

Use Authorization

In presenting this dissertation in partial fulfillment of the requirements for an advanced degree at Idaho State University, I agree that the Library shall make it freely available for inspection. I further state that permission to download and/or print my dissertation for scholarly purposes may be granted by the Dean of the Graduate School, Dean of my academic division, or by the University Librarian. It is understood that any copying or publication of this dissertation for financial gain shall not be allowed without my written permission.

Signature _____

Date _____

**A Structured Approach in the Development of an Online Assistive Technology
Professional Development Training**

By

Janice D. Carson

**A dissertation
submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education in Educational Leadership
Emphasis: Instructional Technology
College of Education
Idaho State University
May 2015**

@ (2015) Janice D. Carson

To the Graduate Faculty:

The members of the committee appointed to examine the dissertation of Janice Carson find it satisfactory and recommend that it be accepted.

Dr. Jane Strickland
Major Advisor

Dr. David Coffland
Committee Member

Dr. Alan Frantz
Committee Member

Dr. Matthew Wappett
Committee Member

Dr. Corey Schou
Graduate Faculty Representative

Idaho State UNIVERSITY

Office for Research Integrity
921 South 8th Avenue, Stop 8046 • Pocatello, Idaho 83209-8046

June 3, 2014

Janice Carson
University of Idaho-College of Education
121 W. Sweet
Moscow, ID 83843

RE: Your application dated 5/30/2014 regarding study number 4111: A Structured Approach in the Development of an Online Assistive Technology Professional Development Training

Dear Ms. Carson:

I agree that this study qualifies as exempt from review under the following guideline: 1. Research on educational practices in educational settings. This letter is your approval, please, keep this document in a safe place.

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

You are granted permission to conduct your study effective immediately. The study is not subject to renewal.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; fax 208-282-4723; email: humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

University of Idaho

Office of Research Assurances

Institutional Review Board

875 Perimeter Drive, MS 3010

Moscow ID 83844-3010

Phone: 208-885-6162

Fax: 208-885-5752

irb@uidaho.edu

To: Matthew Wappett

From: Traci Craig, Ph.D.,
Chair, University of Idaho Institutional Review Board
University Research Office
Moscow, ID 83844-3010

Date: 5/30/2014 11:20:11 AM

Title: A STRUCTURED APPROACH IN THE DEVELOPMENT OF AN ONLINE ASSISTIVE
TECHNOLOGY PROFESSIONAL DEVELOPMENT TRAINING

Project: 14-269

Certified: Certified as exempt under category 1 at 45 CFR 46.101(b)(1).

On behalf of the Institutional Review Board at the University of Idaho, I am pleased to inform you that the protocol for the above-named research project has been certified as exempt under category 1 at 45 CFR 46.101(b)(1).

This study may be conducted according to the protocol described in the Application without further review by the IRB. As specific instruments are developed, modify the protocol and upload the instruments in the portal. Every effort should be made to ensure that the project is conducted in a manner consistent with the three fundamental principles identified in the Belmont Report: respect for persons; beneficence; and justice.

It is important to note that certification of exemption is NOT approval by the IRB. Do not include the statement that the UI IRB has reviewed and approved the study for human subject participation. Remove all statements of IRB Approval and IRB contact information from study materials that will be disseminated to participants. Instead please indicate, 'The University of Idaho Institutional Review Board has Certified this project as Exempt.'

Certification of exemption is not to be construed as authorization to recruit participants or conduct research in schools or other institutions, including on Native Reserved lands or within

Native Institutions, which have their own policies that require approvals before Human Subjects Research Projects can begin. This authorization must be obtained from the appropriate Tribal Government (or equivalent) and/or Institutional Administration. This may include independent review by a tribal or institutional IRB or equivalent. It is the investigator's responsibility to obtain all such necessary approvals and provide copies of these approvals to ORA, in order to allow the IRB to maintain current records.

As Principal Investigator, you are responsible for ensuring compliance with all applicable FERPA regulations, University of Idaho policies, state and federal regulations.

This certification is valid only for the study protocol as it was submitted to the ORA. Studies certified as Exempt are not subject to continuing review (this Certification does not expire). If any changes are made to the study protocol, you must submit the changes to the ORA for determination that the study remains Exempt before implementing the changes. Should there be significant changes in the protocol for this project, it will be necessary for you to submit an amendment to this protocol for review by the Committee using the Portal. If you have any additional questions about this process, please contact me through the portal's messaging system by clicking the 'Reply' button at either the top or bottom of this message.

