), Adler (1927), and Fromm (1947), Coopersmith found four factors involved in the formation of self-esteem including (1) respect from significant others, (2) prior achievement, (3) goals and dreams, and (4) the “...individuals *manner of responding to devaluation*” (1967, p. 37). Thus, if people are treated with respect, if they have a history of succeeding, if they set personal goals for succeeding, and if they have adequate defenses prepared for occasions when others try to bring them down, they are more likely to have a high self-esteem that will assist in controlling their destiny.

Coopersmith (1967) field tested a 50-item questionnaire with 87 students (44 males and 43 females) and was later administered to 1,748 school children from diverse backgrounds. The Coopersmith Self-Esteem Inventory (CSI) will be discussed further in Chapter III.

Research-Based Literature Supporting Online TUSK

This literature review will now focus on research based articles on the effectiveness of online instruction designed, developed, and implemented within indigenous populations.

Working in the Aleutian and Pribilof Islands on a nutrition project, Smith, George, and Easton (2001) distributed information via a home-grown television program. (Although television might not always be considered “online,” its delivery methods are similar to online delivery.) They integrated an “Aleut Word of the Week” about nutrition to encourage cultural connections to the Woman, Infant, Children (WIC) program. Their

project included 11 villages in the Aleutian and Pribilof Islands with 51% of the participants identified as Aleut. They found a significant change in knowledge between pretest/posttest ($p < .05$) on nine of the ten questions. Participation during the six-month project grew from 321 to 405. The researchers concluded that delivering instruction via television in an Aleutian area covering 60,000 square miles with Aleut words integrated in a “culture based on oral tradition, the use of visual and oral presentation on nutrition information made WIC information more culturally acceptable and accessible to families living in remote areas” (p. 60). They encouraged future research into the “use of the Internet or computer-driven telephone systems...in educating the remote Native population... to measure effectiveness [of instructional technologies]... that are simple to use, valid, inexpensive, and easy to administer” (p. 60). This TUSK model project proposed research similar to what Smith, George, and Easton recommended, specifically, use of course management systems such as MOODLE on the internet to deliver model kayak instruction.

Working with students in the Pribilof Islands in the Bering Sea, Rowe and Probst (1995) emphasized the need for Aleut youth to be involved in “action-based learning through hands-on, practical application of knowledge” (p. 62). Rowe and Probst provided examples including building models of traditional Aleut boats which resulted in dramatic positive changes in “improved student attendance... greater self-esteem... students ... spending more time on task... the reward... is the ‘now’” (p. 64). This proposed TUSK project sought to engage students in building 1/6th scale model boats that they will be able to take home at the end of the class to show to their family and friends and thus become junior ambassadors in sharing the Unangan culture with others. In

addition, these models will serve as a three-dimensional representation which can be handed down to future generations.

In northern Alaska, Lipka and Adams (2004) found that 258 students attending a culturally-based school performed significantly better when local culture (constructing a fish rack in the Yupik region) was integrated into mathematics curriculum. Lipka and Adams collected data from 258 students in 15 classes during one semester, reporting that the “rural treatment group outperformed the rural control group” (p. 4) when Yupik culture was integrated into the teaching of mathematics. The results of Lipka and Adams’ research may indicate that cultural activities such as building a fish rack is more meaningful for students who live in rural Alaska.

Similarly, Seitz (1998) in southeast Alaska, while researching relationships between students’ self-esteem and attendance at Alaska Native culture camps, found increases in self-worth of participants as compared to non-participants. The Alaska Native culture camps in Seitz’s study were five days long.

Members of the Oneida Nation of New York post cultural information on their website which assists in the “rebirth and understanding of the Oneida culture” (McAuliffe, 1996, p. 47). Ongtooguk (1998), while attending high school in Nome, noted a “veil of silence” (§ 6) about Alaska Native culture and history, and argues that this veil should be lifted, because “Native students also need a curriculum that teaches them about themselves” (§ 3).

Dirks (2004) noted that Aleuts (both youth and elders) cannot sit for extended periods of time because it is unhealthy as well as boring; many Aleuts would “rather do hands-on type of work... Unangax people are used to hands-on, kinesthetic type of

learning” (p. 13). Iqyax construction (both model- and full-scale) is an active educational event involving the history and culture of the Aleut people as well as active participation in which students energetically assist in the construction of the kayak frame (Brinck, 1995; Livingston, 2004; Steinbright, 2001) with little tolerance for sitting or idleness. This proposed TUSK project involved a fair amount of hands-on activity such as measuring, marking, drilling, sawing, gluing, sanding, following directions, and learning about the history and culture of Aleut sea kayaks.

Van Duzer (2008), finding that students attending a history of Indian education course face several challenges (scheduling, family responsibilities, negative traditional experiences, weather, distance), created an online course, administered the *Rubric for Online Instruction* (CSU, 2009) to 16 students whose response was “overwhelmingly positive” (p. 1). Even though the project began with goals of providing easier access for an Indian education course, Van Duzer discovered that it is “both exciting and serendipitous to find that high-quality online instruction is such a good fit for Native American populations” (p. 5).

At Queen’s University Faculty of Education Aboriginal Teacher Education Program, Freeman and Moore (2007) researched desktop video-conferencing (DVC) in Canada where high costs of transportation and geographic isolation prevent indigenous students from pursuing advanced degrees. Ten volunteers who tested the videoconferencing for three months were surveyed and interviewed. The results indicated the “new talking stick” (reference to sticks held by indigenous people to indicate one’s turn to speak) may be utilized to assist indigenous people wanting to pursue lifelong educational goals. All of the participants responded that DVC is an

“appropriate communication tool for use in Indigenous communities” (p. 5), particularly in the geographically isolated areas where there is “often limited access to resources in general” (p. 5). Participants did not have a need for high speed Internet for the DVC to work properly. Canadian indigenous peoples and Alaska Natives share similar backgrounds; technology tools, such as video conferencing, may assist development and implementation of online courses for classes like model sea kayak construction.

ADDIE Model

One of the templates utilized while working towards the goal of designing an online iqyax course was the ADDIE model (Gagne, Wager, Golas, & Keller, 2005), which encourages educators to approach instructional design in a systematic manner. The acronym ADDIE stands for “Analyze, Design, Develop, Implement, and Evaluate” (p. 21). The ADDIE model is a fundamental concept within the Instructional System Design (ISD) field, and is a process which is “systematic and scientific... documentable, replicable...and leads to predictable outcomes” (p. 18) The word *systematic* has several implications, including relationships amongst the various components of instruction (teacher, student, instructional materials, and assessment) (Walter & Carey, 1996), as well as an organized approach aimed at analyzing goals and learner characteristics before designing and developing curriculum.

Some Alaska Native instructional techniques utilize systems similar to the ADDIE model. For example, after examining the customs and traditions in Unalaska in the 1820s, Veniaminov (1984) discovered a complex process that Aleuts employed of analyzing, developing, implementing and evaluating until near-perfection was achieved:

All Aleut handicraft products... their hunting equipment and baidarkas, or their national dress, have been brought...to the state of all possible excellence...in

every item there is evidence that much thought has been given over and over to make each one convenient and suited for the intended purpose... great patience of the workman is evident everywhere... (p. 286).

Instructional designers work toward the goal of making learning “easier and more enjoyable” (Reigeluth, 1983, p. xi). Reigeluth asserted that the foundation of ID rests upon learning theory, particularly Skinner’s “scientific investigation of instruction” (p. 27) whose work rests upon the work of prior educational psychologists such as Thorndike.

Online instruction provides instructional opportunities that were “impossible, infeasible, or unimaginable” (Hannafin, Land, & Oliver, 1999, p. 118) only a few decades ago. Furthermore, when the ADDIE model or ISD principals are applied to online instructional design, major improvements can be made for diverse learners who approach learning from a wide range of styles (verbal/visual, visual/nonverbal, tactile/kinesthetic, auditory/verbal) (Gagne, Wager, Golas, & Keller, 2005).

In traditional Alaska Native instruction, new learners begin instruction through a process of watching experts perform basic, intermediate, and advanced tasks (Dirks, 2004) and finally begin deeper levels of learning through performing the work themselves. Man (2004) asserts that instructor-designers who integrate culture into the ADDIE model can “obtain cultural knowledge and develop multicultural perspectives to meet tomorrow’s culturally diverse learners’ challenge” (p. 50).

The roots of the ADDIE model and ID rest upon research conducted by educational theorists who encouraged educators to develop a systematic approach to instruction based upon a deeper understanding of human psychology (Reigeluth, 1983). Locke (2007), commenting on education in the 1500s, noted that people go about their

daily activities to fulfill specific goals and that the machinations within the human mind are “...invisible powers that constantly govern them... therefore of the highest concernment that great care should be taken of the understanding, to conduct it right in the search of knowledge“ (p. 182). Thus, the deeper understanding one has for the ancient Unangan ways (customs, language, and traditions), the greater care one might have in constructing an Aleut sea kayak model course.

Delphi Method

In this research project, a Delphi technique was used to evaluate the effectiveness of the ADDIE model for designing and developing an online TUSK course. Two Delphi panels were engaged in this process: one Subject Matter Expert (SME) panel on the history and culture of model Aleut sea kayak construction, and one Instructional Design Expert (IDE) panel of college professors with expertise in principles of instructional design.

The traditional Delphi method involves the use of a panel of experts who carefully analyze data on complex issues (Kemp, Morrison, & Ross, 1999). The panel is then presented with a series of questionnaires to which they respond. Their results are summarized in anonymous form, presented to the panel, and (if needed) requested to reprioritize their previous responses until the group forms a focused consensus (described as reaching at least 80% consensus).

The foundation of the Delphi method rests upon the basic concept that a group of people with expertise, through the process of focused input, is more likely to arrive at a sagacious conclusion than one person working without the advice of others (Rescher, 1998). Linstone and Turoff (2002) defined the Delphi technique as a “method for

structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem” (p. 3). The name of the Delphi method has its roots in ancient Greece and was popularized in the 1940s and 1950s when military and private organizations used panels of experts to formulate probabilities of the effect of technology on a wide range of complex topics such as nuclear proliferation (Rescher, 1998).

Rescher asserted that 20th century Delphi methods trace their anthropological roots to more ancient techniques employed for centuries in these societies. People from many cultures utilize similar forms of decision making. For example, in ancient Unangan communities, when complex issues arose, the leader of the village called together a panel “composed of all the notables and elders” (Veniaminov, 1984, p. 242). The issue was presented, and the notables and elders were asked to express their opinion until a unanimous decision was declared. The notables and elders in ancient Unangan society were known for their expertise in a wide range of topics such as future predictions about weather, the arrival of invaders, or disaster planning such as compiling lists of resources needed for survival in major catastrophes (Veniaminov, 1984).

In 21st century qualitative research, the Delphi method is utilized to “solicit the latest and best thinking” (Patton, 2002, p. 200). This best thinking can be achieved through a guidance process; “To be sure, the primary function of the Delphic Oracle was ...to give advice” (Rescher, 1998, p. 20).

Literature Review Summary

To summarize the literature review, for thousands of years the Unangan people of the Aleutian Islands and Alaska Peninsula built efficient full-size kayaks while utilizing

model kayaks as an instructional tool for younger generations. Unangan sea kayaks were an effective hunting and fighting tool, valued by the people within the community.

Invading Russians enslaved the Unangan in the 18th century, decimating human populations while causing the sea kayak population to plummet. American colonizers in the 19th century criticized Unangan traditions and kayaks. By the 20th century, the number of traditional Aleutian sea kayaks dwindled to zero.

The literature review indicated that, in general, during the mid-20th century, Aleut self-esteem was low. However, a small number of Aleut elders began building traditional kayaks, and the number of iqyax slowly began to increase in the 1990s. The increase or decrease of Unangan iqyax population for the remainder of the 21st century may well depend upon the capability of Unangan instructors to design, develop, and implement effective online instruction. Several Alaska Native and Western educational theories support developing indigenous online instruction as an effective technique for keeping cultural traditions alive. Online instruction, such as model kayak building, may help improve student's self-esteem. The Coopersmith Self-Esteem Inventory is designed to measure self-esteem and may provide insight into this issue.

CHAPTER III: METHOD

Introduction

The purpose of this study was to design an online multimedia-rich unit on Traditional Unangan Sea Kayak (TUSK) model construction to investigate differences between students attending face to face instruction and students attending online instruction.

In this chapter, the research questions and design will be presented; the research participants will be presented; the assessment instruments will be outlined; and, the utilization of the ADDIE model (Gagne, Wager, Golas, & Keller, 2005) for construction of the online instructional site will be delineated. Finally, the implementation of instructional delivery will be discussed as well as the administration of instruments and data collection/analysis procedures.

Research Questions

The following research questions addressed differences in self-esteem, knowledge acquisition, student interview, student product, and instructional design compliance:

1. Is there a difference in self-esteem in performing specific tasks related to building the 1/6th scale Unangan sea kayak model between those students in an online section and those in a traditional (face to face) section as measured by the Coopersmith Self-Esteem Inventory?

2. Is there a difference in Unangan kayak cultural history content knowledge acquisition among those learners who received online instruction and those who received traditional (face to face) instruction as measured by a researcher-created achievement instrument?
3. What are the results of an interview of adolescent students attending a first-time online Unangan iqyax model class related to self-esteem?
4. Is there a difference between the 1/6th scale Unangan sea kayak model produced by students in an online section and those in a hands-on section as measured by a researcher-created rubric?
5. What is the instructional design evaluation compliance level for each of the five phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model in the creation of Unangan sea kayak RLOs, as measured by a modified Delphi Technique?

Research Design

The research design in this project was multiple methods incorporating quantitative and qualitative research techniques. In order to examine differences between the control group and the experimental group, a quasi-experimental nonequivalent control group design was used. Students in both groups attended a pre-test (self-esteem inventory), treatment (face to face or online model kayak instruction), and post-treatment (self-esteem inventory, cultural-historical assessment, survey/interview, and model-kayak product assessment). For illustrative purposes, the research design as described in Chapter 1 is displayed in Figure 6.

Group	Pretreatment	Treatment	Post-treatment			
	Self-Esteem Inventory		Self-Esteem Inventory	Cultural Historical Quiz	Survey & Interview	Product Assessment
Control (Face to face)	0 ₁	X ₁	0 ₂	0 ₅	0 ₇	0 ₉
Experimental (Online)	0 ₃	X ₂	0 ₄	0 ₆	0 ₈	0 ₁₀
Key: 0 _x = Observation of self-esteem, post-test, post-interview, product-assessment X ₁ = Traditional face to face instruction X ₂ = Online instruction						

Figure 6. Research design portraying Control (face to face) and Experimental (online) group with pretreatment, treatment, and post-treatment displayed.

The control (face to face) group in this study consisted of six adolescent students attending traditional face to face model kayak classes at one of four Aleut culture camps (two in urban settings on mainland Alaska and two in rural settings on Alaska islands). The ethnicity of the control group was Aleut. The experimental (online) group consisted of five students from four states (Alaska, Virginia, Idaho, and Arizona) attending an online course titled “Model Alaska Sea Kayak Building 101” provided in a course management system. The ethnicity of the online group was Aleut, Native (non-Aleut), and White.

Pre-treatment consisted of the Coopersmith Self-esteem Inventory (CSI), a fifty question inventory designed to examine participant self-esteem. Post-treatment (self-esteem inventory, cultural historical quiz, survey & interview, and product assessment) focused on detecting differences in changes of self-esteem and product (model kayaks built by students). Sample size was small (N = 11). Thus, rather than utilizing advanced statistics to measure significant differences, descriptive statistics were utilized to measure differences which may not be applicable to larger populations. In addition, participant interviews were examined to detect changes in self-esteem.

Research Participants

Participants in this research project were 11 adolescent females and males between the ages of 8 and 15 attending model Aleut sea kayak classes. Sample size was dictated by the available recruiting population, as well as the desire to maintain a small number of initial participants for the case study method. The researcher worked with Alaska Native organizations, Aleut culture camp instructors, teachers, and parents in recruiting participants.

Research participants consisted of two groups: (1) Traditional face to face (Control group); and, (2) on line (experimental). Convenience sampling was based upon participants who attended and completed the model kayak course. Demographic (age, gender, and ethnicity) of research participants follows with additional discussion in Chapter 4 and Chapter 5.

Face to face (Control group) participants.

Twenty-four students registered for the Control (face to face) course at Aleut culture camps in Alaska. Of those 24 students, six completed the model kayaks and all of the paperwork (pretest, posttest, etc.). Participants from four Aleut culture camps during the summer of 2011 included: (1) *Model Unangax Iqyax Building* at the Alaska Native Heritage Center in Anchorage; (2) *Urban Unangax* at the Aleutian/Pribilof Island Association in Anchorage; (3) *Sand Point Culture Camp* in the Shumagin Islands; and, (4) *Camp Qungaayux* on Unalaska Island in the Aleutian Islands. The Control group consisted of six participants (N=6) with four females and two males, ages 11 through 15, all Aleut, and all residing in Alaska. Additional demographic information about the Control group is presented in Chapter 4.

Online (experimental) participants.

The on line (experimental) group initially consisted of 17 students who registered for the class *Model Sea Kayak Building 101* provided by the Instructional Technology Resource Center (ITRC) at Idaho State University (ISU). Of those 17 students, five completed the model kayaks and the paperwork (pre-test, treatment, post-test). The experimental group consisted of five participants (N=5); ages 8 through 14; one female and four males; and, two Aleuts, two White, and one Alaska Native (non-Aleut), residing in Alaska, Idaho, and Virginia.

Assessment Instruments

The goal of this research project was to examine changes in self-esteem of students attending a media-rich fully online Alaska Native model kayak course. Instrumentation in educational research is a “tool for measuring, observing or documenting” (Creswell, 2002, p. 173) data to examine performance, attitude, behavioral observations, or factual information. The researcher employed five instruments to address the research questions: (1) the Coopersmith Self-Esteem Inventory; (2) a researcher-designed cultural/historical content knowledge acquisition test; (3) a product rubric for Subject Matter Expert (S140ME) evaluation of the model kayak frames built by the students; (4) a researcher-created Instructional Experience Interview protocol; and (5) a Delphi survey reviewed by a panel of experts to evaluate compliance levels in instructional design.

1. Self-esteem inventory.

The self-esteem inventory consisted of the Coopersmith Self-esteem Inventory (CSI) designed to measure adolescent self-esteem. The CSI consists of 50 short

statements such as “I am proud of my school work” (Coopersmith, 1967, p. 265) to which the students select one of two responses (“Like Me” or “Unlike Me”). The CSI contains four subcategories: general self, social self-peers, home-parents, and school-academic (Coopersmith, 2002). Children form their self-esteem based upon “self-images – pictures of themselves- based largely on the way they are treated by the significant people, the parents, teachers, and peers” (Coopersmith, 2002, p. 1) thus creating a “mental set that prepares the person to respond according to expectations of success, acceptance, and personal strength” (p. 1). Quantitative differences between the CSI pretest and posttest (see Figure 1, O₁, O₂, O₃, and O₄) were analyzed, and results are presented in Chapter 4.

In terms of reliability, Spatz and Johnson (as cited in Coopersmith, 2002) administered the CSI to over 600 adolescents (5th, 9th, and 12th grade students) with Kuder-Richardson reliability estimates of .81 (fifth grade students), .86 (ninth grade students), and .80 (twelfth grade students). The validity of the CSI has been investigated by several researchers over the past 30 years including Kokenes (as cited in Coopersmith, 2002) who examined results of over 7000 adolescents (4th through 8th grade students), confirming the “construct validity of the subscales proposed by Coopersmith as measuring sources of self-esteem” (Coopersmith, 2002, p. 13).

CSI is owned and copyrighted by Mind Garden, Inc. (www.mindgarden.com) who issued the researcher a limited license to administer the Coopersmith Self-Esteem Inventory as well as publish a limited number (five) questions from the instrument in this dissertation. Results of the CSI will be presented in Chapter IV. (See [Appendix B-1](#) for this license and five sample questions.)

2. Cultural-historical quiz.

A researcher-created cultural-historical quiz (CHQ) was designed to measure knowledge related to the Unangan iqyax. The researcher created the cultural-historical quiz based upon elder Aleut instruction (predominantly Sergie Sovoroff of Nikolski), upon years of field research in Alaska while instructing traditional face to face model kayak classes, upon four years of doctoral degree instructional design classes, as well as input from the researcher's major academic advisor.

The CHQ consisted of 20 multiple choice questions about basic Aleut background information in following general areas:

- Basic kayak orientation (for example, bow, stern, hull);
- Basic kayak terminology (for example, gunwale, thwarts, ribs);
- Aleut archaeology;
- Relationship with the sea;
- Construction of traditional dwellings;
- Traditional kayak coverings;
- Present day Aleut living conditions;
- Traditional kayak name;
- Traditional Aleut territory;
- Aleutian weather conditions;
- Traditional clothing;
- Colonization.

Quantitative differences between the cultural-historical quiz taken by the Control (face to face) and experimental (online) students (see Figure 1, O₅ and O₆) were analyzed using a descriptive statistics due to the small sample size (N = 11). Results of the CHQ will be presented in Chapter IV. Please see Appendix B-2 for the Cultural Historical Quiz which has the correct answers in bold font.

3. Post-treatment survey & Post-treatment interview.

An instructional experience interview of the face to face group was completed to assist the researcher in designing the online class (see Figure 1, O₇). This interview focused on how the traditional face to face students viewed the experience of learning how to build model kayaks during Aleut culture camps as well as gaining input from adolescents in how the on line model kayak class might be designed. Results of the post-treatment survey and interview will be presented in Chapter IV. Following the development and implementation of the fully online class, the online students were surveyed and interviewed (see Figure 1, O₈).

Post-treatment survey.

The post-treatment survey (see Figure 1, O₈) consisted of 30 questions (fill in the text box and multiple choice) in five categories designed to learn more about students' backgrounds and reactions to the on line course: (1) demographics; (2) model kayak building; (3) culture & history of the Aleut kayak; (4) online course delivery; and, (5) future online course participation. The first four questions pertained to students' backgrounds, and the remaining 26 questions were statements (for example, "The model kayak arrived before the online class started") to which the students were asked their level of agreement (e.g., "Agree" or "Disagree"). (See this Post-treatment Survey in Appendix B-3.)

Post-treatment interview.

The post-treatment interview (see Figure 1, O₈) consisted of 20 open ended questions in three categories: (1) Model Kayak Building; (2) Aleut Kayak Culture and History; and, (3) Aleut Kayak Online Course. These open ended questions were

designed to gain insights into student attitude about sufficiency of time allotted to complete the course, technology challenges, student's desire to attend future on line instruction, and other indicators in changes in student self-esteem as outlined below.

The interview instrument included questions designed to elicit information about changes in self-esteem during (and shortly after) attending the online course such as most favorite aspects of learning through an online course, least favorite parts about building the model kayak, student satisfaction with online video instruction, whether or not they showed their completed model kayak to others, reactions of others, interest in future learning, whether or not the student was inspired to teach others model kayak building, and so forth. As Coopersmith (1967) noted, expressions of self-esteem include how one communicates about experiences, how one interacts with others, levels of satisfaction with one's work product (for example, school work, art, music), and how significant others (family, teachers, peers) react to quality of work.

The responses from the post-treatment interview were analyzed using qualitative evaluation methods to gain insights into improving the quality of future online Alaska Native instruction and insights into student self-esteem. Focusing on indicators of self-esteem (evaluation of workmanship; reactions from relative, friends, or others; interest in topic; and, desire to teach others), each interview was examined and given a score utilizing a four-point Likert scale (0 = very dissatisfied; 1 = dissatisfied; 2 = satisfied; 3 = very satisfied). (See [Appendix B-4](#) for the Post-treatment Interview.)

4. Product assessment matrix.

Product assessment (see Figure 1, O₉ and O₁₀) consisted of a product rubric completed by a panel of Subject Matter Experts (SMEs) after viewing photographs of

model kayak frames completed by the Control (face to face) students and model kayak frames completed by the experimental (online) students. The SMEs utilized a researcher-created rubric designed to determine which category of expectation the three areas (deck, hull, and superstructure) of the model kayak fit into: Exceeds, Meets, Does Not Meet. Rather than have the panel of SMEs evaluate all 11 model kayaks eight model kayaks were selected as representative samples (four from the face to face group and four from the online group) as representative samples. Product matrix assessment forms and photographs of these eight model kayaks were mailed to the SMEs for evaluation. The results of the product assessment matrix will be presented in Chapter IV. A sample of the Product Assessment Matrix form and photographs of samples of two model kayaks (one produced by a face to face student and one produced by an online student) are in Appendix B-5.

5. Delphi survey for instructional design.

The online component of this research project was created utilizing the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model of instructional design (Gagne, Wager, Golas, & Keller, 2005) which was evaluated by an instructional design expert (IDE) panel. The interface used was MOODLE, a linear learning management system with a sequence for building the model kayak in 26 steps which were essentially redundant (dry fit the parts together, take photographs of the dry-fitted parts, e-mail the photographs to the instructor for evaluation, after the instructor approves of the dry-fitted parts, then glue and clamp the parts together, let the glue dry, sand the parts, and then move on to the next step).

Rather than have the IDE panel review all 26 steps which were highly redundant and repetitive, the researcher prepared a storyboard of the first page of the online course for review by the panel of experts for evaluation of instructional design compliance levels with the five phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate). The survey was sent to the IDE panel for compliance evaluation with ADDIE. Results will be presented in Chapter IV. A sample of the story board is displayed in Appendix B-6: IDE/ADDIE.

Construction of On Line Model Kayak Class

In order to address the research questions, the researcher created an online instructional course titled “Model Sea Kayak Building 101” containing four reusable learning objects (RLOs) with 28 reusable information objects (RIOs) following the ADDIE model of instructional design. To design the online class, the traditional face to face class (instructed at Aleut culture camps for years) was used as a template. The following sections delineate the chronological development of the traditional face to face class, acknowledging the foundation laid down by generations of ancient Unangax iqyax instructors, particularly Sergie Sovoroff of Nikolski Island.

Ancient Origins of the Online Model Kayak Instruction

The ancient art of designing and building Unangax iqyax began thousands of years ago along the coast of Alaska and the Aleutian Islands (Laughlin, 1980). Under harsh Western colonization, this ancient art might have been lost, but was saved through the efforts of Aleut elders such as Sergie Sovoroff (Hudson, 1992).

The researcher began learning how to build model iqyax from Aleut elder Sergie Sovoroff (1901 – 1989) at the *Unalaska Baidarka Project* in 1978 at Unalaska City

School in the Aleutian Islands. One Unangax cultural value is respecting elders and instructors, honoring them by mentioning their names, and honoring them by displaying images of them, such as ivory carvings (Veniaminov, 1984). The closest modern equivalent of an ancient ivory facial carving in the 1970s might be a 35 mm slide or film. The black and white photograph in Figure 7 shows a portrait from a 35 mm negative of Sergie Sovoroff holding a full size paddle during the 1978 Unalaska Baidarka Project. See Figure 7.



Figure 7. Sergie Sovoroff holding a kayak paddle during the 1978 Unalaska Baidarka Project.

Sovoroff built model kayaks from scratch, carefully carving out each piece, often from raw wood such as alder, using only a pocket knife (Hudson, 1992). Sovoroff's model kayaks are works of art, displayed in Alaska museums, but require more time than is available during the week-long culture camps. Sovoroff's models also require patience, advanced woodworking skills and months of time (*cf.*, Hudson, Unugulux Tunusangin: Oldtime Stories, 1992) which the average culture camp attendee does not possess.

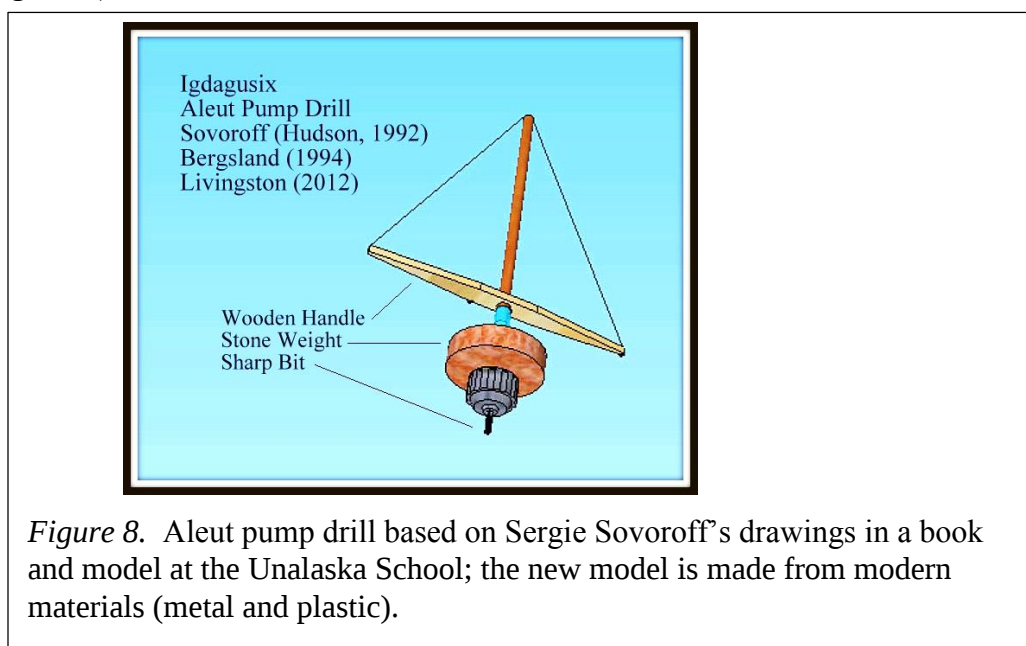
After attending Sovoroff's model baidarka instruction in 1978, the researcher "devoted his life to building Aleut kayaks and its implements" (McBride, 2012), conducting decades of literature review, examining frames of Aleut iqyax in museums (Alaska, Washington, Oregon, and California), building kayak frames, paddling the kayaks in Aleutian waters, participating in the *Qayaqs and Canoes* project at the Alaska Native Heritage Center, learning from other traditional Alaska Native kayak builders, and attending sea kayak training certified by the American Canoe Association (the national organization which certifies sea kayak instructors) in California and Georgia. The researcher has also worked as a sea kayak instructor for the University of Alaska and several Alaska Native organizations to learn practical skills in instructing basic sea kayak construction and use.

Development of the 1/6th scale model iqyax.

In the late 1990s and early 2000s, the researcher designed and developed a 1/6th scale model Aleut kayak. The simplified model developed by the researcher is detailed in *Ikyak: How to build the model Aleut Baidarka* (Livingston, 2004) and involves a step-by-step sequence building the model kayak wooden frame from commercially available materials in three-foot lengths from local home improvement stores. From 1999 through 2014, the researcher instructed Aleut kayak building and use in a wide range of locations including the Alaska Peninsula (Cold Bay, King Cove, and Chignik Bay); the Aleutian Islands (Unalaska and Akutan); the Shumagin Islands (Sand Point); the Pribilof Islands (Saint Paul Island and Saint George Island); south central Alaska (Anchorage); and Prince William Sound (Nutchek Spirit Camp on Hinchbrook Island and Cordova).

Integration of ancient archaeology into model iqyax.

During this time period, the researcher also attended archeology field schools in the Pribilof Islands (Zapadni site on Pribilof Island in 2000) and on the Alaska Peninsula (Adamagan site at Morzhovoi Bay in 2001). During these archaeology excavations, the researcher examined recently unearthed artifacts made of wood, bone, and stone which were likely used for constructing ancient Unangax iqyax. These artifacts included items such as the head for a bow drill and stone bits for pump drills. The researcher subsequently incorporated ancient Unangan technology such as the Aleut bow drill (Livingston, 2010) into model kayak instruction at Aleut culture camps. After investigating the pump drill documented by Sergie Sovoroff (Hudson, 1992), the researcher incorporated the *igdugusix* (Aleut pump drill) in instruction of model sea kayaks at Aleut culture camps. The new model is made from modern materials. (See Figure 8.)



Through the process of designing and field testing the model kayak class in dozens of Alaska communities with hundreds of students over several years, the researcher refined traditional face to face instruction of model Aleut kayak building with the integration of ancient and modern terminology and techniques as well as Unangax kayak terminology as delineated by Bergsland (1991) with assistance from Aleut culture camp instructors.

Basic kayak terminology.

This process consists of learning basic kayak terminology while building the deck of the model kayak, the hull, and the superstructure. While the students are involved in the hands-on work of building the model kayak, they also learn basic kayak terminology, as well as the history and culture of the sea craft. Traditional instruction focuses on learning basic sea kayak terminology (gunwales, thwarts, ribs, and so forth), kayak directionality (bow, stern, port, starboard, deck, and hull) as well as how this sea craft fit into the culture and history of the Aleut people. Basic kayak terminology is emphasized utilizing Zimmerly's (1976) illustrated basic kayak glossary as a guideline developed due to an "appalling lack of terminological standardization" (p. 27). Zimmerly studied traditional kayak construction through the Arctic region including northern Canada, Alaska, Siberia, and Greenland, and the lack of standard terminology was observed within these groups as well as others such as American and English.

Zimmerly's basic kayak terminology is based upon ancient British sailing terminology with words such as the "gunwale" having etymological origins in cannons ("guns") mounted on the outside "wall" of the sailing ship. After a foundation of British boat terminology was established, ancient Aleut sea kayak terminology was integrated

into instruction as encouraged by Aleut educators (Shapsnikoff & Hudson, 1973) and Aleut linguists (Bergsland, 1991).

Overview of ADDIE Procedures in Creating Online Iqyax Class

The analyze phase began with examining the instructional process of the Control group of traditional face to face students at Aleut culture camps during the summer of 2011. The objective was to adapt traditional face to face instruction to the online environment for the experimental model kayak course. After identifying the instructional need, an instructional analysis was conducted to “determine the cognitive, affective, and motor skill goals” (Gagne, Wager, Golas, & Keller, 2005, p. 22) for the online model kayak course.

In compliance with the Human Subjects procedures, informed consent forms were read, reviewed, and signed by parents and students. Before model kayak classes began, students were administered the 50-question Coopersmith Self-esteem Inventory (CSI). During model kayak class at Aleut culture camps, students were provided supplies and tools for building the 1/6th scale model kayak frame and three hours of instruction per day over five days for a total of 15 hours of face to face instruction. Culture camps are funded by Alaska Native organizations as well as public and private donors.

As the students built their model kayaks, the researcher analyzed model kayak building techniques and learner characteristics as a foundation for designing the online model class. Upon the completion of the Control group, students were administered the CSI and interviewed for insights into designing the online class as well as gaining insights into changes in self-esteem (feelings about model kayak built, reactions from others, etc.).

Research Timeline

The research timeline followed the protocol of the ADDIE (analyze, develop, design, implement, and evaluate) model of instructional design (Gagne & Briggs, 1974).

During the summer of 2011, the researcher analyzed model kayak building during traditional face to face instruction at four Aleut culture camps in Alaska: (1) *Unangax Iqyax* at the Alaska Native Heritage Center in Anchorage; (2) *Urban Unangax Culture Camp* at Aleutian Pribilof Islands Association in Anchorage; (3) *Sand Point Culture Camp* in the Shumagin Islands near the end of the Alaska Peninsula; and, (4) *Camp Qungaayux* on Unalaska Island in the Aleutian Islands. During the morning of the first day of culture camp, before the class began, the students completed the Coopersmith Self-Esteem Inventory(CSi). At the last day of culture camp, the students completed the CSI and the Cultural History Quiz (CHQ). The traditional face to face students also were interviewed by the instructor for input into the design of the online class.

During the fall of 2011, the researcher designed, developed, and implemented an online model kayak class. Subject matter experts (SMEs) and instructional design experts (IDEs) evaluated the process during the fall of 2011 and the spring of 2012 including examination of photographs of the product (model kayaks built by students).

Students from Alaska, Virginia, Idaho and Arizona registered for the online class. Model kayak kits were shipped to the online students. During the two weeks before the class began, students were administered the Coopersmith Self-esteem Inventory (CSI). Due to school and holiday schedules, the online class was arranged so that students could spend 1.5 hours per week over ten weeks for a total of 15 hours before winter break. The online course was opened to students on November 1st, 2011 and closed ten weeks later

on December 24, 2011. Following treatment, online students were administered the CSI, completed a cultural-historical quiz (CHQ), completed a model kayak survey, and were interviewed. Due to the fall semester ending, the holiday season, and the commencement of spring semester, online students were allowed four weeks to complete the CSI, the CHQ, the survey, and the interview.

Initial Development of Online Class

This research project utilized the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model (Gagne, Wager, Golas, & Keller, 2005) with guidance provided by subject matter expert (SME) and instructional design expert (IDE) panels. Using the ADDIE model, the researcher developed a face to face unit and an online unit. The general format of both sections followed Gagne's (1985) nine events of instruction (attention, expectancy, memory retrieval, material presentation, learner guidance, performance elicitation, feedback/assessment, enhancing long-term memory) while also integrating Alaska Native instructional techniques.

Based upon over 30 years of instructing model Aleut kayak construction and based upon over five years of attending instructional design classes, the researcher created a primary prototype online class and model kayak kit in early fall 2011.

After development of the content (text, photographs, and video instruction) into a course management system (CMS) and after delivering several model kayak kits to several potential students, the researcher determined that the instructions were too complex and the initial kits were too expensive to create and expensive to ship to a large number of students.

As Moulton *et al.* (2010) noted, “It is not a simple matter to convert a face to face course to an online presence” (p. 2047) and involves a process requiring that the “instructor role morphs from a source of knowledge to that of a facilitator of student learning” (p. 2047). This process of morphing, of transforming from one shape to another, rests as a foundation of ancient Aleut instruction (Berreman, 1954; Shapsnikoff & Hudson, 1973; Veniaminov, 1984), and may rest as a foundation for future Aleut instruction integrating 21st century technology. For example, if Aleut elders are instructing youth about birds or other fauna and their natural behaviors, they may transform their movements to mimic ravens, whales, or halibut.

Secondary Analysis and Redesign of Online Class

The researcher re-analyzed the preliminary online class model kayak kits and designed a secondary version, removing some of the more complex steps which require elaborate tools such as the pump drill (time-consuming to build and expensive to ship).

The construction of the model kayak courses and assessment instruments consisted of designing the traditional face to face model kayak course and then utilizing information learned during the traditional instruction to assist in designing the online modules.

Gaps identified between face to face and online instruction.

One of the fundamental tasks during the analysis phase is the identification of gaps, “discrepancy between a desired and current state of affairs” (Gagne, Wager, Golas, & Keller, 2005, p. 23). Identifying the gaps in this research project involved looking back over thousands of years, examining online technology available during the second decade of the 21st century, and appreciating basic woodworking skills of adolescent

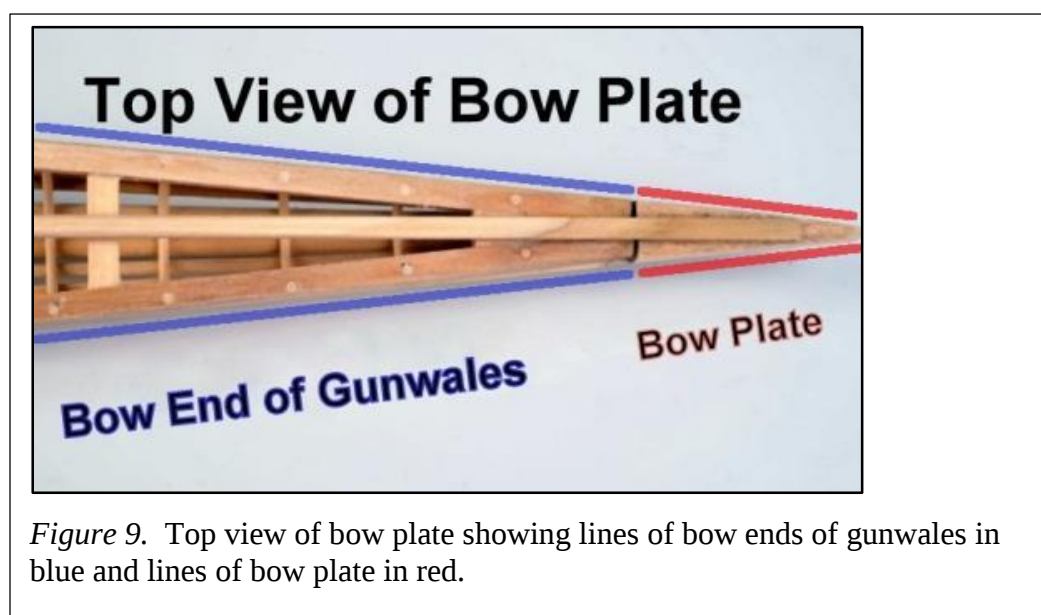
students in the 21st century. In many US schools, the rise of computer technology classes in the late 1900s occurred concurrent with a decrease in basic wood working classes.

Traditional face to face instruction on model kayaks was delivered in a similar fashion to the method the researcher has been delivering in Alaska since 1978 but further refined in the first decade of 2000. The detail of the design and development of this traditional face to face model Aleut kayak course was necessary to demonstrate that it was part of a long procession of traditional instruction, passed from one generation of Aleuts, extending back hundreds (if not thousands) of years. In addition, ancient Alaska Native instruction was aligned with the modern ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model of instructional design. Based upon the ADDIE model, a deconstruction process was applied to the model Aleut kayak to align the traditional course with the various ADDIE tasks.

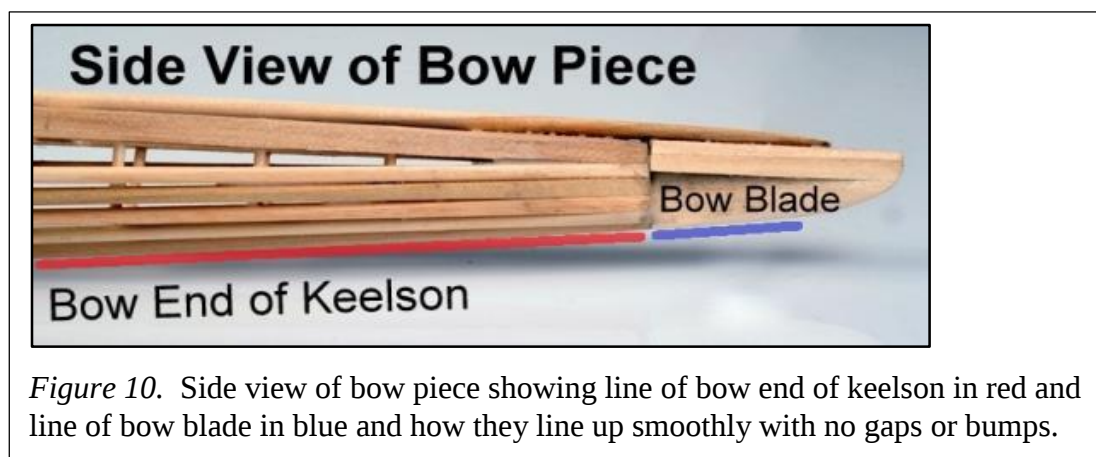
For example, while instructing the traditional class, the researcher deconstructed the model kayak, taking it apart to analyze the steps that the online students would follow to get the model completed in an online environment. Then, in the design process, the researcher asked the traditional students to assist in mentally deconstructing the model that they had just completed to provide their insights and suggestions to assist the online students in completing the model kayak. During the development stage, the researcher developed an initial prototype which had to be deconstructed, realizing that the process was too complex and beyond reasonable expectations of online adolescent students with little wood working experience without having an instructor present.

To illustrate the multifaceted wood working challenges for a novice model kayak builder, the bow of the Aleut kayak is a one of the most complex parts, consisting of a

bow blade and a top plate which must mate up smoothly with 12 other parts (two gunwales, eight stringers, the keelson, and the deck beam). The top plate must match the curve of the bow end of the gunwales. Figure 9, *Top View of Bow Plate*, shows the lines of the bow ends of the gunwales in blue and the lines of the bow plate in red. This photograph portrays how the lines of the gunwales line up smoothly with the lines of the bow blade. There are no bumps or gaps; the transition between gunwales and bow blade is smooth. (See Figure 9.)



In a well-designed kayak, the bow plate lines will closely follow the lines of the gunwales. This helps the full-size kayak in tracking straight forward in the ocean waters surrounding the Aleutian region. Similarly, the bottom of the bow blade must match the curve of the bow end of the keelson. In Figure 10, *Side View of Bow Piece*, the curve of the bow end of the keelson is shown in red, and the curve of the bow blade is shown in blue. In a well-designed kayak, the line of the bow blade follows the gradual upward curve of the bow end of the keelson. (See Figure 10.)



This assists the kayak in tracking smoothly forward, and also assists the skin sewers when they sew the waterproof hide onto the kayak. Learning how to design the bow pieces requires years of experience building both the full size kayak and the model kayak. Thus, in culture camp, the instructor individually assists each of the face to face students with carving the complex bow piece.

Therefore, to leave the online students without some form of instructor assistance would create a gap which might provide a frustrating experience. To assist the online students, the model kayak was deconstructed into three parts: (1) The Deck; (2) The Hull; and, (3) The Superstructure. For example, for the bow piece, the instructor prefabricated the bow blade and the bow piece for the online students to fill the gap and level the playing field between the face to face students and the online students.

Another example of work the researcher completed in order to fill the gaps was to examine the specific bow style utilized in the western Aleutians (Atka Island) and the eastern Aleutians (Akun Island) in terms of how the upcurving bow blade as opposed to the bifurcated bow might affect the complexity of assembling the model for the online students. After some experimentation, the instructor found that the Atka Island bow style

with the upcurving bow blade presented difficulties in attaching the prefabricated bow pieces onto the gunwales and keelson. (The rubber bands used to hold the bow piece to the rest of the kayak kept slipping on the upcurving bow piece of the Atka style kayak.)

The drawing of the *Atka Style Bow* from Lubischer 1993 shows the upward curving bow from the kayak frame in the Phoebe Hearst Museum collected from Atka around 1948.

(See Figure 11.)

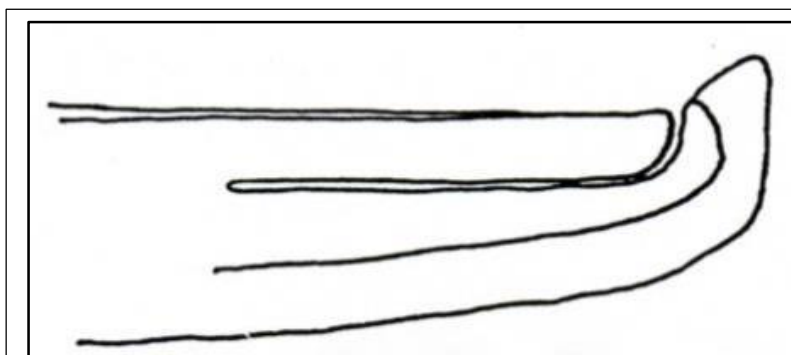


Figure 11. Side profile of Atka style bow from Lubischer (1983) showing curved bow blade.

To assist the online students, the bow blade style was replaced with the bifurcated bow of Akun Island. The split bow provided a place for the rubber bands to grab onto without slipping on the Akun bifurcated bow. The drawing in Figure 12, *Akun Style Split Bow* from Lubischer 1993, shows the bifurcated bow from Akun Island. In this drawing a stick is portrayed in the bifurcated bow, which is tied onto the skin after the skin is sewn over the wooden frame; the stick keeps kelp or seaweed from getting stuck in the split bow.

Due to the model kayak frames being uncovered by skin, this stick will not be seen in subsequent photographs. For the online model kayak, this split bow provided a natural place for the rubber bands to be fitted without slipping off, perhaps reducing the

frustration level for the online students. In the basic model kayak class, the waterproof skin is not sewn onto the kayak due to time limitations and also due to students not wanting their model kayaks covered so that others can see how it is made. Thus, the stick portrayed in Lubischer's drawing are not part of the basic model kayak class. (See Figure 12.)

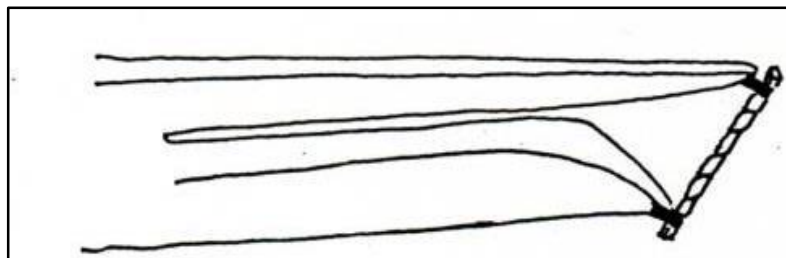


Figure 12. Akun style split bow from Lubischer (1993) showing bifurcated bow.

The following photograph depicts a rough cut of the 1/6th scale model Aleut sea kayak bow piece designed for the online class with the plastic bag stickered with a label and brief directions to assist students in identifying the various pieces of the model kayak and their orientation (for example, the label "bow" goes up). Students unfamiliar with the full size Aleut kayak can easily place the bow piece upside down. (See Figure 13.)

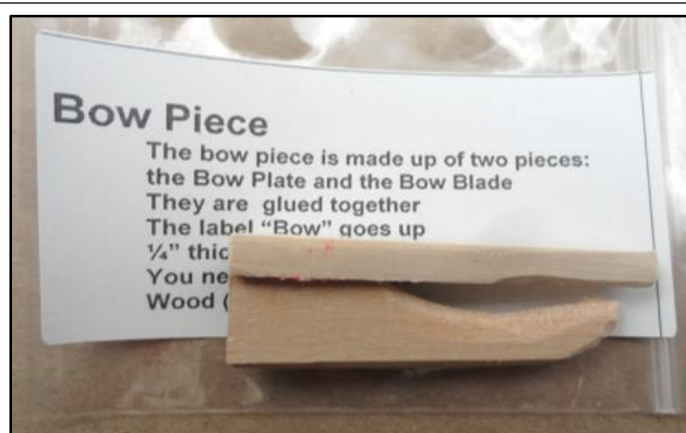


Figure 13. Photograph of side view of bow piece for online model kayak course showing bifurcated Akun style bow.

These are not significant changes within the Aleut kayak building culture since both styles are from within the variations of the kayaks of the Aleut region (Lubischer, 1988), but the Akun Island style appeared to be more simple, and perhaps greater chances of success for the novice online student who does not have the benefit of an instructor being physically present to provide immediate, in-person, hands-on assistance.

Additional information about the gaps and how they were filled will be provided in the section titled “Design of online model kayak course.” The evaluation phase is also delineated in a separate subsection of this chapter.

Interviews with traditional face to face students.

In May 2011, as part of this doctoral dissertation, the researcher received permission from ISU’s Human Subjects Committee to begin preliminary field research into designing and developing an entirely online model kayak course. While instructing model kayak building at four separate Aleut culture camps, the researcher began gathering input from students attending the traditional face to face class as the mechanism for the instructional design process that lead to the online course.

Interviews with traditional face to face students.

Seven traditional face to face students were interviewed at Aleut culture camps during the summer of 2011 to gain their insights into the design of the online model kayak class. As youth in the thick of actively building model kayaks at Aleut culture camps and labeled as neo-millennials by being born in the last decade of the 20th century, their perceptions about the design of online model kayak instruction were of value to this research project.

These culture camps were in Anchorage, the Shumagin Islands, and the Aleutian Islands. In qualitative case study investigations, sources of information are often chosen based upon their relevancy to the subject of research as well as their richness of description (Merriam, 1998; Miles & Huberman, 1994). Interviews from the following four students were selected because of recommendations which could be incorporated into online instruction.

Synopsis of student interview C1.

Student C1 (an Aleut female, aged 11) said that, if she were teaching an online model kayak class, she would try to use something like Facebook to communicate with her students and to give lessons to students. She said it would be good if students could be able to communicate with students in real time and to not have to wait until a question is answered such as through e-mail. She said it would be good if the students could learn the historical cultural part of kayaks while students are actually building the model kayak. She said the cultural historical part of the class could be made more interesting by relating it to their culture, adding pictures and variety. She said having small video clips to demonstrate how to build certain parts of the model kayak would help.

Recommendations from this student to incorporate small video clips were utilized in creating the online model iqyax class. Many short video clips were created and uploaded to the instructional site, showing the students how to dry fit the frame, how to glue the frame together, how to build the hull, and how to build the superstructure. Other suggestions such as integrating social media like Facebook or incorporating synchronous communication were not incorporated due to time constraints.

Synopsis of student interview C2.

Student C2 (an Aleut male, aged 13) said that the online class should include pictures and videos that show the students step by step how to build the model kayak. Recommendations from this student were incorporated into the design of the online site in several ways. A photograph of the top view of a 1/6th scale model kayak was incorporated into the banner of the online site so that it was available for viewing whenever the students logged into the site. (See Figure 14.)

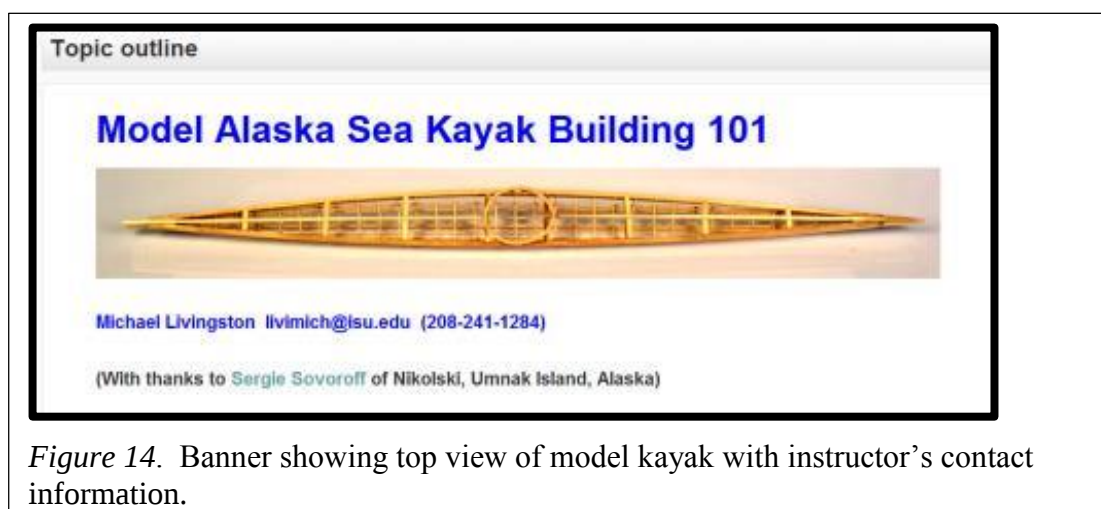


Figure 14. Banner showing top view of model kayak with instructor's contact information.

This student also recommended the use of photographs so that students could clearly see close up details on the small parts of the model kayak. The researcher incorporated still photographs into the video so that the students could see details in the higher resolution photographs. (See Figure 15.)

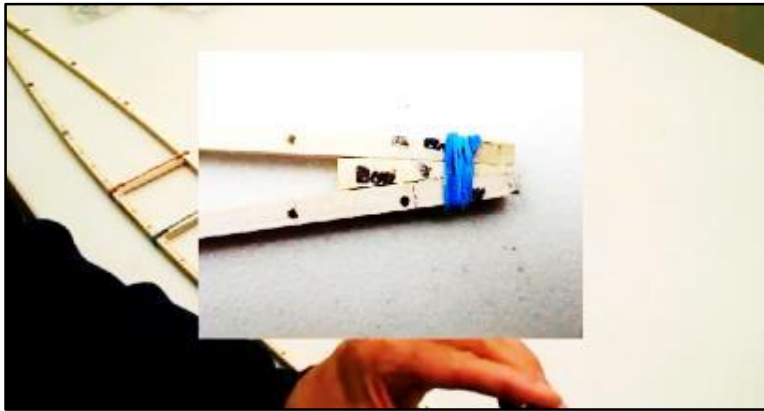


Figure 15. Screen capture showing digital photograph embedded into instructional video showing detail of bow wedge inserted between gunwales.

Synopsis of interview with student C3

Student C3 (an Aleut female, age 13) recommended that repetition be incorporated into the online course so that the online students could hear the information several times. This recommendation was incorporated into the instructional design in the form of video instruction. Online students may play the video, listen to the audio, watch the video, pause it, rewind it, and play it again by pushing the “play and pause” button or the “rewind” button. (See Figure 16.)

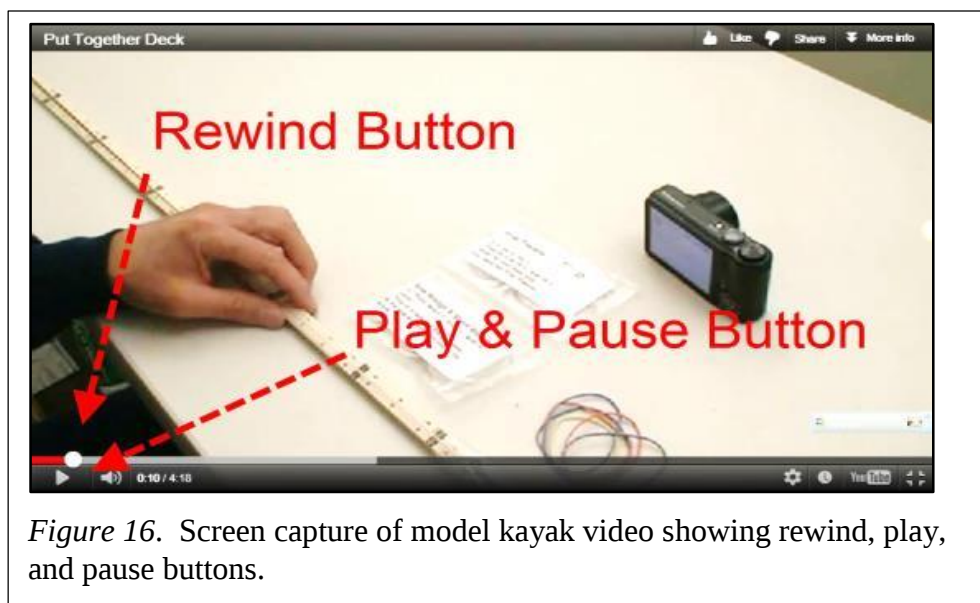


Figure 16. Screen capture of model kayak video showing rewind, play, and pause buttons.

Repetition appears to be one of the foundations of ancient Aleut instruction; after a Unalaska school teacher interviewed Aleut elder Bill Tcheripanoff about how he was taught, the school teacher summarized, “The use of repetition was a standard device in training children” (Hudson, 1992, p. 9).

Synopsis of student interview C4.

Student C4 (an Aleut female, age 14) said it is important for the students to be able to communicate with the instructor if they have questions through e-mail, or phone, or video in case the students need certain steps to be demonstrated. She said that sometimes students are too intimidated to ask questions, but they need to feel comfortable asking questions or they will not learn how to build the model kayak, and they will just become frustrated.

This student’s suggestions to make communication with the instructor easier were incorporated into the design of the online model kayak site. The instructor’s name, e-mail address, and cell phone were published on the top of the main page of the site. In addition, within the video instructions, this information was published multiple times on each one of the initial 28 assignments.

Synopsis of student interview C5.

Student C5 (an Aleut male, age 14) said he would put videos and pictures on the online model kayak site, describing how to build them and what stuff you need to build model kayaks. He said he thinks it would be easier for students to learn how to build model kayaks in Aleut culture camps because the teacher is there to help you, and you can ask questions. This student’s recommendations for videos and pictures were followed.

Synopsis of student interview C6.

Student C6 (an Aleut female, age 15) said she would incorporate ways for the online students to communicate with the students so that they have the option of e-mailing, calling, or video-chat communication because without being able to talk with the instructor, they do not have the opportunity to ask questions, and if they cannot ask questions, they will not be able to figure out how to build the model kayak. She said students are often afraid to ask, but they should not be afraid to ask questions because the instructor can explain what has been done and how to fix it. Recommendations of this student were followed in that the students were encouraged to e-mail or call the instructor if they had questions.

This last interview concluded the interviews of the traditional face to face students. The researcher conducted additional analysis during the face to face course to assist in the designing of the online component as outlined below.

Additional Analysis Conducted While Instructing Face to face.

While teaching model Aleut sea kayak construction in the face to face environment, the researcher also analyzed instructional techniques, particularly focusing on the amount of assistance provided to students. Previously, the researcher had incorrectly assumed that the students conduct 100% of the work themselves. However, traditional Alaska Native instruction encourages student success as well as individual tailored assistance (Barnhardt & Kawagley, 2005; Dirks, 2004; Hudson, 1992; Veniaminov, 1984).

Thus, assistance was provided to students when needed, particularly when adjusting the height of the ribs and keelson to the bow blade and tail fin. This step

appeared to present challenges, especially for younger students, in terms of designing the bow blade to fit to the depth of the ribs. The custom designing of the bow blade would often be completed mostly (estimated at 75 to 85%) by the researcher/instructor. In addition, the researcher/instructor assisted the student in adjusting the ribs to the proper depth, sometimes requiring multiple (three to five) examinations by the instructor with subsequent adjustments by the student.

First Online Prototype

The researcher concluded field research of traditional face to face model kayak construction in Alaska in August 2011, returned to college campus in southeast Idaho, and began constructing an online class. Before leaving Alaska, the researcher created several (about eight) model kayak kits which were delivered to parents or teachers who expressed interest in attending the online model kayak class.

First online prototype model kayak kits.

These model kayak kits contained all of the supplies, tools, and materials for building the model kayaks as they were built in Aleut culture camps including the pump drills. These kits required time and funding to assemble, particularly the pump drills, which had to be individually hand-made. Because of the amount of time and energy required to design and make these unique tools designed after drawings and photographs made by Sergie Sovoroff, these pump drills were in high demand in Aleut territory with one of them selling at a culture camp auction for \$250.

In addition to the Aleut pump drill, these kits contained all of the parts for building the model kayak (gunwales, thwarts, bow/stern piece, ribs, stringers, keelson, deck beams, stanchions, and cockpit coaming material), tools (wood saw, wood plane)

and other materials (wood glue, rubber bands). The cost of the individual model kayak kits (including material and time) was conservatively estimated by the researcher at \$350 apiece.

Translating face to face classes into online classes.

Back on campus, the researcher designed and developed an online model kayak class, endeavoring to closely follow the traditional face to face class in terms of sequence, complexity, and procedures. Utilizing Moodle, all of the modules were created with digital still photographs, video, and audio recordings.

At the same time, during the fall of 2011, by coincidence, the researcher was (for the first time) instructing an entirely online course for undergraduate students preparing to teach with technology. During this experience, the researcher came to the realization that instructing complex procedures can be somewhat quick and easy in traditional face to face environments. For example, if a student does not understand how to make bold font in a word formatting program, the instructor can easily take over the mouse and keyboard to demonstrate the procedure to the student.

However, attempting to instruct complex procedures in an online environment can be challenging and time consuming. During this same time period, the researcher experienced additional concerns including the cost of creating and shipping model Aleut kayak kits as well as the possibility of online students getting injured from sharp tools.

The case of the disappearing kits.

Parents or teachers to whom model kayak kits had been delivered were disappearing. Some of these adults who expressed a great deal of interest in the model

kayak kits simply vanished. They did not respond to multiple (up to seven) phone calls or e-mails. They did not respond to other forms of communication.

Due to the amount of time, energy, and funding that went into creating and delivering these model kayak kits to students and then to have the adults quietly disappear with them was a frustrating experience which potentially doomed this educational research project. One adult quickly grabbed enough material and supplies to build four model kayaks, and then disappeared. Educational researchers can only pour resources into a bottomless pit for so long before despair sets in. An alternative to the expensive cost and loss of model kayak kits needed to be found.

As an interesting side note, after the educational research project had been completed, some adults resurfaced, as mysteriously and quickly as they had disappeared, enthusiastically requesting to join the project with little explanation of their disappearance.

Reducing potential of risk of injury.

In addition to concerns about the high cost of disappearing resources, the researcher experienced additional concerns about student safety. After working in Alaska as a public safety officer (emergency medical technician, fire fighter, dive rescue specialist, and police officer) for over 27 years, the researcher learned that sometimes people get hurt when least expected. In Aleut culture camp, if a student gets hurt in a classroom, an instructor can simply reach across the table and administer effective first aid. However, with online students thousands of miles away, this luxury does not exist.

Thus, one of the researcher's concerns was reducing the potential of risk of injury to online students through a redesign of the course, focusing on a reduction of use of

tools with sharp edges. For these reasons, the researcher re-analyzed, re-designed, and re-developed the online model Aleut sea kayak class, transforming it into a second generation course which was safer, less costly, and more compact.

Second prototype model Aleut sea kayak course.

After the researcher realized that traditional face to face techniques of instruction were simply not going to transition directly into an online course management system, the researcher went through stages of reflection and literature review, seeking methods for a successful transition, ultimately finding ancient Alaska Native techniques of transformation applicable in modern technology.

The role of archaic transformation in 21st century online instruction.

Transformation is an archaic process which has existed within the indigenous world for thousands of years as a tool for survival while hunting or gathering (Coon, 1971). Transformation is an inherent part of ancient Unangan lifestyle in general and hunting from an iqyax in particular (Bergsland, 1998; Hudson, 1992; Laughlin, 1980). In addition, designing educational systems adapted to different learning situations to increase the chances of success is a foundation of instructional design of people from a variety of cultural backgrounds (Gagne, Wager, Golas, & Keller, 2005) including Alaska Native education (Barnhardt & Kawagley, 2005; Dirks, 2004; Kawagley, 1995).

For example, an Aleut far out at sea in a skin kayak, in order to get close to hunting prey such as a whale, might transform his actions from typical human movements into movements of a sea mammal, utilizing techniques such as avoidance of eye contact, allowing him to get close enough to successfully complete his hunt, sometimes meaning the difference between survival of the entire community or starvation

(Laughlin, 1980; Veniaminov, 1984). Aleut tales and ancient Aleut names are rife with examples of Aleuts transforming into a wide variety of mammals, birds, and insects (Bergsland, 1998; Bergsland & Dirks, 1990).

Shapsnikoff and Hudson (1973) also wrote about “cultural transformation” (p. 48) from beach grass (*Elymus molus*) to raffia (*Raphia*) which was an innovation essential for the survival of Aleut basketry. Traditional beach grass is difficult to prepare and fragile whereas raffia is easier to handle and more robust for new learners. Some Aleut elders viewed the transition to raffia as a betrayal to traditional ways, referring to the change with derogatory terms (p. 49) whereas others viewed it as an essential step towards survival of ancient instruction. While writing about the instruction of 23 traditional Aleut skills or crafts instructed by seven Aleut elders born between 1900 and 1910, Hudson (1992) noted that several transformations had occurred within the materials, students, and cultures over time: “Traditional crafts had become contemporary art... this transformation heightened the significant role played by elders... recipients of ancestral knowledge taught to them in traditional ways for traditional purposes” (p. 12).

Transformation of face to face model kayak instruction to online.

A similar transformation was required for the development of the online model kayak course as more difficult portions of the frame building process were identified and simplified. This included the gunwales, thwarts, bow blade, stern blade, other minor revisions as well as a bagging and tagging system.

Gunwale redesign.

The researcher re-analyzed the drilling and cutting of wood in the original prototype and concluded that the Aleut pump drills were simply too expensive to create

and deliver to dozens of online students. The researcher developed a system for quickly marking and drilling the holes in the gunwales for the ribs. This system involved the creation of a gunwale jig which could firmly hold three gunwales at one time. Marks were made every inch on the gunwale jigs which facilitated the marking of the 35 lines on three gunwales at once.

In addition, the researcher set up a small drill press (model name Dremel®) which could be used to quickly drill the 70 holes in the two gunwales necessary for each model kayak kit. This substantially decreased the number of tools and materials that had to be shipped to the online student including the Aleut pump drill, the 36" metal ruler, and gunwale jig.

Thwart redesign.

Next, the thwart design was re-analyzed. The first prototype involved complex directions for the students to learn how to measure, mark and cut the thwarts. In traditional face to face class, this task can be easily accomplished. However, creating easy-to-follow directions for the online class proved to be daunting.

For example, the ends of the thwarts in the middle of the kayak are approximately square, and fairly easy to cut. However, as the students begin marking the ends of the thwarts towards the bow and stern ends of the kayak, the angle becomes steeper. If the students do not cut the ends of the thwarts with the appropriate angle, the glue bond between the thwarts and the gunwales will be weak. Cutting the ¼" by ¼" thwart material at the correct angle with a coping saw is difficult, even for the researcher. The ends of the thwarts have to be at the correct angle as well as nice and straight. Cutting

the ends of the thwarts crooked is easy to do, particularly for someone who does not have a lot of experience with a coping saw.

The cutting of the correct angle can be simplified by changing from an American coping saw to a high-quality Japanese woodworking saw, but these cost over \$50 and have to be carefully attended to due to their extremely sharp teeth. In designing the first online prototype, the researcher purchased some less expensive Japanese saws, costing about \$10, but these proved to be significantly inferior to the higher quality saws, quickly binding while cutting wood.

As an illustration of the importance of cutting the proper angle on the ends of the thwarts, when the student starts placing ribs into the gunwales, the ribs tend to spread the gunwales apart. If the glue bonds are weak, the deck of the kayak will fall apart. The researcher has witnessed model kayak deck failure at several Aleut culture camps. The result of this deck failure is immediately visible upon the faces of the students, but can be quickly ameliorated in a face to face class. Based upon years of instructing model kayak class in Alaska, the researcher anticipated that the rate of deck failure for online students would be high and devastating to the self-esteem of online students.

Therefore, during the redesign process, the researcher decided to cut the eight thwarts for the online students. The eight thwarts were grouped into sets of two and adjusted within the gunwales so that they were the same length with the same angle. These sets of gunwales were grouped into groups A, B, C, and D. These thwarts were stamped and placed into a tagged bag. Please see *Stamps, labels, bags, photographs, and lists* for additional details.

Bow blade redesign.

The bow blade can be one of the most difficult parts of the model Aleut sea kayak to construct because its design depends upon the depth of the ribs, stringers, and keelson. Each model kayak builder tends to adjust the depth of the kayak to their own personal preference with some model kayaks being deep (about 1.25") and some model kayaks being shallow (about .75"). The ideal depth is about 1.0", but some model kayak builders in traditional face to face class have had challenges achieving this ideal depth.

In the redesign of the second online prototype class, the researcher created an ideal model bow blade. After reviewing what actually occurs at traditional face to face model kayak class, the researcher realized that many of the bow blades at Aleut culture camps are designed and roughed out by the instructor. Thus, the bow blade for the online class was redesigned.

The first prototype of this design was based upon the design of the full-size kayak frame made at Atka Island which demonstrates the "best wood working techniques, bar none" (Zimmerly, 1983, p. 28). However, when the researcher attempted to construct multiple copies of this bow piece for the online model kayak kits, it proved to be too time consuming and too difficult to attach to the deck and hull of the kayak. Thus, the researcher transitioned to the bifurcated bow style of Unalaska or Akun Island (*cf.*, Webber's drawing from Cook's 1778 expedition in Dyson, 1986, p. 19). The bifurcated bow design was easier to mass produce, and the split bow made it easier to attach to the deck and hull with rubber bands and glue.

In addition, through the process of redesign, the bulky and expensive saws (coping or Japanese) did not need to be shipped to the online students. This substantially

decreased the number of size of shipping containers that needed to be shipped to the students. Instead of two boxes (one containing heavy tools), the model kayak kit was reduced down to one three-foot mailing tube which was lighter and therefore less expensive to mail.

In addition, this redesign reduced the chances of a student getting injured from the sharp teeth of a wood working saw or the blade of a wood working plane. The original kit contained a coping saw, a Japanese wood working saw, a wood working plane, and a pump drill – tools with sharp edges. The revised kit contained sand paper, and a hack saw. The teeth on a hack saw (designed for cutting metal) are significantly less sharp than the teeth on a coping saw or a Japanese wood working saw. Thus, an online student was less likely to get injured using a hack saw, and the injury was likely to be less serious.

Additional redesigns.

The tail fin was redesigned into a more basic style (similar to the Atka kayak tail fin), cut into rough shape, drilled, and placed into a tagged bag. This made it unnecessary to mail to the students a wood saw, reducing the cost of the tools and reducing the chances of injury to students from the sharp teeth of a saw blade.

The ¼” flat reed was cut to length for the cockpit coaming and glued together, making it unnecessary to mail to each student a three-inch plastic form. The cockpit coaming was placed into a tagged bag. The two 18-inch deck beams were cut from a 36-inch round wooden dowel, making it unnecessary to mail a wood saw and a 36-inch ruler to the students. The deck beams were tagged.

Stamps, labels, bags, photographs, and lists.

As the second online prototype was being developed, it became clear that the various kayak parts needed to be clearly labeled so that online students could easily locate the part and learn the basic kayak terminology. The researcher designed rubber stamps with English and Unangax names (for example, *gunwales* or *unagaax*), sent the design off to an online rubber stamp company, and used these stamps to mark the names on the wooden parts.

In addition, the researcher created names for adhesive labels which were affixed to plastic bags to contain the various model kayak parts. Finally, the researcher captured digital photographs of all of the various model kayak parts, supplies, and tools, creating a parts-and-supply checklist. Students were encouraged to examine the model kayak kits that they received to make certain that all of the parts and supplies arrived.

Reusable learning objects (RLOs) were created to introduce students to the model kayak building course, to provide directions on how to upload pictures to Moodle, to introduce basic sea kayak terminology, to introduce basic kayak directionality (bow, stern, port, starboard, deck, and hull). At the end of the course, an RLO was created to provide cultural and historical background. A multiple-choice quiz on cultural-historical content was also developed.

Online model kayak course with four RLOs and 28 RIOs.

Four instructional modules were created with each building upon the former with the goal of students completing their model kayak while also learning about the history and cultural context in which the sea craft developed. This material was categorized into

four RLOs modules and then subdivided into 28 RIOs (reusable information object).

(See Figure 17.)

Model Kayak Instructional Modules			
Instructional Module 1: Build Deck	Instructional Module 2: Build Hull	Instructional Module 3: Build Superstructure	Instructional Module 4: History & Culture
RIO 0.01: Introduction	RIO 07: Stuff Ribs	RIO 18: Sand Ribs	RIO 27 History & Culture
RIO 0.1: Six Directions	RIO 08: Attach Stringers	RIO 19: Dry-fit Deck Beams	RIO 28: Graduation
RIO 0.2: Terminology	RIO 09: Clip Ribs	RIO 20: Glue Deck Beams	
RIO 01: Dry Fit Deck	RIO 10: Glue Ribs	RIO 21: Glue Stanchions	
RIO 02: Glue Deck	RIO 11: Sand Deck	RIO 22: Glue Cockpit	
RIO 03: Dry Fit Thwarts	RIO 12: Glue Stringers & Keelson to Ribs	RIO 23: Sand Deck	
RIO 04: Glue Thwarts	RIO 13: Sand Bow & Stern	RIO 24: Photograph Deck	
RIO 05: Sand Gunwales	RIO 14: Dry Fit Stern Blade	RIO 25: Photograph Side	
RIO 06: Tie Gunwales	RIO 15: Glue Stern Blade	RIO 26: Photograph Hull	
	RIO 16: Dry Fit Bow Piece		
	RIO 17: Glue Bow Piece		

Figure 17. Model kayak instructional modules including four RLO (Reusable Learning Object) modules (Deck, Hull, Superstructure, and History & Culture) and 28 RIO (Reusable Instruction Object) modules.

Employing the ADDIE Model to design instructional modules.

The researcher employed the ADDIE instructional design model for designing and developing the four reusable learning object (RLOs) modules containing the 28 reusable information objects (RIOs). Instruction may be delivered synchronously (at the same time, such as during Aleut culture camps when the instructor is giving directions to students face to face) or asynchronously (recorded at one time and delivered at another time). The model kayak class was entirely online and asynchronous; thus, students in

Virginia, Arizona, Alaska, and Idaho relied heavily upon instructional information available in the 28 RIOs. In addition, one of the research questions in this project involves the ADDIE process. Thus, this process will be explained below.

The acronym ADDIE stands for five stages of a model used for designing instruction: Analyze, Design, Develop, Implement, and Evaluate (Gagne, Wager, Golas, & Keller, 2005). Instructional designers advocate a methodical approach for the investigation of systems defined as follows:

A system is technically a set of related parts, all of which work together toward a defined goal... the parts of the system depend on each other for input and output, and the entire system uses feedback to determine if its desired goal has been reached. If it has not, then the system is modified until it does reach the goal” (Dick & Carey, 1996, p. 3).

This systematic approach towards designing instruction is “both *systematic* and *scientific* in that it is documentable, replicable in its general application, and leads to predictable outcomes” (Gagne, Wager, Golas, & Keller, 2005, p. 18). During the analyze phase, the problem is clearly articulated to make certain that instruction may improve the situation. In addition, people involved in the project clearly establish goals and objectives of the instruction. The target group of learners is identified as well as learner characteristics. During the design phase, the instructional designers utilize the goals and objectives to begin drawing out a blueprint of the project, mapping out lesson plans, assessment, and the interface. Design tools such as flow charts and story boards are employed. During the development phase, the actual content of the course is created including the instructional material. During the implement stage, the instructional material is made available for the students; instruction is also delivered. Throughout the

above four mentioned phases, the instructional designers continually evaluate the entire process in both a formative and summative manner.

The Analyze, Design, Develop and Implement phases of the ADDIE instructional design model are broken into smaller units called “tasks” which are articulated below.

Analyze Phase.

One essential step in design process involves people gathering together to investigate needs which may be subdivided into tasks, answering such questions as the following:

- Why is instruction being planned?
- What are the project goals?
- From the goal, what are the objectives?
- Who are the students?
- What is known about the students that can be integrated into instruction?

In order to systematically address these questions, Moulton, Strickland, Strickland, White and Zimmerly (2010) delineated fourteen tasks for instructional designers to follow during the Analyze phase which begins on a global scale (establishing the rationale) and proceeds to focus on more narrow topics such as timeline. (See Figure 18.)

Task	Description	Face Validity	Content Validity
Task A01	Rationale	SME	SME
Task A02	Goal	SME	SME
Task A03	Objectives	SME	SME
Task A04	Concept Map	SME	n/a
Task A05	Learning Influence Document	SME	n/a
Task A06	Expected Learning Outcome Document	SME	n/a
Task A07	Learning Hierarchy Document	SME	n/a
Task A08	Learner Characteristics Document	SME	n/a
Task A09	Target Audience Document	SME	n/a
Task A10	Learner Constraints Document	SME	n/a
Task A11	Pedagogical Considerations Document	SME	n/a
Task A12	Learner Constraints Document	SME	n/a
Task A13	Delivery Options Document	SME	n/a
Task A14	Analysis Timeline Document	SME	n/a

Figure 18. Fourteen tasks of the Analyze Phase showing description, face validity, and content validity expert panels (where applicable) adapted from Moulton, Strickland, Strickland, White & Zimmerly (2010).

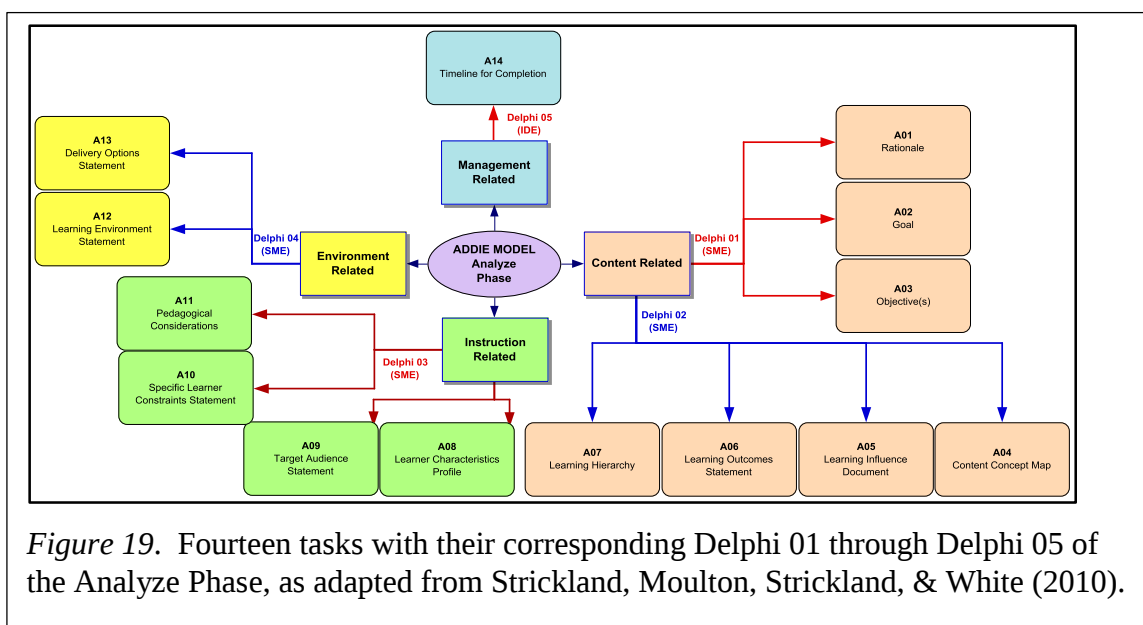
In this instructional model kayak project, the investigator completed the fourteen tasks of the Analyze Phase of the ADDIE model. The results of these 14 tasks are discussed in this chapter with more detailed information (templates, raw data, data analysis, and any required revisions) presented in the appendices.

Moulton, Strickland, Strickland, White and Zimmerly (2010) divided the Analyze tasks into categories with Delphi panels assigned to each category. These four categories are as follows with the pertinent tasks:

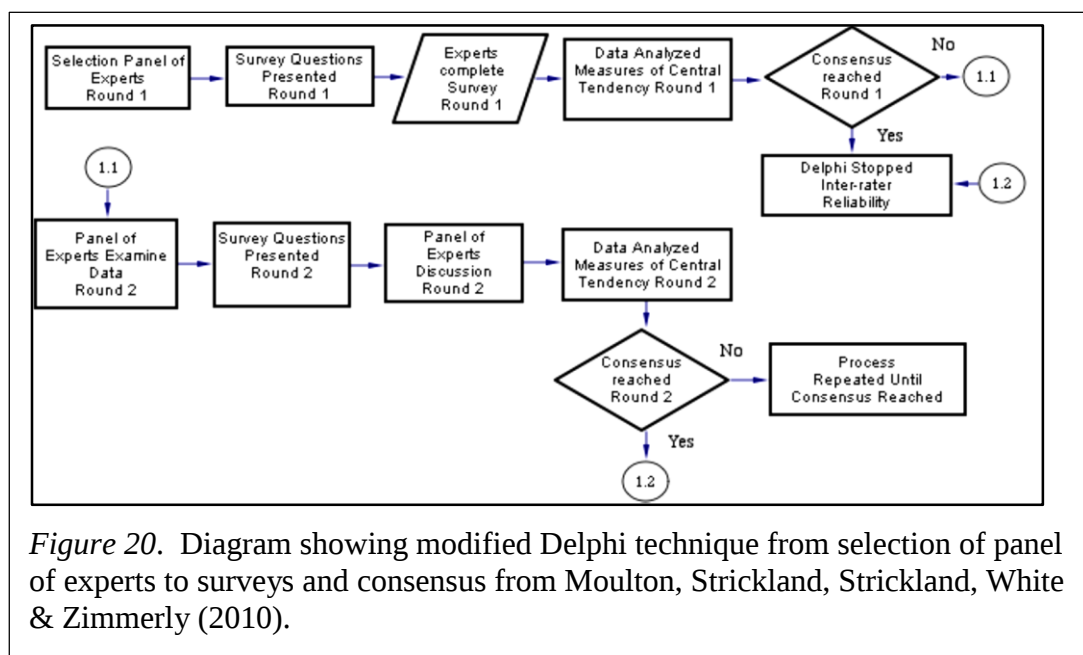
- (1) Content (rationale, goal, objectives, concept map, learner-influence document, learning outcomes statement, learning hierarchy);
- (2) Instruction (learner characteristics profile, target audience statement, specific learner constraints, pedagogical considerations);
- (3) Environment (learning environment, delivery options); and,
- (4) Management (timeline for completion).

Each of the 14 Analyze phase tasks is reviewed in more detail below. The level of detail in describing the purpose of instruction is paramount: “The greatest clarity in conception of outcomes of instruction is achieved when human performances are described” (Gagne & Briggs, 1974, p. 97).

Moulton, Strickland, Strickland, White, and Zimmerly (2010) established a goal of facilitating “quality course development” (p. 2046) in the development of online courses by “creating a more structured model for the instructional designer to follow” (p. 2046) which they verified through panels of experts. (See Figure 19.)



Strickland, Moulton, Strickland, and White (2010) investigated the Delphi technique as a tool for improving the quality of developing online courses by establishing face and content validity through the process of selecting expert judges whose confidentiality is maintained, creating survey instruments, gaining feedback from the judges, providing the opportunity for the judges to arrive at a consensus, and then utilizing statistics to analyze the results. (See Figure 20.)



In order to develop the online model kayak course in a systematic and organized manner so that the process could be replicated by others, the researcher utilized the 14 tasks recommended by Moulton, Strickland, Strickland, White and Zimmerly (2010). The researcher also utilized the Delphi Technique as an evaluation tool advocated by Strickland, Moulton, Strickland and White (2010). The results of these 14 tasks and 5 Delphi surveys are presented as an overview in Table 1 and then delineated in detail.

For this project, there were two panels of experts: (1) subject matter experts (SMEs) composed of three judges who instruct at Aleut culture camps; and, (2) instructional design experts (IDEs) composed of three judges who work as college professors and who specialize with expertise in instructional design. Documents (text and/or photographs) from Tasks A01 through A14 were submitted to the judges to review for face and content validity as part of the Delphi reiteration process.

For each of the tasks, statements were presented to the judges who were asked to provide responses about their level of agreement ranging from 1 (Strongly Disagree) to 4

(Strongly Agree). For each item, scores ranged from a possible low of three ($3 \times 1 = 3$) and a possible high of 12 ($4 \times 3 = 12$). The possible high score was calculated by multiplying the possible high score times the number of judges times the number of items (for example, $4 \times 3 \times 7 = 84$). The Delphi number, task number, number of items, possible high score, Delphi score, mean, median, standard deviation (SD), percentage of consensus, and whether or not Delphi consensus was reached are summarized in Table 1.

Table 1
Summary of Delphi Analyze Phase for Task Analysis A01 through Task A14

Delphi	Tasks	<i>Delphi Analyze Phase for Tasks A01 through Task A14</i>					
		Number of Items	Possible High Score	Delphi Score	Mean	Median	SD
1A	A01	7	84	83	11.9	12	.38
1B	A02	7	84	83	11.9	12	.38
1C	A03	7	84	80	11.4	11.2	.53
2	A04 – 07	20	240	238	11.9	12	.31
3	A08 – 11	20	240	239	11.95	12	.21
4	A12 – 14	12	144	144	12.0	12.0	0
5	A15	9	108	108	12.0	12.0	0

Task A01 through Task A03: Content Related Phase (Part 1).

Task A01 through Task A03 focused on the first portion of the content related component of the analyze phase. Each task is presented below with its corresponding Delphi survey results in greater detail. To familiarize the reader with the Delphi process, first Delphi is divided into three parts (1A, 1B, and 1C) with Delphi 1A presented following Task A01 Rationale.

Task A01: Rationale.

In this phase of the ADDIE model, Task A01 supplied an explanation of the foundation for the project. The rationale for this project is summarized as follows:

The rationale for this Traditional Unangan Sea Kayak (TUSK 101) project rests upon the desire of Unangan descendants (Aleuts) to integrate technology

into teaching ancient ways before they are lost forever (Shapsnikoff, as cited in Shapsnikoff & Hudson, 1973). Despite attempts by officials from two powerful countries to extinguish interest in ancient ways, 21st century descendants of Unangan still want to learn traditional customs, such as model kayak building (APIA, 2011; Dirks, 1997; Hudson, 1992). Sea kayaks rest as a cornerstone of the ancient Aleutian maritime culture (Brinck, 1995). "Sadly enough, we have lost much -- much of our history, culture and language, and what we're trying to do is reinstate that" (Philemonof, as cited by Bartz, 2010). One technique of reinstating ancient ways is week-long Aleut culture camps, leaving instructional gaps for the other 51 weeks of the year. More and more youth are turning to the Internet as a source for information and education (Prensky, 2007), and online instruction may serve as an effective tool for filling cultural activity gaps (Gagne, Wager, Golas, & Keller, 2005). Virtually no online Aleut traditional education exists (Livingston, Strickland, & Moulton, 2009). This project created an online class on building the Traditional Unangan Sea Kayak (TUSK 101) model frame and may serve as a template for additional online courses in traditional Unangan topics. This class provides step-by-step directions as well as providing the cultural/historical context in which the Unangan *iqyax* (sea kayak) developed. The target audience is students who typically attend Aleut culture camps (mostly adolescent Aleuts).

The SMEs were provided the *Project Rationale* (as stated above), and then they were asked to carefully review it.

Delphi Survey 1A: Project Rationale Reviewed by SME Panel

In Delphi Survey 1A, Subject Matter Experts (SMEs) reviewed Task A01 composed of seven items and reviewed by three judges addressing the project rationale. The researcher sent this Delphi survey to the SME panel requesting an evaluation for face and content validity. The members of the SME panel were selected from experienced Aleut culture camp instructors who are familiar with the rationale of culture camps.

Members of the SME were provided the project rationale and then given a series of seven statements, asking for a rating that most represented their expert evaluation on a Likert-scale with ratings of Strongly Disagree (1), Disagree (2), Agree (3), and Strongly Agree (4). Thus, if all three of the SMEs strongly disagreed with seven of the statements,

then the total score would be 21 ($3 \times 1 \times 7 = 21$). If, on the other hand, all three of the SMEs strongly agreed, the total score would be 84 ($3 \times 4 \times 7 = 84$).

Of the seven statements in Delphi Survey 1A related to the project rationale, two of the SMEs gave the highest possible rating (“Strongly Agree), indicating that they strongly agree with the project rationale. One of the SMEs gave a rating of “Agree” to one statement (see Table 2 for details). From a possible total of 84 points, the SME’s gave 83 points to the project rationale. To assist the reader, the results from the SME survey of project rationale are portrayed in Table 2 with mean, median, standard deviation (SD), and percentage calculated for descriptive statistics purposes. (See Table 2.)

Table 2
Delphi Survey 1A: SME Face & Content Validity Task A01

Item	SME 1	SME 2	SME 3	Total Item Score
Project Rationale:				
1. The benefit of this project to the institution or organization is clearly stated.	4	4	4	12
2. The benefit of this project to the targeted learners is clearly stated.	4	4	4	12
3. The need for this project is clearly stated.	4	4	4	12
4. The geographical scope for this project is clearly stated.	4	4	3	11
5. The project’s subject matter is clearly stated.	4	4	4	12
6. The project’s approach to the problem is clearly stated.	4	4	4	12
7. The project’s expected outcome is clearly stated.	4	4	4	12
Total Subject Matter Expert Scores for Project Rationale	28	28	27	83
			mean	11.9
			median	12
			SD	.38
			%	98.8

The percentage is calculated by the total item score (in this case, 83) divided by the total item score possible (84); thus, $83/84 = 98.8\%$. When the percentage is equal to

or greater than 80%, the Delphi survey is finalized. Results of the Delphi Survey 01 were 98.8%. Thus, Delphi 1A was finalized.

Task A02: Goal.

In an educational project, goals are “broad statements of desirable outcomes” (Gagne, Wager, Golas, & Keller, 2005, p. 45) which clarify what “skills, knowledge, and/or attitudes” (p. 47) that students should acquire. For this project, the researcher established the following goal:

The goal of this project is to teach adolescent learners the cultural/historical context related to iqyax sea kayaks and to build a 1/6th scale replica according to traditional construction methods. The purpose is to provide students the same cultural/historical knowledge and guided instruction for building sea kayak models targeted in face to face culture camp experiences through equivalent online instruction.

The SMEs were provided the *Project Goal*, were asked to carefully review seven statements relating to the project goal, and then select their level of agreement with a four-point Liker scale as described in the above project rationale section.

Delphi Survey 1B: Project Goal reviewed by SME Panel

Of the seven statements in Delphi Survey 1B related to the project goal, two of the SMEs gave the highest possible rating (“Strongly Agree), indicating that they strongly agree with the project goal. One of the SMEs gave a rating of “Agree” to one statement. From a possible total of 84 points, the SME’s gave 83 points to the project goal. To assist the reader, the results from the SME survey of project goal are portrayed in Table 3 with mean, median, standard deviation (SD), and percentage calculated for descriptive statistics purposes. (See Table 3.)

Table 3
Results from SME Evaluation of Project Goal

Item	SME 1	SME 2	SME 3	Total Item Score
Project Rationale:				
1. The benefit of this project to the institution or organization is clearly stated.	4	4	4	12
2. The benefit of this project to the targeted learners is clearly stated.	4	4	4	12
3. The need for this project is clearly stated.	4	4	4	12
4. The geographical scope for this project is clearly stated.	4	4	3	11
5. The project's subject matter is clearly stated.	4	4	4	12
6. The project's approach to the problem is clearly stated.	4	4	4	12
7. The project's expected outcome is clearly stated.	4	4	4	12
Total Subject Matter Expert Scores for Project Rationale	28	28	27	83
			mean	11.9
			median	12
			SD	.38
			%	98.8

When the percentage of total subject matter expert scores is equal to or greater than 80%, the Delphi survey is finalized. Results of the Delphi Survey 1B were 98.8%; thus, Delphi Survey 1B was finalized.

Task A03: Objectives.

Objectives are generally described as desired outcomes of a project which “communicate the aims of instruction... and provide a foundation for the development of instructional activities and assessment of learning” (Gagne, Wager, Golas, & Keller, 2005, p. 133). Objectives are often articulated in five categories (situation, learned capabilities, object performance, and observable behavior).

The researcher outlined the following four objectives related to Traditional Unangan Sea Kayaks (TUSK):

1. Given tools, supplies, and instructions, the student will build the deck of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.

2. Given tools, supplies, and instructions, the student will build the hull of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.
3. Given tools, supplies, and instructions, the student will build the super structure of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.
4. Given instructional material on basic kayak orientation, terminology, culture and history, student will achieve a score of 70% on a researcher-developed multiple-choice test.

Tasks A03 was then reviewed by a Subject Matter Expert panel in Delphi Survey 1C as outlined below.

Delphi Survey 1C: Project Objectives Reviewed by SME Panel

Of the seven statements in Delphi Survey 01C related to the project objectives, two of the SMEs gave the highest possible rating (“Strongly Agree”). One of the SMEs gave a rating of “agree” to four statements related to project objectives. From a possible total of 84 points, the SME’s gave 80 points to the project objectives. To assist the reader, the results of the SME survey related to project objectives are portrayed in Table 4.

Table 4
Delphi Survey 1C: SME Survey of Project Objectives

Item	SME 1	SME 2	SME 3	Total Item Score
Project Objectives:				
1. Each objective of this project module is aligned to the goal statement.	4	4	4	12
2. Each objective of this project module contains a behavior/action verb that is measureable.	4	4	3	11
3. Each objective of this project module has an identified audience.	4	4	4	12

4. Each objective of this project module contains a degree/constraint that is clearly stated.	4	4	3	11
5. Each objective of this project module contains a condition/situation that is clearly stated.	4	4	3	11
6. Each objective of this project is aligned to the identified audience.	4	4	4	12
7. Using the project goal(s) [Task A02] as a reference, it appears the concept map accurately presents each of those goal(s).	4	4	3	11
Total Subject Matter Expert Scores for Project Objectives	28	28	24	80
			mean	11.4
			median	11.2
			SD	.53
			%	95.2

When the percentage is equal to or greater than 80%, the Delphi survey is finalized. Results of the Delphi Survey 1C were 95.2%; thus, Delphi Survey 1C was finalized. Thus, Delphi Survey 1A through 1C were finalized.