Traci Craig, Ph.D.

To enrich education through diversity, the University of Idaho is an equal opportunity/affirmative action employer

Dedication

There are moments when *thank you* cannot fully express gratitude, and this is one of those moments. My journey to the completion of my dissertation has been long, yet I have not traveled it alone. At my side has been my best friend and husband Craig. His dedication to filling the gap of keeping our daily lives moving forward without my assistance cannot be overstated. There have been too many events we have missed while I pushed toward completion. You have been long-suffering and always gracious, Craig. I am forever in your debt and over-the-moon looking forward to the adventures you have planned for us! Jon, Beth, Jake, and Tae Hun, your patience and understanding when I missed your activities due to school and work indeed showed your loving support. We agreed in the beginning that we were in this together as a family. You held up your end of the bargain like champions! I love each of you so much!

My loving gratitude extends to the rest of my family and friends as well. You have all been there to support each step. Mom, Mom Carson, and Aunt Susan, thank you for being wonderful examples of strong women for me. Thank you, Schells, for late-night edits and encourage when I was so weary!

We are all interdependent in life; I am blessed to be surrounded by amazing family and friends who bring peace and love to the journey.

Acknowledgements

“A mentor empowers a person to see a possible future, and believe it can be obtained.”— Shawn Hitchcock

Dr. Jane Strickland, you have been my mentor and friend for so long. Your unwavering determination that I would finish gave me strength. I have grown so much professionally and personally in this journey, which I owe to you. You have my deepest appreciation.

“You gave me your time, the most thoughtful gift of all.” –Dan Zadra

Dr. Coffland, Dr. Wappett, Dr. Schou, and Dr. Frantz, thank you for the generosity of your time and wisdom. Your thoughtful input to guide me in my interpretation and analysis assisted me in looking at my research with a deeper understanding. I am grateful.

“A teacher is a compass that activates the magnets of curiosity, knowledge, and wisdom in the pupils.”—Ever Garrison

I would be remiss if I did not take a moment to thank Dr. Doty Sammons and Dr. Al Strickland. I hold your contributions to my education close to my heart. Dr. Sammons, you planted the idea of completing a doctorate. Dr. Strickland, your belief in my abilities floored me and gave me wings. Thank you all so much.

“One child, one teacher, one pen and one book can change the world.”—Malala Yousafzai

TABLE OF CONTENTS

List of Figures	xiii
List of Tables	xiv
Abstract	xvii
Chapter I: Introduction.....	1
Statement of Problem	6
Purpose of the Study	6
Research Questions	7
Research Design.....	7
Limitations	7
Delimitations.....	9
Definitions of Terms	9
Significance of Study	12
Chapter II: Review of Literature.....	14
Introduction.....	14
Assistive Technology Knowledge	14
Online Learning	19
Instructional Systems Design.....	26
Summary	35

Chapter III: Method	37
Introduction.....	37
Research Questions.....	37
Research Sample	38
Research Design.....	38
Treatment Development.....	41
Research Timeline	41
Construction of the Instructional Modules	42
Summary	61
Chapter IV: Results.....	63
Introduction.....	63
Research Questions	63
Data Sample	64
Data Analysis for Research Question One.....	65
Data Analysis for Research Question Two	73
Data Analysis for Research Question Three	91
Data Analysis for Research Question Four.....	92
Chapter V: Conclusions and Recommendations.....	96
Summary of Findings.....	96
Conclusion	107
Recommendations for Future Research	108
REFERENCES	110

APPENDICES	117
Appendix A: Pretest/Posttest Instrument & Raw Data	118
Appendix B: DELES & Raw Data.....	127
Appendix C: Focus Group Questions Based on DELES Scales & Raw Data.....	136
Appendix D: AT Plan Rubric & Raw Data	150
Appendix E: ADDIE Analyze Phase... ..	155
Appendix E-1: Tasks A01 to A03 & Raw Data.....	156
Appendix E-2: Tasks A04 to A06 & Raw Data.....	166
Appendix E-3: Tasks A07 to A08 & Raw Data.....	184
Appendix E-4: Tasks A09 to A10 & Raw Data.....	193
Appendix E-5: Task A11 Timeline.....	202
Appendix F: ADDIE Design Phase... ..	204
Appendix F-1: Task D01 & Raw Data	205
Appendix F-2: Task D02 & Raw Data	213
Appendix F-3: Task D03 & Raw Data	225
Appendix F-4: Task D04 & Raw Data	233
Appendix G: ISU & U of ID Institutional Review Board Modification Letter	237

List of Figures

Figure 1: One-Group Pretest-Posttest Design.....	7
Figure 2: Research Timeline	42
Figure 3: Instructional Sequence and Timeline	43
Figure 4: ADDIE Analysis Phase Tasks	44
Figure 5: ADDIE Design Phase.....	55
Figure 6: Domains and Delphis Design Phase.....	55

List of Tables

Table 1: Comprehensive Survey Results: Delphi Analyze Phase A01-A11	45
Table 2: Delphi Survey: Face & Content Validity Tasks A01-A03	49
Table 3: Delphi Survey: Face & Content Validity Tasks A04-A06	51
Table 4: Delphi Survey: Face & Content Validity Tasks A07-A08	53
Table 5: Delphi Survey: Face & Content Validity Tasks A09-A10	54
Table 6: Comprehensive Survey Results: Delphi Phase D01-D04.....	56
Table 7: Delphi Survey: Content & Face Validity Task D01	57
Table 8: Delphi Survey: Face Validity Task D02.....	58
Table 9: Delphi Survey: Face Validity Task D03.....	59
Table 10: Delphi Survey: Face & Content Validity Task D04.....	60
Table 11: Demographic Data for Research Sample	64
Table 12: Frequency Distribution of Teacher Pretest Achievement Scores	66
Table 13: Pretest for Module One: Items 1-5	67
Table 14: Pretest for Module Two: Items 6-10.....	67
Table 15: Pretest for Module Three: Items 11-15.....	67
Table 16: Pretest for Module Four: Items 16-20	68
Table 17: Pretest for Module Five: Items 21-25	68
Table 18: Pretest for Module Six: Items 26-30.....	68
Table 19: Pretest for All Modules (One through Six).....	69
Table 20: Frequency Distribution of Teacher Posttest Achievement Scores	69

Table 21: Posttest for Module One: Items 1-5.....	70
Table 22: Posttest for Module Two: Items 6-10	70
Table 23: Posttest for Module Three: Items 11-15	70
Table 24: Posttest for Module Four: 16-20.....	71
Table 25: Posttest for Module Five: Items 21-25	71
Table 26: Posttest Module Six: Items 26-30	71
Table 27: Posttest for All Modules (One through Six).....	72
Table 28: t-test Comparing the Means of the Pretest and Posttest Group Scores	72
Table 29: Frequency Distribution of Teacher Attitudes toward Online PD	74
Table 30: DELES Scales 1-7 Descriptive Statistics	75
Table 31: DELES Scale 1: Instructor Support Frequency Responses	76
Table 32: Focus Group Question 1 Example Quotes	77
Table 33: DELES Scale 3: Personal Relevance	78
Table 34: Focus Group Question 2 Category Example Quotes	79
Table 35: DELES Scale 2: Student Interaction and Collaboration	80
Table 36: Scale Two Responses	81
Table 37: DELES Scale 4: Authentic Learning	81
Table 38: Focus Group Question 3 Category Example Quotes	83
Table 39: DELES Scale 5:Active Learning	83
Table 40: Focus Group Question 4 Category Example Quotes	85
Table 41: DELES Scale 6: Student Autonomy.....	85
Table 42: Focus Group Question 5 Category Example Quotes.....	87
Table 43: DELES Scale 7: Enjoyment	88

Table 44: Focus Group Question 6 Category Example Quotes	89
Table 45: Frequency Distribution of AT Plan Results.....	91
Table 46: AT Plan Descriptive Statistics	91
Table 47: ADDIE Model: Analyze Phase Summary of Delphi Experts Results	92
Table 48: ADDIE Model: Design Phase Summary of Delphi Experts Results	93
Table 49: ADDIE Model: Analysis Phase Summary of Delphi Inter-rater reliability	93
Table 50: ADDIE Model: Design Phase Summary of Delphi Inter-rater reliability	94
Table 51: Tasks A01-A03: Rationale/Goal/Objectives Results	166
Table 52: Tasks A04-A06: Outcomes/Hierarchy/Influence Results	184
Table 53: Tasks A07-A08: Learner Characteristics Profile/Pedagogical Results	193
Table 54: Tasks A09-A10 Constraints/Environment & Delivery Option Results.....	202
Table 55: Task D01: Task Analysis Results	213
Table 56: Task D02: Flowcharts Results	225
Table 57: Task D03: Storyboards Results	233
Table 58: Task D04: Assessment Instruments Results	237