Even though no changes were made in the project rationale, goals, or objectives following the SME surveys, the researcher did keep in mind the responses of the SMEs and endeavored to fine tune the processes with guidance from the SME's input. For example, one SME did not agree that the time constraints were clearly defined. This was particularly true for designing time constraints for the online model kayak class due to the researcher's inexperience with an online model class at the time of the writing of the objectives. To address this, with some assistance from the major academic advisor who has more experience in online instructional design, the researcher developed a clear time constraint of 10-weeks for the online model class. The researcher respects and honors the opinions of the SMEs who agreed or strongly agreed with any of the rationale, goal, or objectives of the model kayak class. Task A04 through Task A07 will be presented below and then reviewed in Delphi 02 as part of the Content Related Domain of the Analyze phase of the ADDIE model.

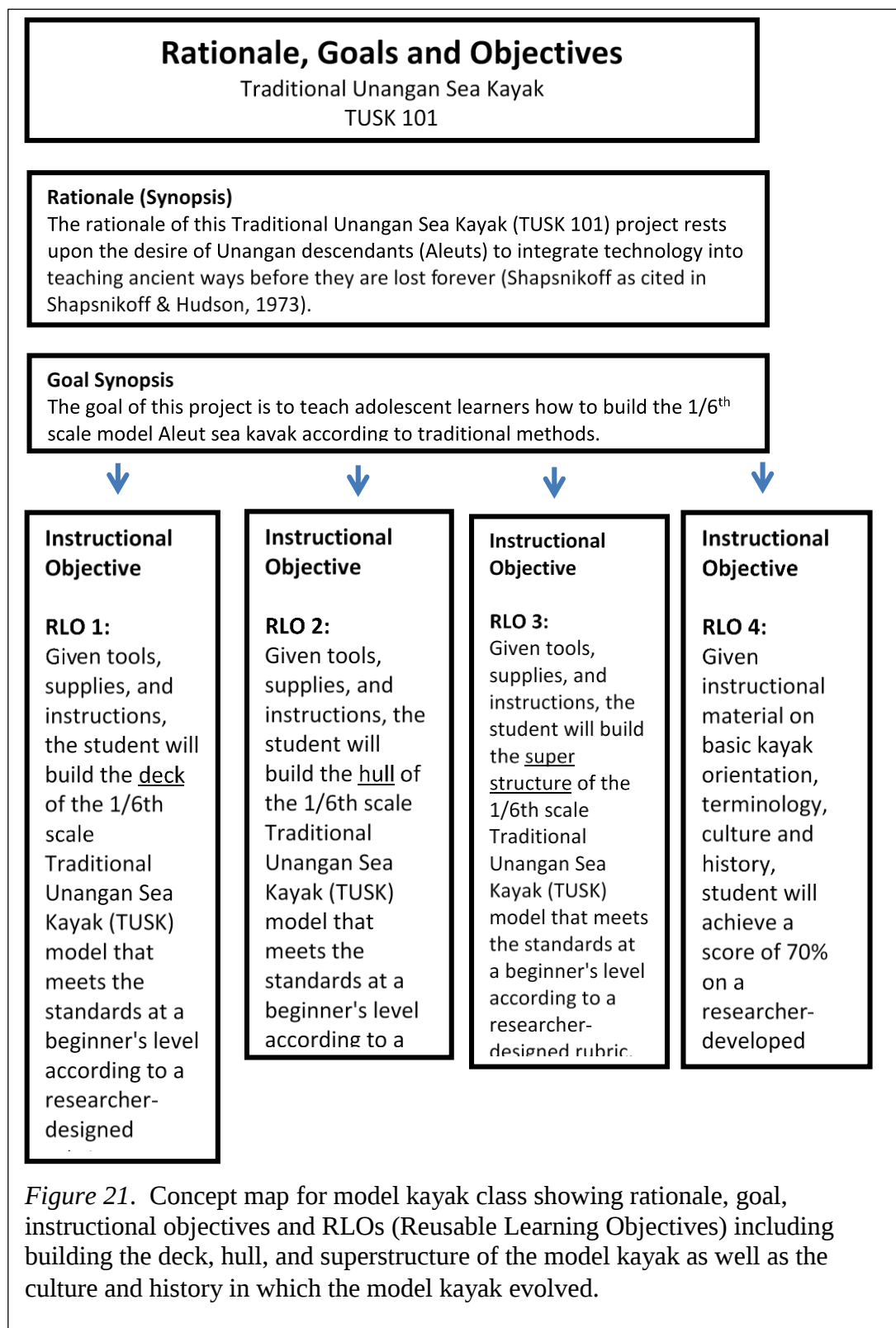
Task A04 through Task A07: Content Related Phase (Part 2).

Task A04 through Task A07 focused on the second portion of the content related component of the analyze phase. These domains included the concept map (Task A04), learner influence document (Task A05), learning outcome statement (Task A06), and learning hierarchy (Task A07).

Task A04: Concept map.

Concept maps assist people by providing a graphic representation of ideas so that relationships and connections may be more clearly understood. In this project, a concept map portrays a hierarchical relationship with the rationale at the top followed by the goal and then the four objectives.

The project rationale (integrating technology into instructing Unangan ways) is linked to the goal (helping people learn Unangan ways by instructing traditional model kayak building online) and to the four objectives (build the deck; build the hull; build the superstructure; and, cultural/historical knowledge). As the project unfolded, this concept map was updated and revised to reflect the Delphi panel recommendations as well as the final design. The concept map is portrayed in Figure 21.



The concept map was evaluated by the subject matter expert (SME) panel as part of Delphi Survey 2 and will be presented below following Task A07.

Task A05: Learner Influence Document.

The learner-influence document delineates Gagne's (1985) nine events of instruction (gaining attention, objectives, stimulate recall, material presentation, learner guidance, performance elicitation, feedback, assessment, retention & recall), learner-capability outcomes (build the kayak deck; build the kayak hull; build the kayak superstructure; demonstrate basic knowledge of the culture and history of the Aleut sea kayak), assessment, and accommodations for learner diversity for both the experimental (online) and Control (face to face) group. The learner influence document is depicted in Appendix C-1 Learner Influence Document.

The learner influence document was evaluated by the subject matter expert (SME) panel as part of Delphi Survey 2 and will be presented below following Task A07.

Task A06: Learning outcome statement.

Gagne et al. (2005) categorized learning outcomes into five areas: verbal, intellectual, cognitive, attitude, and motor skills. Task A06 involved creating the Learning Outcome Statement (LOS) for the Traditional Unangan Sea Kayak (TUSK) online module. The LOS identifies three learning effects: (1) short-term; (2) long-term; and, (3) anticipated changes as a result of learning. The following is a partial list of the anticipated learning outcomes for the model kayak class:

Learning Outcome Statement

1. Given tools, supplies, and instructions, the student will build the deck of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.
2. Given tools, supplies, and instructions, the student will build the hull of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.
3. Given tools, supplies, and instructions, the student will build the super structure of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.
4. Given instructional material on basic kayak orientation, terminology, culture and history, student will achieve a score of 70% on a researcher-developed multiple-choice test.

The complete learning outcome statement with expected changes (short- and long-term) as a result of instruction is portrayed in Appendix C-2 Learner Outcome Statement. The learning outcome statement was evaluated by the subject matter expert (SME) panel as part of Delphi Survey 2 and will be presented following Task A07.

Task A07: Learning hierarchy.

Learning hierarchies show “relationships of prerequisite skills to the task” (Gagne *et al.*, 2005, p. 123). Task A07 portrays the relationship amongst the skills required before entering the class, the major parts of the cultural/historical and model building of the class, and the goals (desired outcomes). Although there are four objectives within this class, the Learning Hierarchy addresses the desired knowledge components and steps necessary to achieve the project goal (desired outcomes).

The learning hierarchy in this class proceeds from learning basic sea kayak terminology to learning basic sea kayak directionality, learning how to build the deck of the model kayak, how to build the hull, how to build the superstructure, and learning

about the basic culture and history of the model Aleut sea kayak. The complete learning hierarchy is portrayed in Appendix C-3 Learning Hierarchy.

Delphi Survey 02 – Content Related 2

Task A05 through Task A07 were evaluated by a Delphi panel through Delphi Survey 02 to gain input from the SMEs concerning the face validity and content validity of the concept map, learner influence document, and learning hierarchy. Members of the SME were provided these instruments and given statements, asking for a rating which most represented their evaluation on a Likert-scale with a scale of: Strongly Disagree (1), Disagree (2), Agree (3) and Strongly Agree (4). Thus, if all three of the SMEs strongly disagreed with of the statements, then would be 100% disagreement. If, on the other hand, all three of the SMEs strongly agreed, then there would be 100% strong agreement.

In rating Delphi Survey 02, SME 1 and SME 2 provided ratings of “Strongly Agree” for all of the statements; and, SMI 3 provided ratings of “Strongly Agree” to 18 of the statements and “Agree” to two of the statements. Thus, out of a possible of 240 points ($4 \times 3 \times 20 = 240$), the SME’s gave a total of 238 points in evaluating the Concept Map document, the Learner Influence document, and the Learning Hierarchy statement. (See Table 5.)

Table 5
Delphi Survey 02 Concept Map, Learner Influence, and Learning Hierarchy

Item		SME 1	SME 2	SME 3	Total
Concept Map Document (Task A04):					
1.	It appears the concept map accurately presents each goal of the project. (Refer to Task A02 for the goal(s), if needed.)	4	4	4	12
2.	It appears the concept map accurately presents each of the primary objectives. (Refer to Task A03 for the objectives, if needed.)	4	4	4	12
3.	Using the project goal(s) and the project objectives [Task A032] as references, it appears the concept map accurately links each goal with its corresponding primary objective(s).	4	4	4	12
4.	Using the project objectives as reference, it appears the concept map accurately presents each of the secondary objectives.	4	4	4	12
5.	Using the project objectives as reference, it appears the concept map accurately links each of the secondary objectives to its corresponding primary objective.	4	4	4	12
6.	The total concept map presents an accurate depiction of the project.	4	4	3	11
7.	The total concept map displays appropriate linkages among all elements.	4	4	3	11
Learner Influence document (Task A05):					
8.	There is an accurate description for gaining the learner's attention within each RLO/Module.	4	4	4	12
9.	There is an accurate description for maintaining the learner's attention within each RLO/Module.	4	4	4	12
10.	There is an accurate description for assessing the learner's satisfaction within the instruction for each RLO/Module.	4	4	4	12
11.	There is an accurate description of how each RLO/Module will include a focus on specific learner capabilities.	4	4	4	12
12.	There is an accurate description of how each RLO/Module will stimulate the learner's prerequisite knowledge (or skills).	4	4	4	12
13.	There is an accurate description of how each RLO/Module will accommodate identified learner disabilities.	4	4	4	12
14.	There is an accurate description of how each RLO/Module will respond to a participant's particular learning traits.	4	4	4	12
Learning Outcome document (Task A06):					
15.	There is an accurate description of the <u>short-term</u> learning effect for each of the objectives for each RLO/Module.	4	4	4	12
16.	There is an accurate description of the <u>long-term</u> learning effect for each of the objectives for each RLO/Module.	4	4	4	12
17.	There is an accurate description of how the learner is expected to change as a result of each objective.	4	4	4	12
18.	There is an accurate description of what is expected to change as a result of the instruction.	4	4	4	12
Learning Hierarchy statement (Task A07):					
19.	The essential prerequisite learner knowledge/skills to achieve the objectives are identified.	4	4	4	12
20.	The hierarchal map provides accurate graphical representation of the prerequisite knowledge/skills the learner is to achieve before commencing work on this project's objectives.	4	4	4	12
Total		80	80	78	238
					mean 11.9
					median 12
					SD 0.31
					% 99.2

Thus, the results of Delphi Survey 02 of the project concept map, learner influence document, learning outcome document, and learning hierarchy statement were 99.2%.

Each SME could strongly agree with all 20 items in the for the concept map, learner influence document, and learning hierarchy, giving a score of four for each of the three categories for a total high score of 12 for each of the 20 items resulting in a potential total high of 240 points ($3 \times 4 \times 20 = 240$). In Delphi 2, the total score for all three SMEs was 238 or 99.2%. The mean was 11.9, the median was 12, and the standard deviation was 0.31. Thus, Delphi 2 was finalized with most SMEs strongly agreeing to the 20 items within the concept map, learner influence document, and learner hierarchy. One SME agreed (rather than strongly agreed) with two of the items.

Regardless, a 99.2% total score from all SMEs speaks as a nod of positive approval for the three areas evaluated in Delphi Survey 02. In addition, a mean of 11.9 and a standard deviation of only 0.31 indicate consistent positive approval of the concept map, learner influence document, and learner hierarchy. When the percentage is equal to or greater than 80%, the Delphi survey is finalized. Delphi Survey 02 was finalized.

Task A08 through Task A11: Instruction Related.

Task A08 through A11 focused on instruction related components of the analyze phase including learner characteristic profile (Task A08), target audience statement (Task A09), learner constraint statement (Task A10), and pedagogical considerations statement (Task A11). These tasks are presented below, followed by Delphi Survey 03.

Task A08: Learner characteristics profile.

Learner characteristics are “certain qualities that relate to instruction” (Gagne et al., 2005, p. 107) in factors such as cognitive/meta-cognitive, motivational/affective, developmental/social, individual differences. In this research project, the learner characteristics for both the traditional face to face class and the online class mirrored past attendees of Aleut culture camps: adolescent students, mixture of males and female, mostly Aleut (or related to Aleuts) but also a few Whites, Hispanics, or Asians, interested in learning how to build a model kayak. Culture camp students generally speak English as a first language, learn some Aleut language, and exhibit few learning disabilities (with perhaps the exception of attention challenges).

Please see the complete learner characteristics profile in [Appendix C-4 Learner Characteristic Profile](#).

Task A09: Target audience statement.

Learners who were directly affected by this instruction include traditional face to face students attending Aleut culture camp and students attending an online model kayak course created in this project. Grade levels include middle- and high-school students (ages 8 through 18). The geographic regions for face to face students were Aleut culture camps in Alaska. The specific academic discipline was Aleut traditional skills (such as model kayak building, basket weaving, skin sewing, drumming, dance, traditional language).

The model Aleut sea kayak class occurred at four Aleut culture camps in Alaska during the summer of 2011. Two of these camps were located on mainland Alaska in large (population 200,000+) urban settings, and two occurred in Alaska islands in rural

small (population less than 3,000) communities. Due to the fact that some of these culture camps are held in Aleut communities with small populations, identifying information (names, dates, locations) of the camps have been omitted to preserve student anonymity.

The online section of this class began November 1st and ended December 24th, 2011. Online students attended from Alaska, Virginia, Idaho, and Arizona. One student traveled with his parent from Alaska through Canada to the Lower 48 where he continued to work on his model kayak mostly in Arizona and also some in California; thus, his final location is described as Arizona. The complete target audience statement for this project was listed as follows.

Learners who were directly affected by this instruction include traditional face to face students attending Aleut culture camp and students attending an online model kayak course created in this project. Grade levels include middle- and high-school students (ages 8 through 18). The geographic regions for face to face students were Aleut culture camps in Alaska. The specific academic discipline was Aleut traditional skills (such as model kayak building, basket weaving, skin sewing, drumming, dance, traditional language).

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Task A10: Learner constraints statement.

In general, rural Alaska students face more constraints than urban Alaska students. Resources, supplies, and services in the Aleutian Islands, the Shumagin Islands, and the Pribilof Islands are limited and costly. For example, a round-trip plane ticket from Anchorage to some Aleutian communities can cost \$1000 to \$1500. Fuel (heating

or gasoline) can cost between \$5 and \$10 per gallon. Internet service to the islands is limited to satellite providers and is, therefore, often costly, slow, and unreliable. Stores in rural communities have limited, expensive supplies. Students living in urban centers connected to highway systems in Alaska, such as Anchorage or Fairbanks, are less constrained with wider choices of stores, Internet service providers, and other supplies, often available for a fraction of the cost in rural areas.

The complete Learner Constraints Statement for this project was stated as follows.

Learner constraints in this project are divided into two major categories: face to face and online; and, into geographic locations. Due to the fact that some of these culture camps are held in Aleut communities with small populations, identifying information (names, dates, locations) of the camps have been omitted to preserve student anonymity.

In Alaska in general, the more urban areas have greater access to more resources at lower costs. The major urban areas in Alaska consist of Anchorage (population about 296,000), Fairbanks (population about 97,000), Matanuska-Susitna Borough (91,000), and Juneau (32,000) (Alaska, 2010). Population in the Aleutians East Borough is estimated at 3,000 whereas the Aleutians West Borough is estimated at 5,000 (Alaska, 2010). As an example of the differences in learner constraints between urban Alaska and rural Alaska, the cost a round-trip plane ticket from Salt Lake City to Anchorage (a total distance of about 4000 miles) is around \$600 whereas a round-trip ticket from Anchorage to communities within the Aleutians East Borough (distances of less than 2000 miles) can easily cost over \$1,200. In other words, travel in the Aleutians can average twice the cost for half of the distance. These disparities can provide other learner constraints in terms of cost of housing for instructors, cost of supplies, heating fuel, and gasoline for automobiles, food and so forth.

Online Constraints for the online model kayak students vary. In the Aleutians, particularly in the islands such as Shumagin, Pribilof, or Aleutians, Internet access is provided through satellites and is therefore often slow and not always reliable. Logging on to Internet sites, downloading or uploading files can be a lengthy, frustrating process. Online students in more urban areas of Alaska (e.g., Anchorage, Fairbanks, Juneau, Matanuska Valley, Kenai Peninsula) enjoy faster, more reliable, less expensive Internet service. Mental, emotional, and attitudinal constraints during online classes are anticipated to be less than provided during traditional face to face culture camp experiences. Energy levels run high during culture camps due to the big annual event of the summer occurring. Replicating these events in an online event presents challenges. In culture camp, one can see the enthusiasm and smiles on faces; one can feel the energy and the friendly competition. In online environments, one might be able to replicate this with online video conferencing, but this may not be available to all of the students, particularly in rural areas where Internet service is slow.

Specific tools needed to meet the expected instructional outcomes include Internet access with at least high speed (faster than dial-up) access, digital camera with macro (close-up) and computer program to view videos.

Model Kayak Kits Model kayak kits were provided to both face to face students and online students. Tools, supplies, and instructions were provided. Inevitably, supplies at culture camps run out or get broken. Students in urban areas can easily locate resources at reasonable costs. However, students living in rural areas frequently face challenges locating resources; or, supplies must be purchased at exorbitant costs.

Task A11: Pedagogical considerations statement.

In both the traditional face to face class and the online class, instructional techniques built upon foundations originating from both the Alaska Native world and the Western world. Alaska Native instruction is constructed upon centuries of designing and field testing teaching styles which increase self-esteem and success of new generations as they adapt to changing environments (Barnhardt & Kawagley, 2005; Dirks, 2004; Hudson, 1992). More complex techniques are often broken into smaller tasks that Alaska Native youth can observe repeatedly until they begin to achieve mastery levels; for example, even the complex Attu basket begins with learning how to weave two wefts around the warp (Kay, 2007; Shapsnikoff & Hudson, 1973). Experienced Alaska Native instructors adapt their teaching style to the learning environment as well as the particular needs of the individual students (Kawagley, 1995).

Similarly, in the Western world, “different types of learning outcomes call for different types of instruction” (Gagne, Wager, Golas, & Keller, 2005, p. 3); online instruction are broken down into the “smallest objects possible, aiming for 5 to 15 minutes” (p. 325) while taking into “consideration the skills the learner brings to the task, so that the learner can succeed” (p. 73). The researcher began instructing model Aleut kayaks in 1978 while apprenticing under Aleut elder Sergie Sovoroff; thus, the traditional face to face instruction continued as in the past. The original prototype for the online class was designed to mirror the traditional face to face instruction, but ultimately was

decided to be too complex (see discussion above in *Second Prototype Model Aleut Sea Kayak Course*). A second, simplified version was designed, developed, pilot-tested, and implemented during 2011.

The following is a complete Pedagogical Consideration Statement for the model Aleut sea kayak class:

During face to face traditional Aleut culture camps, pedagogical considerations include a vast array of materials to encourage student success including verbal encouragement, frequent breaks with refreshments, group approval, a little friendly competition, and so forth. Traditional face to face instruction was instructed as it had been over the past few decades based upon instruction provided by Aleut elders.

In creating material for the online course, traditional face to face students were asked to volunteer to create material which encourages success for online students. This material included text, writings, drawings, photographs, videos, and other material designed to improve chances of success for online students.

Online instruction was broken down into small units. Instruction in the basics of attending an online class was provided in video format to assist students in learning how to upload pictures to Moodle. Instructional videos were also created so that online students can begin to learn basic kayak terminology (such as gunwales, thwarts, bow piece, stern piece, ribs, stringers, keelson, deck beams, stanchions, cockpit coaming and so forth) as well as basic boat directionality (bow, stern, port, starboard, deck, hull).

Model kits were designed, developed, and sent to online students with parts sorted and labeled. Model kits also included other supplies and tools such as sand paper, rubber bands, pencils, ruler, saw, binder clips, clippers, and so forth. A list of parts and supplies was included on the online site so that students could check their kits to ascertain if they received everything they need.

The process of building the model Aleut sea kayak was broken down into four major steps as follows: (1). Build the Deck; (2) Build the Hull; (3) Build the Superstructure; and, (4) History and Culture of the Model Aleut Sea Kayak. These four major steps were broken down into 28 smaller steps with the students instructed to first dry-fit (put together the wooden parts without any glue) and to then capture a digital photograph of their work to upload to Moodle so that the instructor could examine their work before they glued it. This process was designed to avoid the kayak frame being glued together incorrectly, a small disaster which can be easily corrected in traditional face to face classes but which presents significant problems for online students. Students were encouraged regularly to contact the instructor if they had any questions or if they ran into any challenges. A fourth module was created on the culture and history of model Aleut sea kayaks.

Thus, pedagogical considerations included traditional face to face instruction as presented for generations and online instruction broken down into simple steps to maximize the potential of success.

The above is the complete Pedagogical Consideration Statement which was part of Delphi Survey 03 and was sent to the SME panel as described below.

Delphi Survey 03 – Instruction Related

Task A08 through Task A11 were evaluated by a Delphi panel to gain input from SMEs concerning the face validity and content validity of the learner characteristics, targeted audience statement, specific learner constraints, and pedagogical considerations. Members of the SME panel were provided these instruments and then given a series of 20 questions asking for the rating that most represented their expert evaluation on a Likert-type scale from Strongly Disagree (1) to Disagree (2) to Agree (3) and Strongly Agree (4). Thus, if all three of the SMEs strongly disagreed with 20 of the statements, then the total score would be 20 ($20 \times 1 = 20$). If, on the other hand, all three of the SMEs strongly agreed, then the total score would be 80 ($20 \times 4 = 80$).

The SMEs strongly agreed with all of the statements, except for statement number 15 which received an agreed. Thus, the total score was 263 out of 264 possible points with a mean of 11.95, a median of 12.0, a standard deviation of 0.21, and a percentage of 99.6. Table 6 presents the statements and the responses of the SMEs as well as the total points, mean, median, standard deviation, and percentage. (See Table 6.)

Table 6
Delphi Survey 03 with Results

Item	SME 1	SME 2	SME 3	Total Item Score
Learner Characteristics document (Task A08):				
1. It appears the general characteristics accurately describe the target population of the project.	4	4	4	12.0
2. It appears the age range accurately represents target population of the project	4	4	4	12.0
3. It appears the gender distribution accurately represents target population of the project	4	4	4	12.0

	Item	SME 1	SME 2	SME 3	Total Item Score
4.	It appears the ethnic/cultural distribution accurately represents target population of the project	4	4	4	12.0
5.	It appears the language distribution accurately represents target population of the project	4	4	4	12.0
6.	It appears the entry behavior is appropriate for target population of the project	4	4	4	12.0
7.	It appears the time frame for completion is reasonable for target population of the project	4	4	4	12.0
8.	It appears the list of prior knowledge needed for completion of the project is complete.	4	4	4	12.0
9.	It appears the statement of prerequisite cognitive skills for completion of the project is complete.	4	4	4	12.0
10.	It appears the statement of prerequisite motor skills for completion of the project is complete.	4	4	4	12.0
Target Audience document (Task A09):					
11.	It appears the description of the learners accurately represents target population of the project.	4	4	4	12.0
12.	It appears the description of the location accurately represents intent of the project.	4	4	4	12.0
13.	It appears the description of the time allotment for assessment and instruction accurately represents intent of the project.	4	4	4	12.0
Learner Constraints document (Task A10):					
14.	It appears the learner constraints (e.g. Time, budget, user preferences, organizational culture, available technology) have been reasonable addressed for target population of the project.	4	4	4	12.0
15.	It appears the learner constraints regarding ADA considerations have been reasonable addressed for target population of the project.	4	4	3	11.0
16.	It appears the learner constraints regarding network software have been reasonable addressed for target population of the project.	4	4	4	12.0
Pedagogical Considerations document (Task A11):					
17.	It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional sequencing.	4	4	4	12.0
18.	It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional motivation.	4	4	4	12.0
19.	It appears that the Pedagogical Considerations Statement has addressed issues student-centered learning.	4	4	4	12.0
20.	It appears that the Pedagogical Considerations Statement has addressed issues regarding use of an advance organizer or some system to clarify the instructional goals and objectives of the project/	4	4	4	12.0
Total		80	80	79	239
mean					11.95
Median					12.0
SD					0.21
%					99.6

When the percentage was equal to or greater than 80%, the Delphi survey was finalized. The results of this survey was 99.6%; thus, Delphi 03 was finalized.

Delphi 04 consisted of environment related topics, specifically the learning environment statement (Task A12) and delivery options statement (Task A13).

Task A12: Learning environment.

The learning environment has been described as a “set of elements that interact in the process of promoting and supporting learning activities” (Gagne et al., 2005, p. 20) as students receive new material provided by others while discovering how to construct their own instructional situations. The Learning Environment Statement (LES) provides specific details for what is required. When attending the traditional face to face model kayak learning environments, the Aleut culture camp organizers provide the necessary materials and supplies. When attending the online section, students needed hardware and software essential for success in an online environment.

The design decisions driven by the online environment in delivering this content might be compared to making and driving an automobile on planet Earth to landing and driving an spacecraft on planet Mars in so far as the instructor was on the northwest part of the North American content (Alaska) and some of the students were on the east coast of the continent (Virginia). The analysis of the learning environment required that the instructional designer to pace through the transformation process of being present in the woodworking shop and providing the students materials and directions to packaging up the materials and directions to deliver them long distance in a neat and tidy package. The parts, tools, and instructions needed to be delivered to adolescent students who were required to assemble a transportation vehicle (model sea kayak) to fairly high standards in a relatively short time period.

In the classroom with the instructor and students present, the instructor could pick up tools and show the students how to carefully and correctly use carpentry tools with sharp edges. If the students did not pay attention to the tool safety and nicked their finger with a sharp metal blade, the instructor could get a band aid to stop the bleeding and help the student get back on track. In the traditional face to face instructional setting that Alaska Natives have employed for thousands of years, the elder can hand to the youth a very precious and specialized tool which has been made and refined over hundreds of years. Furthermore, the elder can show the youth how to carefully use ancient yet complex wood working tools, demonstrating subtle tricks to enhance success without damage to the tool, student, or material.

No such luxuries existed in the online instructional environment. The student might as well have been on another planet. The students were hundreds or thousands of miles away, and communication was not synchronous. Therefore, the instructional designer needed to re-think through the process of ancient model Aleut sea kayak building and assist the instructional design process into a transformation process of adapting into a 21st Century online environment, capable of working on planet Earth or capable of working (in some fashion) on faraway planets.

Some of the more complex and dangerous processes (such as drilling the holes in the gunwales) simply needed to be completed by the instructor. For the instructor to send the students bow drills or pump drills was far too expensive. Furthermore, ancient drills, if not properly used, might have resulted in injury to young students. An injury, even slight, could be enough to make a new student (without an instructor present to assist them through a rough spot) frustrated to the point of giving up. In ancient Alaska Native

villages, when lives of many depend upon success (such as hunting during the winter months), giving up was not an option.

In addition, drilling the holes in the gunwales by an adult was not significantly different from face to face culture camp. When Aleut culture camps were compressed due to time scheduling of other classes (for example, catching salmon, basket weaving, seal butchering, or Aleut dance), it was fairly common for adults to gather in the wood working shop, mark the gunwales for rib holes, and drill the holes on an electric drill press.

In this particular instance, while designing this online class, the researcher designed a small gunwale jig which could hold four gunwales for quick marking with a square and pencil, set up a small drill press with a Dremel™ drill, and quickly drilled the holes in the gunwales. Figure 22 portrays gunwales drilled and stamped.



Figure 22. Gunwales stamped with names (Unangan Iqya-x), locations of thwarts (A, B, C, etc.), and rib holes drilled.

One of the most challenging processes of transformation into the online environment was getting systematically organized. Over the previous decade (approximately 1999 through 2009), the traditional face to face classes were transitioned from Sergie Sovoroff's four month 1/12th model class into a one-week 1/6th scale model kayak class so that students could complete a model kayak during one-week Aleut culture camps. This transition was done intuitively, based upon the traditional instruction of Sovoroff (1901 – 1989), and were mostly organized within the mind of the instructor without extensive documentation, save Ikyak (Livingston, 2004) which was not widely distributed or extensively updated.

For the online class, the researcher had to map out the entire process, determine what supplies the online students needed, decide what tools the students needed, create written directions that students needed, and get everything packaged up in a neat and professional manner. The researcher created print labels for the parts, ordered rubber stamps so that wooden parts could be stamped. For example, rubber stamps were ordered with name “Unangan Iqya-x” so the students could begin to learn the ancient names. Figure 23 depicts the rubber stamps, a yellow metal ruler, and the gunwales stamped.



Figure 23. Gunwales stamped with rib holes drilled.

The researcher also needed to get the whole process mapped out, continually thinking of what a student with little wood working skills at a long distance from the instructor might do. Throughout this instructional research design process, the researcher attempted to keep the online class as similar to the traditional face to face class as possible. In addition, the researcher frequently kept the concept of “Safety First” at the forefront of the mind, trying to develop the online class with the minimal chances of injury to online students. The researcher developed a template for the bow pieces and designed a system for quickly making them and gluing them together so that they were prefabricated for the students. In the traditional face to face class, the instructor typically provides a significant amount of assistance to the students with the complex bow pieces, each which often must be custom designed because the students frequently make the model kayaks at different depths, sometimes very deep (about two inches which is proportionately too deep) and sometimes shallow (about one inch which is proportionately about how shallow a 1/6th scale model kayak should be).

The photograph in Figure 24 portrays eleven bow pieces glued, clamped with rubber bands, and drying in sunlight. (See Figure 24.)



Figure 24. Model kayak bow pieces.

After the thwarts were cut to the proper length with the correct angles on the end, they were labeled (for example, “A” through “D”) so that the students could easily identify where the thwarts are placed along the gunwales. The placement of the thwarts at the appropriate location along the gunwale is an important component of building a strong model kayak. In a sense, the gunwales, thwarts, bow piece, and stern piece are the foundation of the kayak, somewhat similar to the foundation of a house. If the foundation is strong, straight, and true, then the remainder of the structure is likely to go together well. The photograph in Figure 25 depicts thwarts “A” through “D” stamped, bagged, and tagged. (See Figure 25.)

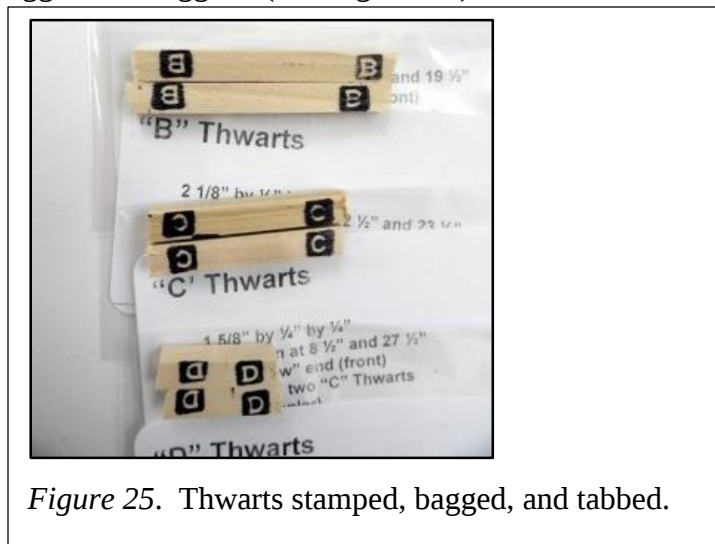


Figure 25. Thwarts stamped, bagged, and tabbed.

The researcher also designed the kits so that the shipping containers were of minimal quantity, size, and weight. Initially there were two separate large packages of tools and supplies which were expensive to send and difficult to track. After a few redesigns (such as using smaller tools or prefabricating parts as outlined above), the researcher found that all of the necessary items could be loaded into one 36-inch long cardboard tube, about three inches around. The supplies and names of wooden parts were needed to be realigned with the instructions presented in the online instructional videos.

The photograph in Figure 26 depicts about ten cardboard tubes (about three inches round and 36 inches long) loaded with model kayak kits to and ready to be mailed to students. (See Figure 26.)



Figure 26. Cardboard mailing tubes 36 inches long with model kayak kits ready to be mailed to online students.

Additional equipment for the learning environment is portrayed [Appendix C-5 Learning Environment](#).

Task A13: Delivery options statement.

The Delivery Options Statement (DOS) portrays available options for the online model kayak course including the delivery platform for the syllabus, cultural/historical content, assignment submission, assessment, grading, and so forth. Task A13 was broken down into a 12-part DOS, detailing delivery options in categories of essential for an online model Aleut sea kayak course including (1) welcoming, (2) directions for the 28 steps; (3) brief introduction; (4) preparing for online camp; (5) six basic kayak directions;

(6) basic kayak terminology; (7) building the deck; (8) building the hull; (9) building the superstructure; (10) capturing digital photographs; (11) paper on history and culture of Aleut sea kayaks; and, (12) graduation.

Below is the delivery options statement:

Delivery Options Statement Task A13

The delivery plan for this research project is Moodle 1.9 provided by the Instructional Technology Resource Center (ITRC) at Idaho State University (ISU). The delivery plan for the targeted content activities followed this outline:

1. Welcome!
2. Directions for the 28 steps
3. Brief introduction
4. Preparing for Online Camp
5. Six Basic Kayak Directions
6. Basic Kayak Terminology
7. Building the Deck of the Model Kayak
8. Building the Hull of the Model Kayak
9. Building the Superstructure of the Model Kayak
10. Capturing and uploading digital photographs
11. Paper on the History and Culture of Aleut Sea Kayaks
12. Graduation

Each of these 12 components had sub-components. For example, within the “Building the Deck of the Model Kayak”, there were step-by-step directions on how to build the deck including how to dry-fit the parts together before gluing.

The delivery plan for the targeted content’s assessment included quizzes, surveys, and assignments. For example, during the cultural and historical content section, students read instructional material, view video tutorials, and took surveys or quizzes. During the building of the model kayak, the students viewed video tutorials and then performed tasks. For example, students assembled the parts of the deck (gunwales, thwarts, bow/stern wedge) and then clamped the parts together with rubber bands. The students then captured and uploaded digital images so that the instructor could view the dry-fitted pieces before the students glued them together. In this way, the instructor could assess the student’s work to keep them on track.

The plans for learner self-directed instruction included reading instructional material, viewing online video tutorials, taking online quizzes, and (if necessary), reviewing material and re-taking quizzes. Self-directed materials also included viewing video tutorials for building the model, following directions, completing steps in the wood working project, capturing and submitting digital photographs with close-up detail of their wood working, and so forth.

Plans for remedial learning included the instructor inspecting photographs of dry-fitted work before the student had glued the parts together. If the student had dry-fitted the parts together incorrectly, then the instructor gave directions on how to correct the misassembled parts. The plan for the availability of auxiliary formats of material included as many venues as possible including online text, audio recordings, blogs, Moodle Wikis, video recordings.

The plan for student-to-instructor communication was to achieve the lowest-common denominator for all of the students in the class. For example, if all students could only achieve asynchronous communication such as e-mail, then everyone in the online class used e-mail. If, on the other hand, all students in the class had high speed Internet with video conferencing capabilities, then this option would be explored. Other options for online communication included Moodle chat, forums, and so forth. It was anticipated that students new to online instruction would initially need some support in getting logged in to a Moodle course and with learning how to navigate in an online course management system. Training videos were created and a supportive instructional environment was created to assist students new to a technology-rich online instruction.

Delphi Survey 04 – Environment Related

Task A12 and Task A13 were evaluated by a Delphi panel for verification of face and content validity. The scores ranged from a potential low of 12 (if all of the SMEs strongly disagreed) and a potential high of 48 (if all of the SMEs strongly agreed). Delphi survey results are reported in forms of measures of central tendency (i.e., mean, median, and standard deviation). Results of this survey are portrayed in Table 7.

Table 7
Results of Delphi Survey 04 – Environment Related

Item		SME 1	SME 2	SME 3	Item Total
Learning Environment Statement (Task A12):					
1.	It appears the specific hardware requirements have been accurately described for the project.	4	4	4	12
2.	It appears the specific requirements to navigate the content materials have been accurately described for the project.	4	4	4	12
3.	It appears the specific software requirements have been accurately described for the project.	4	4	4	12
4.	It appears the specific learner requirements have been accurately described for the project.	4	4	4	12
5.	It appears the specific learner requirements for students with physical disabilities have been accurately described for the project.	4	4	4	12
6.	It appears the specific learner requirements for students with English as a second language have been accurately described for the project.	4	4	4	12
7.	It appears the specific learner requirements for students with cognitive disabilities have been accurately described for the project.	4	4	4	12
Delivery Options Statement (Task A13):					

8.	It appears the specific delivery plan for content assignments has been accurately described for the project.	4	4	4	12
9.	It appears the specific delivery plan for content activities has been accurately described for the project.	4	4	4	12
10.	It appears the specific delivery plan for content assessments has been accurately described for the project.	4	4	4	12
11.	It appears the specific delivery plan for content assessment feedback has been accurately described for the project.	4	4	4	12
12.	It appears the specific delivery plan for student-to-instructor communication has been accurately described for the project.	4	4	4	12
Total		48	48	48	144
		mean			12
		median			12
		SD			0.0
		%			100

The Delphi survey instrument for measuring face validity of Tasks A12 through

A13 consisted of 12 Likert-scaled items on a scale from Strongly Disagree (1) to Disagree (2) to Agree (3) and Strongly Agree (4). The Delphi Survey 4 from the three SME judges generated a mean score of 12. Thus, there are indications that the SMEs strongly agreed with face and content validity of the learning environment statement and delivery options statement of the model kayak project.

Task A14: Proposed timeline.

Analyze task A14 was a proposed timeline for finishing the Analyze phase. This timeline provided guidance for the SMEs and IDEs in understanding how the project plan was to be carried out. The Proposed Timeline for the analyze phase with the task list of the project is portrayed in Appendix C-6 Proposed Time Line for Analyze Phase. Delphi Survey 05 Task A14: Project Timeline was sent to the IDE panel. See Appendix C-7: Delphi Survey 05 (Task A14). The Delphi survey instrument measuring face validity of

Task A14 consisted of nine Likert questions on a scale of 1 (Strongly Disagree) through 4 (Strongly Agree) with a possible low score of nine (if all of the SMEs strongly disagreed). For Delphi Survey 5, there was a possible high score of 36 (if all of the SMEs strongly agreed). All three of the IDE judges strongly agreed with the proposed time line. The results are presented in Table 8.

Table 8.

Delphi Survey 05 – Face Validity (IDE Panel) Task A14

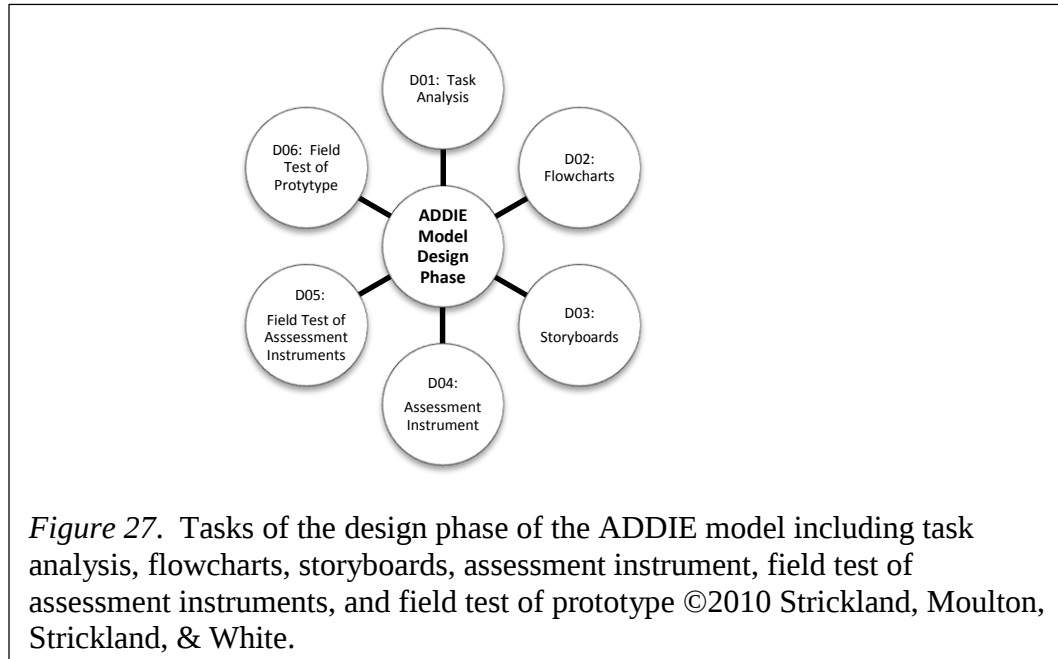
Survey	Number of Items	Mean	Median	SD
Delphi 5 (Analyze Phase)	9	12.00	12.00	0.00

The raw data from Delphi Survey 5 is presented in [Appendix C-8: Delphi 05 Raw Data](#). If the consensus on the expert panels is greater than 80%, then panel expert consensus was reached. The consensus on the IDE panel for the proposed timeline was 100%. Thus, the consensus was gained on the proposed timeline. This concludes the Analyze Phase; the next phase in the ADDIE model of instructional design is the Design Phase.

Design Phase.

The purpose of the design phase is to create a “plan or blueprint for guiding the development of instruction” (Gagne, Wager, Golas, & Keller, 2005, p. 26) with six steps suggested: (1) use course goals to define objectives; (2) create major categories of instruction; (3) begin rough drafting the major units by articulating what is expected of students at the conclusion of the course; (4) create course content in the form of events in which the students may participate; (5) clarify how students and course content will interact to achieve desired outcomes; and, (6) assessment. Moulton, Strickland, Strickland, White and Zimmerly (2010) suggested the following tasks for the Design Phase: task analysis; flowcharts (with/without content); storyboards; instruments for

assessment; assessment instruments; prototype; and field testing of prototype. The six phases of the design phase are portrayed in a circular pattern in Figure 27.



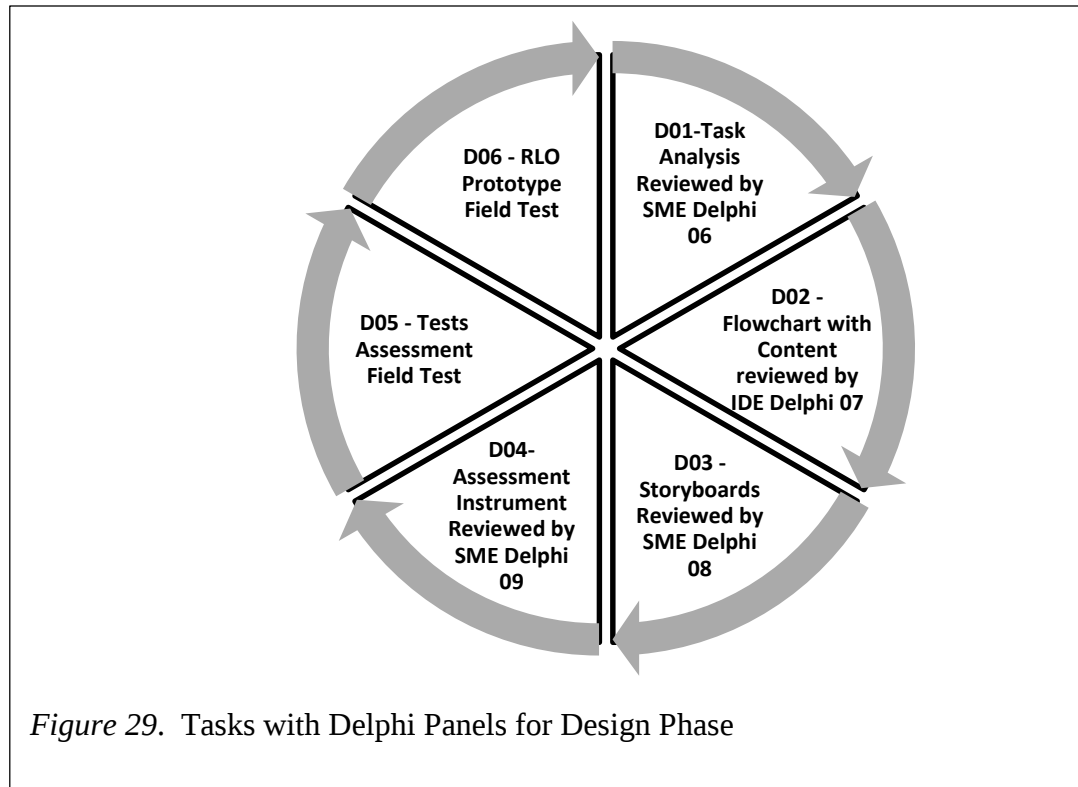
During the Design Phase for the model kayak class, the six tasks were reviewed by the panel of experts (SME or IDE) for face validity as displayed in Figure 28.

Task	Description	Panel
D01	Task Analysis	SME
D02	Flow Charts with Content	IDE
D03	Storyboards	IDE
D04	Assessment Instrument	SME
D05	Field Test of Test Assessment Instrument	SME
D06	Prototype Field Test of RLO	Field Test

Figure 28. Seven tasks (D01 through D07) and descriptions with expert panels during the Design Phase of the ADDIE model.

The tasks with corresponding Delphi panels are graphically represented in Figure 30, and are also portrayed in more detail in Appendix C, including additional information

on the tasks, the templates for the Delphi Survey, Delphi survey raw data, data analysis, and (if required) revisions for the tasks. Please see Figure 29.



For design phase of this project, there were again two panels of experts: (1) Aleut culture camp instructors, and (2) instructional design experts. Documents (text and/or photographs) from the design tasks were submitted to the judges to review for face and content validity as part of the Delphi reiteration process. For each of the tasks, statements were presented to the judges who were asked to provide responses about their level of agreement ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). For each item, scores ranged from a possible low of three ($3 \times 1 = 3$) and a possible high of 12 ($4 \times 3 = 12$). Possible high score was calculated by multiplying the possible high score times the number of judges times the number of items (for example, $4 \times 3 \times 7 = 84$). The Delphi number, task number, number of items, possible high score, Delphi score, mean,

median, standard deviation (SD), percentage of consensus, and whether or not Delphi consensus was reached in the design tasks are summarized in Table 9. Table 9 is presented as an overview in summarizing the results of the Delphi panels for the Design Phase. Following Table 9, details of each of tasks and Delphi panels will be presented.

Table 9
Summary of Delphi Results for Design Phase

Tasks Title	Delphi	#	Possible High	Delphi Score	Mean	Median	SD	% Consensus	Delphi Consensus
D01- Task Analysis	06	30	360	357	11.90	12	0.31	99	Yes
D02- Flowchart	07	12	192	192	12.0	12	0.0	100	Yes
D03- Storyboards	08	19	228	228	12.0	12	0.0	100	Yes
D04- Assessment Instrument	09	8	96	95	11.9	12	.35	99	Yes
D05-Field Test of Assessment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D06- Prototype	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Task D01: Task Analysis. Instructional designers analyze tasks to demonstrate what the learner will do in order to meet the objectives (Gagne, Wager, Golas, & Keller, 2005). Once the tasks were identified, prerequisites, environmental factors (time, media, learning environment), domain (motor, affective, motivation), importance (high, medium, low), and difficulty (high, medium, low) were analyzed. For the entire task analysis for all objectives, see [Appendix C-1 Task D01 Task Analysis](#).

Delphi Survey 06 – Task Analysis

A Delphi survey was sent to a panel of SMEs (three judges selected from a pool of Aleut culture camp instructors) to evaluate the face validity of the Task Analysis for *Model Alaska Sea Kayaking 101* course. Since RLO 1, RL 2, and RLO 3 were basically

redundant (build the deck, build the hull, and build the superstructure), for efficiency, only RLO 1 was submitted to the SMEs for review. On the other hand, RLO 4 (learn the basic history and culture of the model Aleut sea kayak) was not redundant, and was dissimilar from the first three RLOs, so the SME panel was requested to review RLO 4 as part of the task analysis of Delphi 06.

The Delphi instrument consisted of 15 four-point, Likert-scaled items (1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree). The tasks were separated into four categories corresponding with the objectives: (1) deck, (2) hull, (3) superstructure, and (4) history and culture of Aleut sea kayaks. Each category had 15 statements for the SME judges to review. If all of the three judges strongly disagreed (value = 15) with all of the statements in a category, then the lowest possible rating for the two RLOs would be 90 (i.e., $1 \times 3 \times 15 \times 2 = 90$). If all three of the SME judges strongly agreed (value = 4) in all three categories of the survey for the two RLOs, then the highest possible rating would be 360 (i.e., $4 \times 3 \times 15 \times 2 = 360$). For each of the categories, the SMEs strongly agreed with all but three of the statements with those three statements receiving a rating of “agreed” from one of the SMEs, resulting in 357 out of a possible 360 total items score. The results of this Delphi 06 survey for the Task Analysis (Task D01) are summarized in Table 10.

Table 10
Results of Delphi Survey 06 for the Task Analysis (Task D01)

Item	SME 1	SME 2	SME 3	Total Score
RLO 1: Build the Deck of the 1/6th Scale Model Aleut Sea Kayak				
Project Tasks:				
1. The listed tasks appear to be aligned with the Objective.	4	4	4	12
2. The listed tasks appear to be aligned with the Objective.	4	4	4	12
3. The Knowledge identification type is aligned with each task.	4	4	4	12
4. The Prerequisite decision (Y/N) is aligned with each task.	4	4	4	12
5. The Environmental Factors identified for each task are clearly aligned.	4	4	4	12
6. The Domain Type is aligned with each task.	4	4	4	12
7. The Importance level is aligned for each task.	4	4	4	12
8. The Difficulty level is aligned for each task.	4	4	3	11
9. The listed sub-tasks appear to be aligned with the task.	4	4	4	12
10. The Knowledge identification type is aligned with each subtask.	4	4	4	12
11. The Prerequisite decision (Y/N) is aligned with each subtask.	4	4	4	12
12. The Environmental Factors identified for each subtask are clearly aligned.	4	4	4	12
13. The Domain Type is aligned with each subtask.	4	4	4	12
14. The Importance level is aligned for each subtask.	4	4	4	12
15. The Difficulty level is aligned for each subtask.	4	4	4	12
RLO 4: Learn the Basic History and Culture of the Model Aleut Sea Kayak				
1. The objective for task is clearly stated.	4	4	4	12
2. The listed tasks appear to be aligned with the Objective.	4	4	4	12
3. The Knowledge identification type is aligned with each task.	4	4	3	11
4. The Prerequisite decision (Y/N) is aligned with each task.	4	4	4	12
5. The Environmental Factors identified for each task are clearly aligned.	4	4	4	12
6. The Domain Type is aligned with each task.	4	4	4	12
7. The Importance level is aligned for each task.	4	4	4	12
8. The Difficulty level is aligned for each task.	4	4	4	12
9. The listed sub-tasks appear to be aligned with the task.	4	4	3	11
10. The Knowledge identification type is aligned with each subtask.	4	4	4	12
11. The Prerequisite decision (Y/N) is aligned with each subtask.	4	4	4	12
12. The Environmental Factors identified for each subtask are clearly aligned.	4	4	4	12
13. The Domain Type is aligned with each subtask.	4	4	4	12
14. The Importance level is aligned for each subtask.	4	4	4	12
15. The Difficulty level is aligned for each subtask.	4	4	4	12
Total	120	120	117	357.00
mean				11.9
median				12.00
SD				0.31
%				99

The results of Delphi Survey 06 (Task D01 Task Analysis) were a total item score of 357 (out of a possible high score of 360) with a mean of 11.9, a median of 12.00, a standard deviation of 0.31, and a percentage of 99 ($357/360 = 99\%$). When the percentage is equal to or greater than 80%, the Delphi survey was finalized. The percentage of this survey was 99%; thus, Delphi Survey 06 for the Task Analysis (Task D01) was finalized. *Task D02: Flowcharts with Content.* The second stage of the design process is creation of flowcharts, which visually portray the goals and objectives of the model kayak building project from beginning through completion. The researcher created flowcharts to portray these steps to assist in understanding this project from rationale to goals through objectives and sub-objectives. The complete flow charts are located in Appendix C-4 Task D02 Flowcharts.

Delphi Survey 07 – Flow Charts with Content

Three judges serving on an Instructional Design Expert (IDE) panel evaluated the flowcharts with content for face validity using Delphi Survey 07. The Delphi instrument consisted of four four-point, Likert-scaled items (1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree) in categories matching the four RLOs (deck; hull, super structure; and, culture/history). Delphi Survey 07 is located in Appendix C-5 Delphi Survey 07 Task D02.

If three SME judges strongly disagreed (value = 1) in all four categories of the survey, then the lowest possible rating would be 12 (i.e., $1 \times 4 \times 3 = 12$). If all three of the SME judges strongly agreed (value = 4) in all four categories of the survey, then the highest possible rating would be 48 (i.e., $4 \times 4 \times 3 = 48$).

All three of the judges strongly agreed with all of the categories of the flowchart with content survey. All three of the SME judges scored “strongly agree” for all four portions of Delphi Survey 06 with a mean score of 12.0, a median score of 12.0, and a standard deviation of 0.00. (See Table 11.)

Table 11
Results of Delphi Survey 07 Flow Chart with Content (Task D02)

Item	SME 1	SME 2	SME 3	Item Score
RLO 01: Build the Deck of the Model Kayak				
1. There is a series of RIO Flowcharts with content that are aligned with RLO 01 (Objective #1: Build the Deck of the 1/6 th Scale Model Aleut Sea Kayak)	4	4	4	12
2. The flowchart for RIO 1.1 is aligned with each task described in RLO 01.	4	4	4	12
3. The flowchart for RIO 1.2 is aligned with each task described in RLO 01.	4	4	4	12
4. The flowchart for RIO 1.3 is aligned with each task described in RLO 01.	4	4	4	12
RLO 02: Build the Hull of the Model Kayak				
5. There is a series of RIO Flowcharts with content that are aligned with RLO 02 (Objective #2: Build the Hull of the 1/6 th Scale Model Aleut Sea Kayak)	4	4	4	12
6. The flowchart for RIO 2.1 is aligned with each task described in RLO 02.	4	4	4	12
7. The flowchart for RIO 2.2 is aligned with each task described in RLO 02.	4	4	4	12
8. The flowchart for RIO 2.3 is aligned with each task described in RLO 02.	4	4	4	12
RLO 03: Build the Superstructure of the Model Kayak				
9. There is a series of RIO Flowcharts with content that are aligned with RLO 03 (Objective #3: Build the superstructure of the 1/6 th Scale Model Aleut Sea Kayak)	4	4	4	12
10. The flowchart for RIO 3.1 is aligned with each task described in RLO 03.	4	4	4	12
11. The flowchart for RIO 3.2 is aligned with each task described in RLO 03.	4	4	4	12
12. The flowchart for RIO 3.3 is aligned with each task described in RLO 03.	4	4	4	12
RLO 04: Identify Kayak Orientation, Terminology, Culture & History				
13. There is a series of RIO Flowcharts with content that are aligned with RLO 04 (Objective #4): Identify Kayak Orientation, Terminology, Culture & History)	4	4	4	12
14. The flowchart for RIO 4.1 is aligned with each task described in RLO 04.	4	4	4	12
15. The flowchart for RIO 4.2 is aligned with each task described in RLO 04.	4	4	4	12
16. The flowchart for RIO 4.3 is aligned with each task described in RLO 04.	4	4	4	12
Total	64	64	64	192
			mean	12.0
			median	12.0
			SD	0.00
			%	100

When the percentage was equal to or greater than 80%, the Delphi survey was finalized. The results of this survey was 100%; thus, Delphi Survey 07 Flowcharts (Task D02) was finalized.

Task D03: Storyboards. The researcher created storyboards for the sequence of building the model kayaks within Moodle, a linear learning management system (LMS) with linear sequencing depicted in 28 steps. In order to create the storyboards, researcher broke down the process of building the model kayak into four RLOs (Reusable Learning Objects): (1) Building the Deck of the Model Kayak; (2) Building the Hull of the Model Kayak; (3) Building the Superstructure of the Model Kayak; (4) and, History and Culture of the Model Kayak. These four RLOs were then broken down into smaller subunits called Reusable Information Objects (RIOs). For example, the first RLO (Build the Deck of the Model Kayak), was broken down into several RIOs including directions, terminology, dry fitting the deck, and gluing the deck.

Delphi Survey 08 – Story Boards

The four RLOs with 28 linear steps were essentially redundant with each one of the steps having the same basic format (directions in text; link to video with demonstration how to perform the step, followed by window to submit photograph of student's work). Rather than asking the IDE panel to redundantly review all 28 steps, three steps of RLO 01 (build the deck of the model kayak) were selected as a representative sample. These three steps involved building the deck of the kayak since the layout fundamentally exemplified the remaining 25 steps. The storyboards are located in Appendix C-7 Task D03 Storyboards.

The IDE is composed of college professors with years of experience in instructional design, familiar with the concepts of RLOs, and familiar with the researcher and the model kayak project. The IDE panel of three judges examined the storyboards utilizing Delphi surveys as Task D03.

The Delphi survey for the storyboards for Task D03 to measure face validity of the storyboards. The Delphi instrument consisted of four four-point, Likert-scaled items (1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree). The panel of IDEs were asked to view 19 statements and provide their level of agreement/disagreement according to the four-point Likert scale. If all three of the judges strongly disagreed with the statements, the lowest possible score on Delphi Survey 08 would be 57 (i.e., $1 \times 3 \times 19 = 57$). If, on the other hand, all three IDEs strongly agreed with all of the statements, the highest possible score on Delphi Survey 08 would be 228 (i.e., $4 \times 3 \times 19 = 228$).

In Delphi Survey 08, all three IDE judges gave the highest ratings of *Strongly Agree* to the 19 statements in their review of the storyboard. (See Table 12.)

Table 12

Delphi Survey 08 Results: Task D03 Storyboard with Content for RLO 01 (Building the Deck)

Item	SME 1	SME 2	SME 3	Item Total
Evaluation of RLO				
1. There is a series of Storyboards for RLO 01 that are aligned with Task D02 (Flowcharts) and Task D03 (Content-Flowcharts).	4	4	4	12
Quality of the Storyboards of RIO 01 (Dry-fit the Deck of the Model Kayak)				
2. The RIO 1 storyboard uses the prescribed storyboard template.	4	4	4	12
3. The RIO 1 storyboard has a graphic inserted in the correct location.	4	4	4	12
4. The RIO 1 storyboard has text content (where needed) in the correct location.	4	4	4	12
5. The RIO 1 storyboard has the necessary text formatting (i.e., font, size, style, and alignment).	4	4	4	12
6. The RIO 1 storyboard has hypertext links (where needed).	4	4	4	12
7. The RIO 1 storyboards have button links (where needed) in the correct location.	4	4	4	12
Quality of the Storyboards of RIO 02 (Glue the Deck of the Model Kayak)				
8. The RIO 2 storyboard uses the prescribed storyboard template.	4	4	4	12
9. The RIO 2 storyboard has a graphic inserted in the correct location.	4	4	4	12
10. The RIO 2 storyboard has text content (where needed) in the correct location.	4	4	4	12
11. The RIO 2 storyboard has the necessary text formatting (i.e., font, size, style, and alignment).	4	4	4	12
12. The RIO 2 storyboard has hypertext links (where needed).	4	4	4	12
13. The RIO 2 storyboards have button links (where needed) in the correct location.	4	4	4	12
Quality of the Storyboards of RIO 03 (Sand the Deck of the Model Kayak)				
14. The RIO 3 storyboard uses the prescribed storyboard template.	4	4	4	12
15. The RIO 3 storyboard has a graphic inserted in the correct location.	4	4	4	12
16. The RIO 3 storyboard has text content (where needed) in the correct location.	4	4	4	12
17. The RIO 3 storyboard has the necessary text formatting (i.e., font, size, style, and alignment).	4	4	4	12
18. The RIO 3 storyboard has hypertext links (where needed).	4	4	4	12
19. The RIO 3 storyboards have button links (where needed) in the correct location.	4	4	4	12
Total	76	76	76	228
			mean	12.0
			median	12.0
			SD	0.00
			%	100

When the percentage was equal to or greater than 80%, the Delphi survey was finalized. The results of this survey was 100%; thus, Delphi Survey 08 Storyboards (Task D03) was finalized.

Task D04: Assessment Instrument Reviewed by SME Delphi 09.

The purpose of assessment instruments is to determine if the goal and objectives of instruction have been achieved (Gagne, Wager, Golas, & Keller, 2005). Goals of this course included instructing adolescent students about the cultural and historical context related to iqyax, and objectives included students achieving a score of 70% on a researcher-developed multiple-choice test.

The cultural historical quiz was created based upon elder instruction (principally Anfesia Shapsnikoff in 1971; Bill Tcheripanoff in 1977; Phil Tutiakoff in 1978; and, Sergie Sovoroff in 1978), years of field experience instructing model kayak building in Alaska, and studying fundamental principles of instructional design.

The four objectives of this class were for the students to (1) build the deck of the model kayak; (2) build the hull of the model kayak; (3) build the superstructure of the model kayak; and, (4) to learn basic culture and history in which the Aleut sea kayak evolved.

Thus, the 20 multiple-choice questions in the Cultural Historical Quiz (CHQ) were designed to ascertain the students' level of model kayaks including basic kayak terminology (front, back, port, starboard); major parts of the model kayak (gunwales, thwarts, cockpit, hull); time-span of Aleut habitation of the region; traditional housing; geography; weather; utilization of natural resources, and population changes.

The assessment instrument consisted of 20 multiple-choice *Cultural Historical Quiz* to assess student knowledge of the culture and history of the model Aleut sea kayak post-treatment for the Control (face to face) group and experimental (online) group. The Cultural Historical Quiz with the correct answers in bold font is located in Appendix B-2.

Delphi Survey 09 – Assessment Instrument

The SME panel evaluated the face validity of the *Cultural Historical Quiz* utilizing the Delphi process. The Delphi survey for the assessment instrument for Task D09 to measure face validity consisted of six four-point Likert-scaled questions. The Delphi instrument consisted of four four-point, Likert-scaled items (1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree).

The panel of SMEs was asked to review the four objectives and then view 8 statements and provide their level of agreement/disagreement according to the four-point Likert scale. If all of the SMEs gave the lowest score for each item, then the lowest possible score was 24 ($3 \times 1 \times 8 = 24$). On the other hand, if all of the SMEs gave the highest score, then the highest possible total item score was 96 ($3 \times 4 \times 8 = 96$).

The judges gave the highest ratings of *Strongly Agree* for all but one of the items. Thus, the total item score was 95 out of possible high rating of 96. The mean was 11.9. The standard deviation was .35. The percentage was 99 ($95/96 = 99$). (See Table 13.)

Table 13.

Results of Delphi 09: Face & Content Validity for Task D05 (SME Panel) Assessment Instrument

Item	SME 1	SME 2	SME 3	Total
1. The multiple-choice assessment Cultural-Historical Pretest/Posttest Quiz appears to have item (question) stems related to the four objectives.	4	4	4	12
2. The multiple-choice assessment Cultural-Historical Pretest/Posttest Quiz appears to have logical distractors for each item related to the four objectives.	4	4	4	12
3. The multiple-choice assessment Cultural-Historical Pretest/Posttest Quiz appears to be composed of identical items with random distribution, as expected in the Posttest.	4	4	4	12
4. The multiple-choice assessment Cultural-Historical Pretest/Posttest Quiz appears to be correctly formatted.	4	4	4	12
5. The assessment Cultural-Historical Pretest/Posttest Quiz appears to contain a sufficient number of items related to Objective #1 (build the deck of the model kayak).	4	4	4	12
6. The multiple-choice assessment Cultural-Historical Pretest/Posttest Quiz appears to contain a sufficient number of items related to Objective 2 (build the hull of the model kayak).	4	4	4	12
7. The multiple-choice assessment Cultural-Historical Pretest/Posttest Quiz appears to contain a sufficient number of items related to Objective 3 (build the superstructure of the model kayak).	4	4	4	12
8. The multiple-choice assessment Cultural-Historical Pretest/Posttest Quiz appears to contain a sufficient number of items related to Objective 4 (learn the culture and history of the Aleut sea kayak).	4	4	3	11
Total SME Score	32	32	31	95
mean				11.9
median				12
SD				0.35
%				0.99

When the percentage was equal to or greater than 80%, the Delphi survey was finalized. The result of this survey was 100%; thus, Delphi Survey 09 Assessment Instrument (Task D04) was finalized.

The 20-question Cultural Historical Quiz was uploaded into an online Moodle quiz program and field-tested with participants of the approximate age as Aleut culture camp attendees. The students stated that, had they attended the full course (rather than merely previewing the online course), they did not anticipate any challenges with the multiple choice Cultural Historical quiz.

Task D06: RLO Prototype Field-Test. Task D06 involved the creation of a pilot test with a small number (one to three) of students who represent the characteristics of the targeted research group (i.e., middle- or high-school; wanting to learn how to build a model kayak; or, wanting to learn about people from Alaska Native or American Indian cultures). The prototype was field tested with two adolescent students in September 2011. The students (both around age 11) experienced no difficulty navigating in the Moodle site, quickly found and viewed the instructional videos, expressed positive comments (e.g., “I thought it was really good... really cool... well done... put together well”), and expressed no concerns about the format or layout of the online model kayak course. Due to the generally positive feedback from two adolescents approximately the same age, interest level, and skill level of potential online students, no revisions to the prototype online class were recommended.

Develop phase. In the Develop phase, the researcher created face to face and online instructional content during the Develop phase. The instructional delivery platform was Moodle, which stands for “Modular Object-Oriented Dynamic Learning Environment” (Cole & Foster, 2008, p. ix) designed by Dougiamas in Australia. The Control group received comparable materials in printed and static formats.

Implement phase.

During the Implement phase there was two delivery components: face to face and online. The face to face phase occurred during summer 2011, approximately May through August. During this phase, the researcher instructed model kayak building at Aleut culture camps in Alaska. The face to face component lasted approximately three days, beginning with the historical/cultural component and then progressing to the kayak model building component. Students had about five hours of contact per day for three days for a total of about 15 contact hours. During this phase, the researcher (with assistance from the students) gathered photographs, interviews, audio recordings, video recordings, drawings, and other material to supplement the online class. About four students were selected from the face to face camp attendees. A fourth day during culture camp was set aside for any students who lagged behind the others to finish their model kayaks. After the fourth day, the face to face class was closed. The researcher taught at four Aleut culture camps between May and August 2011. The researcher kept a journal or blog as a record of progress in the instructional design process. Photographs from both the face to face group and the online group were submitted to a SME panel on kayak building for product-matrix evaluation.

Evaluate phase.

The Evaluate phase included formative evaluation throughout the Design, Development, and Implement phase; summative evaluation occurred after both sections (face to face and online) completed their model kayaks. This data will be presented in Chapter IV.

Data Collection Procedures

Several sets of data were collected during this research: (1) the Coopersmith Self-Esteem Inventory results; (2) the pretest/posttest of content knowledge (cultural historical quiz); (3) the product rubric scoring; and, (4) the qualitative interview responses.

The Coopersmith Self-Esteem Inventory was administered and collected in a similar fashion to the cultural/historical test: in paper form in the face to face class and electronically in the online class.

In the face to face class, the cultural/historical question results were administered (and collected) in paper form. (There was no computer access in the camp setting.) In the online course, the cultural/historical test was administered (and collected) using the Moodle quiz tool.

The product rubric data was delivered to (and collected from) the SME evaluators via email. Digital photographs of the products for both the Control and experimental groups was gathered and sent with the rubric to each individual evaluator. The completed scoring rubric was returned to the researcher via email.

Qualitative interviews in the face to face class were collected electronically (audio/video recorders) as well as through notes (handwritten or typed). In the online course, data was collected electronically in the form of text, assignments, digital photographs, and/or e-mails.

Data Analysis

To answer Research Question 1, the researcher administered the Coopersmith Self-Esteem Inventory to both the Control (traditional face to face) students and the

experimental (online) students. The results were analyzed utilizing descriptive statistics to determine if there were differences in changes in self-esteem.

To address Research Question 2, the posttest of cultural/historical quiz results between the two groups were analyzed for differences utilizing descriptive statistics. This project involved two groups (experimental and Control) with participants who self-selected to attend Aleut culture camp or the online component. Due to sample size being small ($N = 11$), the data was analyzed utilizing descriptive statistics to determine differences. Thus, results may not be generalized to larger populations.

To answer Question 3, qualitative interviews were collected from face to face and online students, focusing on attitudes in terms of increases or decreases in self-esteem. Coopersmith (1967) noted that students who experience an event which increases their feeling of self-esteem generally display attitudes portraying positive experiences. Coopersmith also noted that changes in self-esteem measured by tests such as the CSI should be corroborated by interviewing the students or gathering information from people who know the students (e.g., parents, teachers, friends, etc.). In this study, interviews were analyzed and categorized as positive, neutral, or negative by the instructor with corroboration from others when available (parents, culture camp instructors, culture camp directors) or from other sources (e.g., SME product matrix results). Coopersmith also noted that, even though these other sources are subjective, one cannot rely strictly upon standardized test results, but such results should be measured against local norms as well as expert opinions including parents, teachers, and so forth. In addition, in this study, the responses from student surveys were grouped into four categories (model kayak building; culture & history of the Aleut kayak; online course delivery; and, future online course

participation) and their responses were grouped into two categories (agree or disagree) which were then calculated as descriptive statistics (percentages).

To answer Research Question 4, numerical data from the product rubrics completed by kayak-building SMEs was evaluated with descriptive statistics to illustrate any differences.

To answer Research Question 5, data collected from the Subject Matter Experts (SME) and/or Instructional Design Experts (IDE) panel members during the Analyze, Design, and Develop phase using modified Delphi survey instruments. The results were analyzed to evaluate compliance levels of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) levels.

Methods Summary

The literature review indicated that the Aleut people suffered a devastating blow to their cultural traditions from Russian invaders in the 1700s followed by Americans in the 1800s who ridiculed ancient Unangax ways. Aleut adolescents in the 1900s and early 2000s have subsequently faced self-esteem challenges which Aleut elders have sought to bolster through week-long culture camps. These culture camps, and Alaska Native cultural self-esteem, may be bolstered through online instruction.

The purpose of this study was to investigate the effect of an online multimedia-rich unit for building Traditional Unangan Sea Kayak (TUSK) models on self-esteem of adolescent students. To answer the five research questions related to this purpose, the researcher designed and developed four reusable learning objects (RLOs) with 28 reusable instruction objects (RIOs) related to building the 1/6th scale model Aleut sea kayak as well as instructing the Aleutian culture and history in which this kayak

developed. The researcher developed the online model Aleut sea kayak instructional site using the ADDIE model of instructional design.

During the Analyze phase of the model Aleut sea kayak, all 14 tasks recommended by Moulton, Strickland, Strickland, White and Zimmerly (2010) were completed utilizing the subject matter expert (SME) or instructional design expert (IDE) panels Delphi surveys. The results from these surveys indicate that the expert panels found face validity and content validity during the analyze phase of the model kayak class.

Shapsnikoff, the researcher's basket weaver instructor, exhorted people to gather regularly to learn ancient Aleut ways before they are lost forever (Shapsnikoff & Hudson, 1973). The researcher in turn anticipates that present and future Alaska Native instructors will find beneficial information within this study beneficial for the development and implementation of online Alaska Native classes.

CHAPTER IV: RESULTS

The purpose of this study was to examine nuanced differences in self-esteem of adolescent students attending a model Aleut sea kayak class as well as variances between the Control group (traditional face to face students) and the Experimental group (online students) in terms of learning the rich cultural history in which the model kayak evolved. Changes in self-esteem of adolescent students attending the model kayak class were also scrutinized, as were differences between model kayaks produced by traditional face to face students and models produced by experimental online students. An instructional design expert panel evaluated the instructional design of the online model kayak class.

Research Questions

The following research questions addressed differences in self-esteem, differences in knowledge acquisition, student interviews, produced model kayaks, and instructional design.

1. Is there a difference in self-esteem in performing specific tasks related to building the 1/6th scale Unangan sea kayak model between those students in an online section and those in a traditional (face to face) section as measured by the Coopersmith Self-Esteem Inventory?
2. Is there a difference in Unangan kayak cultural history content knowledge acquisition among those learners who received online instruction and those who

received traditional (face to face) instruction as measured by a researcher-created achievement instrument?

3. What are the results of an interview of adolescent students attending a first-time online Unangan iqyax model class related to self-esteem?
4. Is there a difference between the 1/6th scale Unangan sea kayak model produced by students in an online section and those in a hands-on section as measured by a researcher-created rubric?
5. What is the instructional design evaluation compliance level for each of the five phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model in the creation of Unangan sea kayak RLOs, as measured by a modified Delphi Technique?

The researcher employed five instruments to address the research questions: (1) the Coopersmith Self-Esteem Inventory; (2) a researcher-designed cultural/historical content knowledge acquisition test; (3) a researcher-designed interview post-treatment survey; (4) a product rubric for Subject Matter Expert (SME) evaluation of the model kayak frames built by the students; and, (5) a Delphi survey of Instructional Design Experts (IDE) to evaluate instructional design compliance.

The Data Sample

The data sample for this study consisted of 11 adolescent students attending model kayak classes. The Control (traditional face to face) group consisted of six students (four females and two males), ages 11 through 15, of one ethnic group (Aleut). The Experimental (online) group consisted of five students (one female and four males), ages 8 through 14, of two ethnic groups (White and Alaska Native – the latter group consisted of two Aleuts and one non-Aleut).

The age, gender, and ethnicity of the students (both groups) are presented in Figure 30. Students in the Control group (traditional face to face) received a group label

beginning with C followed by student identification number (for example, C1), and students in the experimental group received a group label beginning with E followed by student identification number (for example, E1). Within each group, students were arranged by age (youngest to oldest) within each group. (See Figure 30.)

Group & ID Number	Age	Gender	Ethnicity
C1 ^a	11	Female	Aleut
C2	13	Male	Aleut
C3	13	Female	Aleut
C4	14	Female	Aleut
C5	15	Male	Aleut
C6	15	Female	Aleut
E1 ^b	8	Male	Native
E2	10	Male	White
E3	10	Male	Aleut
E4	13	Male	White
E5	14	Female	Aleut

^a The group letter “C” refers to participants in the Control group.
^b The group letter “E” refers to participants in the Experimental group.

Figure 30. Participant demographic information including group (control or experimental) and identification number, age, gender, and ethnicity.

From the researcher’s experience teaching at several locations within Aleut territory, the age of culture camp attendees tends to range from elementary school to high school students. The gender tends to be an approximate equal mix of females and males. The ethnicity of Aleut culture camps tends to be strongly represented with Aleuts followed by White students, other Alaska Native (non-Aleut) students, Asian students, Hispanic, and African American students.

Thus, it appears that the age range of the Control group members is older than the Experimental group. The mean of the Control group is 13.5 years whereas the mean of the Experimental group is 11.0 years – a difference of 2.5 years. The gender of the

Control group appears skewed towards female whereas the Experimental group appears skewed towards male. The ethnicity of the face to face group was skewed towards Aleut (100%).

Data Analysis for Research Question 1

Research Question 1 addressed differences in changes in self-esteem between the Control group (face to face) and the experimental group as measured by the Coopersmith Self-esteem Inventory (CSI):

Is there a difference in self-esteem in performing specific tasks related to building the 1/6th scale Unangan sea kayak model between those students in an online section and those in a traditional (face to face) section as measured by the Coopersmith Self-Esteem Inventory?

The results of the Coopersmith Self-Esteem Inventory (CSI) indicate the self-esteem of students in both groups increased slightly with a greater increase in the experimental (online) students.

The CSI consisted of 50 statements (for example, “I’m pretty sure of myself”) to which the students were asked to place a check mark in one of two columns (“Like Me” or “Unlike Me”) how they usually feel about the statement. There were no “right” or “wrong” answers; nor were the students given a grade based on their responses.

Table 14 portrays results of the Coopersmith Self-Esteem Inventory (CSI) for both the Control group and the Experimental group with pretest results and post-test results. (See Table 14.)

Table 14
Coopersmith Self-Esteem Inventory Pretest and Posttest Results (N=11)

Group & ID Number	Age	Gender	Ethnicity	Pretest	Posttest
C1	11	Female	Aleut	90	90
C2	13	Male	Aleut	88	86
C3	13	Female	Aleut	80	82
C4	14	Female	Aleut	88	90
C5	15	Male	Aleut	84	94
C6	15	Female	Aleut	68	76
Control Group Means				83.00	86.33
E1	8	Male	Native	70	92
E2	10	Male	White	72	72
E3	10	Male	Aleut	98	94
E4	13	Male	White	98	96
E5	14	Female	Aleut	78	88
Experimental Group Means				83.20	88.40

Because of the small number (N=11), descriptive statistics were calculated in this research project. Thus, for the Coopersmith Self-esteem Inventory, the mean score between the pretest and posttest were calculated for both the Control group and the Experimental group. The Control group had a mean pretest of 83.00 and a mean posttest of 86.33. The Experimental group had a mean pretest of 83.2 and a mean posttest of 88.40. Thus, the mean of the CSI of the Control group increased 3.33 whereas the mean of the CSI of the Experimental group increased 5.2, a difference of 1.87. Figure 31 portrays a line graph of the CSI pretest/posttest for the Control (face to face) and Experimental (online) groups. (See Figure 31.)

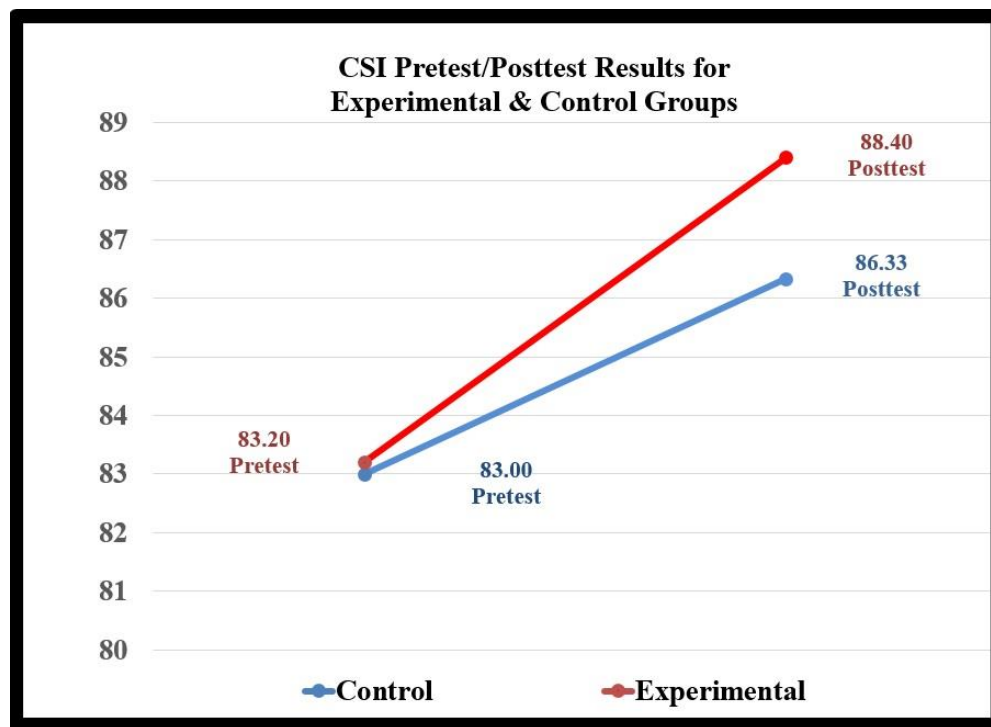


Figure 31. Pretest/posttest mean scores for the control and experimental groups displayed in a line graph with the blue color line representing to control (face to face) group and the red line representing the experimental (online) group).

Based upon the results of the means of CSI score, self-esteem of students in both groups increased; yet, with small numbers (N=11), the results cannot be generalized to larger populations.

Based solely on the numerical results of the Coopersmith Self-Esteem Inventory, it was not possible to specifically identify where differences in self-esteem occurred while performing the various tasks. Nonetheless, Coopersmith (1967) urged that local norms and other sources be integrated into the interpretation of results. Interviews indicated that online students faced challenges while assembling the complex bow piece, particularly while working on the hull of the model kayak and trying to line up the keelson and stringers with the bow blade. Product review by subject matter experts

(SME) tended to corroborate that model kayaks created by some of the online students fell below expectations in the hull section, specifically, where the keelson and stringers joined the bow blade.

Based upon the CSI results with supportive data from student interviews for Research Question 1, there were differences in self-esteem in performing tasks related to building the 1/6th scale Unangan sea kayak model with the self-esteem of the Control (face to face) group greater than the Experimental (online) group who faced challenges with the hull of the model kayak, particularly in aligning the keelson and stringers to the bow blade. Yet the results were paradoxical in that the numerical data (means of the CSI) indicated greater gains in self-esteem of the Experimental group whereas the qualitative data (interviews and SME evaluations) indicated higher gains for the Control group. These apparent paradoxical results are discussed in further data in Chapter V, and may be explained by situational uniqueness in that the Control group students were six out of dozens of students attending Aleut culture camp whereas the Experimental group students were often the only student in their home state (Idaho, Arizona, or Virginia) attending an Aleut model kayak course.

In terms of examining individual differences in the CSI for possible explanations, student E1 (an eight year old Native male) went from 70 to 92, an increase of 22 points. E1 was the youngest student, and his interview indicates that putting on the keelson was his least favorite part; yet, he also said it was the “easiest part. I hard parts on it. It was interesting.” It may be that student E1 gained self-esteem from facing (and overcoming) difficult challenges. He also indicated that his parents appeared surprised when seeing the model kayak he built:

I showed it to my parents. They thought it was cool. I showed it to my dad first. He was surprised I could make something like that. My mom thought it was cool that I could make a small kayak.

Student E1 also indicated a desire to learn more about traditional Alaska Native skills such as building full size kayaks, drums, and baskets.

Student E2, a ten year old White male, had a pre-CSI of 72 and a post-CSI of 72. His interview indicated that he faced challenges with the bow piece, but does not appear to reveal additional information about why the CSI score did not change.

Student E3 (a ten year old Aleut male) had a pre-CSI of 98 and a post-CSI of 94. A pre-CSI of 98 indicated a high self-esteem with the only room for mild change in any direction. His interview indicated challenges with parts of the kayak and that the videos took a long time to load.

Student E4 (a 13 year old White male) had a pre-CSI of 98 and a post-CSI of 96. A pre-CSI of 98 indicated a high self-esteem with little room for change. His interview indicated some challenges with gluing and the ribs, but otherwise a positive experience and no apparent explanations for the decline in the CSI score.

Student E5 (a 14 year old Aleut female) had a pre-CSI of 78 and a post-CSI of 88, an increase of 10 points. Her interview indicated some challenges with gluing on the stringers and thwarts as well as challenges with the videos taking too long to load. Her interview also indicated that she showed her model kayak to her friends and parents who responded positively: “They were surprised and happy for me. They said, ‘You did a really good job.’ My mom said, ‘It’s really cool that you got to make a kayak and participate in building one.’”

To summarize the changes in CSI scores and student hindrances, one recurring theme appeared to be student frustration with slow speeds for loading the instructional videos over the internet. Internet speeds in rural Alaska, particularly the islands (Aleutian, Shumagin, Pribilof), can be slow due to the data being sent first to a satellite and then down to the communities. These challenges might be addressed with loading the data (text, pictures, audio, or videos) onto media, such as CDs, DVDs, or USB travel drives, which can then be mailed to students as a component of the model kayak kits. This will be further discussed in Chapter 5.

Data Analysis for Research Question 2

Research Question 2 addressed differences in Unangan kayak cultural history content knowledge acquisition between the Control group (face to face) and the Experimental group (online) as measured by a researcher-created achievement instrument:

Is there a difference in Unangan kayak cultural history content knowledge acquisition among those learners who received online instruction and those who received traditional (face to face) instruction as measured by a researcher-created achievement instrument?

The researcher created a cultural historical quiz (CHQ) with 20 multiple-choice questions, which was administered to both groups following treatment (completion of the model kayak course). (See Appendix D-2 for the CHQ instrument.) Each of the 20 questions was assigned five points (lowest possible score of zero and highest possible score of 100). Table 15 portrays the student group and identification number, demographic information, individual score, and group mean of the cultural historical quiz. (See Table 15.)

Table 15.
Cultural-Historical Quiz Results with Group Mean Score (N=11)

Group & ID Number	Age	Gender	Ethnicity	Individual Score
C1	11	Female	Aleut	75%
C2	13	Male	Aleut	50%
C3	13	Female	Aleut	90%
C4	14	Female	Aleut	80%
C5	15	Male	Aleut	80%
C6	15	Female	Aleut	95%
Control Group Mean				78.3%
E1	8	Male	Native	50%
E2	10	Male	White	95%
E3	10	Male	Aleut	100%
E4	13	Male	White	50%
E5	14	Female	Aleut	80%
Experimental Group Mean				75%

The mean score of the cultural historical quiz for the Control (face to face) group was 78.3%, whereas the mean score for the Experimental (on line) group was 75%. Thus, there was a difference between the mean scores of the control group and the experimental group.

Data Analysis for Research Question 3

Research Question 3 addressed differences in attitude between the Control group (face to face) and the Experimental group (online) related to building the 1/6th scale model as measured by a researcher-designed, post-treatment interview instrument:

What are the results of an interview of adolescent students attending a first-time online Unangan iqyax model class related to self-esteem?

Coopersmith (1967) noted that written tests, such as a self-esteem inventory, should not be utilized alone and should be substantiated through additional sources, such as

direct communication, observations of local norms, and other indications of behavioral changes.

The results of the interviews indicated the self-esteem of both traditional face to face and online students increased, but the online students faced vexing challenges while working on the hull of the model kayak and the complex bow piece which hindered their self-esteem. Specifically, the online students faced challenges while working on the hull of the kayak in trying to line the keelson and stringers up with the bow blade. Two of the students undershot the keelson and stringers, leaving a gap or “jag” just aft of the bow blade.

The positive self-esteem reflections from one Control group participant (C5) was representative of the other positive outlooks of the Control group members, and a synopsis of the interview with C5 follows. On the other hand, interviews with two Experimental group members (E1 and E2) were indicative of the frustrations expressed in relation to self-esteem, and synopses of their interviews follows. The raw data for the student interviews are located in Appendix E-1.

Student C5 was a 15 year old Aleut male whose CSI pretest was 84% and whose posttest was 94% (an increase of 12%). This student’s score on the cultural-historical quiz was 80% and the model kayak received the highest possible score from review by the subject matter expert panel. The test scores of C5 indicated a strong foundation in cultural-historical knowledge of the Aleut sea kayak as well as the capability to build a model kayak that meets standards. C5’s age is at the high end of the age range of students (ages 8 to 15). C5 stated:

I felt like I put a lot of work into it, and eventually it turned out really nice. My dad was really proud of me, excited that I got something from the actual Aleutians, from the real Aleut. He was amazed, excited, glad... really happy for me. It made me feel glad because I got something done.

This student also showed the completed model kayak to friends and fellow students, and was asked to place the model kayak in a display case at the school library for public viewing. Interviews with the remaining five face to face students indicated positive self-esteem following the model kayak class.

Two online participant interviews indicated frustrations and a lower level of self-esteem. Student E1, an eight year old Native male whose CSI pretest was 70, CSI posttest was 92, and CHQ was 50%. The test scores indicated that E1 may not have had a strong background in the culture and history of the Aleut sea kayak. Yet it should be emphasized that the age of E1 was at the low range of the age range (8 to 15) with his age being the youngest (eight).

The model kayak produced by E1 did not meet hull standards due to the keelson undershooting the bow blade causing a “jag” or “undershoot.” This “jag” or “undershoot” will be discussed in additional detail later on in this document, but, to assist the reader in understanding, a photograph of this “jag” or “undershoot” is displayed in Figure 32.



Figure 32. Photograph portraying “jag” or “undershoot” of keelson to bow blade.

E1 expressed irritation with fitting the ribs into the gunwales, saying, “It was really hard at the end... especially the ribs,” and that the least favorite part was, “putting on the keelson.” A second online student (E3, a 10 year old Aleut male whose CSI pretest was 98, CSI posttest was 94, and whose CHQ was 100%) expressed frustration with the bow pieces, saying, “Well, they mostly kept falling off.” Although E3’s test scores were high, his age was towards the young end of the range (age 10 in a range of age 8 to age 15).

In general, interviews with the Control (traditional face to face) students indicated increases in self-esteem, such as showing their model kayaks to family or friends and receiving accolades. These participant interviews indicated the traditional face to face students (Control group) enjoyed high levels of self-esteem upon completing their model kayaks whereas the online students (Experimental group) experienced frustration but also exhibited satisfaction through associated self-esteem; e.g., positive feedback from significant others.

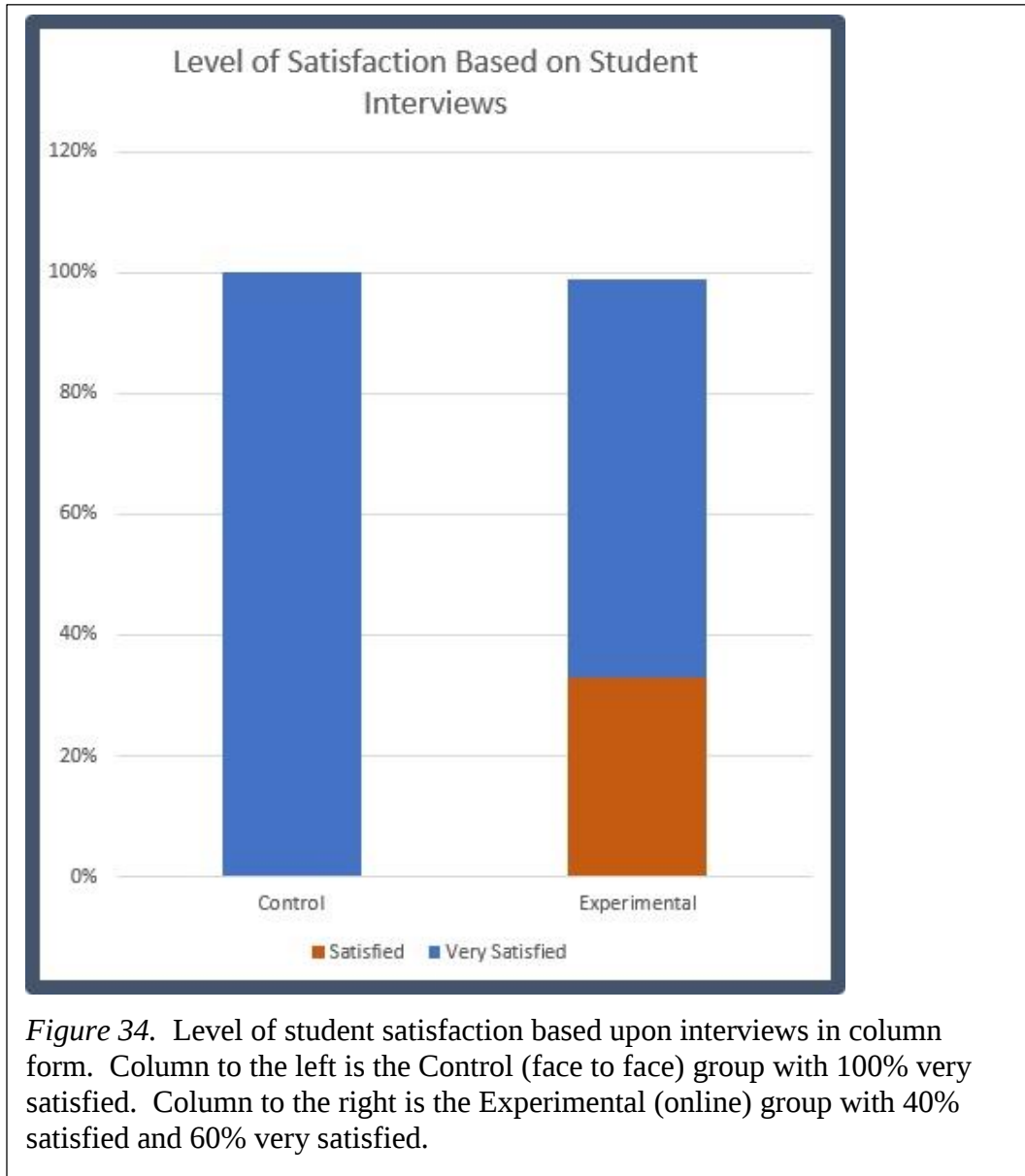
Based upon interviews and the researcher's years of experience instructing model kayaks to adolescent students, each participant was placed into one of four categories: (1) Very Dissatisfied; (2) Dissatisfied; (3) Satisfied; and, (4) Very Satisfied. This categorization into these groups was based upon statements provided by the online students during interviews, such as "The bow wedges kept falling off" (indicating lower level of satisfaction), or, "I really liked the hands on experience that it provided" (indicating higher levels of satisfaction).

Six of the traditional face to face students (Control group) fit into the "Very Satisfied" category as did three of the five Experimental online students. Two of the online students fit into the "Satisfied" category. These levels of satisfaction were placed in columns with the students' group and identification numbers and demographic information. (See Figure 33.)

Group & ID Number	Age	Gender	Ethnicity	Level of Satisfaction
C1	11	Female	Aleut	Very Satisfied
C2	13	Male	Aleut	Very Satisfied
C3	13	Female	Aleut	Very Satisfied
C4	14	Female	Aleut	Very Satisfied
C5	15	Male	Aleut	Very Satisfied
C6	15	Female	Aleut	Very Satisfied
E1	8	Male	Native	Satisfied
E2	10	Male	White	Satisfied
E3	10	Male	Aleut	Very Satisfied
E4	13	Male	White	Very Satisfied
E5	14	Female	Aleut	Very Satisfied

Figure 33. Level of student satisfaction based upon participant interviews showing that the Control group (face to face) had 100% very satisfied while the Experimental group (online) had 40% satisfied and 60% very satisfied.

Figure 34 portrays the student's levels of satisfaction in a bar chart with interviews from the Control group indicating 100% very satisfied whereas interviews with the Experimental group indicated 40% satisfied and 60% very satisfied. (See Figure 34.)



It should be noted that the results from student interviews were consistent with local norms as determined by subject matter experts (see Data Analysis for Research Question 4) in that the SME panel rated some of the model kayaks created by online

students as slightly lower in workmanship in the hull section of the kayak, particularly the keelson and stringers mating up smoothly with the bow blade.

In addition to the interviews, the online students were asked to respond to a 30-question survey to gain insights into their experiences during the online model kayak course in four areas: (1) model kayak building; (2) culture & history of the Aleut kayak; (3) online course delivery; and, (4) future online course participation. (See complete survey in Appendix B-3: Post-treatment survey.)

In response to statements regarding the model kayak building course such as model kits arriving on time with all of the parts clearly labeled, sufficient time allotted, and skills/knowledge after completing the course, the responses of the online students indicated 85% agreement and 15% disagreement as portrayed in Table 16.

Table 16.

Responses of Online Students to Statements concerning Model Kayak Building course

Model Kayak Building	Agreed	Disagreed
The model kayak arrived before the online class started.	4	1
All of the parts of the model kayak were contained in the kit.	4	1
All of the parts of the model kayak were clearly labeled.	5	0
The amount of time allotted for instruction was sufficient for me to learn how to build the model kayak.	5	0
After completing this course, I have the skills needed to build another model kayak.	4	1
After completing this course, I know the names of the parts of the Aleut kayak.	5	0
Percent Agreement/Disagreement	85%	15%

In response to statements regarding knowledge of the culture and history of the Aleut kayak, writing a paper on the history and culture of Aleut kayaks, and time allotted, the students gave 90% agreement and 10% disagreement as portrayed in Table 17.

Table 17.

Responses of Online Students to Statements concerning Aleut Kayak Culture & History

Culture and History of the Aleut Kayak	Agreed	Disagreed
After completing this course, I know the history of the Aleut kayak.	4	1
After completing this course, I know the cultural significance of the Aleut kayak.	5	0
Writing a paper on the kayak's importance to Aleut history and culture was important for my understanding.	5	0
The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut culture.	4	1
The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut history.	5	0
Percent Agreement/Disagreement	90%	10%

In response to statements regarding online delivery of the course concerning creating and using a Moodle account, positioning of items in the Moodle screen, clear directions, taking and uploading digital photographs, internet speed, or YouTube videos, the students provided responses with 85% agreement and 15% disagreement as portrayed in Table 18.

Table 18.

Responses of Online Students to Statements concerning Online Course Delivery

Online Course Delivery	Agreed	Disagreed
The instructions for creating my new account in Moodle were clear.	5	0
Logging in to the model kayak class through Moodle was easy.	5	0
The positioning of items on the Moodle screen helped me to know what to access next.	5	0
The directions for building each section of the kayak were clearly presented.	4	1
Taking digital pictures for documenting the parts of my model kayak was easy.	5	0
Uploading my model kayak digital pictures to Moodle for submission was easy.	4	1

The speed of my Internet connection did not cause a problem while using Moodle for my model kayak class.	5	0
There was no problems with the speed of my Internet connection while watching the YouTube videos.	4	1
The content of the YouTube videos helped me understand the steps for building my model kayak.	5	0
The video quality of the YouTube videos enhanced my understanding of the steps for building my model kayak.	5	0
Percent Agreement/Disagreement	85%	15%

In response to statements regarding attendance of future online instruction, the students gave 70% agreement and 30% disagreement as portrayed in Table 19.

Table 19.

Responses of Online Students to Statements concerning Future Online Instruction

Future Online Instruction	Agreed	Disagreed
After participating in this model kayak class, I would like to take another class that is delivered online.	5	0
After participating in this online class, I would like to take an advanced model kayak-building class	5	0
After participating in this online class, I would like to learn more about Aleut Native culture and history.	3	2
After participating in this online class, I would like to take another class that uses Moodle.	3	2
I would want to have YouTube instructional videos in future online classes.	3	2
Percent Agreement/Disagreement	70%	30%

It might be noted that students who disagreed to participating in future online instruction indicated challenges with Internet speeds while downloading videos, such as “They were slow loading,” or, “Took too long to load.” Speeds in rural Alaska, particularly islands that receive Internet through satellites, can be slow, expensive, and frustrating. This may be addressed in future research by providing different formats for delivery such as CDs, DVDs, or USB travel drives.

To summarize the surveys, students reported 85% agreement with the statements concerning the model kayak building course; 90% agreement with culture and history; 85% agreement with online course delivery; and, 70% agreement concerning future online instruction. The raw data for the surveys are located in [Appendix E-2](#).

To summarize Research Question 3, the results of interviews and surveys with adolescent students attending a first-ever online Unangan iqyax model course indicated that participants from both groups experienced increases in self-esteem with higher levels in the Control (traditional face to face) group than in the Experimental (online) group due to the students in the Experimental group facing challenges while assembling the complex bow piece.

Data Analysis for Research Question 4

Research Question 4 addressed differences in the model kayak produced by the traditional face to face students (Control group) and the on line students (Experimental group) as measured by a researcher-created rubric utilized by a subject matter experts (SME) in judging the resultant product:

Is there a difference between the 1/6th scale Unangan sea kayak model produced by students in an online section and those in a hands-on section as measured by a researcher-created rubric?

As outlined in Chapter 3, a product matrix (see [Appendix B-5](#)) was sent to a panel of SMEs (subject matter experts) with photographs of eight model kayaks (four from the face to face Control group and four from the online group) completed by participants. In order to reduce the volume of data for the SMEs in reviewing multiple photographs from 11 model kayaks, four model kayaks from each group (total of eight) were selected with expert input as representative samples. The researcher, in viewing the model kayaks

produced by the Control group, saw that all of them met minimum standards whereas, while viewing photographs of the model kayaks created by the online students, saw that some of them may not have met minimum standards, and therefore made certain to include a representative sample for submission to the Subject Matter Expert (SME) panel.

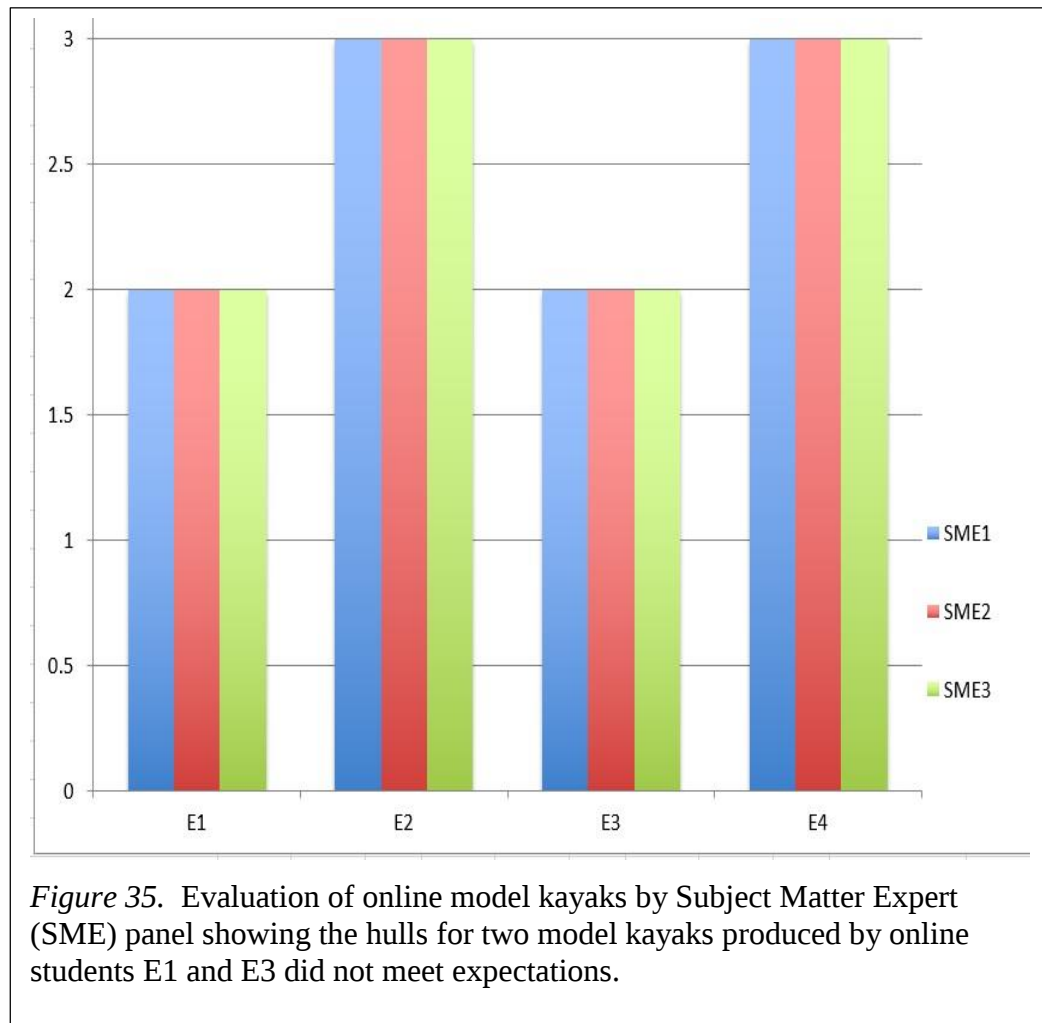
The SMEs were asked to evaluate the photographs in three areas (deck, hull, and superstructure) according to a two-point scale (0 = does not meet expectations; or, 1 = meets expectations). Thus, each kayak could receive a low evaluation score of zero ($3 \times 0 = 0$) to a high evaluation score of three ($3 \times 1 = 3$).

Each of the four model kayaks produced by students in the Control (traditional face to face) group received the highest rating (three points each) from the SME panel.

Two of the model kayaks produced by the Experimental (online) group also received the highest rating (three points) by the SME panel, but two others (produced by online students E1 and E3) were rated below expectations in the hull section of the kayak, receiving a rating of two points out of possible three points (For raw data of product matrix evaluation by SME panel, see [Appendix E-3](#).)

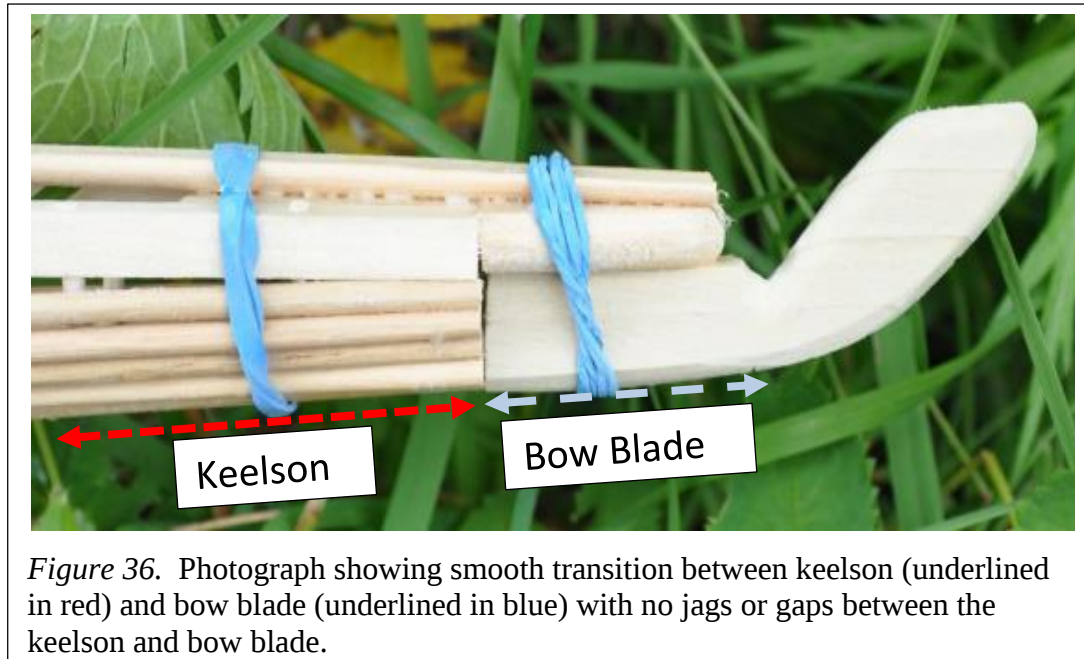
To assist the reader in visualizing the SME ratings for the four model kayaks constructed by the online (Experimental) students, a bar chart was created showing the ratings by the three SMEs. In the bar chart, E1 through E4 represent the four model kayaks produced by the online students and examined by the panel of Subject Matter Experts (SME1 through SME3). The SMEs rated each portion of the model kayaks (deck, hull, or superstructure) as *Not Meeting Expectations* (0) or *Meeting Expectations* (1) with a total possible low score of zero (0) and a total possible high score of three (3).

The model kayaks produced by online students E2 and E4 received the highest possible ratings (total of 3), whereas the model kayaks produced by online students E1 and E3 were rated as *Not Meeting Expectations* in the hull section of the kayak with a total score of two. (See Figure 35.)



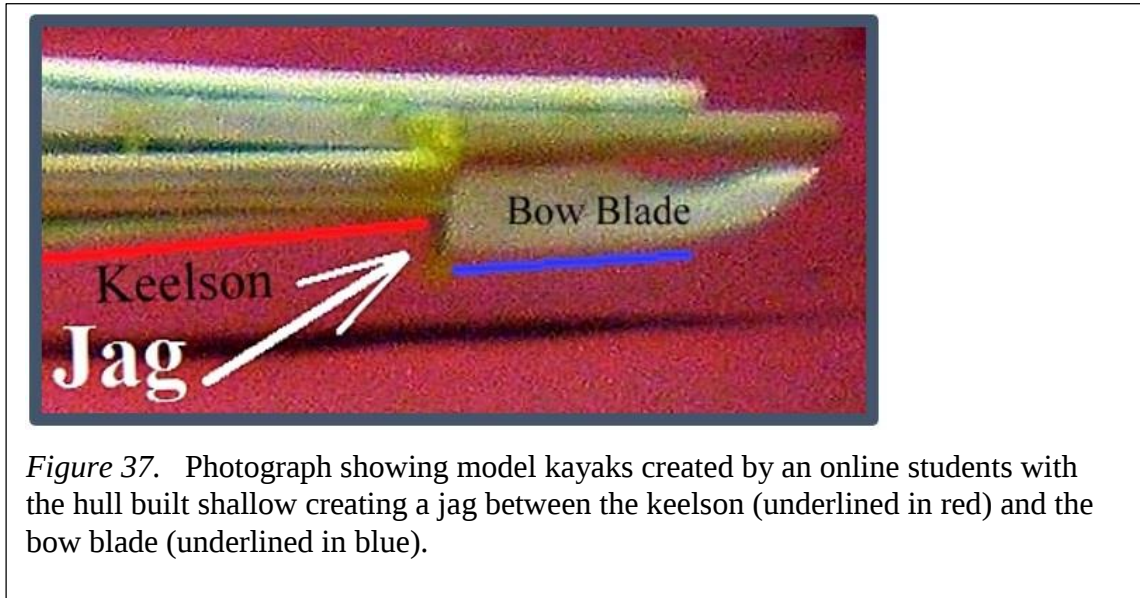
To assist the reader in gaining a deeper appreciation for the deficiencies that the SME panel saw in the two kayaks produced by the online (Experimental) students, Figure 36 depicts how the keelson and stringers should meet with the bow piece. Note the smooth transition between the keelson and the bow blade. This bow piece was produced by a student in the Control (traditional face to face) group with assistance from the

instructor while adjusting the ribs to the appropriate depth so that the stringers and keelson line up with the bow blade. (See Figure 36.)



The next photograph (Figures 37) portray the bow pieces constructed by an online students. Note the less-than-smooth transitions between the keelsons and the bow pieces. For some of the online students, the keelsons tended to undershoot the bow blades, leaving abrupt jags in the hulls of the kayaks. On full-size kayaks, these transitions need to be smooth so the waterproof skin can have support and the kayak tracks forward smooth and straight. When reviewed by the subject matter experts, these sections of the model kayaks did not meet expectations. It should also be noted that this was not the only online student who faced challenges in creating a smooth transition between the

keelson and bow blade. Other students faced similar challenges. This may reflect model design challenges and will be discussed in Chapter IV. (See Figure 37.)



It should be noted that getting the hull depth and a smooth transition for the traditional face to face students was consistently a challenge – a process that the instructor closely monitored. Students tended to try to make the hull of the kayak too deep, which resulted in a mismatch between keelson and bow blade. Two of the model kayaks produced by the Experimental (online) students in this research project fell below expectations of those produced by the traditional face to face students as measured by a researcher-created rubric and utilized by the SME panel. Model kayaks produced by students in the face to face section met expectations whereas those produced by the online section were below expectations, particularly in the hull of the kayak.

To summarize the results of Research Question 4, even though some of the model kayaks produced by the online students did not meet expectations due to challenges with having the keelson meet smoothly with the bow blade, these issues may be addressed

through redesign and field testing as discussed in the conclusion, implications, and recommendations sections of Chapter 5. The differences between the models produced by the face to face students and online students may warrant another research project in which the model kayak is redesigned for online students, field tested, implemented, and evaluated.

Data Analysis for Research Question 5

Research Question 5 addressed compliance of the on line model kayak instructional design process with the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model RLOs as measured by a modified Delphi Technique?

What is the instructional design evaluation compliance level for each of the five phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model in the creation of Unangan sea kayak RLOs, as measured by a modified Delphi Technique?

The IDE and SME panels determined the Unangan sea kayak RLOs (reusable learning objects) were in a level of high compliance with ADDIE.

During the Design Phase, Delphi 06 through Delphi 09 were reviewed by expert panels. When the percentage of consensus was over 80%, then Delphi consensus was achieved. Each of the Delphis during the Design Phase was greater than 80%. Since the prototype was field tested and the assessment instruments were reviewed by students and individual experts who expressed approval of the material without concerns, D05 (Field Test of Assessment) and D06 (Prototype) with their corresponding Delphis (10 and 11) were not presented to expert panels for formal Delphi review.

To summarize Research Question 5 results, the compliance level for the Analyze and Design phases of ADDIE in the creation of Unangan sea kayak RLOs, as measured by the modified Delphi technique, were high (100%).

To summarize the findings, in relation to the data analyzed for the five research questions, the self-esteem of both groups increased. In terms of acquisition of cultural/historical knowledge, the Control group scored higher than the Experimental group. The interviews indicated that the Control group had more satisfaction with subsequent self-esteem than the Experimental group. Review by SMEs indicated the products (model kayak) built by the Control (face to face) students met expectations, whereas two of the four model kayaks produced by the Experimental (online) group were below expectations. The instructional design expert (IDE) and SME panels indicated the model Unangan sea kayak RLOs were in compliance with the Analyze and Design phases of the ADDIE ID process.

CHAPTER V: CONCLUSION & RECOMMENDATIONS

This research project examined differences in self-esteem and acquisition of cultural history content knowledge of adolescent students attending a model kayak class. In addition, this research project studied nuanced indications of changes in self-esteem of online model kayak students through student interviews. A panel of experts from Aleut culture camps inspected the model kayaks produced by the students to determine differences between those produced by the Control group (face to face) and those produced by the Experimental group (online). A panel of instructional design experts evaluated the compliance level of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model of instructional design in developing the model kayak online class.

In this chapter, the conclusion and recommendations of the research project are presented.

Summary of Findings

This project addressed the following five research questions:

1. Is there a difference in self-esteem in performing specific tasks related to building the 1/6th scale Unangan sea kayak model between those students in an on-line section and those in a traditional (face-to-face) section as measured by the Coopersmith Self-Esteem Inventory?
2. Is there a difference in Unangan kayak cultural history content knowledge acquisition among those learners who received on-line instruction and those who

received traditional (face-to-face) instruction as measured by a researcher-created achievement instrument?

3. What are the results of an interview of adolescent students attending a first-time online Unangan iqyax model class related to self-esteem?
4. Is there a difference between the 1/6th scale Unangan sea kayak model produced by students in an on-line section and those in a hands-on section as measured by a researcher-created rubric?
5. What is the instructional design evaluation compliance level for each of the five phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model in the creation of Unangan sea kayak RLOs, as measured by a modified Delphi Technique?

To answer Research Question 1, the Coopersmith Self-esteem Inventory (CSI) was utilized to measure self-esteem before and after the model kayak class. Eleven adolescent students participated in this project with six in the Control (traditional face to face) group (n=6) and five in the Experimental (online) group (n=5). Means of the CSI pretest and posttest scores were calculated to scrutinize differences. In addition, student interviews and subject matter expert input assisted in examination of differences in self-esteem in performing specific tasks related to building the model kayak.

To address Research Question 2, the researcher created an Unangan kayak Cultural Historical Quiz (CHQ) to measure differences in content acquisition knowledge. The mean score of each group (Control and Experimental) was calculated to determine differences.

In response to Research Question 3, a qualitative analysis of interviews with participants was used to examine self-esteem related to attending a first-ever online Unangan iqyax model class. Based upon statements pertaining to the performance of specific tasks while building the model kayak, responses were placed into categories (for example, very dissatisfied, dissatisfied, satisfied, very satisfied) by the researcher based

upon years of experience instructing model kayak classes. Student self-esteem was extrapolated from their level of satisfaction. In the end, only two of the categories (satisfied and very satisfied) were needed for ranking of the student interviews.

To answer Research Question 4, the researcher developed a rubric, which a panel of subject matter experts (SMEs) used to evaluate the quality (meeting standards or not meeting standards) of model kayaks produced by students in the Control (face to face) and Experimental (online) groups.

Research Question 5 was addressed by panels of experts employing the Delphi technique. Several phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model were presented to an instructional design expert panel for review. The reviewed phases gained consensus at greater than 80%. A prototype of the online model kayak class with assessment instruments was field tested by adolescent students and reviewed by individual subject matter experts who approved of the material without concerns.

Research Question 1

This research question asked if there were differences in self-esteem of students while performing specific tasks while building the 1/6th scale model sea kayak between the Control (face to face) group and the Experimental (online) group as measured by the Coopersmith Self-esteem Inventory (CSI). The mean of the scores of the CSI pretest for the control group was 83.00 while the mean of the scores for the posttest was 86.33. On the other hand, the mean of the scores of the CSI pretest for the experimental group was 83.2 while the mean of the scores for the posttest was 88.40. Thus, there was a difference

with the control group mean changing from 83.00 to 86.33 while the experimental group mean changed from 83.20 to 88.40.

However, based solely upon the CSI, it was not possible to identify specific task performances that might have affected differences in self-esteem. Following Coopersmith's (1967) recommendations, student interviews were conducted and local norms (subject matter experts) were consulted. Student interviews (explained in detail elsewhere in this document) indicated the online students faced frustrating challenges constructing the hull, specifically the complex bow piece while trying to get the keelson and stringers to match up smoothly with the bow blade. Review by subject matter experts tended to corroborate the interviews of online students in that they rated the bow piece for two of the model kayaks created by the online students as not meeting expectations due to a "jag" (gap) between the keelson and bow blade.

Thus, there were overall differences in the self-esteem while building the 1/6th scale Unangan sea kayak model with the Experimental (online) group rising more than the Control (face to face) group, but with the self-esteem of the Experimental group hampered while performing the task of smoothly forming the keelson with the bow blade.

Even though the sample size in this research project is small (N=11) and not generalizable to larger groups, the results for Research Question 1 may be profound within the Aleut community in that the self-esteem in both groups appeared to rise while building the model kayak in both the traditional face to face group and the online group. Although Unangax elders and Aleut teachers have stated their beliefs about the value of traditional instruction in ancient ways for many years, this is perhaps the first hints of verification and confirmation from within a Western scientific perspective that learning

some basic Aleut model kayak building can assist adolescents in their capabilities and self-perceptions.

During the turbulent times of the growing pains of adolescence, having even the tiniest of anchors to grasp may assist youth in weathering through the rough storms. Having a model kayak built by one's own hands to display to others and realizing that one's ancestors might have built similar craft with stone age tools may lead to appreciation of the cultural history in which that kayak evolved. Public displaying of the model kayak, and the reception of accolades from the public about a complex model hand built with over 50 pieces may make youngsters feel better. Confidence in their capabilities in basic wood working, model construction, and learning traditional skills at Aleut culture camp or in fully online course environments should certainly increase self-esteem, as well.

Even though the Coopersmith Self-Esteem Inventory could not be used in this research project to clearly identify performance of specific tasks that might have affected student self-esteem, the CSI may be an effective measurement for detecting overall changes pre-treatment and post-treatment. Future research might focus on larger sample sizes with students of closer age ranges (for example, 12 through 14).

In addition, there are broader possible implications from the results of Research Question 1 in that there are other groups of adolescents who have experienced rough challenges throughout history for a wide variety of reasons (cultural, spiritual, historical, religious, and so forth). If the self-esteem of adolescents attending an online Aleut model kayak may be increased, the possibility exists that analyzing, designing, and developing

online courses may help pull other youth through the sometimes rough waters of the adolescent years.

Research Question 2

This question asked about differences in acquisition of cultural/historical knowledge related to the Unangan sea kayak model between face to face students and online student as measured by a researcher created quiz. Each of the 20 questions was assigned five points, providing a possible low score of zero and a possible high score of 100. The mean of the Control group was 78.3% while the mean of the Experimental group was 75.0%. Thus, the Control (face to face) group scored 3.3% higher than the Experimental (online) group.

Based upon the mean scores, it appears students in both groups were able to learn at least the basic history and culture of the model Aleut kayak at the established criterion level. After having taught model kayak building at several locations in Alaska, the researcher found that little time has been devoted toward providing basic instruction on the culture and history of the model kayak. Approximately 99% of time in Aleut culture camp is devoted to helping the students complete the frames of their model kayaks. The tight schedules permits little opportunity to present information on culture and history, whereas the online course provides the opportunity to present vital background information necessary to understand why building the model kayak has contextual meaning.

After reflection, the researcher realized that there was sufficient time during both groups to have conducted a pre-test to assess student cultural/historical content knowledge before treatment. The creation of the cultural historical quiz in this project

provided a foundation upon which future researchers may build. For example, before online students are allowed to attend a model kayak course, they might be required to attend an online course targeting the culture and history of Aleut kayaks. Then, the attendance of the model-building course might be held as an honorable privilege, as it likely was in ancient times.

Meeting the achievement criterion level for this initial course may indicate there are opportunities to establish intermediate and advanced content classes. Each of these courses should have a quiz which is administered before and after treatment so that instructors can evaluate the implementation of their courses to examine whether or not students are learning. Finally, training for teachers who would deliver the online content should be part of future research in order to maintain quality of delivery and broaden the pool of experts in Aleut kayak building and culture/history to reach as many potential students as possible.

Research Question 3

This research question looked at results of interviews with adolescent students attending a first-ever online Unangan iqyax model class related to self-esteem. Results of those interviews indicated that three of the students were very satisfied with the model kayak class, but two of the students faced vexing challenges while trying to get the keelson of the kayak to line up with the bow blade.

These results are paradoxical in that, even though the interviews with the online students indicated challenges, their CSI scores indicated a post-treatment increase in self-esteem; in fact, a higher increase than the traditional face to face students. In addition, even though the online students faced challenges, the interviews indicated they were

proud of what they had accomplished. It may be that, despite the vexing challenges with the complex bow piece, the overall process of attending a fully online class and completing the model kayak resulted in increases of online student self-esteem.

Future research should include student interviews to detect issues that present challenges to online students. The lengthy interviews might require revision (i.e., consider alternative methods for interviewing – online synchronous, online asynchronous with structured prompts, etc.), but the end results did reveal insight might not have otherwise been discovered. Tightening the age requirements for a group of students that is closer in age range may also facilitate the research. For example, in this project, differences between an 8 year old and a 15 year old student might have influenced the results in that the younger student may have less basic skills in wood working or in online skills.

Research Question 4

This research question looked at differences between the model kayaks produced by the Control (face to face) group and the Experimental (online) group. Eight of the 11 model kayaks produced were randomly selected as representative samples, and photographs of those eight models were inspected by a panel of subject matter experts (SMEs) who determined that the hulls of two of the model kayaks produced by the Experimental (online) students did not meet expectations. The keelson on these model kayaks did not line up smoothly with the bow blade, leaving a “jag” or a gap that resulted in an SME hull rating of “does not meet standards.” Thus, there was a difference in the models with the Control (face to face) group meeting standards and the Experimental (online) group not meeting expectations on the hulls of two model kayaks.

Research Question 5

This research question examined the compliance level of the online model kayaks reusable learning objects (RLOs) with the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model. A panel of instructional design experts (IDEs) examined the Analyze and Design phases of the model kayak course, as well as the storyboards, finding high levels of compliance with ADDIE. The prototype and assessment instruments were field tested by adolescents and reviewed by individual subject matter experts who approved the prototype without concerns. The basic foundation of the Delphi model ran parallel to the elder councils within Unangax villages who encouraged consultation with experts within the community about matters of cultural importance.

Recommendations for Future Research

The goal of this research included the creation of an online model Unangan sea kayak course so that the youth unable to attend Aleut culture camps might have the opportunity to learn how to build the 1/6th scale model kayak, to learn about the rich culture and history in which this kayak evolved, and to have the opportunity of buttressing their self-esteem by learning basic model construction while attending online instruction. The results of this study indicated that online students can learn the basics of Unangan sea kayak model building and that the self-esteem of students may increase while learning how to build the model kayaks despite challenges presented by online instruction.

Even though the panel of subject matter experts rated two of the hulls of the model kayak as not meeting standards, throughout the process of building the model

kayaks, these students have learned at least the basics of model kayak construction, an opportunity which they likely would have not experienced had the online class not been designed, developed, and implemented. Basic skills the students learned in this class (wood working, bending wood, three-dimensional wood construction, and attending an online class) may be later applied to a wide variety of situations (practical, occupational, artistic, academic, or cultural) to further bolster student self-esteem.

This research project set out to determine if online model kayak instruction was at least as effective as traditional face to face instruction. The results indicated that a replacement for traditional face to face Alaska Native instruction has not yet been developed – or was not utilized in this research project. For centuries the opportunity for Alaska youth to meet face to face with warriors who have gone out into the wilderness to wage war with dangerous enemies has proven to be an invaluable survival tool for generations, particularly when the youth hold a smaller model in their hands – built with their own hands – a transportation device similar to the one the warrior employed.

The opportunity for an Alaskan instructor to reach out and physically assist students in learning complex skills in settings, such as Aleut culture camps, is challenging to emulate, particularly in an asynchronous setting in which students do not have the opportunity to consult with experts as challenges arise. However, if advanced medical skills can be instructed online, the possibility of developing complex indigenous Alaska Native instruction in an online environment may exist.

Traditional Alaska Native instruction has evolved over thousands of years in an environment which emphasizes face to face contact to learn survival skills which often involves not only the lives of elder and youth but the entire community who depend upon

hunters going forth in hazardous conditions in search of sustenance. Yet, times are changing as youth in North America are moving away from traditional approaches and into a digital world where more and more is being learned over the internet. If Alaska Native elders and instructors want future generations to learn traditional ways, they must – as was demonstrated in the literature review for this project - increasingly move into the online world and design instruction that captivates youthful minds. Traditional Unangax ways must be documented and shared with others in a meaningful way, or, it will, to paraphrase Unangax leader and instructor Anfesia Shapsnikoff, all be lost, taken to the grave where it will do no one any good (Shapsnikoff & Hudson, 1973).

The ADDIE model proved to be an effective framework for an Alaska Native instructor to transform traditional face to face instruction into an online environment. Alaska Native instructors may want to transform their traditional teachings into online instruction, but may not consider themselves as experts on the topic. By relying upon panels of subject matter experts and instructional design experts for review and guidance, more Alaska Native instructors may gain confidence in their capabilities of designing, developing, and implementing online instruction.

This study contained several weaknesses. There was previously no online Unangan model sea kayak course, and, therefore, no foundation upon which to build. Much of the material (for example, instructional videos, assessment instruments, product matrix) had to be developed from scratch while also recruiting students and developing kits at a reasonable expense that could be mailed to students at no cost. Now that a foundation has been built, perhaps researchers can use this foundation for future research into the topic of online Alaska Native instruction.

Another weakness in this research project was sample size ($n=11$), which did not allow for more complex statistical analysis. Future research may focus on recruiting and retaining larger sample sizes so that results may be generalized to larger populations.

Another weakness in this research project was differences among participants. For example, even though the acceptable age range for the school version of the Coopersmith Self-Esteem Inventory is ages 8 through 15, it may be considered as an unacceptable age range to attend a research project involving complex woodworking and online skills. Allowing an 8 year old to attend the online model kayak class while there were also 15 year old students who may have had more advanced skills might have skewed the results in this research project in that the youngest student (age 8) might have had less skills (e.g., manual dexterity or experience working with wood or online technology) than older students (e.g., the 15 year old student) had. Future researchers might focus on recruiting participants with closer age ranges (for example, 13 through 15).

A potential weakness of the design of the 1/6th scale model involved the adaptation of the through-gunwale rib drilling, which was a time-saving technique that evolved from model classes in the early 2000s when bow drills were used for drilling the rib holes. The bits on the bow drills were difficult to adjust to half-gunwale (1/8") depth, so through-gunwale drilling was developed which also appeared to make it easier for the younger students to adjust the rib depth in bulk (as opposed to individually). However, in view of the challenges that the online students had in adjusting the keelson depth to the bow blade, future research might abandon the through-gunwale drilling, attach the bow plate and stern plate, attach the bow blade and stern blade, attach the keelson to the

blades, and then individual fit each rib – as is done on the full size iqyax. This may be more time consuming, but the end results may be more satisfactory as well as more authentic.

Future research might focus on more field testing to make certain whichever process is utilized (for example, through gunwale drilling as opposed to partial gunwale drilling) works well for online students. Additional field testing will identify problems that can be addressed to reduce frustration of online students. An updated written document on building the 1/6th scale model Unangan sea kayak should be designed and published, making the information available to a wider audience. An online support group should be created to provide technical assistance to those wanting to learn how to build model iqyax. This research project addressed the basic model iqyax; future research may focus on an intermediate and advanced model iqyax.

Rather than an individual project, experts in model iqyax around the world may be connected to collaborate in additional research. If this occurs, it will remain crucial to provide the cultural and historical context in which the iqyax evolved. The emphasis on traditional cultural values such as honoring elders will remain paramount. Sergie Sovoroff continues to serve as one giant in the iqyax world, a giant upon whose shoulders many 21st Century iqyax builders stand with pride.

Implications

One implication of this study was that it might be possible to boost student self-esteem through Alaska Native online instruction. As the literature review indicated, some Alaska Natives struggle with self-esteem issues, an issue that often shakes the foundational fabric of Alaska Native villages from coast to coast. The possibility of

designing and developing traditional Alaska Native instruction and implementing this instruction to fortify student self-esteem has powerful implications. Seitz's (1998) research indicated that Alaska Native culture camps may help boost student self-esteem. Alaska Native elders might be consulted for additional insights into ancient self-esteem boosting techniques.

Traditional culture camps have been well received in Aleut territory even though Aleut culture camps are expensive (Lindley, 2010) ranging around \$50K. If approximately 50 students attend a week long camp, this averages to \$1,000 per student per week. Implications are that the cost of traditional face to face instruction is expensive and the number of camps and/or attendees may be adversely affected; whereas, online delivery may be more cost efficient, an important consideration during financially challenging times.

Oil revenues heavily influence Alaska's economy, which, in turn, influences the Aleut culture camp director's capability to transport, house, and pay instructors. In 2015 with plunging oil prices, the State of Alaska is facing a multibillion dollar budget deficit. Aleut culture camp directors and instructors may be able to develop online instruction that is cost efficient, may reach audiences in more remote locations, and may provide a venue in which traditional Unangan instruction can occur year round rather than only one week a year. Plane tickets for each instructor can cost \$1000 to \$2000, and housing for a week can cost \$1000. On the other hand, parts for a model kit, such as a gunwale that can be sent through the mail, can cost as little as 98 cents. Furthermore, the cost of online instructional platforms, as well as the learning curve in designing and developing these online course modules, continues to decrease. The science of capturing and editing

photographs and video continues to become available to more and more people – no longer something reserved for the wealthy elite as in decades past.

In addition, online platforms may provide the opportunity for more in-depth cultural and historical instruction. If youth are able to attend Unangan instruction online throughout the year, this may provide the opportunity for Aleut culture camps to focus on train-the-trainer opportunities in which elder and youth can focus on developing new generations of instructors who are passionate about instructing ancient ways.

Twentieth century Aleut leaders, such as Anfesia Shapsnikoff, provided instructional design admonitions: Learn and teach ancient Aleut ways, document them so they can be shared with others; don't be afraid of standing up and voicing opinions about something that can improve the quality of life in the community; don't be afraid of using technology to instruct ancient ways; don't hoard ancient information and take it to the grave, because it won't do anyone any good there; and, meet regularly with others to learn and teach Aleut crafts (Shapsnikoff & Hudson, 1973). Anfesia's instructional design advice from the 20th century continues to speak strongly in the 21st century for those who care to listen.

Future research might focus on the development of a technique for testing the effectiveness of face to face and online instruction in terms of self-esteem or some other construct that Aleut culture camp directors and instructors can agree upon. Future research might also include the redesign of complex tasks followed by thorough field-testing to assure they work well for online students. Other topics (e.g., basket weaving, drum making, hat carving, or skin sewing) may be viable to evaluate the potential of online instruction for these traditional (cultural/historical) topics.

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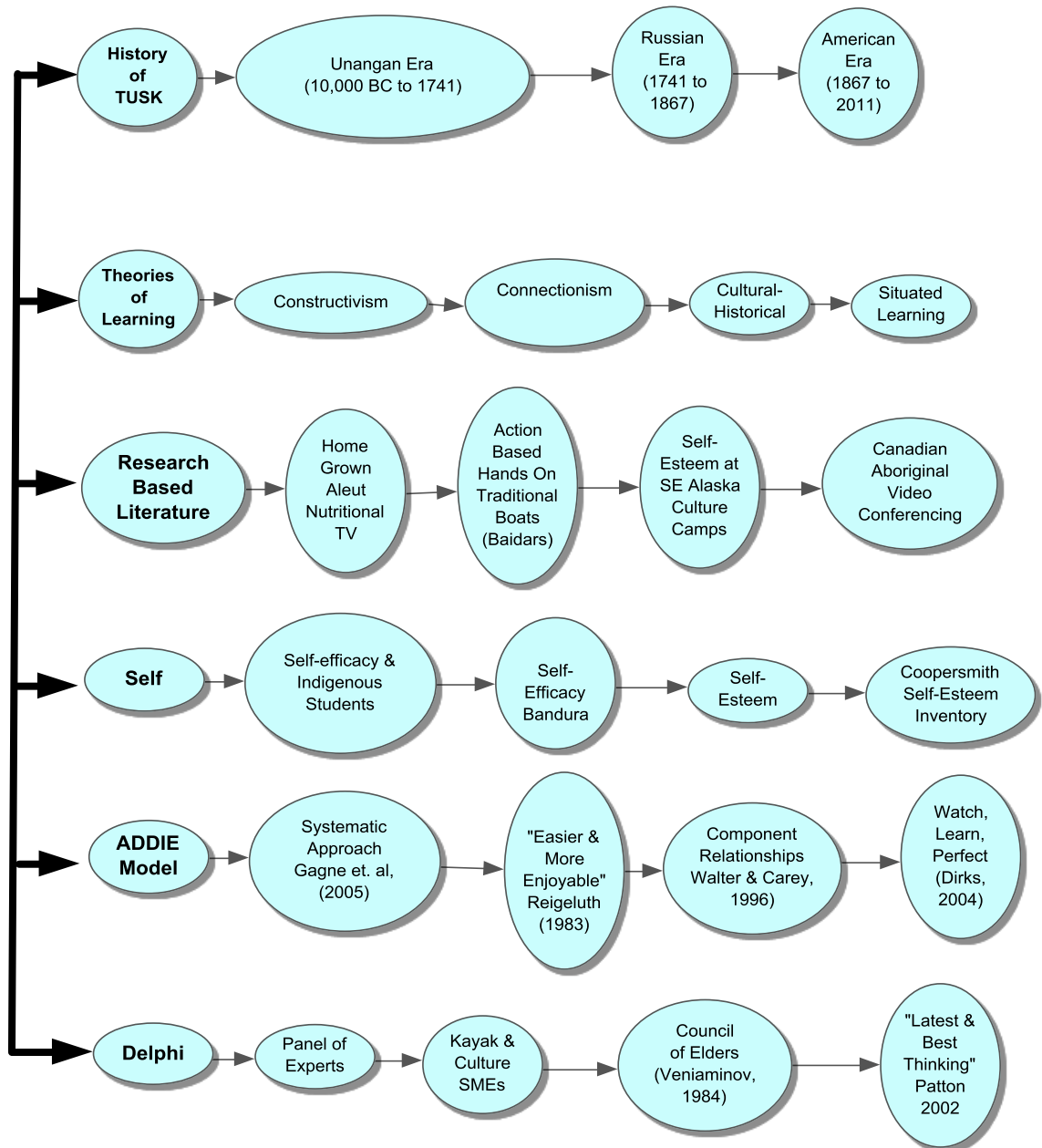
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APPENDICES

Appendix A: Literature review concept map

Literature Review Concept Map



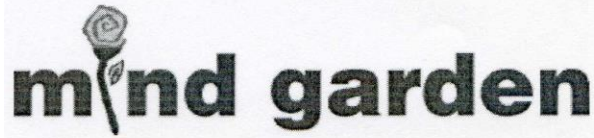
Back to "Review of Literature" in Chapter II.

Appendix B: Assessment Instruments

Appendix B-1: CSI Inventory & Five Sample Questions

Mind Garden License with Five Sample Questions

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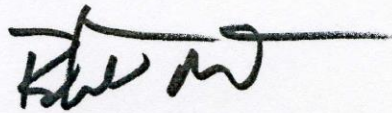
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Sincerely,



Robert Most
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Like Me	Unlike Me	
☐	☐	30.
☐	☐	31.
☐	☐	32.
☐	☐	33. I'm proud of my school work.
☐	☐	34.
☐	☐	35.
☐	☐	36.
☐	☐	37. I'm doing the best work that I can.
☐	☐	38. I can usually take care of myself.
☐	☐	39.
☐	☐	40.
☐	☐	41.
☐	☐	42. I like to be called on in class.
☐	☐	43.
☐	☐	44.
☐	☐	45.
☐	☐	46.
☐	☐	47.
☐	☐	48.
☐	☐	49.
☐	☐	50.
☐	☐	51.
☐	☐	52.
☐	☐	53.
☐	☐	54. My teachers make me feel I'm not good enough.
☐	☐	55.
☐	☐	56.
☐	☐	57.
☐	☐	58.

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Back to Self-esteem Inventory in Chapter III.

Appendix B-2: Cultural Historical Quiz

Cultural-Historical Quiz Student Name: _____

[Correct answers in bold font.]

1. What is the name for the front of the kayak?
a. Stern b. Port c. Starboard d. Bow
2. What is the name for the back of the kayak?
a. Stern b. Port c. Starboard d. Bow
3. What is the name for the left side of the kayak?
a. Stern b. Port c. Starboard d. Bow
4. What is the name for the right side of the kayak?
a. Bow b. Stern c. Port d. Starboard
5. What is the name for the top of the kayak?
a. Bow b. Stern c. Deck d. Hull
6. What is the name for the bottom of the kayak?
a. Bow b. Stern c. Deck d. Hull
7. Which of the following parts of the kayak has holes for the ribs?
a. Gunwales b. Bow Piece c. Stern Piece d. Keelson
8. Which of the following parts of the kayak holds the gunwales apart?
a. Keelson b. Thwarts c. Stringers d. Deck Beam
9. Which of the following parts of the kayak does the kayaker sit inside?
a. Bow Piece b. Stern Piece c. Cockpit d. Stern Blade
10. Archaeological evidence indicates that people have lived in the Aleutian region for at least how long?
a. 8,000 years

b. 80,000 years c. 800,000 years d. 8,000,000 years
11. Aleuts got most of their food from which of the following sources? a. The land b. The rivers c. The sea d. The sky
12. Aleuts made dwellings by digging into which of the following? a. The ground b. The snow c. The ice d. The ocean
13. What did Aleuts use to cover the wooden frames of the sea kayaks during ancient times? a. Canvas b. Hides c. Nylon d. Plastic
14. Which of the following is true about Aleuts today? a. Aleuts live in houses built of dirt heated with wood fires. b. Aleuts live in houses made from snow heated with seal oil. c. Aleuts live modern homes heated with natural gas. d. Aleuts live in tents made with hides heated with burning sticks.
15. Which of the following words is the ancient Unangan name for a sea boat? a. Canoe b. Iqyax c. Baidarka d. Kayak
16. Which of the following areas is Aleut territory? a. Northeast Alaska b. Northwest Alaska c. Southwest Alaska d. Southeast Alaska
17. In ancient times before the Russians arrived, what did Aleuts use to cover the wooden kayak frame? a. Bird hides b. Whale skin c. Sea lion hides d. Parka squirrel skins
18. The weather in the Aleutians is well known for which of the following? a. Sunshine b. Winds c. Warm temperatures d. Dryness
19. What did Aleuts use to make raincoats? a. Intestines b. Sea weed c. Beach grass d. Cotton
20. What happened to the number of Aleut people after the Russians arrived in the 18th century? a. The number of Aleuts increased. b. The number of Aleuts remained the same. c. The number of Aleuts decreased. d. No one knows if the numbers of Aleuts increased or decreased.

Return to Cultural-Historical Quiz in Chapter III.

Appendix B-3: Post-treatment Survey

Post-treatment Survey Model Kayak Student Survey

Directions

This survey will assist me in gaining insight into the online model kayak module in which you participated. I would appreciate your assistance. Your feedback will help improve the experience for future model kayak builders! You will not be identified in any reporting of this data. The survey is for the researcher's use in modifying the learning module. To navigate through this survey, please complete all items on the page. And then click on the "Next" button at the bottom of the screen.

A. Demographic Information

The following items relate to your background.

Please select the choice for each that best reflects your profile.

1. What is your first name?

2. Please select the range in which your age falls.

- ☐ 8 - 10 years of age
- ☐ 11 - 13 years of age
- ☐ 14 - 17 years of age
- ☐ 18 and over years of age

3. Please select the grade in which you are currently placed:

- ☐ 3rd grade level
- ☐ 4th grade level
- ☐ 5th grade level
- ☐ 6th grade level
- ☐ 7th grade level

- ☐ 8th grade level
- ☐ 9th or above grade level

4. Please select the category that best describes your ethnic background.

- ☐ African American
- ☐ Aleut
- ☐ Athabaskan
- ☐ Haida
- ☐ Hispanic
- ☐ Inupiat
- ☐ Native American
- ☐ Tlingit
- ☐ Unangan
- ☐ White
- ☐ Other (please specify)

B. Model Kayak Building

The following items relate to the process of building the model kayak.
Please select the answer for each that best represents your view.

5. The model kayak arrived before the online class started.

- ☐ Agree
- ☐ Disagree

6. All the parts of the model kayak were contained in the kit.

- ☐ Agree
- ☐ Disagree

7. All of the parts of the model kayak were clearly labeled.

- ☐ Agree
- ☐ Disagree

8. The amount of time allotted for instruction was sufficient for me to learn how to build the model kayak.

- ☐ Agree
- ☐ Disagree

9. After completing this course, I have the skills needed to build another model kayak.

- ☐ Agree
- ☐ Disagree

10. After completing this course, I know the names of the parts of an Aleut kayak.

- ☐ Agree
- ☐ Disagree

C. Culture & History of the Aleut Kayak

The following section relates to the culture and history of the Aleut kayak.

Please select the answer for each that best represents your view.

11. After completing this course, I know the history of the Aleut kayak.

- ☐ Agree
- ☐ Disagree

12. After completing this course, I know the cultural significance of the Aleut kayak.

- ☐ Agree
- ☐ Disagree

13. Writing a paper on the kayak's importance to Aleut history and culture was important for my understanding

- ☐ Agree
- ☐ Disagree
- ☐ I did not write a paper on the kayak's importance to Aleut history and culture.

14. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut culture.

- ☐ Agree
- ☐ Disagree

15. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut history.

- ☐ Agree
- ☐ Disagree

D. On Line Course Delivery

The following section relates to the online interface you experienced.

Please select the answer for each that best represents your view.

16. The instructions for creating my new account in Moodle were clear.

- ☐ Agree
- ☐ Disagree

17. Logging in to the model kayak class through Moodle was easy.

- ☐ Agree
- ☐ Disagree

18. The positioning of items on the Moodle screen helped me to know what to access next.

- ☐ Agree
- ☐ Disagree

19. The directions for building each section of the kayak were clearly presented.

- ☐ Agree
- ☐ Disagree

20. Taking digital pictures for documenting the parts of my model kayak was easy.

- ☐ Agree
- ☐ Disagree

21. Uploading my model kayak digital pictures to Moodle for submission was easy.

- ☐ Agree
- ☐ Disagree

22. The speed of my Internet connection did not cause a problem while using Moodle for my model kayak class.

- ☐ Agree
- ☐ Disagree

23. There were no problems with the speed of my Internet connection while watching the instructional YouTube videos.

- ☐ Agree
- ☐ Disagree

24. The content of the YouTube videos helped me understand the steps for building my model kayak.

- ☐ Agree
- ☐ Disagree

25. The video quality of the YouTube videos enhanced my understanding of the steps for building my model kayak.

- ☐ Agree
- ☐ Disagree

E. Future Online Course Participation

The following section relates to taking another Internet-based course.

Please select the answer for each that best represents your view.

26. After participating in this model kayak class, I would like to take another class that is delivered online.

- ☐ Agree
- ☐ Disagree

27. After participating in this online class, I would like to take an advanced model kayak-building class.

- ☐ Agree
- ☐ Disagree

28. After participating in this online class, I would like to learn more about Aleut Native culture and history.

- ☐ Agree
- ☐ Disagree

29. After participating in this online class, I would like to take another class that uses Moodle.

- ☐ Agree
- ☐ Disagree

30. I would want to have YouTube instructional videos in future online classes.

- ☐ Agree
- ☐ Disagree

Return to [Post-treatment Survey & Post-treatment Interview](#) in Chapter III.

Return to [Data Analysis for Research Question 3](#) in Chapter IV.

Appendix B-4: Post-treatment Interview

Online Aleut Kayak Model-Building Course Interview Instrument

Prelude

Student Identifier:

Today's Date:

Time Start:

Hello, this is Michael Livingston, your instructor in the model kayak class. How are you? I am conducting follow-up interviews as part of my research. I will need about 30 minutes of your time without interruptions. Is now a good time for you to be interviewed? I need to remind you that participation is completely voluntary with no negative consequences for refusal. Do you have any questions about the interview before we get started?

Discussion Prompt	Interviewer's Notes
Model Kayak Building	
1. Please tell me the most <i>favorite</i> thing about building your kayak.	
If you did not have a favorite thing, what did you like best about building the model kayak? <u>OR</u> What part of building the kayak was the most fun for you?	
2. Please tell me your <i>least</i> favorite thing about building your model kayak.	
If you did not have a least favorite, what did you find the most difficult in building your model kayak? <u>OR</u>	

Discussion Prompt	Interviewer's Notes
What part of building the model kayak was the most frustrating?	
3. Please tell me how the instructor could improve the model kayak course.	
Did you find any of the directions in the model kayak course confusing? If so, can you tell me which ones?	
4. Please tell me how you feel about the quality of the model kayak kit's pieces	
Can you tell me about any pieces that were especially difficult to put together?	
Were there any tools in the kit that were difficult to handle or use?	
5. Please tell me how feel about the model kayak that you built.	
After you finishing your model kayak, did you show it to others? What were their reactions to your model?	
Aleut Kayak Culture and History	
6. Please tell me what you knew about the kayak in in relation to the Aleut culture before you started this course.	
Did you learn anything about the kayak and Aleut culture from elders, family, friends, or teachers before this course?	
<u>OR</u>	
Did you learn anything about the kayak and Aleut culture from books, magazines, the Internet, or other materials?	
7. Please tell me the most interesting thing you learned about the Aleut culture and the kayak.	
What was the one fun thing you learned about the Aleut culture and the kayak?	
8. Please tell me how the instructor could improve Aleut culture content.	

Discussion Prompt	Interviewer's Notes
Did you find any of the content in the Aleut culture section confusing? If so, can you tell me which ones?	
9. Please tell me whether attending this model kayak course made you interested in learning more about the Aleut culture Aleut kayaks.	
Is there one, or two, pieces of information that sparked this interest?	
<i>Aleut Kayak Online Course</i>	
10. Please tell me what was good about taking the Aleut kayak model-building course through the Internet.	
Can you tell me what the best thing was about the online course? <u>OR</u> Can you tell me what was the most fun about taking the online course?	
11. Please tell me what you did not like about taking the Aleut kayak model course through the Internet.	
Can you tell me what the worst thing was about taking the Aleut kayak model-building course online? <u>OR</u> Can you tell me what was the least fun about taking the Aleut kayak model-building course through the Internet?	
12. Please tell me how you feel about taking a similar type of course through the Internet in the future.	
Would you take another online course for a skills-based building project? Why, or why not?	
13. Was it convenient to have access to the course anytime you wanted?	
If yes, can you give me an example of how it was convenient?	

<i>Discussion Prompt</i>	<i>Interviewer's Notes</i>
<u>OR</u> If no, can you give me an example of how it was not convenient?	
14. Please tell me how you feel about the communication with your instructor through the Internet.	
Did you find it convenient to send a question or comment to your instructor through the Internet? What did you especially like about the communication? What did you especially dislike about the communication?	
15. Please talk to me about viewing YouTube videos in the online course.	
Was it easy to view the videos? What did you like most about the videos in the course? What did you like least about the videos in the course?	
16. Please talk to me about building a model kayak without this online class.	
Would you have been able to build the model on your own? Would you have attended an Aleut culture camp to learn how to build this model? Why, or why not?	
17. Please talk to me about other online course experiences you have had.	
If this was your first online course, will you consider taking another online course because of your experience with the Aleut kayak model-building class? Why, or why not? If this is not your first online course, how does the quality of this class compare to another course you have taken	

<i>Discussion Prompt</i>	<i>Interviewer's Notes</i>
online? Can you give me an example that illustrates the difference in quality between the two courses?	
18. Tell me how you feel about having other online courses for traditional Alaska Native crafts.	
For instance, would you like to have an online course related to drum-making, or skin-sewing, or wooden hat carving, basket weaving, etc.? Are there other Alaska Native craft courses you would be interested in taking through the Internet?	
19. Tell me how you feel about taking this course online versus attending a face to face class.	
Do you feel a face to face class would have been better for you? Why, or why not? Would your model kayak have turned out differently if you had attended a face to face class? Why, or why not?	
<i>Open-Ended General Prompt</i>	
20. What other information about your experience with this online Aleut kayak model-building course would you like to provide?	

Return to Post-treatment Survey & Post-treatment Interview in Chapter III.

Appendix B-5: Product Assessment Matrix

Dear Subject Matter Expert:

Thank you kindly for your on-going support of my doctoral dissertation research of model Aleut sea kayak construction. I conducted field research in Alaska at the Alaska Native Heritage Center, Aleutian Pribilof Island's Association's *Urban Unangax*, Sand Point Culture Camp, and Camp Qungaayux in Unalaska. As part of my educational research project, I designed and developed the first-ever online model Aleut sea kayak class with students enrolled from Alaska, Virginia, Idaho, and Arizona.

Eight Random Model Kayaks

From the work done by these students, I have selected model kayaks built by students for your evaluation. I now need your expert input for evaluating the quality of the work performed.

Your Expertise in Aleut Culture Camps

Because of your experience in instructing at Aleut culture camps, you are considered a Subject Matter Expert (SME) in topics of ancient Unangax traditions. Your expertise is needed to assist in designing online Aleut instruction.

Directions

Please carefully examine the photographs of the model kayak frames attached and please complete "Product Matrix" form attached. Please read the descriptions for each of the two expectations (Does Not Meet Expectations; Meets Expectations). The minimum number of points possible for each category is zero (0). The maximum points possible for each category (deck, hull, and superstructure) is one (1). Thus, for all three categories (deck, hull, superstructure) the minimum number of possible points is zero (0) and the maximum number of points is three (3).

Number and Quality of Photographs

Here's a quick note on the number and quality of photographs. Students were given specific directions on the number and quality of photographs to take for this model kayak project. As an instructor and researcher, I often do not have much control over what the students chose to do. I have attached all of the photographs that I received.

I would appreciate receiving your completed survey via email by [date]. If you have any questions, please contact me.

Respectfully,

Michael Livingston

Idaho State University
Box 8468
Pocatello, Idaho 83209



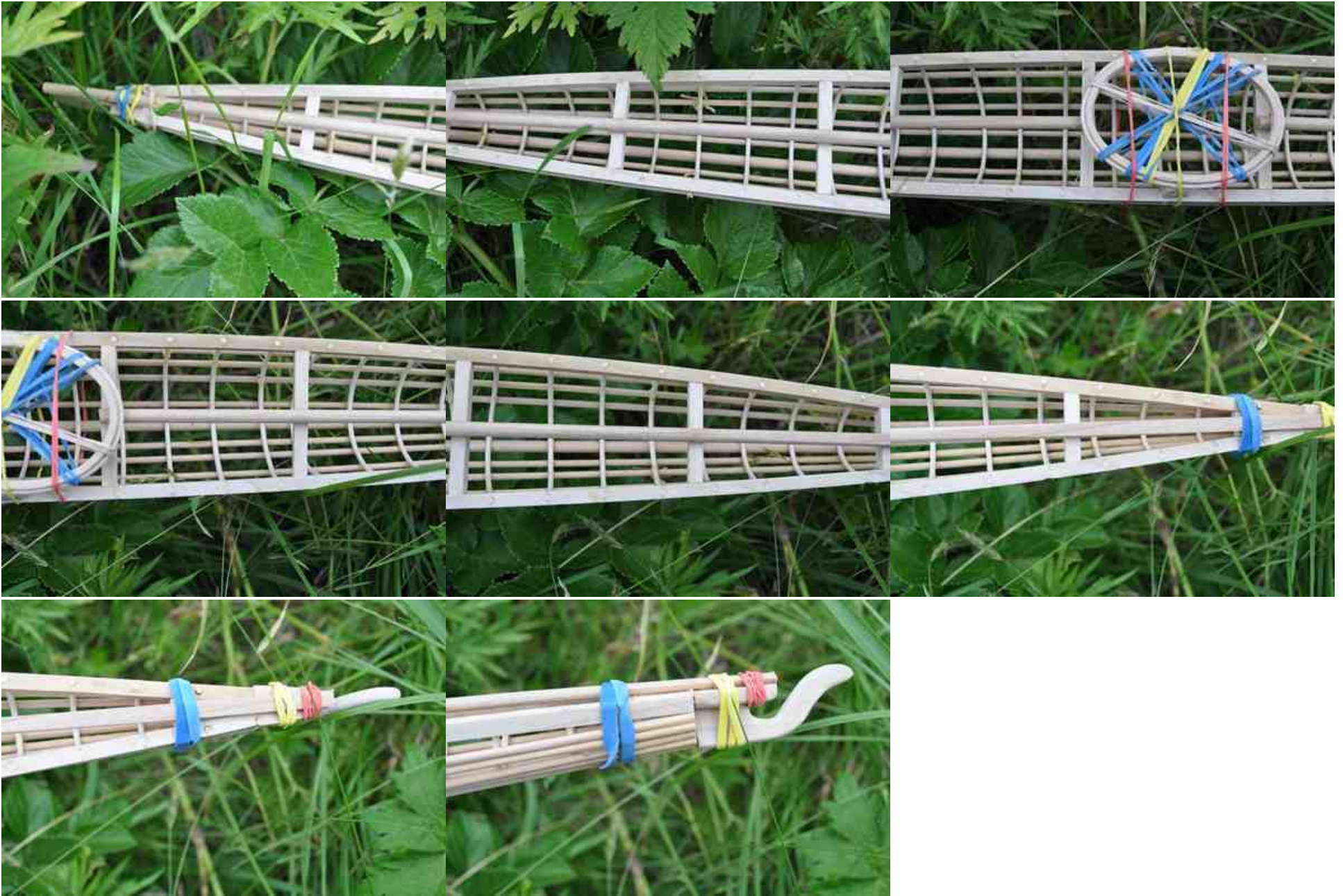
Return to Product Assessment Matrix in Chapter III.

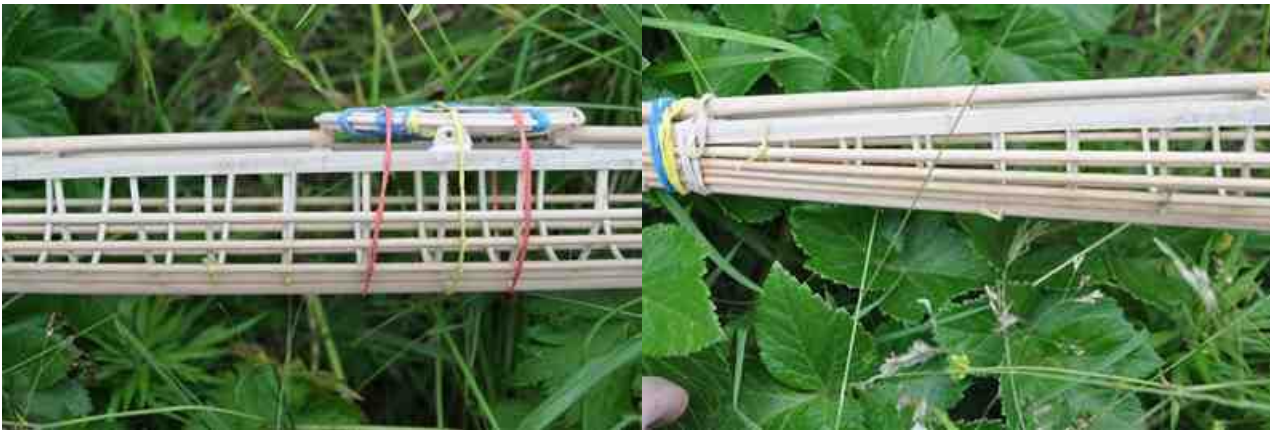
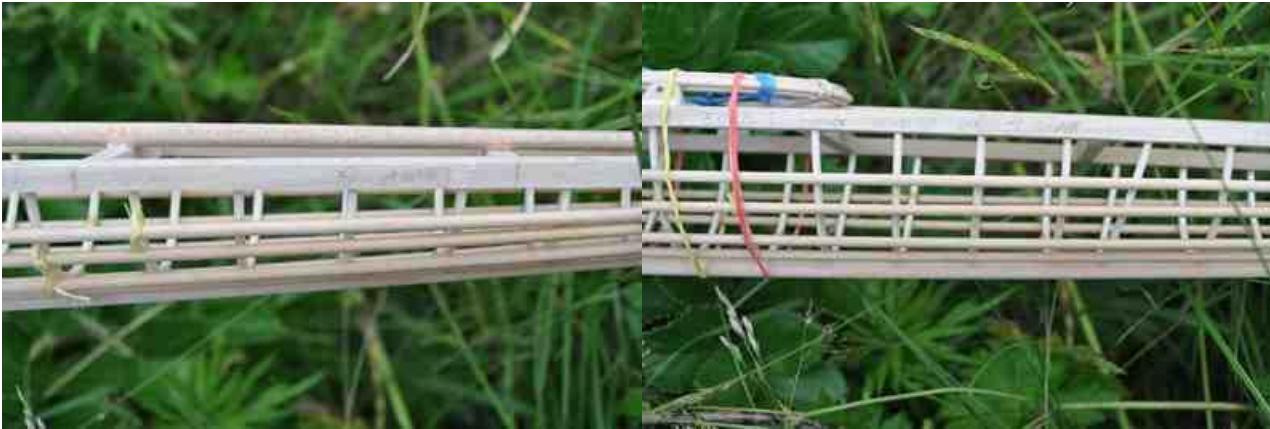
Return to Data Analysis for Research Question 4 in Chapter IV.

Sample Product Assessment Matrix Form		Traditional Unangan Sea Kayak Model Frame	
	Does Not Meet Expectations (0)	Meets Expectation (1)	PT
Deck	Any one of the conditions exist to the degree that the deck of the model kayak does not meet expectations: - The gunwales are not symmetrical. - The thwarts are not evenly spaced. - The thwarts are not perpendicular to the centerline. - The gunwales and bow pieces do not fit together smoothly. - The gunwales and stern pieces do not fit together smoothly.	All of the conditions exist to the degree that the deck of the model kayak meets expectations: - The gunwales are symmetrical. - The thwarts are evenly spaced. - The thwarts are not perpendicular to the centerline. - The gunwales and bow pieces fit together smoothly. - The gunwales and stern piece fits together smoothly.	/1
Hull	Any one of the conditions exist to the degree that the hull of the model kayak does not meet expectations: - The ribs are not evenly space. - The ribs do not form a smooth hull. - The ribs are not adjusted to the proper depth, not proportionate to a full-size Aleut kayak (either too shallow or too deep). - The stringers are not evenly spaced. - The keelson is not set approximately to the centerline of the kayak. The keelson does not form a smooth fit to the tail fin of the kayak. The keelson does not form a smooth fit to the bow blade of the kayak. - The hull of the kayak is not smooth.	All of the conditions exist to the degree that the hull of the model kayak meets expectations: - The ribs are evenly spaced. - The ribs form a smooth hull. - The ribs are adjusted to the proper depth, proportionate to a full-size Aleut kayak. - The stringers are evenly spaced. - The keelson is set at approximately the centerline of the hull of the kayak. - The keelson forms a smooth fit to the tail fin of the kayak. - The keelson forms a smooth fit to the bow blade of the kayak. - The hull of the kayak is smooth.	/1
Super-structure	Any one of the conditions exist to the degree that the superstructure of the model kayak does not meet expectations: - The deck beams are not correctly positioned down the centerline of the kayak. - The bow deck beam does not run from the bow of the kayak to the inside of the cockpit coaming. - The stern deck beam does not run from the stern of the kayak to the inside of the cockpit coaming. - The cockpit coaming is not centered approximately on the centerline of the kayak. - The stanchions (if applicable; some model kayaks do not have stanchions) are not centered in the middle of the cockpit coaming.	All of the conditions exist to the degree that the superstructure of the model kayak does not meet expectations: - The deck beams are correctly positioned down the centerline of the kayak. - The bow deck beam runs from the bow of the kayak to the inside of the cockpit coaming. - The stern deck beam runs from the stern of the kayak to the inside of the cockpit coaming. - The cockpit coaming is centered approximately on the centerline of the kayak. - The stanchions (if applicable; some model kayaks do not have stanchions) are centered in the middle of the cockpit coaming.	/1
Points Total			<u> </u> /3
Comments:			

Return to Product Assessment Matrix in Chapter III.

Photographs of Sample Kayak Produced by Control (Face to Face) Student

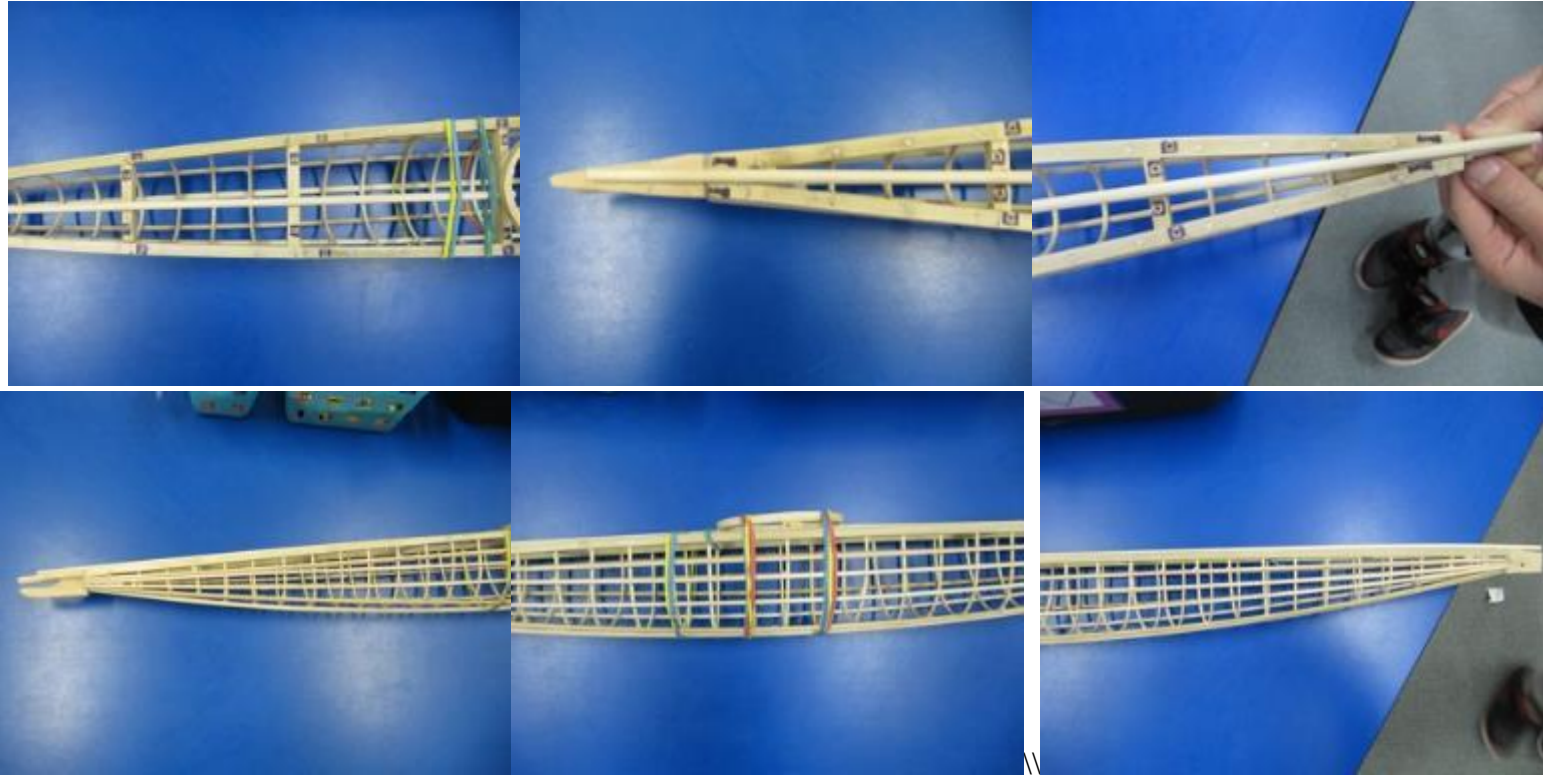




Return to [Product Assessment Matrix](#) in Chapter III.

Return to Data Analysis for [Research Question 4](#) in Chapter IV.

Photographs of Sample Kayak Produced by Experimental (Online) Student



Return to [Product Assessment Matrix](#) in Chapter III.

Return to Data Analysis for [Research Question 4](#) in Chapter IV.

Appendix B-6: IDE/ADDIE

Dear IDE Expert:

Please find attached Task D04: Storyboard with Delphi Survey 08 for the Design Phase. My interface is Moodle, a linear LMS with a sequence for building the model kayaks with 26 steps, which are essentially redundant. These 26 steps involve locating the parts of the kayak, dry-fitting them together without glue, taking and uploading digital photographs, gluing the parts together, and then sanding the parts.

The following storyboard will represent the first web page that students see (the opening page, which contains an introduction and directions). The layout is a continuous web page that presents Step 1 through Step 26. Each one of the steps has the same format (label with directions in text, link to video with directions and demonstration of how to perform the task, followed by a submission window (drop box) for digital photographs). All steps follow this basic format and are redundant throughout the entire interface design. Thus, the storyboards below portraying RLO 1 (build the deck of the model kayak) for objective RLO 1 through RLO 3 (dry-fit, glue, sand the deck of the model kayak) are representative of this learning process.

As a reminder, I am utilizing the Delphi technique for my educational research validity studies. As part of the survey process, I am asking that you review the attached materials by yourself without asking for input or advice from anyone else. This will encourage unbiased feedback and assist in the analysis of the resulting data. If you have any questions or comments, please send an e-mail to me or call me any time on my cell phone.

I have attached the following documents to this e-mail for you to review:

- Task D-04: Storyboard
- Delphi Survey 08

I would appreciate receiving your completed survey via email by [date]. This will allow me time to examine your responses and determine any revisions needed based on your review.

Respectfully,



Michael Livingston
Idaho State University

Return to [Delphi Survey for Instructional Design](#) in Chapter III.

ADDIE Design
Phase Task D04 – Storyboards
Opening Page and RLO #1 Build the Deck of the Model Kayak

Name:	Michael Livingston Revised 11/1/2011	Media:	Internet Browser; Moodle, images (.jpgs), text, videos
Project Name:	Model Alaska Sea Kayak Building 101	Concept Map/Flowchart Reference:	Opening Page
Screen Name:	Opening Page	Screen #:	Opening Page
Topic:	Building the Model Kayak	Subtopic:	Welcome!

File Name(s)	Type
Model Alaska Sea Kayak Building 101	.txt
Photograph of Kayak	.jpeg
Bow Wedge Fitted	.jpeg
Sergie Sovoroff	.html
Welcome to Model Alaska Sea Kayak Building 101!	.txt
Participants	.html

Navigation
Student logs in to Moodle with username & password, views opening page, reads directions, scrolls down to additional directions, instructional videos, assignments

HTML Code File
None for this portion of the opening page.

Text Content:

Model Aleut Sea Kayak Building 101

Michael Livingston

(With thanks to Sergie Sovoroff of Nikolski, Umnak Island, Alaska)

Welcome to Model Alaska Sea Kayak Building 101!



Text Field Name	Contents File Name	Font	Style	Color	Size
Model Alaska Sea Kayak Building 101	Label	Trebuchet	Heading 1	#0000FF	6
Michael Livingston	Label	Trebuchet	Heading 5	#0000FF	2

Button Name	Button Type	Places to Go
Sergie Sovoroff	Embedded Video	http://en.wikipedia.org/wiki/Sergie_Sovoroff
Vertical Scroll Bar	Scroll Down	Additional directions, instructional videos, assignments

Name:	Michael Livingston Revised 11/1/2011	Media:	Internet Browser; Moodle, images (.jpgs), text, videos
--------------	---	---------------	---

Project Name:	Model Alaska Sea Kayak Building 101	Concept Map/Flowchart Reference:	RLO #1: Build the Deck
Screen Name:	Step #1 Dry Fit the Deck	Screen #:	RIO #1
Topic:	Building the Model Kayak	Subtopic:	Dry Fit the Deck

File Name(s)	Type
Step 1: Dry Fit Deck	text
<i>Dry Fit the Deck</i>	.wmv
Bow Wedge Fitted	.jpeg
Thwarts Fitted	.jpeg
Stern Wedge Fitted	.jpeg
Text (directions)	.wmv
Text (submission)	.html

Navigation
Student logs in to Moodle with username & password, reads directions, clicks on link to video, play/pause, submit

HTML Code File
<iframe width="200" height="150" src="http://www.youtube.com/embed/_PenMu-N8bE" frameborder="0" allowfullscreen></iframe>

Text Field Name	Contents File Name	Font	Style	Color	Size
Step 2	Label	Trebuchet	Heading 4	#0000FF	12
Directions	Label	Trebuchet	Normal	#000000	10

Button Name	Button Type	Places to Go
Glue Deck	Embedded Video	http://youtu.be/_PenMu-N8bE
Submit Photographs	Moodle html	Submission window to submit photos

Name:	Michael Livingston Revised 11/1/2011	Media:	Internet Browser; Moodle, images (.jpegs), text, videos
Project Name:	Model Alaska Sea Kayak Building 101	Concept Map/Flowchart Reference:	RLO #1: Build the Deck
Screen Name:	Step #2 Glue the Deck	Screen #:	RIO #2
Topic:	Building the Model Kayak	Subtopic:	Glue the Deck

File Name(s)	Type
Step 2: Glue Deck	text
Glue Deck	.wmv
Bow Wedge Glued	.jpeg
Thwarts Glued	.jpeg
Stern Wedge Glued	.jpeg
Text (directions)	.wmv
Text (submission)	.html

Navigation

Student logs in to Moodle with username & password, reads directions, clicks on link to video, play/pause, submit

HTML Code File

```
<iframe width="200" height="150"
src="http://www.youtube.com/emb
ed/sYhSA2FVRPU"
frameborder="0"
allowfullscreen></iframe>
```

Text Content:

Step 2: Glue The Deck (Gunwales, Bow & Stern Wedge, "A" Thwarts)
 Watch the video below.
 Follow the Directions in the video.
 Take pictures of the deck glued and upload to Moodle in the submission window below.
 Submission window for Photographs of Deck Glued Together



Text Field Name	Contents File Name	Font	Style	Color	Size
Step 2	Label	Trebuchet	Heading 4	#0000FF	12
Directions	Label	Trebuchet	Normal	#000000	10

Button Name	Button Type	Places to Go
Glue Together Deck	Embedded Video	http://youtu.be/sYhSA2FVRPU
Submit Photographs	Moodle html	Submission window to submit photos

Name:	Michael Livingston Revised 11/1/2011	Media:	Internet Browser; Moodle, images (.jpgs), text, videos
Project Name:	Model Alaska Sea Kayak Building 101	Concept Map/Flowchart Reference:	RLO #1: Build the Deck
Screen Name:	Step #3 Sand Ends Square	Screen #:	RIO #3
Topic:	Building the Model Kayak	Subtopic:	Sand the Deck

File Name(s)	Type
Step 3: Sand Ends	text
<i>Sand Gunwales Square</i>	.wmv
Bow Sanded Square	.jpeg
Stern Sanded Square	.jpeg
Text (directions)	.wmv
Text (submission)	.html

Navigation
Student logs in to Moodle with username & password, reads directions, clicks on link to video, play/pause, submit

HTML Code File
<iframe width="200" height="150" src="http://www.youtube.com/embed/A8_jOoEFdd8" frameborder="0" allowfullscreen></iframe>

Text Field Name	Contents File Name	Font	Style	Color	Size
Step 3	Label	Trebuchet	Heading 4	#0000FF	12
Directions	Label	Trebuchet	Normal	#000000	10

Button Name	Button Type	Places to Go
Sand Gunwales Square	Embedded Video	http://youtu.be/A8_jOoEFdd8
Submit Photographs	Moodle html	Submission window to submit photos

Return to Delphi Survey for Instructional Design

Task D04: Storyboard Delphi Survey 08
RLO 1: Build the Deck of the Model Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than **[date]**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
Evaluation of RLO				
1. There is a series of Storyboards for RLO 01 that are aligned with Task D02 (Flowcharts) and Task D03 (Content-Flowcharts).				
Quality of the Storyboards of RIO 01 (Dry-fit the Deck of the Model Kayak)				
2. The RIO 1 storyboard uses the prescribed storyboard template.				
3. The RIO 1 storyboard has a graphic inserted in the correct location.				
4. The RIO 1 storyboard has text content (where needed) in the correct location.				
5. The RIO 1 storyboard has the necessary text formatting (i.e., font, size, style, and alignment).				
6. The RIO 1 storyboard has hypertext links (where needed).				
7. The RIO 1 storyboards have button links (where needed) in the correct location.				
Quality of the Storyboards of RIO 02 (Glue the Deck of the Model Kayak)				
8. The RIO 2 storyboard uses the prescribed storyboard template.				
9. The RIO 2 storyboard has a graphic inserted in the correct location.				
10. The RIO 2 storyboard has text content (where needed) in the correct location.				
11. The RIO 2 storyboard has the necessary text formatting (i.e., font, size, style, and alignment).				
12. The RIO 2 storyboard has hypertext links (where needed).				
13. The RIO 2 storyboards have button links (where needed) in the correct location.				
Quality of the Storyboards of RIO 03 (Sand the Deck of the Model Kayak)				
14. The RIO 3 storyboard uses the prescribed storyboard template.				
15. The RIO 3 storyboard has a graphic inserted in the correct location.				
16. The RIO 3 storyboard has text content (where needed) in the correct location.				
17. The RIO 3 storyboard has the necessary text formatting (i.e., font, size, style, and alignment).				
18. The RIO 3 storyboard has hypertext links (where needed).				
19. The RIO 3 storyboards have button links (where needed) in the correct location.				

[Return to Delphi Survey for Instructional Design](#)

Appendix C: Analyze Phase

Appendix C-1: Learner Influence Document

Task A05: Learner Influence Document (LID)

This learning influence document (LID) was created in alignment with the rationale, goals, and objectives of this model kayak course. Attempts were made to deliver approximately equivalent instructional material (in terms of content, quality, and quantity) to both the traditional face to face class and the online class. However, because the delivery format is altered, there were some differences. These differences are noted with verbiage in the 3rd column (Strategies Online). Where there is no difference, the cells have been merged for readability.

Item/Event	Strategies (Face to Face)	Strategies (Online)
1. What events will the instructional designer utilize to gain the learner's attention?	Several events will be utilized by the instructional designer to gain the learner's attention of why learning traditional sea kayak construction is relevant today. In Alaska, it is a fairly common event for people to end up in survival situations. Knowing how to build traditional boats can be an invaluable survival skill if one is marooned on an island (for example, as portrayed by Tom Hanks in "Castaway"). Learning traditional woodworking skills is a sign of respect to elders; respecting elders is an Aleut cultural value.	
2. What techniques will the instructional designer use to inform the learner of the objectives?	Students will be informed of the four objectives in this course: (1) build the deck of the model kayak; (2) build the hull of the model kayak; (3) build the superstructure of the model kayak; (4) gain a basic understanding of the culture and history of the model kayak within ancient Aleut communities.	
3. What events will the instructional	Students likely already know something about the	Students may know some of the basics of online learning such as how to capture and upload

designer provide to stimulate recall of prerequisite knowledge?	history of Alaska and how Natives lived in Alaska for thousands of years. This foundation will be used to assimilate more information, particularly focusing on Aleut sea kayak history. Students in Aleut culture camps may already have a background in Aleut culture and history that will assist in their understanding of additional topics that relate to model Aleut sea kayaks. In terms of building the model kayak frame, students have likely glued together paper items in class before. Students may have also watched their parents work with wood (sanding, sawing, or drilling); this will assist in their gaining experience in woodworking to build the model kayak.	photographs. Students may also know some basic boat terminology. Students may know a little about Alaska history. Modules will be built into the online course to provide basic kayak terminology, boat directionality, how to capture and upload digital photographs, how to assemble the parts of the boat, and basic information on Aleut culture and history. Additional resources include online sites, links to video or other media-rich sources to stimulate recall of prerequisite knowledge. Instruction will be provided to show students how to sandpaper wood, how to clamp and glue wood, how to capture and upload digital photographs.
4. How will the instructional designer present the stimulus material?	The instructor will present to the students the cultural/historical information relevant to model Aleut sea kayaks. Most of these materials will be presented in traditional Aleut format,	During the cultural/historical segment of the class, students will be presented the material in several multimedia formats (text, digital photographs, or digital video). During the woodworking segment, students will be presented with video that

	which places a strong emphasis on verbal presentation. However, portions of the material will be in written form, such as the pre-/post-test. Little emphasis will be placed on modern technology (computers, projectors, graphic presentations, videos), because not all culture camps have access to services, even electricity. The instructor will demonstrate to the students how to use the tools and how to make the model kayak.	provides examples of how to work with the wood and how to make the 1/6th scale model kayak. For students with learning challenges, video may be supported with text, digital still photographs, or digital audio recordings.
5. What techniques will the instructional designer use to provide learning guidance?	In the traditional face to face class, the instructional designer will provide learning guidance by watching how the students are doing as they build the model kayaks, giving them verbal guidance, and demonstrating appropriate woodworking techniques.	The instructor will review the submitted digital photographs and provide the online students with guidance in the form of written feedback, comments, and (if necessary) additional instruction in the form of text, pictures, or videos.
6. What techniques will the instructional designer employ to elicit performance?	In the traditional face to face class, students will be given verbal encouragement to elicit performance. Students will also be competing with other peers in	In the online course, students will be directed to perform basic tasks such as dry-fitting together wooden parts without glue, capture and submit a photograph, and then upload the photograph so that the instructor may review their work. The instructor will review the work to

	relation to quality of product and timeframe.	make certain that the parts are correctly assembled. Performance will also be elicited through e-mails to encourage the students to work on their model kayaks.
7. How will the instructional designer provide feedback?	Feedback in the face to face class will be given verbally during instruction and in written form on the posttest. While building the model kayaks, feedback will be given in verbal form.	Feedback in the posttest will be given in the LMS through written mode (Moodle). Feedback on the model will be through Moodle in both written and multimedia (visual and auditory) modes.
8. How will the instructional designer assess performance or product?	A product rubric will be used for the model kayak that a panel of Subject Matter Experts (SMEs) will use to evaluate the product in terms of quality of woodworking.	
9. How will the instructional designer enhance retention and transfer?	Throughout both the traditional class and the online class, students will be asked to give the name of the part of the kayak frame on which they are working. Where possible, the names will be given in the three languages related to Aleut history (Unangan, Russian, and American). For example, <i>iqyax</i> , baidarka, and kayak. Students will be asked to relate the model kayak to the culture in which it developed. Once students have demonstrated solid understanding of the basic concepts, they will be advanced to more complex levels. Students will be requested to write a paper on the culture and history of the Aleut sea kayak. Students will be administered a post-test on basic sea kayak terminology, basic kayak directionality, and basic Aleut culture and history.	
A. What learner capabilities will the instructional	Students will demonstrate verbal outcomes by stating the names of basic sea kayak terminology for the parts of the kayak frame (gunwales, thwarts, and so forth). Students will demonstrate verbal outcomes by stating basic kayak directions (bow, stern, port, starboard, deck, hull). Student will also demonstrate	

designer develop as an outcome?	the learned capabilities of knowing how to build the deck, hull, and superstructure of the model kayak by having built a 1/6 th scale model. Finally, student will demonstrate learner capabilities by passing a multiple-choice quiz on basic Aleut sea kayak history and culture with at least a 70% score. Attitude learned capabilities anticipated are a greater appreciation of ancient kayak builders who utilized stone, bone, and ivory tools for making kayak frames. Motor skills will include basic wood working techniques including sanding, gluing, clamping.
B. How will the instructional designer assess learner satisfaction with the instruction?	Students will be interviewed following the course to gain insights into the module's design, implementation, and assessment procedures. Questions will be designed to elicit information from students about what worked for them, what did not, how the course could be improved upon.
C. How will the instructional designer accommodate any learner disability (psychomotor, cognitive, emotional)?	Instructional material will be provided in text for anyone who has auditory challenges, with graphics for those who are visual learners, and in audio format. Model kayak building techniques will be demonstrated; verbal directions will be presented; and, if necessary for visually impaired students, directions will be in written form. For students with auditory challenges, directions will be audio-recorded for playback instructional videos posted on a free Internet video sharing site.

Back to [Task A-5 Learner Influence Document](#) in Chapter III.

Appendix C-2: Learning Outcome Statement

Task A06

Expected Learning Outcome Statement

Task A06

The expected Learning Outcome Statement (LOS) originates from the project Objectives (Task B03) and entails expected changes (short- and long-term) as a result of instruction.

Objective	Expected to change short-term or long-term.
1. Given tools, supplies, and instructions, the student will build the deck of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.	The expected short term change is that student be able to log in to an online instructional web site, watch instructional videos online, locate various parts (gunwales, thwarts, bow/stern piece), dry fit them together, capture and upload digital photographs, wait for feedback from the instructor, and then glue the deck together, resulting in a short-term increase in self-esteem. Long term expected change is increase in student's capability to design and develop three-dimensional objects, increase in student's capability to succeed in attending online instruction, increase in student's interest in attending online instruction in a wide range of cultural topics, and long-term increase in student's self-esteem.
2. Given tools, supplies, and instructions, the student will build the hull of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the	Short term expectations are completion of the hull of the model kayak. Long term expectations are stronger skills in three-dimensional conceptualization of objects, an increased appreciation of cultural art, and an increased appreciation of the ancient people who designed, built,

standards at a beginner's level according to a researcher-designed rubric.	and paddled Aleut sea kayaks in an exciting and challenging natural environment
3. Given tools, supplies, and instructions, the student will build the super structure of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.	Short term expectations include the completion of the superstructure of the kayak and therefore the completion of the 1/6 th scale model kayak. Short term expectations also include an increase in the self-esteem of the student in terms of being able to complete a three-dimensional object having almost 100 separate parts. Long term expectations are an increase in the student's self-esteem in being able to attend online instruction.
4. Given instructional material on basic kayak orientation, terminology, culture and history, student will achieve a score of 70% on a researcher-developed multiple-choice test.	Short term expectations include student's capability to perform well on a multiple-choice test involving the culture and history of Aleut sea kayaks, basic kayak terminology, and basic kayak directionality. Long term expectations include a deeper interest in learning more about traditional skills, learning more about people of different cultures around the world, and a deeper appreciation of the rich and diverse history of humankind. A final long-term expectation is a broadening of the pool of students who may gain long term interest in the instruction of traditional (and modern) skills in an online environment.

Back to [Task A06: Learning Outcome Statement](#) in Chapter III.

Appendix C-3: Learning Hierarchy

ADDIE Analyze Phase
Appendix B - 7: Learning Hierarchy
TUSK

The learning hierarchy is basically a road map which portrays essential knowledge components, their relationship to goals, and what steps must be taken to achieve the desired outcomes.

Objective	Components of Knowledge	Relationship Amongst Components
1. Given tools, supplies, and instructions, the student will build the deck of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.	Components of knowledge identifying the various parts of the deck (gunwales, thwarts, bow/stern piece), determining how those various parts fit together, learning how to manipulate the objects in a three-dimensional arena, experimenting with temporary clamping, and gluing together the deck into a more permanent structure.	The student begins to understand the relationship between the various parts of the deck of the kayak and the resulting complete model. For example, the thwarts set the width of the kayak, and the gunwales determine the length of the kayak.
2. Given tools, supplies, and instructions, the student will build the hull of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level	Components of knowledge for the hull of the kayak include the utilization of subtraction of three-dimensional spaces (in this instance, the holes drilled in the gunwales for the ribs), the bending of the ribs to form the	The relationship among the components of the hull of the model kayak provide rich opportunities for students to learn about the flexibility of the ribs as they form the rounded hull, the lay of the stringers and keelson as they form the tubular shape of the long Aleut sea kayak, well-known for its speed among

according to a researcher-designed rubric.	curved hull, the running of the stringers to form the hull.	traditional Arctic and sub-Arctic skin-on-skeleton kayaks.
3. Given tools, supplies, and instructions, the student will build the super structure of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.	The components of knowledge for the superstructure of the model Aleut sea kayak include the attaching of the deck beams and stanchions to the thwarts and gunwales on the deck of the kayak as well as the attaching of the cockpit coaming to the stanchions and deck beams.	The relationship among the components of the superstructure of the kayak include the role of the deck beams in forming a ridge to keep water from entering the hull of the kayak, the stanchions to hold the cockpit coaming up off of the gunwales, and the coaming to form a lip onto which the kayaker can attach a waterproof spray skirt, effectively connecting the kayaker to the kayak.
4. Given instructional material on basic kayak orientation, terminology, culture and history, student will achieve a score of 70% on a researcher-developed multiple-choice test.	The components of knowledge include identifying the various parts of the frame of the traditional Aleut sea kayak, location the various kayak directionalities (bow, stern, port, starboard, deck, hull), knowing the basics of the culture and history of the Aleut sea kayak in terms of the role that this sea vessel played in hunting, fishing, traveling, courting, exploring, and warring.	The relationships among the components include a basic understanding of how the role of the sea kayak has changed over time such as the languages for the names (Unangan, Russian, and American) as well as the shifting role of the kayak from one of utmost independence to slavery to independence, completing the circle, a strong symbol within indigenous cultures.

Return to [Task A07: Learning hierarchy](#) in Chapter III.

Appendix C-4: Learner Characteristics Profile

ADDIE Analyze Phase

Appendix C4: Learner Characteristics Profile (LCP)

The following is a summary of the learner characteristics profiles.

	Data Collected	Resources Used
1.0 General Characteristics of the Target Population	The general characteristics of the target population roughly matches the population of students who attend Aleut Culture Camps in Alaska during the summer time, so they are typically middle- or high-school students; typically Aleut (or related to someone Aleut); typically interested in learning to build model kayaks. Students self-select to attend and are screened by culture camp directors.	Traditional face to face instruction will be verbal and demonstrations using three-dimensional models, pictures, drawings. Online classes will be pictures, drawings, and video.
1.1 Age Range	Middle- to high-school students, adolescents, approximately ages 10 through 17, plus or minus about two years.	
1.2 Gender Distribution	Typically more males than females, although this varies.	
1.3 Special Needs	No significant special needs noted so far, although some students have challenges paying attention.	
1.4 Ethnic/Cultural Background	Mostly Aleut, of Aleut descent, or related to Aleuts. Some Whites, some Hispanics, some Asians. Few African Americans or Hispanics.	
1.5 Language Distribution	Predominantly English. The Unangan language is taught during Aleut Culture Camps, but most Aleut students have English as a first language.	

Academic Information

	Data Collected	Resources Used
2.0 What entry behavior(s) is needed for learner success?	Capability to pay attention, capability to follow directions, must understand directions (verbal, written, audio, video).	
2.1 What is the attitude toward target content material?	Students are generally interested in culture camp activities, although some students are distracted by other activities such as fishing, goofing off, horsing around.	
2.2 What is the learning preference(s) or modality?	The learning modality is traditional face to face instruction during culture camp, but the audience is limited due to logistics.	
2.3 Is it reasonable to expect that the material to be cognitively learned by these learners?	Yes, during traditional culture camp, many students are able to get the model kayak completed. In the online class, instead of about 15 hours concentrated during one week, students are expected to work one day (for example, a Saturday) for two hours spread over about eight weeks. Thus, online students are expected to work a comparable time span to face to face students.	
2.4 What is a reasonable time frame for the targeted content to be mastered?	In culture camp, a reasonable time frame for students to learn the cultural/historical content and to build the 1/6 th scale model kayak is about 15 hours spread over three to five days. Culture camps are typically five days long, but some camps are two weeks long.	
2.5 What is the motivation for the learner to complete this targeted content?	Motivations for students include completing the model kayak frame to take home to display to family and friends. Some students auction off their model kayaks at the end of Aleut Culture Camp. Other students give away the model kayaks as presents to their parents, grandparents, or to friends or relatives as wedding gifts. Motivation includes knowing how to build the model kayak, learning the basics for building full-size kayaks, and learning some of the basics necessary to advance to learning how to paddle a sea kayak.	

Prior Information Needed

	Data Collected	Resources Used
3.0 What prior knowledge is needed for learner success?	Capability of speaking, understanding, reading English. Some basic knowledge of the geography and history. Online students must know how basic Internet skills such as how to send/receive e-mail, how to capture digital photographs and then how to upload them into a course management system such as Moodle.	
3.1 What prerequisite cognitive skills are needed for learner success?	Interest in learning traditional Aleut skills, knowledge or attitudes. Interest in learning how to build a model kayak. Online students should have cognitive technology skills such as working in an online environment.	
3.2 What prerequisite motor skills are needed for learner success?	Motor skills include capability to take measurements with a ruler, to make marks with a pencil, to use a traditional drill (hand, bow, or pump), to cut wood with a coping- or jeweler-s saw, to glue wood, to bend reed, to clamp wood that is gluing with rubber bands, to sand wood. Online students must be able to control a mouse, enter data on a keyboard, and capture digital photographs with a camera.	
3.3 What previous experience would the learner have that would inhibit success?	The previous experience that would inhibit success is ridiculing or mocking of ancient Aleut language, traditions, or beliefs as occurred in the 1900s under American educational systems. For online students, previous negative experiences in an online class would inhibit success.	

Return to Task A08: Learner characteristics profile in Chapter III.

Appendix C-5: Learning Environment

Learning Environment

Task A2

Traditional face to face instruction requires minimal technology. The instructions can be entirely verbal with no electronic equipment. For example, some Aleut culture camps are located at remote sites on beaches with no electricity. Equipment such as computers or projectors will not work. Learning environments includes delivery and reception. The online delivery environment required a computer with access to high-speed Internet capable of hosting the course management system Moodle provided by the Instructional Technology Resource Center (ITRC) on the campus of Idaho State University (ISU).

Instructional designers attempting to create online courses sometimes commit the error of “overestimating the computer skills of end users” (Gagne *et al.*, 2005, p. 319). To attempt to avoid this, instructional material was created in the online model kayak course which provided instruction for essential online skills such as uploading digital photographs to Moodle. Online students were required to have computers with high-speed Internet access (faster than dial-up). Students were required to have operating systems and browsers on their computer with firewalls, virus protection, and additional security features to keep their submitted assignments virus-free. Students were also required to have digital still cameras capable of capturing macro (close-up) digital photographs of their wood working on their model kayaks.

Students were required to have computer programs which allow them to view instructional videos on sites such as www.youtube.com.

The following is a three-part LES created for Task A12.

First, traditional face to face culture camps will continue to be instructed as in the past with small changes to better align content with the online section. The bulk of instruction will be face to face.

Second, the online students were required to have (or have easy access to) the following electronic hardware, software, and other essential equipment:

1. Computer;
2. Computer virus protection program to prevent malware from attaching to submitted assignments;
3. Active firewall protection to prevent unauthorized communication between computer networks or hosts
4. Operating system (e.g., Windows, Macintosh, Linux, Chrome);
5. Web browser software (e.g., Google Chrome, Internet Explorer, Mozilla Firefox);
6. High-speed (faster than dial-up) Internet Connection;
7. Keyboard;
8. Mouse;
9. Speakers;
10. Display monitor with 640 by 480 resolution;

11. Computer program capable of playing audio files such as Windows® Media Audio (.wma), Windows audio file (.wav), open source audio files (.ogg), MPEG audio stream (.mp3).
12. Computer program capable of playing video files such as Macromedia® Flash Format (.swf), QuickTime® Video Clips (.mov), Windows® Media File (.wmv), RealMedia ®Player (.ram, .rm. or .rmp), MPEG (.mp3), open source (.ogg or .ogv).
13. Computer program to open Portable Document Format files (Adobe® reader);
14. Digital camera (may be cell phone camera) with macro (lens) to take close-up detail photographs;
15. Electronic equipment to transfer digital images from camera to computer (cables or wireless transfer);
16. Computer printer for printing documents or model templates;
17. Computer program for viewing graphic presentations (Microsoft, Google docs, or OpenOffice);
18. Computer program for viewing word documents (Microsoft, Google docs, OpenOffice, or LibreOffice);
19. Computer program for viewing photographs (e.g., Google Picasa, Paint).
20. Mailing address (may be “general delivery”) for receiving the model kayak kit.
21. Area (desk, table, and floor) about two foot by three foot for working on the model kayak.
22. A lighted area (can be natural outdoor lighting) for illuminating the model kayak frame while capturing close-up digital photographs.
23. A warm, dry area so that wood glue can dry.

In addition to the above listed items, the following hardware or software may be used to support learning:

- Microphone;
- Computer program to record audio such as Sound Recorder, Audacity;
- Webcam;
- Free video conferencing program such as Skype or Google Talk;
- Free online telecommunication programs such as Skye talk, Google Talk, Yahoo chat, Ventrillo.
- Instant messaging (I/M) program such as Moodle I/M, Skype I/M, Google Talk I/M.
- Telephone or cell phone for verbal communication or text-messaging to support learning.

The Experimental group (online) must attend all online activities (synchronous and asynchronous), must complete and submit assignments (including surveys, quizzes, and interviews) in sequence, and should spend about two (2) hours of online instruction per week for eight weeks (estimated total of 15 hours). The control group (traditional face to face) must attend culture camp (estimated four hours per day for four days or about 15 hours total), take and submit all assignments (including surveys, quizzes, and interviews), must follow

camp rules (for example, being respectful of others), must work on their model kayaks.

Students from both the control group and the Experimental group were expected to ask for help when needed. The third group small test pilot group (discussed below) consisted of students viewing the online course to see if instruction, content, and delivery flowed smoothly and made sense to adolescent learners.

Return to [Task A12: Learning environment in Chapter III.](#)

Appendix C-6: Proposed Timeline for Analyze Phase

Proposed Project Timeline for Analyze Phase Task A14

This is a projected timeline for modules of the model Aleut sea kayak class:

Task	Task Detail	Time (in days)	Comments
Analysis Phase:			
01	Create A01: Rationale of the project	3	The project rationale will be justified based upon the course goals and objectives.
02	Create A02: Goal of the project	3	The instructional goal of the project will be delineated.
03	Create A03: Objectives of the project	3	There are three objectives and each objective has an RLO.
04	Delphi Survey 01: Send to SME panel	2	The researcher will include Tasks A-01 to A-03 with a cover letter and Delphi survey.
05	Delphi Survey 01: Feedback from SME panel	7	Feedback from the SME panel provides the opportunity for the researcher to revise the survey questions.
06	Delphi Survey 01: Survey data analysis	2	If the results are acceptable, produce the final version of Tasks A101 through A103. If results are not acceptable, then repeat the process.
07	Create A04: Project Concept Map	3	The project concept map will help the SMEs gain an overview of the entire project.
08	Create A05: Project Learner Influence Document (LID)	4	The purpose of the LID is for the researcher to delineate learner strategies such as Gagne's nine events of instruction.
09	Create A06: Learning Outcome Statement (LOS)	3	The LOS originates from the objectives and describes anticipated changes (both short- and long-term) as a result of instruction.
10	Create A07: Project Learning Hierarchy	5	The project learning hierarchy provides a road map to display the relationship of goals to essential knowledge components as well as necessary steps to achieve desired outcomes.
11	Delphi Survey 02: Send to SME panel	1	Panel members will be sent cover letter, tasks, and survey.
12	Delphi Survey 02: Feedback from SME panel	7	Feedback will provide the opportunity for revision.
13	Delphi Survey 02: Survey data analysis	7	Revise the questions, if necessary.

14	Create A08: Project Learning Environment Statement	3	The researcher will delineate both face to face and online learning environments.
15	Create A09: Project Delivery Option Statement	3	The Environment Related and Management Related tasks are combined in one instrument (Delphi 3). See details under Management Related Tasks section.
16	Create A10: Project Learner Characteristics Profile	5	The researcher will use data learned from instructing at Aleut culture camps to create this profile.
17	Create A11: Project Target Audience Statement	5	This statement summarizes the characteristics developed in Task A10.
18	Create A12: Project Learner Constraints Statement	2	Both face to face and online learner constraints must be addressed here.
19	Create A13: Project Learner Pedagogical Considerations Statement	3	This statement summarizes pedagogical considerations developed in the previous tasks.
20	Delphi Survey 03: Send to SME panel	7	Panel members will be sent cover letter, tasks, and survey.
21	Delphi Survey 03: Feedback from SME panel	7	Revise the questions, if necessary.
22	Delphi Survey 03:Survey data analysis	7	If the results are acceptable, produce the final version of Tasks A10 through A13. If results are not acceptable, then repeat the process.
23	Create A14: Project Timeline	1	Timeline helps the researcher plan the schedule.
24	Delphi Survey 04: Send to SME panel	7	Panel members will be sent cover letter, tasks, and survey.
25	Delphi Survey 04: Feedback from IDE panel	7	Revise the questions, if necessary.

Return to Task A14: Proposed timeline in Chapter III.

Appendix C-7: Delphi Survey 05 (Task A14)

ADDIE Analyze Phase
Task A14: Project Timeline
Delphi Survey 05

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's timeline.
2. Mark the rating that most represents your expert evaluation for each item on the survey.
3. Return your completed instrument via reply email as an attachment no later than [date].

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
Project Timeline Statement (Task A14):				
1. It appears the project timeline addresses the tasks with a reasonable time for creation of materials for the project. (Weeks/days)				
2. It appears the project timeline addresses the appropriate amount of time for Delphi01 solicitation and feedback. (Weeks/days)				
3. It appears the project timeline addresses the appropriate amount of time for Delphi01 data analysis and feedback to the panel members. (Weeks/days)				
4. It appears the project timeline addresses the appropriate amount of time for Delphi02 solicitation and feedback. (Weeks/days)				
5. It appears the project timeline addresses the appropriate amount of time for Delphi02 data analysis and feedback to the panel members. (Weeks/days)				
6. It appears the project timeline addresses the appropriate amount of time for Delphi03 solicitation and feedback. (Weeks/days)				
7. It appears the project timeline addresses the appropriate amount of time for Delphi03 data analysis and feedback to the panel members. (Weeks/days)				
8. It appears the project timeline addresses the appropriate amount of time for Delphi04 solicitation and feedback. (Weeks/days)				
9. It appears the project timeline addresses the appropriate amount of time for Delphi04 data analysis and feedback to the panel members. (Weeks/days)				

Return to Task A14: Proposed timeline in Chapter III.

Appendix C-8: Delphi 05 Raw Data

Appendix C-8: Delphi Survey 05 Raw Data

Table 20

Delphi Survey 05 Raw Data

Delphi Survey 05 Raw Data				
Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
	36	36	36	108
Mean				12.00
Median				12.00
SD				0.00

Return to [Task A14: Proposed timeline.](#)

Appendix D: Design Phase

Appendix D-1: Task D01: Task Analysis

Task Analysis: Task D01

RLO 1: Build the Deck of the 1/6th Scale Model Aleut Sea Kayak

Task/Subtask	Knowledge Type (D, P, S)	Prerequisite (Y/N)	Environmental Factors (T, E, M, P, L) Time Environmental Media Physical Learning Env.	Domain Type (C, M, A, MO)	Importance (H, M, L)	Difficulty (H, M, L)
Objective 1: Given tools, supplies, and instructions, the student will build the <u>deck</u> of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.						
1.1 Dry Fit (Fit together the Gunwales, Thwarts, Bow/Stern Wedges without glue)	P	N	T, E, M	M	H	M
1.2 Photograph (Capture a digital photograph; upload to Moodle so instructor may review)	P	N	T, E, M	M	H	M
1.3 Glue and Clamp (Glue together the gunwales, thwarts, bow/stern wedge; clamp with rubber bands; set aside to dry)	P	N	T, E, M	M	H	M
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Explanation of Terms

Column 2: Knowledge Type (D, P, S)

Instructions: Mark the column with D, P, or S (choose only one knowledge type)

According to Jonassen (1999), there are three types of knowledge for an Instructional Designer to consider: (1) Declarative (**D**), (2) Procedural (**P**), and (3) Structural (**S**).

Declarative Knowledge is defined as factual knowledge (e. g., the capital of Florida is Tallahassee), and may be thought of in at least two ways: episodic (knowledge is organized by where, when, who) and semantic knowledge (knowledge of the meaning of words, facts, geography, and things that are classified). Declarative knowledge may also include information about concepts.

Procedural Knowledge is defined as a listing of “how” something is done (e.g., driving a car or preparing a recipe). This knowledge type details activities required to perform a specific task. Procedural Knowledge transforms detail tasks into a habitual process (e.g., fire drill instructions, pre-flight check list).

Structural Knowledge is defined as the linking of one concept to another in order to solve a problem, generate a plan or a strategy by setting conditions for a set of procedures.

Column 3: Prerequisite

Instructions: Mark the column with **Y** (yes) or **N** (no) (choose only one)

If prerequisite knowledge or skills are required in order to complete the task (e.g., A student cannot add 3+2 unless the concept of the number 3 and 2 exist prior to the act of addition), then this should be identified in the worksheet.

Column 4: Environmental Factors (T, E, M, P, L)

Instructions: Mark the column with **T** (Time), **E** (Environment), **M** (Media), **P** (Physical condition), or **L** (Learning environment) (multiple factors may apply; choose accordingly)

Time is the estimated time to complete the task. (You will use this estimate to compare actual student time to complete the task. The difference between these two quantities (e.g., estimated time 23 min, actual time 36 min, difference 13 minutes) may result in instructional changes to improve performance.

Environment: Examine the literature to see what environmental concerns are related to the specific task requirements. You may also need to consult with one, or more, instructional experts to gain insight.

Media: What is the best media that will assist in the targeted learners in completing the task? You may need to consider your response to the Environment issue (see above) since this may impose conditions on the media that is best given any environmental constraints.

Physical Condition: These are not the same as Environmental issues (see Watson, 1997: *Task Analysis: An Occupational Performance Approach*. Bethesda, MD: The American Occupational Therapy Association). You may wish to examine Card, Moran, and Newell (1983) in relation to GOMS (Goals, Operators, Methods, Selection) in job task analysis for business, industry, and government.

Learning environment: Considerations should include connectivity, type of hardware/software and peripherals, user interface designs for computer assisted Instruction and distance learning interfaces.

Column 5: Domain (C, M, A, MO)

Instructions: Mark the column with **C** (Cognitive), **M** (Motor), **A** (Affective), or **MO** (Motivation) (choose only one)

The terms Cognitive, Motor, and Affective are related to Gagne's taxonomy of learning outcomes and are somewhat similar to Bloom's taxonomies of cognitive, affective, and psychomotor outcomes.

Motivation refers to Maslow's Hierarchy of Needs:

- Self-Actualization (reaching one's maximum potential)
- Esteem (respect from others, self-respect, recognition)
- Belonging (affiliation, acceptance, being part of something)
- Safety (physical safety, psychological security)
- Physiological (hunger, thirst, rest)

Column 6: Importance (H, M, L)

Instructions: Mark the column with **H** (High), **M** (Medium), or **L** (Low) (choose only one)

As an instructional designer you will want to determine if a specific task (or subtask) is highly important, of medium importance, or would actually be considered as being at a low level of importance.

Column 7: Difficulty (H, M, L)

Instructions: Mark the column with **H** (High), **M** (Medium), or **L** (Low) (choose only one)

Similar to Importance, the instructional designer will want to determine the "weight" of the level of difficulty for the specific task. This may impact the amount of time, or placement, or degree of support needed within the instructional project in order to accomplish this task.

Task Analysis: Task D01

RLO 2: Build the Hull of the 1/6th Scale Model Aleut Sea Kayak

Task/Subtask	Knowledge Type (D, P, S)	Prerequisite (Y/N)	Environmental Factors (T, E, M, P, L) Time Environmental Media Physical Learning Env.	Domain Type (C, M, A, MO)	Importance (H, M, L)	Difficulty (H, M, L)
Objective 2: Given tools, supplies, and instructions, the student will build the <u>hull</u> of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.						
2.1 Dry Fit (Fit together the ribs, stringers, keelson, tail fin, and bow blade without glue)	P	N	T, E, M	M	H	M
2.2 Photograph (Capture a digital photograph; upload to Moodle so instructor may review)	P	N	T, E, M	M	H	M
2.3 Glue and Clamp (Glue together the stringers, keelson, tail fin, and bow blade; clamp with rubber bands; set aside to dry)	P	N	T, E, M	M	H	M
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Explanation of Terms

Column 2: Knowledge Type (D, P, S)

Instructions: Mark the column with D, P, or S (choose only one knowledge type)

According to Jonassen (1999), there are three types of knowledge for an Instructional Designer to consider: (1) Declarative (**D**), (2) Procedural (**P**), and (3) Structural (**S**).

Declarative Knowledge is defined as factual knowledge (e, g., the capital of Florida is Tallahassee), and may be thought of in at least two ways: episodic (knowledge is organized by where, when, who) and semantic knowledge (knowledge of the meaning of words, facts, geography, and things that are classified). Declarative knowledge may also include information about concepts.

Procedural Knowledge is defined as a listing of “how” something is done (e.g., driving a car or preparing a recipe). This knowledge type details activities required to perform a specific task. Procedural Knowledge transforms detail tasks into a habitual process (e.g., fire drill instructions, pre-flight check list).

Structural Knowledge is defined as the linking of one concept to another in order to solve a problem, generate a plan or a strategy by setting conditions for a set of procedures.

Column 3: Prerequisite

Instructions: Mark the column with **Y** (yes) or **N** (no) (choose only one)

If prerequisite knowledge or skills are required in order to complete the task (e.g., A student cannot add 3+2 unless the concept of the number 3 and 2 exist prior to the act of addition), then this should be identified in the worksheet.

Column 4: Environmental Factors (**T, E, M, P, L**)

Instructions: Mark the column with **T** (Time), **E** (Environment), **M** (Media), **P** (Physical condition), or **L** (Learning environment) (multiple factors may apply; choose accordingly)

Time is the estimated time to complete the task. (You will use this estimate to compare actual student time to complete the task. The difference between these two quantities (e.g., estimated time 23 min, actual time 36 min, difference 13 minutes) may result in instructional changes to improve performance.

Environment: Examine the literature to see what environmental concerns are related to the specific task requirements. You may also need to consult with one, or more, instructional experts to gain insight.

Media: What is the best media that will assist in the targeted learners in completing the task? You may need to consider your response to the Environment issue (see above) since this may impose conditions on the media that is best given any environmental constraints.

Physical Condition: These are not the same as Environmental issues (see Watson, 1997: *Task Analysis: An Occupational Performance Approach*. Bethesda, MD: The American Occupational Therapy Association). You may wish to examine Card, Moran, and Newell (1983) in relation to GOMS (Goals, Operators, Methods, Selection) in job task analysis for business, industry, and government.

Learning environment: Considerations should include connectivity, type of hardware/software and peripherals, user interface designs for computer assisted Instruction and distance learning interfaces.

Column 5: Domain (C, M, A, MO)

Instructions: Mark the column with **C** (Cognitive), **M** (Motor), **A** (Affective), or **MO** (Motivation) (choose only one)

The terms Cognitive, Motor, and Affective are related to Gagne's taxonomy of learning outcomes and are somewhat similar to Bloom's taxonomies of cognitive, affective, and psychomotor outcomes.

Motivation refers to Maslow's Hierarchy of Needs:

- Self-Actualization (reaching one's maximum potential)
- Esteem (respect from others, self-respect, recognition)
- Belonging (affiliation, acceptance, being part of something)
- Safety (physical safety, psychological security)
- Physiological (hunger, thirst, rest)

Column 6: Importance (H, M, L)

Instructions: Mark the column with **H** (High), **M** (Medium), or **L** (Low) (choose only one)

As an instructional designer you will want to determine if a specific task (or subtask) is highly important, of medium importance, or would actually be considered as being at a low level of importance.

Column 7: Difficulty (H, M, L)

Instructions: Mark the column with **H** (High), **M** (Medium), or **L** (Low) (choose only one)

Similar to Importance, the instructional designer will want to determine the "weight" of the level of difficulty for the specific task. This may impact the amount of time, or placement, or degree of support needed within the instructional project in order to accomplish this task.

Task Analysis: Task D01

RLO 3: Build the Superstructure of the 1/6th Scale Model Aleut Sea Kayak

Task/Subtask	Knowledge Type (D, P, S)	Prerequisite (Y/N)	Environmental Factors (T, E, M, P, L) Time Environmental Media Physical Learning Env.	Domain Type (C, M, A, MO)	Importance (H, M, L)	Difficulty (H, M, L)
Objective 3: Given tools, supplies, and instructions, the student will build the superstructure of the 1/6th scale Traditional Unangan Sea Kayak (TUSK) model that meets the standards at a beginner's level according to a researcher-designed rubric.						
3.1 Dry Fit (Fit together the Deck Beams, Stanchions, and Cockpit Coaming without glue)	P	N	T, E, M	M	H	M
3.2 Photograph (Capture a digital photograph; upload to Moodle so instructor may review)	P	N	T, E, M	M	H	M
3.3 Glue and Clamp (Glue together the Deck Beams, Stanchions, and Cockpit Coaming; clamp with rubber bands; set aside to dry)	P	N	T, E, M	M	H	M
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Explanation of Terms

Column 2: Knowledge Type (D, P, S)

Instructions: Mark the column with D, P, or S (choose only one knowledge type)

According to Jonassen (1999), there are three types of knowledge for an Instructional Designer to consider: (1) Declarative (**D**), (2) Procedural (**P**), and (3) Structural (**S**).

Declarative Knowledge is defined as factual knowledge (e, g., the capital of Florida is Tallahassee), and may be thought of in at least two ways: episodic (knowledge is organized by where, when, who) and semantic knowledge (knowledge of the meaning of words, facts, geography, and things that are classified). Declarative knowledge may also include information about concepts.

Procedural Knowledge is defined as a listing of “how” something is done (e.g., driving a car or preparing a recipe). This knowledge type details activities required to perform a specific task. Procedural Knowledge transforms detail tasks into a habitual process (e.g., fire drill instructions, pre-flight check list).

Structural Knowledge is defined as the linking of one concept to another in order to solve a problem, generate a plan or a strategy by setting conditions for a set of procedures.

Column 3: Prerequisite

Instructions: Mark the column with **Y** (yes) or **N** (no) (choose only one)

If prerequisite knowledge or skills are required in order to complete the task (e.g., A student cannot add 3+2 unless the concept of the number 3 and 2 exist prior to the act of addition), then this should be identified in the worksheet.

Column 4: Environmental Factors (**T, E, M, P, L**)

Instructions: Mark the column with **T** (Time), **E** (Environment), **M** (Media), **P** (Physical condition), or **L** (Learning environment) (multiple factors may apply; choose accordingly)

Time is the estimated time to complete the task. (You will use this estimate to compare actual student time to complete the task. The difference between these two quantities (e.g., estimated time 23 min, actual time 36 min, difference 13 minutes) may result in instructional changes to improve performance.

Environment: Examine the literature to see what environmental concerns are related to the specific task requirements. You may also need to consult with one, or more, instructional experts to gain insight.

Media: What is the best media that will assist in the targeted learners in completing the task? You may need to consider your response to the Environment issue (see above) since this may impose conditions on the media that is best given any environmental constraints.

Physical Condition: These are not the same as Environmental issues (see Watson, 1997: *Task Analysis: An Occupational Performance Approach*. Bethesda, MD: The American Occupational Therapy Association). You may wish to examine Card, Moran, and Newell (1983) in relation to GOMS (Goals, Operators, Methods, Selection) in job task analysis for business, industry, and government.

Learning environment: Considerations should include connectivity, type of hardware/software and peripherals, user interface designs for computer assisted Instruction and distance learning interfaces.

Column 5: Domain (C, M, A, MO)

Instructions: Mark the column with **C** (Cognitive), **M** (Motor), **A** (Affective), or **MO** (Motivation) (choose only one)

The terms Cognitive, Motor, and Affective are related to Gagne's taxonomy of learning outcomes and are somewhat similar to Bloom's taxonomies of cognitive, affective, and psychomotor outcomes.

Motivation refers to Maslow's Hierarchy of Needs:

- Self-Actualization (reaching one's maximum potential)
- Esteem (respect from others, self-respect, recognition)
- Belonging (affiliation, acceptance, being part of something)
- Safety (physical safety, psychological security)
- Physiological (hunger, thirst, rest)

Column 6: Importance (H, M, L)

Instructions: Mark the column with **H** (High), **M** (Medium), or **L** (Low) (choose only one)

As an instructional designer you will want to determine if a specific task (or subtask) is highly important, of medium importance, or would actually be considered as being at a low level of importance.

Column 7: Difficulty (H, M, L)

Instructions: Mark the column with **H** (High), **M** (Medium), or **L** (Low) (choose only one)

Similar to Importance, the instructional designer will want to determine the "weight" of the level of difficulty for the specific task. This may impact the amount of time, or placement, or degree of support needed within the instructional project in order to accomplish this task.

Task Analysis: Task D01

RLO 4: Culture and History of the Model Aleut Sea Kayak

Task/Subtask	Knowledge Type (D, P, S)	Prerequisite (Y/N)	Environmental Factors (T, E, M, P, L) Time Environmental Media Physical Learning Env.	Domain Type (C, M, A, MO)	Importance (H, M, L)	Difficulty (H, M, L)
Objective 4: Given instructional material on basic kayak orientation, terminology, culture and history, student will achieve a score of 70% on a researcher-developed multiple-choice test.						
4.1 Basic Kayak Orientation Student views instructional video on basic kayak orientation; views additional instructional videos while building the 1/6 th scale model kayak	D, P, S	N	T, E, M	C, M	H	M
4.2 Basic Kayak Terminology Student views instructional video on basic kayak terminology; views additional instructional videos while building the 1/6 th scale model kayak	D, P, S	N	T, E, M	C, M	H	M
4.3 Basic Model Aleut Kayak Culture and History Student views instructional videos on basic model kayak culture and history; views additional instructional videos while building the 1/6 th scale model kayak	D, P, S	N	T, E, M	C, M	H	M
4.4 Quiz on Model Kayak Basics Student takes a quiz on the basics of Model Aleut Sea Kayaks	D, P, S	N	T, E, M	C, M	H	M
Used with Permission © A. Strickland, J. Strickland, & J. White						

Explanation of Terms

Column 2: Knowledge Type (D, P, S)

Instructions: Mark the column with D, P, or S (choose only one knowledge type)

According to Jonassen (1999), there are three types of knowledge for an Instructional Designer to consider: (1) Declarative (**D**), (2) Procedural (**P**), and (3) Structural (**S**).

Declarative Knowledge is defined as factual knowledge (e, g., the capital of Florida is Tallahassee), and may be thought of in at least two ways: episodic (knowledge is organized by where, when, who) and semantic knowledge (knowledge of the meaning of words, facts, geography, and things that are classified). Declarative knowledge may also include information about concepts.

Procedural Knowledge is defined as a listing of “how” something is done (e.g., driving a car or preparing a recipe). This knowledge type details activities required to perform a specific task. Procedural Knowledge transforms detail tasks into a habitual process (e.g., fire drill instructions, pre-flight check list).

Structural Knowledge is defined as the linking of one concept to another in order to solve a problem, generate a plan or a strategy by setting conditions for a set of procedures.

Column 3: Prerequisite

Instructions: Mark the column with **Y** (yes) or **N** (no) (choose only one)

If prerequisite knowledge or skills are required in order to complete the task (e.g., A student cannot add 3+2 unless the concept of the number 3 and 2 exist prior to the act of addition), then this should be identified in the worksheet.

Column 4: Environmental Factors (T, E, M, P, L)

Instructions: Mark the column with **T** (Time), **E** (Environment), **M** (Media), **P** (Physical condition), or **L** (Learning environment) (multiple factors may apply; choose accordingly)

Time is the estimated time to complete the task. (You will use this estimate to compare actual student time to complete the task. The difference between these two quantities (e.g., estimated time 23 min, actual time 36 min, difference 13 minutes) may result in instructional changes to improve performance.

Environment: Examine the literature to see what environmental concerns are related to the specific task requirements. You may also need to consult with one, or more, instructional experts to gain insight.

Media: What is the best media that will assist in the targeted learners in completing the task? You may need to consider your response to the Environment issue (see above) since this may impose conditions on the media that is best given any environmental constraints.

Physical Condition: These are not the same as Environmental issues (see Watson, 1997: *Task Analysis: An Occupational Performance Approach*. Bethesda, MD: The American Occupational Therapy Association). You may wish to examine Card, Moran, and Newell (1983) in relation to GOMS (Goals, Operators, Methods, Selection) in job task analysis for business, industry, and government.

Learning environment: Considerations should include connectivity, type of hardware/software and peripherals, user interface designs for computer assisted Instruction and distance learning interfaces.

Column 5: Domain (C, M, A, MO)

Instructions: Mark the column with **C** (Cognitive), **M** (Motor), **A** (Affective), or **MO** (Motivation) (choose only one)

The terms Cognitive, Motor, and Affective are related to Gagne's taxonomy of learning outcomes and are somewhat similar to Bloom's taxonomies of cognitive, affective, and psychomotor outcomes.

Motivation refers to Maslow's Hierarchy of Needs:

Self-Actualization (reaching one's maximum potential)

Esteem (respect from others, self-respect, recognition)

Belonging (affiliation, acceptance, being part of something)

Safety (physical safety, psychological security)

Physiological (hunger, thirst, rest)

Column 6: Importance (H, M, L)

Instructions: Mark the column with **H** (High), **M** (Medium), or **L** (Low) (choose only one)

As an instructional designer you will want to determine if a specific task (or subtask) is highly important, of medium importance, or would actually be considered as being at a low level of importance.

Column 7: Difficulty (**H**, **M**, **L**)

Instructions: Mark the column with **H** (**H**igh), **M** (**M**edium), or **L** (**L**ow) (choose only one)

Similar to Importance, the instructional designer will want to determine the “weight” of the level of difficulty for the specific task. This may impact the amount of time, or placement, or degree of support needed within the instructional project in order to accomplish this task.

Appendix D-2: Delphi Survey 06 (Task D01)

Appendix D-2
Task D01: Task analysis
Delphi Survey 06
RLO 1: Build the Deck of the Model Aleut Sea Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than **month day, year**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
16. The objective for task is clearly stated.				
Project Tasks:				
17. The listed tasks appear to be aligned with the Objective.				
18. The Knowledge identification type is aligned with each task.				
19. The Prerequisite decision (Y/N) is aligned with each task.				
20. The Environmental Factors identified for each task are clearly aligned.				
21. The Domain Type is aligned with each task.				
22. The Importance level is aligned for each task.				
23. The Difficulty level is aligned for each task.				
Project Subtasks (if included):				
24. The listed sub-tasks appear to be aligned with the task.				
25. The Knowledge identification type is aligned with each subtask.				
26. The Prerequisite decision (Y/N) is aligned with each subtask.				
27. The Environmental Factors identified for each subtask are clearly aligned.				
28. The Domain Type is aligned with each subtask.				
29. The Importance level is aligned for each subtask.				
30. The Difficulty level is aligned for each subtask.				

Appendix D-2
Task D01: Task analysis
Delphi Survey 06
RLO 2: Build the Hull of the Model Aleut Sea Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than **month day, year**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1. The objective for task is clearly stated.				
Project Tasks:				
2. The listed tasks appear to be aligned with the Objective.				
3. The Knowledge identification type is aligned with each task.				
4. The Prerequisite decision (Y/N) is aligned with each task.				
5. The Environmental Factors identified for each task are clearly aligned.				
6. The Domain Type is aligned with each task.				
7. The Importance level is aligned for each task.				
8. The Difficulty level is aligned for each task.				
Project Subtasks (if included):				
9. The listed sub-tasks appear to be aligned with the task.				
10. The Knowledge identification type is aligned with each subtask.				
11. The Prerequisite decision (Y/N) is aligned with each subtask.				
12. The Environmental Factors identified for each subtask are clearly aligned.				
13. The Domain Type is aligned with each subtask.				
14. The Importance level is aligned for each subtask.				
15. The Difficulty level is aligned for each subtask.				

Appendix D-2
Task D01: Task analysis
Delphi Survey 06
RLO 3: Build the Superstructure of the Model Aleut Sea Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than **month day, year**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1. The objective for task is clearly stated.				
Project Tasks:				
2. The listed tasks appear to be aligned with the Objective.				
3. The Knowledge identification type is aligned with each task.				
4. The Prerequisite decision (Y/N) is aligned with each task.				
5. The Environmental Factors identified for each task are clearly aligned.				
6. The Domain Type is aligned with each task.				
7. The Importance level is aligned for each task.				
8. The Difficulty level is aligned for each task.				
Project Subtasks (if included):				
9. The listed sub-tasks appear to be aligned with the task.				
10. The Knowledge identification type is aligned with each subtask.				
11. The Prerequisite decision (Y/N) is aligned with each subtask.				
12. The Environmental Factors identified for each subtask are clearly aligned.				
13. The Domain Type is aligned with each subtask.				
14. The Importance level is aligned for each subtask.				
15. The Difficulty level is aligned for each subtask.				

Appendix D-2
Task D01: Task analysis
Delphi Survey 06

RLO 4: Learn the Basic History and Culture of the Model Aleut Sea Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than **month day, year**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
16. The objective for task is clearly stated.				
Project Tasks:				
17. The listed tasks appear to be aligned with the Objective.				
18. The Knowledge identification type is aligned with each task.				
19. The Prerequisite decision (Y/N) is aligned with each task.				
20. The Environmental Factors identified for each task are clearly aligned.				
21. The Domain Type is aligned with each task.				
22. The Importance level is aligned for each task.				
23. The Difficulty level is aligned for each task.				
Project Subtasks (if included):				
24. The listed sub-tasks appear to be aligned with the task.				
25. The Knowledge identification type is aligned with each subtask.				
26. The Prerequisite decision (Y/N) is aligned with each subtask.				
27. The Environmental Factors identified for each subtask are clearly aligned.				
28. The Domain Type is aligned with each subtask.				
29. The Importance level is aligned for each subtask.				
30. The Difficulty level is aligned for each subtask.				

Appendix D-3: Delphi Survey 06 (Raw Data)

Appendix D-3:
Delphi Survey 06 Raw Data
RLO #1

Table 21
Delphi Survey 06 Raw Data

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
	60	60	60	180
			Mean	12.00
			Median	12.00
			SD	0.00

Appendix D-3:
Delphi Survey 04 Raw Data
RLO #2

Table 22
Delphi Survey 04 Raw Data

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
	60	60	60	180
			Mean	12.00
			Median	12.00
			SD	0.00

Appendix D-3:
Delphi Survey 4 Raw Data
RLO #3

Table 23
Delphi Survey 04 Raw Data

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
	60	60	60	180
			Mean	12.00
			Median	12.00
			SD	0.00

Appendix D-3:
Delphi Survey 04 Raw Data
RLO #4

Table 24
Delphi Survey 04 Raw Data

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
	60	60	60	180
Mean				12.00
Median				12.00
SD				0.00

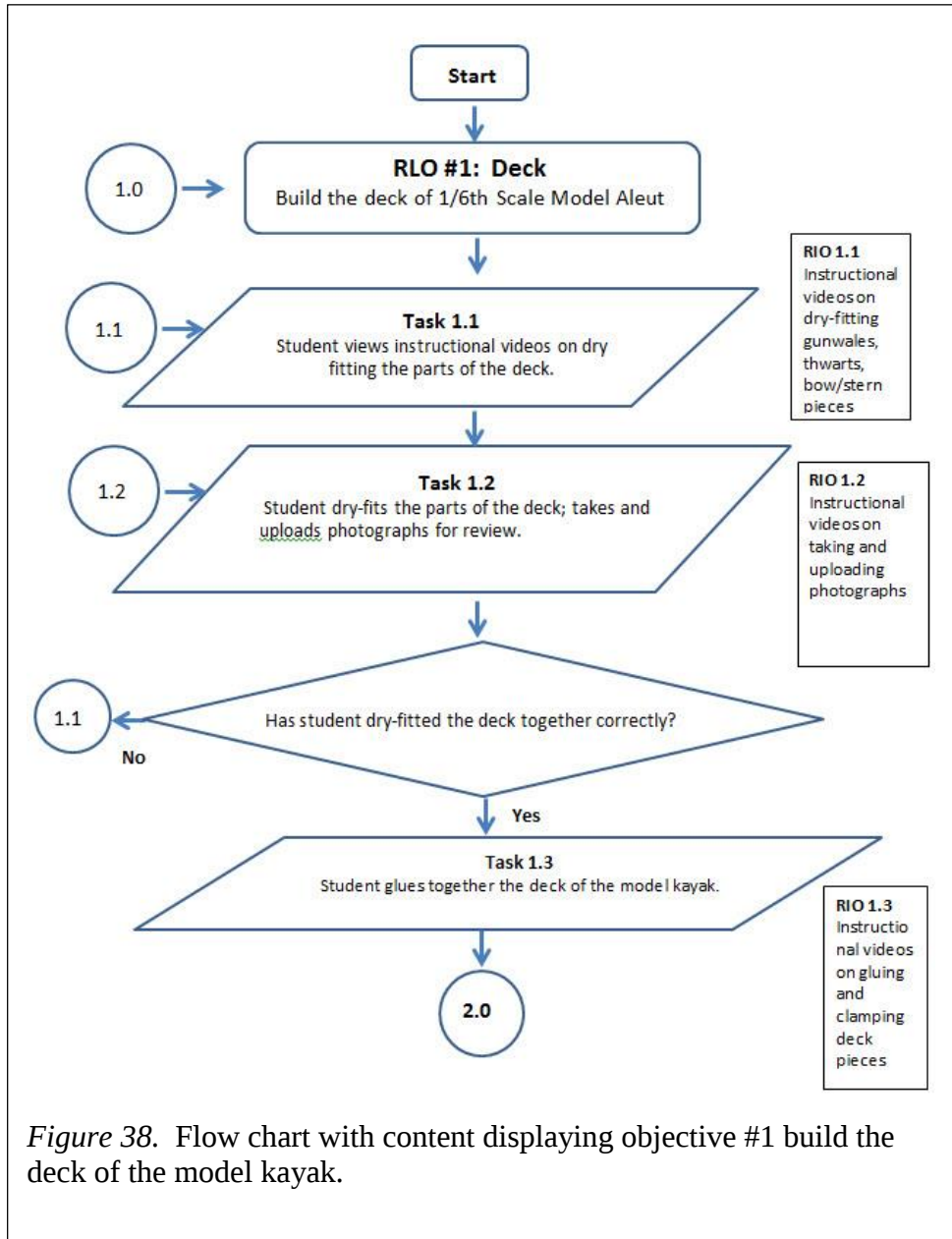
Appendix D-4: Task D02: Flowcharts

Task D-02**Flow Chart with Content**

RLO 1 Flowcharts

Traditional Unangan sea kayak (TUSK)

Objective 1: Build The Deck of the Model Kayak



Task D-02**Flow Chart with Content**

RLO 2 Flowcharts

Traditional Unangan Sea Kayak (TUSK)

Objective 2: Build the Hull of the Model Kayak

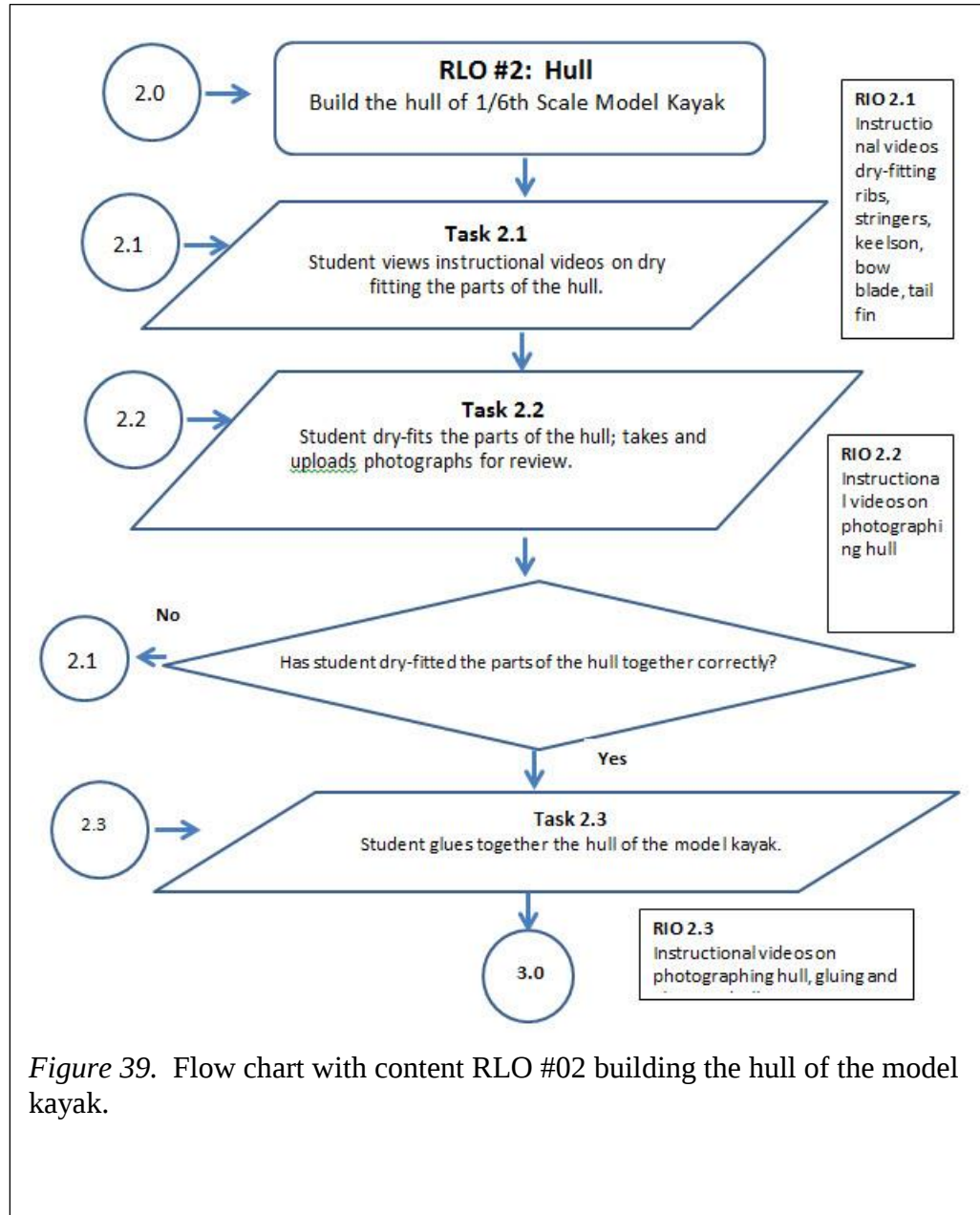


Figure 39. Flow chart with content RLO #02 building the hull of the model kayak.

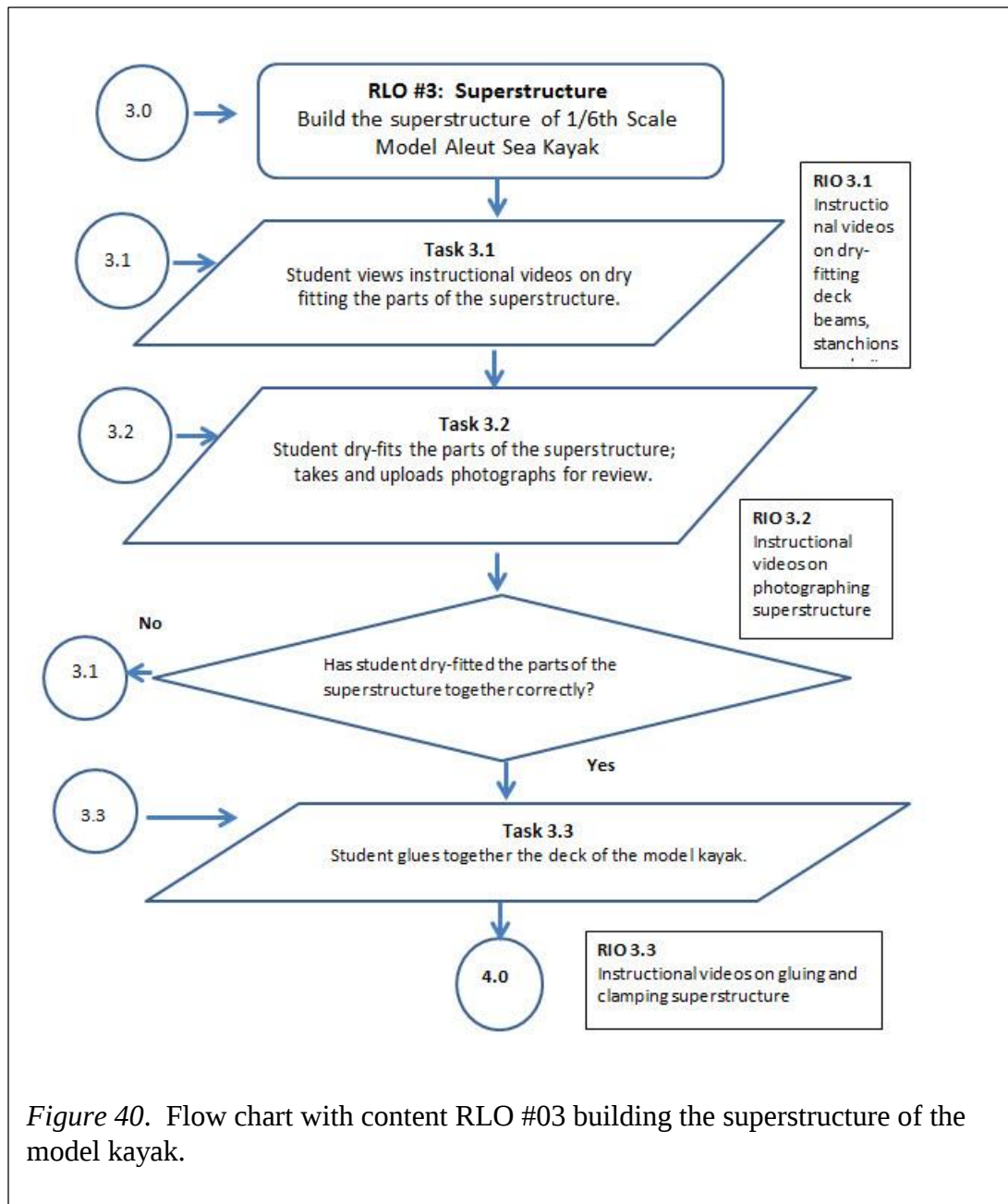


Figure 40. Flow chart with content RLO #03 building the superstructure of the model kayak.

Task D-02**Flow Chart with Content**

RLO 4 flowcharts

Traditional Unangan Sea Kayak (TUSK)

Objective 4:

History and Culture of Model Aleut Sea Kayaks

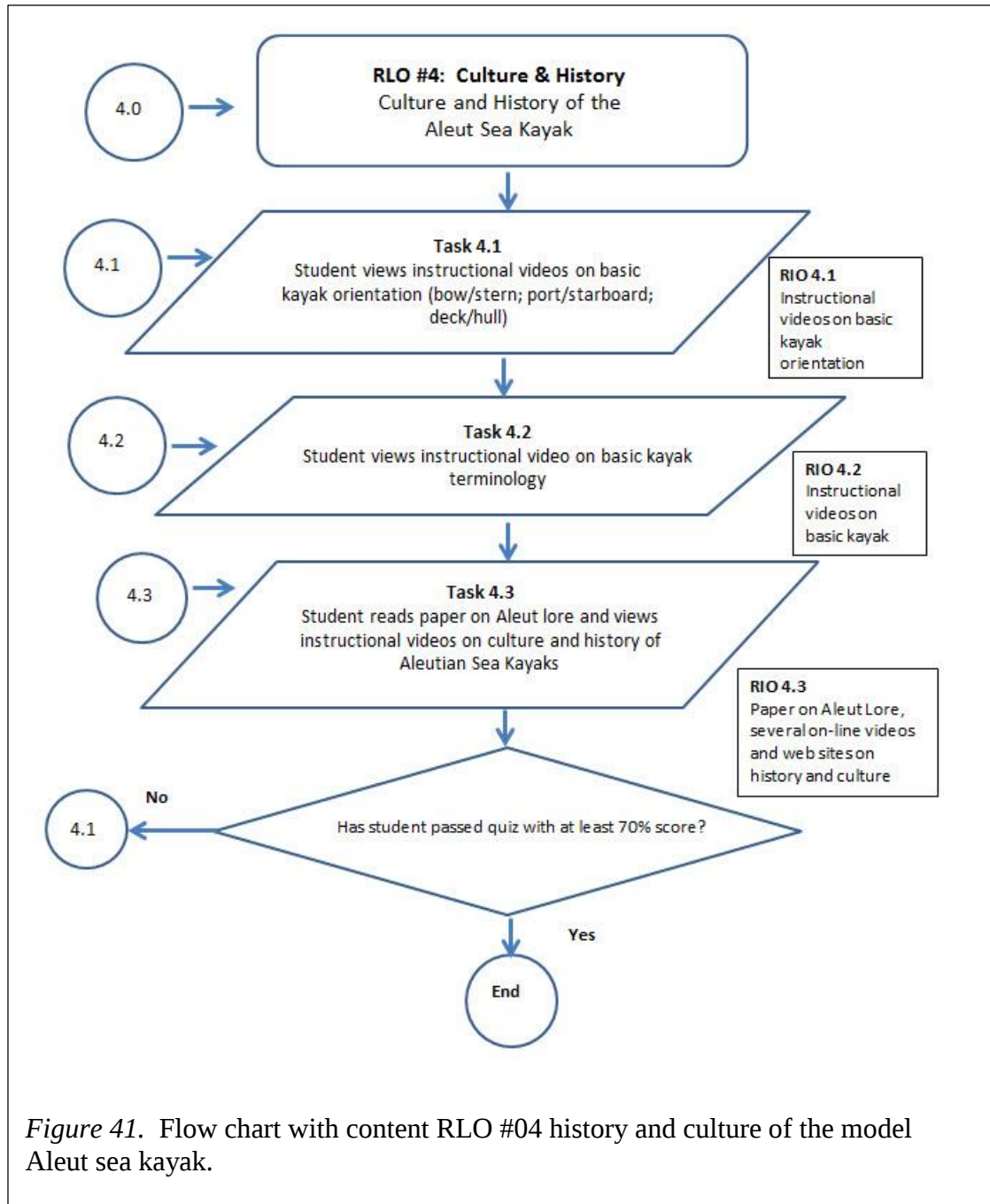


Figure 41. Flow chart with content RLO #04 history and culture of the model Aleut sea kayak.

Appendix D-5: Delphi Survey 07 (Task D02)

Appendix D-5
Delphi Survey 07 (Task D02)
Task D03: Flowchart with Content
RLO 01: Build the Deck of the Model Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than [date].

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
There is a series of RIO Flowcharts with content that are aligned with RLO 01 (Objective #1: Build the Deck of the 1/6 th Scale Model Aleut Sea Kayak)				
The flowchart for RIO 1.1 is aligned with each task described in RLO 01.				
The flowchart for RIO 1.2 is aligned with each task described in RLO 01.				
The flowchart for RIO 1.3 is aligned with each task described in RLO 01.				

Appendix D-5
Delphi Survey 07 (Task D02)
Task D03: Flowchart with Content
RLO 02: Build the Hull of the Model Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than [date].

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
There is a series of RIO Flowcharts with content that are aligned with RLO 02 (Objective #2: Build the Hull of the 1/6 th Scale Model Aleut Sea Kayak)				
The flowchart for RIO 2.1 is aligned with each task described in RLO 02.				
The flowchart for RIO 2.2 is aligned with each task described in RLO 02.				
The flowchart for RIO 2.3 is aligned with each task described in RLO 02.				

Appendix D-5
Delphi Survey 07 (Task D02)
Task D03: Flowchart with Content
RLO 03: Build the Superstructure of the Model Kayak

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than [date].

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
There is a series of RIO Flowcharts with content that are aligned with RLO 03 (Objective #3: Build the superstructure of the 1/6 th Scale Model Aleut Sea Kayak)				
The flowchart for RIO 3.1 is aligned with each task described in RLO 03.				
The flowchart for RIO 3.2 is aligned with each task described in RLO 03.				
The flowchart for RIO 3.3 is aligned with each task described in RLO 03.				

Appendix D-5
Delphi Survey 07 (Task D02)
Task D03: Flowchart with Content
RLO 04: Identify Kayak Orientation, Terminology, Culture & History

In order to best represent your feedback on the project, I ask that you proceed as follows:

1. Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
2. Mark the rating that most represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than [date].

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
There is a series of RIO Flowcharts with content that are aligned with RLO 04 (Objective #4): Identify Kayak Orientation, Terminology, Culture & History)				
The flowchart for RIO 4.1 is aligned with each task described in RLO 04.				
The flowchart for RIO 4.2 is aligned with each task described in RLO 04.				
The flowchart for RIO 4.3 is aligned with each task described in RLO 04.				

Appendix D-6: Delphi Survey 07 (Raw Data)

Appendix D-6:
Delphi Survey 07
Raw Data
RLO #1

Table 25
Delphi Survey 07 Raw Data RLO #1

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
Mean				12.00
Median				12.00
SD				0.00

Appendix D-6:
Delphi Survey 07
Raw Data
RLO #2

Table 26
Delphi Survey 07 Raw Data RLO #02

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
Mean				12.00
Median				12.00
SD				0.00

Appendix D-6:
Delphi Survey 07
Raw Data
RLO #3

Table 27
Delphi Survey 07 Raw Data RLO #03

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
			Mean	12.00
			Median	12.00
			SD	0.00

Appendix D-6:
Delphi Survey 07
Raw Data
RLO #4

Table 28
Delphi Survey 07 RLO #4 Raw Data

Item	SME 1	SME 2	SME 3	Total Scores
1	4	4	4	12
2	4	4	4	12
3	4	4	4	12
4	4	4	4	12
5	4	4	4	12
6	4	4	4	12
7	4	4	4	12
8	4	4	4	12
9	4	4	4	12
10	4	4	4	12
11	4	4	4	12
12	4	4	4	12
13	4	4	4	12
14	4	4	4	12
15	4	4	4	12
			Mean	12.00
			Median	12.00
			SD	0.00

Appendix E: Results

Appendix E-1: Raw Data for Student Interviews

Online Aleut Kayak Model-Building Course Interview Instrument

*Prelude**Student Identifier: E1*

Hello, this is Michael Livingston, your instructor in the model kayak class. How are you? I am conducting follow-up interviews as part of my research. I will need about 30 minutes of your time without interruptions. I need to remind you that participation is completely voluntary with no negative consequences for refusal. Is now a good time for you to be interviewed? Yes. Do you have any questions about the interview before we get started? No.

Discussion Prompt	Interviewer's Notes
Model Kayak Building	
Please tell me the most favorite thing about building your kayak.	Uhm, getting to see it when it was finished. I didn't think it would that big. I thought would be like a smaller size model of the bigger ones.
If you did not have a favorite thing, what did you like best about building the model kayak?	Uhm, the ribs. Because when you were building them, it was really hard at the end, so it was a lot of work.
Please tell me your least favorite thing about building your model kayak.	Uhm, putting on the keeler.
If you did not have a least favorite, what did you find the most difficult in building your model kayak?	Uhm, it was just the easiest part. I like, like, the hard parts on it. It was interesting.
Please tell me how the instructor could improve the model kayak course.	Uhm, it would cool if like we could put skin on it or something. So like if you put, say you could make it float and stuff.
Did you find any of the directions in the model kayak course confusing? If so, can you tell me which ones?	Uhm, no, they were all understandable.
Please tell me how you feel about the quality of the model kayak kit's pieces	Uhm, there was a lot of pieces, but good quality.
Can you tell me about any pieces that were especially difficult to put together?	Uhm, especially the ribs.
Were there any tools in the kit that were difficult to handle or use?	Uhm, no.
Please tell me how feel about the model kayak that you built.	I feel it would be cool like to build a bigger size. Oh, I feel good because it's the first time that I ever built anything built out of wood.
After you finishing your model kayak, did you show it to others? What were their reactions to your model?	I showed it to my parents. They thought it was cool. I showed it my dad first. He was surprised that I could make something like that. My mom she thought it was cool that I could make a small kayak.
Aleut Kayak Culture and History	
Please tell me what you knew about the kayak in in relation to the Aleut culture before you started this course.	Uhm, that were based on the Eskimo kayak.
Did you learn anything about the kayak and Aleut culture from elders, family, friends, or teachers before this course?	Uhm, no. I learned it from the video that we watched when we were done with the kayak.

Discussion Prompt	Interviewer's Notes
Please tell me the most interesting thing you learned about the Aleut culture and the kayak.	Uhm, that the people could live in the water if they flipped for like 40 minutes. But now we could only live for like 15 minutes.
What was the one fun thing you learned about the Aleut culture and the kayak?	Uhm, that the kayaks were really big.
Please tell me how the instructor could improve Aleut culture content.	Uhm, uh, uhm, if like, if we visit like with a whole class or something.
Did you find any of the content in the Aleut culture section confusing? If so, can you tell me which ones?	No.
Please tell me whether attending this model kayak course made you interested in learning more about the Aleut culture Aleut kayaks.	I would like to learn more about it. Uhm, like how they built their drums. How they built their baskets.
Is there one, or two, pieces of information that sparked this interest?	Uhm, no.
Aleut Kayak Online Course	
Please tell me what was good about taking the Aleut kayak model-building course through the Internet.	Uhm, it's easier because I wouldn't have to go fly down to where you live.
Can you tell me what the best thing was about the online course? <i>OR</i> Can you tell me what was the most fun about taking the online course?	Uhm, it was easy to like understand the instructions and then quit, like, it was easier to just watch the videos and then look at something on paper. Uhm, like the best thing? Uhm, uhm, watching you make the kayak.
Please tell me what you did not like about taking the Aleut kayak model course through the Internet.	Uhm, I don't think I have anything that I didn't like about it. It was all fun.
Please tell me how you feel about taking a similar type of course through the Internet in the future.	Uhm, it would be fun to like, to make another one. So I could have one as a model and I could have one to put in the water and stuff.
Would you take another online course for a skills-based building project? Why, or why not?	Yes. So like if I could do something more with it so I wouldn't mess up or break anything.
Was it convenient to have access to the course anytime you wanted?	Uhm, yeah.
If yes, can you give me an example of how it was convenient?	It was easy to get to your videos on-line.
Please tell me how you feel about the communication with your instructor through the Internet.	Uhm, it was cool because we like got to send you pictures and stuff while we were building the kayak.
Did you find it convenient to send a question or comment to your instructor through the Internet?	Uhm, yes.
What did you especially like about the communication?	Uhm, getting to send pictures.

Discussion Prompt	Interviewer's Notes
What did you especially dislike about the communication?	Uhm, not being able to talk.
Please talk to me about viewing YouTube videos in the online course.	It was good. I thought it was kinda like fuzzy. The videos weren't that good, like how you saw them.
Was it easy to view the videos? What did you like most about the videos in the course? What did you like least about the videos in the course?	Yes. Uhm, that they were easy to watch. And quick. Like the videos were fast, but they gave a lot of instruction. Uhm, you had to watch sets. It would have been better if you could watch one long video.
Please talk to me about building a model kayak without this online class.	
Would you have been able to build the model on your own? Would you have attended an Aleut culture camp to learn how to build this model? Why, or why not?	No. Yes. Uhm, it would be fun to go somewhere and do it instead.
Please talk to me about other online course experiences you have had.	
If this was your first online course, will you consider taking another online course because of your experience with the Aleut kayak model-building class? Why, or why not?	No.
Tell me how you feel about having other online courses for traditional Alaska Native crafts.	I feel good about it.
For instance, would you like to have an online course related to drum-making, or skin-sewing, or wooden hat carving, basket weaving, etc.? Are there other Alaska Native craft courses you would be interested in taking through the Internet?	Yes. Hat carving. Uhm, no. Not that I could think of.
Tell me how you feel about taking this course online versus attending a face-to-face class.	Uhm, I thought it was good.
Do you feel a face-to-face class would have been better for you? Why, or why not? Would your model kayak have turned out differently if you had attended a face-to-face class? Why, or why not?	Yeah. Uhm, it would have been easier instructions. Because it was kind of hard when you did all of the rubber band stuff and the tying. Uhm, no. I thought have been the same.
<i>Open-Ended General Prompt</i>	
What other information about your experience with this online Aleut kayak model-building course would you like to provide?	No.

Online Aleut Kayak Model-Building Course Interview Instrument

*Prelude**Student Identifier: Student E2*

Hello, this is Michael Livingston, your instructor in the model kayak class. How are you? I am conducting follow-up interviews as part of my research. I will need about 30 minutes of your time without interruptions. Is now a good time for you to be interviewed? I need to remind you that participation is completely voluntary with no negative consequences for refusal. Do you have any questions about the interview before we get started? No.

Discussion Prompt	Interviewer's Notes
Model Kayak Building	
Please tell me the most favorite thing about building your kayak.	Uh, I kind of liked the cockpit. It kind of feels like just building blocks a bit and gluing them all together.
If you did not have a favorite thing, what did you like best about building the model kayak?	Uh, I kind of liked the bow and stern. It was just pretty easy actually.
Please tell me your least favorite thing about building your model kayak.	Uh, the bow wedges, I guess. Well, they mostly keep falling off.
Please tell me how the instructor could improve the model kayak course.	Uhm, it would be a little more easier to put a little bit more glue on it.
Did you find any of the directions in the model kayak course confusing? If so, can you tell me which ones?	Well, uhm, no.
Please tell me how you feel about the quality of the model kayak kit's pieces	Pretty good.
Can you tell me about any pieces that were especially difficult to put together?	Well, it was only the bow wedges that kept falling off.
Were there any tools in the kit that were difficult to handle or use?	No.
Please tell me how feel about the model kayak that you built.	Good.
After you finishing your model kayak, did you show it to others? What were their reactions to your model?	Well, uhm, his teacher and his fellow student. And to his parents. Everyone in his class. That it was really nice. That's what they mostly said.
Aleut Kayak Culture and History	
Please tell me what you knew about the kayak in in relation to the Aleut culture before you started this course.	Uh, mostly it flipped over in the water. And a couple of the pieces were not... you ride in the cockpit. The bow and the stern.
Did you learn anything about the kayak and Aleut culture from elders, family, friends, or teachers before this course?	No. Uh, when I was writing this thing down, I was on a couple sides down, when I was writing the report.
Please tell me the most interesting thing you learned about the Aleut culture and the kayak.	Uhm, I didn't really know too much. The easy things, but not any of the hard ones.

Discussion Prompt	Interviewer's Notes
What was the one fun thing you learned about the Aleut culture and the kayak?	Uhm, well, about the kayak, it was like, after I did the report, it was really cool.
Please tell me how the instructor could improve Aleut culture content.	Uhm.... No.
Please tell me whether attending this model kayak course made you interested in learning more about the Aleut culture Aleut kayaks.	Uhm... well, kind of.
Is there one, or two, pieces of information that sparked this interest?	Well, the kayak. The only thing that was most difficult was the bow wedges because they kept falling off.
Aleut Kayak Online Course	
Please tell me what was good about taking the Aleut kayak model-building course through the Internet.	Uhm, well it talked about the dwellings and stuff and everything inside of it. Well, what was in there was really weird. Well, the only thing they had in there was people and their fish, their kayaks that they had, and their hunting stuff and everything. And the other thing was that it was underground.
Can you tell me what the best thing was about the online course?	Uh, well, the best thing was about learning all the stuff that I could write down.
Please tell me what you did not like about taking the Aleut kayak model course through the Internet.	Well, what I didn't like... I pretty much liked everything. Uhm, nothing. I liked everything.
Please tell me how you feel about taking a similar type of course through the Internet in the future.	Good.
Would you take another online course for a skills-based building project? Why, or why not?	Yeah. Because it's really fun. And after they were finished, it was cool.
Was it convenient to have access to the course anytime you wanted?	Yes. It was easy.
Please tell me how you feel about the communication with your instructor through the Internet.	Uhm, good.
Please talk to me about viewing YouTube videos in the online course.	Easy.
Please talk to me about building a model kayak without this online class.	
Would you have been able to build the model on your own?	Well, I needed a help a little bit, but it was still fun.
Please talk to me about other online course experiences you have had.	No.
Tell me how you feel about having other online courses for traditional Alaska Native crafts.	Yeah. Well, I made a drum before, but it wasn't on-line.

Discussion Prompt	Interviewer's Notes
Tell me how you feel about taking this course online versus attending a face-to-face class.	
Do you feel a face-to-face class would have been better for you? Why, or why not? Would your model kayak have turned out differently if you had attended a face-to-face class? Why, or why not?	They're kind of better because they tell you more about it than real. Well, it would be better in person. Well, I think it would be a little bit better if in person. Because a few parts look a little messed up. But it still looks great. It still looks fine.
<i>Open-Ended General Prompt</i>	
What other information about your experience with this online Aleut kayak model-building course would you like to provide?	Uhm, no, not too much. But was kind of hard to hear also [due to medical challenges which make hearing a challenge].

Online Aleut Kayak Model-Building Course Interview Instrument

Prelude

Student Identifier: E3

Hello, this is Michael Livingston, your instructor in the model kayak class. How are you? I am conducting follow-up interviews as part of my research. I will need about 30 minutes of your time without interruptions. I need to remind you that participation is completely voluntary with no negative consequences for refusal. Is now a good time for you to be interviewed? Yes. Do you have any questions about the interview before we get started? No.

Discussion Prompt	Interviewer's Notes
<i>Model Kayak Building</i>	
Please tell me the most favorite thing about building your kayak.	Uhm, I liked putting on the stringy things. It started to look like a boat when I put in the long stringy parts.
If you did not have a favorite thing, what did you like best about building the model kayak?	
Please tell me your least favorite thing about building your model kayak.	Making the bottom of the kayak. The parts did not line up on the bottom of the boat.
If you did not have a least favorite, what did you find the most difficult in building your model kayak?	Getting the bottom to look right. I don't know what I didn't do right, but it just didn't look right.
Please tell me how the instructor could improve the model kayak course.	Uhm, the directions seemed good.
Did you find any of the directions in the model kayak course confusing? If so, can you tell me which ones?	No, they weren't confusing.
Please tell me how you feel about the quality of the model kayak kit's pieces	The pieces were all there.
Can you tell me about any pieces that were especially difficult to put together? Were there any tools in the kit that were difficult to handle or use?	Putting together the bottom of the kayak was hard. No, the tools were OK.

Discussion Prompt	Interviewer's Notes
Please tell me how feel about the model kayak that you built.	It was OK.
After you finishing your model kayak, did you show it to others? What were their reactions to your model?	I showed it to my friends. They liked it.
Aleut Kayak Culture and History	
Please tell me what you knew about the kayak in in relation to the Aleut culture before you started this course.	I knew the Aleuts used kayaks for fishing.
Did you learn anything about the kayak and Aleut culture from elders, family, friends, or teachers before this course? <u>OR</u> Did you learn anything about the kayak and Aleut culture from books, magazines, the Internet, or other materials?	A little. My mom told me that Aleuts paddled kayaks. I found some videos on Youtube about Aleuts using kayaks to hunt whales.
Please tell me the most interesting thing you learned about the Aleut culture and the kayak.	That Aleuts made kayaks from driftwood they found on the beach.
What was the one fun thing you learned about the Aleut culture and the kayak?	Aleut kids learned how to make kayaks.
Please tell me how the instructor could improve Aleut culture content.	Uhm, nothing.
Did you find any of the content in the Aleut culture section confusing? If so, can you tell me which ones?	Not really.
Please tell me whether attending this model kayak course made you interested in learning more about the Aleut culture Aleut kayaks.	I want to learn how to build a big kayak.
Is there one, or two, pieces of information that sparked this interest?	Not really. Getting my model kayak made was fun.
Aleut Kayak Online Course	
Please tell me what was good about taking the Aleut kayak model-building course through the Internet.	I could get onto the course from school or home
Can you tell me what the best thing was about the online course? <u>OR</u> Can you tell me what was the most fun about taking the online course?	I liked the videos because they showed me how to put together the parts.
Please tell me what you did not like about taking the Aleut kayak model course through the Internet.	Uhm, sometimes the videos were slow, took a long time loading.
Please tell me how you feel about taking a similar type of course through the Internet in the future.	It would be ok.

Discussion Prompt	Interviewer's Notes
Would you take another online course for a skills-based building project? Why, or why not?	Yeah, I think so. I like building things.
Was it convenient to have access to the course anytime you wanted?	Yes, but sometimes I couldn't log on because I forgot my password.
If yes, can you give me an example of how it was convenient?	
Please tell me how you feel about the communication with your instructor through the Internet.	I didn't communicate with the instructor.
Did you find it convenient to send a question or comment to your instructor through the Internet? What did you especially like about the communication? What did you especially dislike about the communication?	
Please talk to me about viewing YouTube videos in the online course.	Sometimes they took a long time to load.
Was it easy to view the videos? What did you like most about the videos in the course? What did you like least about the videos in the course?	Sometimes. The videos were short, but sometimes they took a long time to load.
Please talk to me about building a model kayak without this online class.	
Would you have been able to build the model on your own? Would you have attended an Aleut culture camp to learn how to build this model? Why, or why not?	No. Yes. Culture camp sounds like fun.
Please talk to me about other online course experiences you have had.	
If this was your first online course, will you consider taking another online course because of your experience with the Aleut kayak model-building class? Why, or why not?	This was my first time. I would take another course. It was fun.
Tell me how you feel about having other online courses for traditional Alaska Native crafts.	I would like to take more courses.
For instance, would you like to have an online course related to drum-making, or skin-sewing, or wooden hat carving, basket weaving, etc.? Are there other Alaska Native craft courses you would be interested in taking through the Internet?	I would like to take wooden hat carving. No, well, maybe paddle carving.
Tell me how you feel about taking this course online versus attending a face-to-face class.	It was OK.

Discussion Prompt	Interviewer's Notes
Do you feel a face-to-face class would have been better for you? Why, or why not? Would your model kayak have turned out differently if you had attended a face-to-face class? Why, or why not?	It might have been better. Maybe I could have done a better job making my kayak.
<i>Open-Ended General Prompt</i>	
What other information about your experience with this online Aleut kayak model-building course would you like to provide?	None.

Online Aleut Kayak Model-Building Course Interview Instrument

Prelude Student Identifier: E4

Hello, this is Michael Livingston, your instructor in the model kayak class. How are you? I am conducting follow-up interviews as part of my research. I will need about 30 minutes of your time without interruptions. I need to remind you that participation is completely voluntary with no negative consequences for refusal. Is now a good time for you to be interviewed? Do you have any questions about the interview before we get started? No.

Discussion Prompt	Interviewer's Notes
<i>Model Kayak Building</i>	
Please tell me the most favorite thing about building your kayak.	Uhm, well, I really like the hands on experience that it provided. Kind of gave me an opportunity to show what I know about building things.
If you did not have a favorite thing, what did you like best about building the model kayak?	Uhm, like what steps? Or...? All right, well, I liked dry fitting all of it, kind of, what it looked like right in front of my eyes.
Please tell me your least favorite thing about building your model kayak.	Uhm, messing up on gluing. Well, uhm, like if I missed a part, I'd have to unglue it and then glue the part it. Or if I misplaced it or didn't put the glue in the right spot.
If you did not have a least favorite, what did you find the most difficult in building your model kayak?	Uhm, I thought it was pretty simple a lot of the time.
<u>OR</u> What part of building the model kayak was the most frustrating?	Uhm, probably the ribs. Because some of the material was pretty frail and it would break when I bent the wood. I'd let the reed soak in water, and it didn't get too big, so....
Please tell me how the instructor could improve the model kayak course.	Uhm, I thought that it was really easy to follow. And I didn't see anything that was wrong about it.
Did you find any of the directions in the model kayak course confusing? If so, can you tell me which ones?	Uhm, uh, no. I didn't that the directions were too unclear.
Please tell me how you feel about the quality of the model kayak kit's pieces	Uhm, I thought that the wood kept... was pretty durable and it didn't break too easily. But I thought that it was pretty unique. And it was pretty, uhm, it's cool that I got to do this experience.

Discussion Prompt	Interviewer's Notes
Can you tell me about any pieces that were especially difficult to put together? Were there any tools in the kit that were difficult to handle or use?	Uhm, string the ribs. No.
Please tell me how feel about the model kayak that you built.	I think that it's really unique and that it can help me look differently on how the Native Americans had to put up with their daily life.
After you finishing your model kayak, did you show it to others? What were their reactions to your model?	Yes. I brought it to school for a presentation. I showed it to Mr. N's 6 th hour Geography Class. About 30 students. I told them about some history about the Aleuts and how I built the kayak. And what I did to build the kayak. They thought it was pretty cool that I built a model sized kayak and the people actually rode in something that looked like it. I showed it to my close friends and family. They also felt that it was pretty cool that I could participate in something like this. My parents thought that it was pretty cool watching me put together a scale replica. My dad thought that it was pretty cool how this could really show him that I was paying attention while he was making wood things. Mom was impressed at how I could make something with my own hands. My grandparents thought that it was cool that I was kind of stepping into my dad's and uncle's footprints because when they were kids they would build things too.
Aleut Kayak Culture and History	
Please tell me what you knew about the kayak in in relation to the Aleut culture before you started this course.	Uhm, I knew that they went out in boats on water and hunted whales. From scouting activities and US history. Elementary school.
Did you learn anything about the kayak and Aleut culture from elders, family, friends, or teachers before this course? <u>OR</u> Did you learn anything about the kayak and Aleut culture from books, magazines, the Internet, or other materials?	Uhm, no. Yes, uhm, in elementary school, they gave us a picture book of Aleuts or different cultures in Alaska. And the Aleuts were in there.
Please tell me the most interesting thing you learned about the Aleut culture and the kayak.	Uhm, I thought it was cool that they could haul in large masses such as whales or uhm, on such a small boat.
What was the one fun thing you learned about the Aleut culture and the kayak?	Uhm, that they would go out and have wars in their kayaks.
Please tell me how the instructor could improve Aleut culture content.	Uhm, uh, you could, uhm, probably add an extra step on the end, as an additional step to writing the culture paper, you could put together a photo album of the Aleut culture.
Did you find any of the content in the Aleut culture section confusing? If so, can you tell me which ones?	No.

Discussion Prompt	Interviewer's Notes
Please tell me whether attending this model kayak course made you interested in learning more about the Aleut culture Aleut kayaks.	Uhm, it did. Uhm, uh, shortly after I finished with the Aleut course, Mr. N. had us do a culture report. And the culture that my group chose was the Aleuts. Four students. Uhm, we looked through the Internet and found different images from the Aleuts and different things that they would do all up there. A page and a half. About 10 minute presentation.
Is there one, or two, pieces of information that sparked this interest?	Uhm, there were multiple pieces of information that did that. Uhm, how they had multiple people could get in a kayak. And they would cooperate in getting the kayak somewhere. And how one kayak would take up so much time to make.
Aleut Kayak Online Course	
Please tell me what was good about taking the Aleut kayak model-building course through the Internet.	Well, it was easily accessible. Uhm, well, the Internet can get us places around the world in an instant.
Can you tell me what the best thing was about the online course? <i>OR</i> Can you tell me what was the most fun about taking the online course?	Uhm, it was easy to follow. The instructions were very clear. It was good that we had a video of the steps. Uhm, it gave me a challenge to build something with my own hands.
Please tell me what you did not like about taking the Aleut kayak model course through the Internet.	Uhm, sometimes the Internet would be slow and the instructions wouldn't come across as clearly.
Can you tell me what the worst thing was about taking the Aleut kayak model-building course online?	Uhm, uhm, I don't think there was something that bad to be called the worse thing.
Please tell me how you feel about taking a similar type of course through the Internet in the future.	Uhm, well, I'll be expecting something with step-by-step instructions and that it will be easy to follow as well.
Would you take another online course for a skills-based building project? Why, or why not?	Yes. Because I'm always open to learning new skills.
Was it convenient to have access to the course anytime you wanted?	Yes.
If yes, can you give me an example of how it was convenient?	Well, uhm, whenever I didn't have anything to do, I could go on-line and start building more of the kayak.
Please tell me how you feel about the communication with your instructor through the Internet.	Well, it was simple to do to communicate through e-mail and through text.
Did you find it convenient to send a question or comment to your instructor through the Internet? What did you especially like about the communication? What did you especially dislike about the communication?	Yes. It was pretty quick to respond. And get an answer. At shortest, a couple minutes. Uhm, [dislike] that it took time to get an answer back. At longest, a couple days.

Discussion Prompt	Interviewer's Notes
Please talk to me about viewing YouTube videos in the online course.	Well, uhm, they were easy to view. And you could see what you were doing at all times. You could have kind of something to go off of.
Was it easy to view the videos? What did you like most about the videos in the course? What did you like least about the videos in the course?	Yeah. Uhm, that you could see what you were doing at all times. Uhm, that it's only two-dimension.
Please talk to me about building a model kayak without this online class.	Uhm, it would be difficult without having step-by-step instructions on how to build it. And if you messed up, how to go back and change it.
Would you have been able to build the model on your own? Would you have attended an Aleut culture camp to learn how to build this model? Why, or why not?	Uhm, no. Yes.
Please talk to me about other online course experiences you have had.	I have not had any other online classes.
If this was your first online course, will you consider taking another online course because of your experience with the Aleut kayak model-building class? Why, or why not?	Yes. Uhm, because they were easy to follow and I learned skills.
Tell me how you feel about having other online courses for traditional Alaska Native crafts.	Uhm, well, they definitely will help me learn new things and I'm excited about learning new things and broadening my knowledge.
For instance, would you like to have an online course related to drum-making, or skin-sewing, or wooden hat carving, basket weaving, etc.?	Yes.
Tell me how you feel about taking this course online versus attending a face-to-face class.	Yes. Maybe igloo building.
Do you feel a face-to-face class would have been better for you? Why, or why not?	No. It felt like I was face-to-face over you tube.
<i>Open-Ended General Prompt</i>	
What other information about your experience with this online Aleut kayak model-building course would you like to provide?	That it was really fun. Uhm, it's a good way to learn a new skill.

Online Aleut Kayak Model-Building Course Interview Instrument

Prelude

Student Identifier: E-5

Hello, this is Michael Livingston, your instructor in the model kayak class. How are you? I am conducting follow-up interviews as part of my research. I will need about 30 minutes of your time without interruptions. Is now a good time for you to be interviewed? I need to remind you that participation is completely voluntary with no negative consequences for refusal. Do you have any questions about the interview before we get started? No.

Discussion Prompt	Interviewer's Notes
Model Kayak Building	
Please tell me the most favorite thing about building your kayak.	Uhm, I like the part when we were staining the model kayak.
If you did not have a favorite thing, what did you like best about building the model kayak? <u>OR</u> What part of building the kayak was the most fun for you?	We stained it light brown. 'Cause we were finishing up our kayaks, and we were getting closer to getting them finished. Uhm, putting in the stringers. Uhm, 'cause we had, like, to put it in kayak form. It had to be even and everything. We were just getting started on the boat, on the kayak.
Please tell me your least favorite thing about building your model kayak.	
If you did not have a least favorite, what did you find the most difficult in building your model kayak? <u>OR</u> What part of building the model kayak was the most frustrating?	Gluing the stringers on, making sure they fit, uhm, it was taking a little too long to dry. Uhm, I don't think anything was frustrating.
Please tell me how the instructor could improve the model kayak course.	Uhm, more things to do with the kayak. Like, some things to make it more interesting. Like making those little moving people, stuff, for it. Like the kayaker, the paddle, and the other parts.
Did you find any of the directions in the model kayak course confusing? If so, can you tell me which ones?	No. They were all right. They weren't really confusing.
Please tell me how you feel about the quality of the model kayak kit's pieces	Uhm, they were, uhm, they were good quality.
Can you tell me about any pieces that were especially difficult to put together? Were there any tools in the kit that were difficult to handle or use?	The thwarts were kinda tough. They kept on falling out. I think one with letters kept on falling out, like A B C or D [these were the thwart pieces]. But I just glued them back in, waited for them to dry.
Please tell me how feel about the model kayak that you built.	Like an average first time kayak. Could have been better, but.
After you finishing your model kayak, did you show it to others? What were their reactions to your model?	No. I kept it. Yeah. I showed it to my friends, my mom and then. They were surprised and happy for me. They said, "You did a really good job." My mom said, "it's really cool that you got to make a kayak and participate in building one."
Aleut Kayak Culture and History	
Please tell me what you knew about the kayak in in relation to the Aleut culture before you started this course.	Uhm, only things I knew is they hunted in those kayaks, and they built them and everything.
Did you learn anything about the kayak and Aleut culture from elders, family, friends, or teachers before this course? <u>OR</u>	No, yeah, I had Aleut studies for a semester. That was for 8 th grade.

Discussion Prompt	Interviewer's Notes
Did you learn anything about the kayak and Aleut culture from books, magazines, the Internet, or other materials?	
Please tell me the most interesting thing you learned about the Aleut culture and the kayak.	Uhm, they used, uhm, really intelligent parts and stuff, tools for it, like the bow and stern, stringers, to keep it together.
What was the one fun thing you learned about the Aleut culture and the kayak?	They used them for hunting and for traveling and stuff.
Please tell me how the instructor could improve Aleut culture content.	Uhm, could use a little bit too much... culture I guess, like the most important things and stuff... I don't know.
Did you find any of the content in the Aleut culture section confusing? If so, can you tell me which ones?	Uhm, no. It was very detailed and had good information.
Please tell me whether attending this model kayak course made you interested in learning more about the Aleut culture Aleut kayaks.	Uhm, when we were making the boats, it was making me more interested because it was really fun learning about culture.
Is there one, or two, pieces of information that sparked this interest?	Uhm, no, I don't think so. That part where we were making the kayaks, I was getting really interested.
Aleut Kayak Online Course	
Please tell me what was good about taking the Aleut kayak model-building course through the Internet.	Uh, it encourages us to learn how to work online courses by ourselves, like, if we take college courses online and stuff. We can learn on our own how to do it.
Can you tell me what the best thing was about the online course? <u>OR</u> Can you tell me what was the most fun about taking the online course?	Learning how important the kayaks are in Aleut culture.
Please tell me what you did not like about taking the Aleut kayak model course through the Internet.	Uhm, when we had to watch the videos.
Can you tell me what the worst thing was about taking the Aleut kayak model-building course online? <u>OR</u> Can you tell me what was the least fun about taking the Aleut kayak model-building course through the Internet?	They were taking too long to load. It was kind of frustrating waiting. They were kinda taking too long, waiting for it to load and waiting for it to load. Trying to get logged in to the course, getting logged in and stuff. You had to do it a certain way instead of a simple way.
Please tell me how you feel about taking a similar type of course through the Internet in the future.	I would feel OK if it was faster, downloading the videos was faster.
Would you take another online course for a skills-based building project? Why, or why not?	Yeah.
Was it convenient to have access to the course anytime you wanted?	Yeah, I guess so. Had to log on at school

Discussion Prompt	Interviewer's Notes
If yes, can you give me an example of how it was convenient? <u>OR</u> If no, can you give me an example of how it was not convenient?	
Please tell me how you feel about the communication with your instructor through the Internet.	I don't think we ever communicated.
Did you find it convenient to send a question or comment to your instructor through the Internet? What did you especially like about the communication? What did you especially dislike about the communication?	We never did, but, yeah. We didn't. No.
Please talk to me about viewing YouTube videos in the online course.	They were alright, slow loading.
Was it easy to view the videos? What did you like most about the videos in the course? What did you like least about the videos in the course?	They were slow loading. They were short, could watch them again. Took too long to load.
Please talk to me about building a model kayak without this online class.	
Would you have been able to build the model on your own? Would you have attended an Aleut culture camp to learn how to build this model? Why, or why not?	No, I don't think I could build a model kayak on my own without this course. It would have been too difficult on my own. Yes. That would be fun.
Please talk to me about other online course experiences you have had.	No.
If this was your first online course, will you consider taking another online course because of your experience with the Aleut kayak model-building class? Why, or why not? If this is not your first online course, how does the quality of this class compare to another course you have taken online? Can you give me an example that illustrates the difference in quality between the two courses?	Yeah. 'Cause it's really interesting and you learn about new things that you don't know.
Tell me how you feel about having other online courses for traditional Alaska Native crafts.	It would be good.
For instance, would you like to have an online course related to drum-making, or skin-sewing, or wooden hat carving, basket weaving, etc.? Are there other Alaska Native craft courses you would be interested in taking through the Internet?	Yeah. Making wooden hats. That would be fun. How to make the wooden hats and stuff. Making a blanket with a design on it.

Discussion Prompt	Interviewer's Notes
Tell me how you feel about taking this course online versus attending a face-to-face class.	OK that way. OK online. It's OK to do it online instead of having a helping person on hand. You learn how to do it by yourself.
Do you feel a face-to-face class would have been better for you? Why, or why not? Would your model kayak have turned out differently if you had attended a face-to-face class? Why, or why not?	No. I think it would kinda be the same.
<i>Open-Ended General Prompt</i>	
What other information about your experience with this online Aleut kayak model-building course would you like to provide?	No. It was just really fun and interesting.

Return to [Results for Research Question 3](#) in Chapter IV

Appendix E-2: Student Surveys

Appendix E-3: Student Surveys: Raw Data

E1

1. What is your first name?

[Re-labeled to E-1.]

2. Please select the range in which your age falls.

8 - 10 years of age

3. Please select the grade in which you are currently placed:

3rd grade level

4. Please select the category that best describes your ethnic background.

Native American

5. The model kayak arrived before the online class started.

Disagree

6. All the parts of the model kayak were contained in the kit.

Agree

7. All of the parts of the model kayak were clearly labeled.

Agree

8. The amount of time allotted for instruction was sufficient for me to learn how to build the model kayak.

Agree

9. After completing this course, I have the skills needed to build another model kayak.

Agree

10. After completing this course, I know the names of the parts of an Aleut kayak.

Disagree

11. After completing this course, I know the history of the Aleut kayak.

Agree

12. After completing this course, I know the cultural significance of the Aleut kayak.

Agree

13. Writing a paper on the kayak's importance to Aleut history and culture was important for my understanding.

Agree

14. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut culture.

Disagree

15. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut history.

Agree

16. The instructions for creating my new account in Moodle were clear.

Agree

17. Logging in to the model kayak class through Moodle was easy.

Agree

18. The positioning of items on the Moodle screen helped me to know what to access next.

Agree

19. The directions for building each section of the kayak were clearly presented.

Disagree

20. Taking digital pictures for documenting the parts of my model kayak was easy.

Agree

21. Uploading my model kayak digital pictures to Moodle for submission was easy.

Agree

22. The speed of my Internet connection did not cause a problem while using Moodle for my model kayak class.

Agree

23. There were no problems with the speed of my Internet connection while watching the instructional YouTube videos.

Agree

24. The content of the YouTube videos helped me understand the steps for building my model kayak.

Disagree

25. The video quality of the YouTube videos enhanced my understanding of the steps for building my model kayak.

Agree

26. After participating in this model kayak class, I would like to take another class that is delivered online.

Agree

27. After participating in this online class, I would like to take an advanced model kayak-building class.

Agree

28. After participating in this online class, I would like to learn more about Aleut Native culture and history.

Agree

29. After participating in this online class, I would like to take another class that uses Moodle.

Agree

30. I would want to have YouTube instructional videos in future online classes.

Agree

E2

1. What is your first name?

[Re-labeled to E2]

2. Please select the range in which your age falls.

8 - 10 years of age

3. Please select the grade in which you are currently placed:

4th grade level

4. Please select the category that best describes your ethnic background.

White

5. The model kayak arrived before the online class started.

Agree

6. All the parts of the model kayak were contained in the kit.

Disagree

7. All of the parts of the model kayak were clearly labeled.

Agree

8. The amount of time allotted for instruction was sufficient for me to learn how to build the model kayak.

Agree

9. After completing this course, I have the skills needed to build another model kayak.

Agree

10. After completing this course, I know the names of the parts of an Aleut kayak.

Agree

11. After completing this course, I know the history of the Aleut kayak.

Agree

12. After completing this course, I know the cultural significance of the Aleut kayak.

Agree

13. Writing a paper on the kayak's importance to Aleut history and culture was important for my understanding.

Agree

14. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut culture.

Agree

15. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut history.

Agree

16. The instructions for creating my new account in Moodle were clear.

Agree

17. Logging in to the model kayak class through Moodle was easy.

Agree

18. The positioning of items on the Moodle screen helped me to know what to access next.

Agree

19. The directions for building each section of the kayak were clearly presented.

Agree

20. Taking digital pictures for documenting the parts of my model kayak was easy.

Agree

21. Uploading my model kayak digital pictures to Moodle for submission was easy.

Agree

22. The speed of my Internet connection did not cause a problem while using Moodle for my model kayak class.

Agree

23. There were no problems with the speed of my Internet connection while watching the instructional YouTube videos.

Agree

24. The content of the YouTube videos helped me understand the steps for building my model kayak.

Agree

25. The video quality of the YouTube videos enhanced my understanding of the steps for building my model kayak.

Agree

26. After participating in this model kayak class, I would like to take another class that is delivered online.

Agree

27. After participating in this online class, I would like to take an advanced model kayak-building class.

Agree

28. After participating in this online class, I would like to learn more about Aleut Native culture and history.

Disagree

29. After participating in this online class, I would like to take another class that uses Moodle.

Disagree

30. I would want to have YouTube instructional videos in future online classes.

Agree

E3

1. What is your first name?

[Re-labeled to E3.]

2. Please select the range in which your age falls.

8 - 10 years of age

3. Please select the grade in which you are currently placed:

5th grade level

4. Please select the category that best describes your ethnic background.

Aleut

5. The model kayak arrived before the online class started.

Agree

6. All the parts of the model kayak were contained in the kit.

Agree

7. All of the parts of the model kayak were clearly labeled.

Agree

8. The amount of time allotted for instruction was sufficient for me to learn how to build the model kayak.

Agree

9. After completing this course, I have the skills needed to build another model kayak.

Agree

10. After completing this course, I know the names of the parts of an Aleut kayak.

Agree

11. After completing this course, I know the history of the Aleut kayak.

Agree

12. After completing this course, I know the cultural significance of the Aleut kayak.

Agree

13. Writing a paper on the kayak's importance to Aleut history and culture was important for my understanding.

Agree

14. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut culture.

Agree

15. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut history.

Agree

16. The instructions for creating my new account in Moodle were clear.

Agree	17. Logging in to the model kayak class through Moodle was easy.
Agree	18. The positioning of items on the Moodle screen helped me to know what to access next.
Agree	19. The directions for building each section of the kayak were clearly presented.
Agree	20. Taking digital pictures for documenting the parts of my model kayak was easy.
Agree	21. Uploading my model kayak digital pictures to Moodle for submission was easy.
Disagree	22. The speed of my Internet connection did not cause a problem while using Moodle for my model kayak class.
Agree	23. There were no problems with the speed of my Internet connection while watching the instructional YouTube videos.
Disagree	24. The content of the YouTube videos helped me understand the steps for building my model kayak.
Agree	25. The video quality of the YouTube videos enhanced my understanding of the steps for building my model kayak.
Agree	26. After participating in this model kayak class, I would like to take another class that is delivered online.
Agree	27. After participating in this online class, I would like to take an advanced model kayak-building class.
Agree	28. After participating in this online class, I would like to learn more about Aleut Native culture and history.
Agree	29. After participating in this online class, I would like to take another class that uses Moodle.

Agree

30. I would want to have YouTube instructional videos in future online classes.

Agree

E4

1. What is your first name?

[Re-labeled to E4.]

2. Please select the range in which your age falls.

14 - 17 years of age

3. Please select the grade in which you are currently placed:

8th grade level

4. Please select the category that best describes your ethnic background.

White

5. The model kayak arrived before the online class started.

Agree

6. All the parts of the model kayak were contained in the kit.

Agree

7. All of the parts of the model kayak were clearly labeled.

Agree

8. The amount of time allotted for instruction was sufficient for me to learn how to build the model kayak.

Agree

9. After completing this course, I have the skills needed to build another model kayak.

Agree

10. After completing this course, I know the names of the parts of an Aleut kayak.

Agree

11. After completing this course, I know the history of the Aleut kayak.

Agree

12. After completing this course, I know the cultural significance of the Aleut kayak.

Agree

13. Writing a paper on the kayak's importance to Aleut history and culture was important for my understanding.

Agree

14. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut culture.

Agree

15. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut history.

Agree

16. The instructions for creating my new account in Moodle were clear.

Agree

17. Logging in to the model kayak class through Moodle was easy.

Agree

18. The positioning of items on the Moodle screen helped me to know what to access next.

Agree

19. The directions for building each section of the kayak were clearly presented.

Agree

20. Taking digital pictures for documenting the parts of my model kayak was easy.

Agree

21. Uploading my model kayak digital pictures to Moodle for submission was easy.

Agree

22. The speed of my Internet connection did not cause a problem while using Moodle for my model kayak class.

Agree

23. There were no problems with the speed of my Internet connection while watching the instructional YouTube videos.

Agree

24. The content of the YouTube videos helped me understand the steps for building my model kayak.

Agree

25. The video quality of the YouTube videos enhanced my understanding of the steps for building my model kayak.

Agree

26. After participating in this model kayak class, I would like to take another class that is delivered online.

Agree

27. After participating in this online class, I would like to take an advanced model kayak-building class.

Agree

28. After participating in this online class, I would like to learn more about Aleut Native culture and history.

Agree

29. After participating in this online class, I would like to take another class that uses Moodle.

Agree

30. I would want to have YouTube instructional videos in future online classes.

Disagree

E5

1. What is your first name?

[Re-labeled to E5.]

2. Please select the range in which your age falls.

14 - 17 years of age

3. Please select the grade in which you are currently placed:

9th grade level

4. Please select the category that best describes your ethnic background.

Aleut

5. The model kayak arrived before the online class started.

Agree

6. All the parts of the model kayak were contained in the kit.

Agree

7. All of the parts of the model kayak were clearly labeled.

Agree

8. The amount of time allotted for instruction was sufficient for me to learn how to build the model kayak.

Agree

9. After completing this course, I have the skills needed to build another model kayak.

Disagree

10. After completing this course, I know the names of the parts of an Aleut kayak.

Agree

11. After completing this course, I know the history of the Aleut kayak.

Disagree

12. After completing this course, I know the cultural significance of the Aleut kayak.

Agree

13. Writing a paper on the kayak's importance to Aleut history and culture was important for my understanding.

Agree

14. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut culture.

Agree

15. The amount of time allotted for instruction was sufficient for me to learn about the kayak's importance to Aleut history.

Agree

16. The instructions for creating my new account in Moodle were clear.

Agree

17. Logging in to the model kayak class through Moodle was easy.

Agree

18. The positioning of items on the Moodle screen helped me to know what to access next.

Agree

19. The directions for building each section of the kayak were clearly presented.

Agree	20. Taking digital pictures for documenting the parts of my model kayak was easy.
Agree	21. Uploading my model kayak digital pictures to Moodle for submission was easy.
Agree	22. The speed of my Internet connection did not cause a problem while using Moodle for my model kayak class.
Agree	23. There were no problems with the speed of my Internet connection while watching the instructional YouTube videos.
Agree	24. The content of the YouTube videos helped me understand the steps for building my model kayak.
Agree	25. The video quality of the YouTube videos enhanced my understanding of the steps for building my model kayak.
Agree	26. After participating in this model kayak class, I would like to take another class that is delivered online.
Agree	27. After participating in this online class, I would like to take an advanced model kayak-building class.
Disagree	28. After participating in this online class, I would like to learn more about Aleut Native culture and history.
Disagree	29. After participating in this online class, I would like to take another class that uses Moodle.
Disagree	30. I would want to have YouTube instructional videos in future online classes.
Disagree	

Return to Data Analysis for Research Question 3 in Chapter IV.

Appendix E-4: Product Matrix Raw Data

Product Matrix Raw Data

Table 29

Product Matrix Raw Data from Subject Matter Expert (SME) Evaluation of Model Kayaks Produced by Online Students

Student #	Deck	Hull	Superstructure	Total
C1	1	1	1	3
C2	1	1	1	3
C3	1	1	1	3
C4	1	1	1	3
E1	1	0	1	2
E2	1	1	1	3
E3	1	0	1	2
E4	1	1	1	3

Return to Data Analysis for Research Question 4 in Chapter IV.