ABSTRACT

The purpose of this study was to determine the effectiveness of online professional development training on assistive technology by comparing knowledge acquisition through pretest/posttest scores and assessment of the participants' assistive technology implementation plans with a researcher designed rubric. The architecture for the six trainings was built using technology-based instructional modules including real-world, problem-based instruction with multimedia video and student examples. The six-week professional development course was offered by the College of Education at a public university in the intermountain western United States.

This study used a mixed methods analysis including a one-group pretest-posttest design. Specifically, the five data collection procedures were: (1) a researcher-created achievement instrument; (2) the DELES survey instrument; (3) follow-up focus group questions; (4) a researcher-created AT plan rubric; and, (5) a survey data from expert panels.

Results from the data analysis indicated there was a significant difference for the pretest and posttest conditions. The distribution of scores in the DELES, and as further communicated in the Focus Group Questions, indicated the in-service teacher participants had a positive attitude toward the online professional development course. The participants' rubric scores from their assistive technology (AT) plans (assessed post-treatment) fell within the advanced range indicating they exhibited skills in assessing and

implementing assistive technology. The development of the online training met the ADDIE criteria as validated by the SMEs and IDEs through a modified Delphi technique.

The major outcome from the study is the confirmation that the online professional development approach was an effective and much needed alternative approach to face-to-face implementation, particularly for a large geographic and rural state such as Idaho. Further, the method utilized in the training may lead to future online training for Idaho educators to fill a possible gap in teacher professional development within the State.

CHAPTER I

Introduction

The Individuals with Disabilities Education Act (IDEA) of 2004 stipulates that students on an Individual Educational Program (IEP) are to be educated with learners who are nondisabled to the maximum extent appropriate, called the Least Restrictive Environment (LRE) (34 CFR § 300.114). Further, these students must progress toward their IEP goals, which are based on content standards, and they must be involved and progress in the general education curriculum (34 CFR §300.320a4ii). This premise of inclusion and progression in general education carries into the Elementary and Secondary Education Act (ESEA), as well. Rose, Meyer, and Hitchcock (2006) explain the evolution and braiding of the two federal statutes:

The 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA) broke new ground by articulating the right of special education students to participate and progress in the general education curriculum and requiring states to evaluate such students within the same accountability systems as their peers. Four years later, the No Child Left Behind Act of 2001 (NCLB) realigned separate general and special education standards, curricula, and accountability, supporting the idea that students with disabilities, given the means, are able to interact with the general education curriculum, benefit from it, and achieve measurably improved performance. (p. 1)

Improved performance is a critical step for students with disabilities as they prepare for their post-secondary education goals. This theme is at the heart of IDEA (2004) and articulated in the purpose statement:

To ensure that all children with disabilities have available to them a free appropriate public education that emphasizes special education and related services designed to meet their unique needs and prepare them for further education, employment, and independent living. (34 CFR §300.1)

State and national level data indicate students with disabilities are included in ever increasing numbers (more than 80% of the day) in the general classroom (Data Accountability Center, 2007, 2009). At the state level, Idaho also has higher levels of inclusion, with 63 percent of students with disabilities educated in the general education classroom more than 80% of the instructional day (Idaho State Department of Education, 2010).

Although the time spent in the general education setting is increasing for students with disabilities, in order to participate in standards-based reform, they must have access to the general education curriculum (Rose, Meyer, & Hitchcock, 2006). Idaho has adopted the Common Core State Standards (CCSS) to improve academic outcomes. The hallmark of the CCSS is to provide states with a systematic K12 guideline, to prepare students for the complexity of college level content. The new standards call for increased reading levels and study skills to enable students to learn content from complex informational texts, versus the simplified narrative formats previously used (National Governors Association Center for Best Practices, & Council of Chief State School Officers, 2010a).

The Individuals with Disabilities Education Act (IDEA) of 2004 stipulates that AT must be considered in support of the functional needs of the student at each Individual Education Program (IEP) meeting. The functional need for a student with a print disability will range from physical to content access. Specifically, within the context of reading, Local Education Agencies (LEA) must provide alternate formats for students who cannot access print-based instructional materials due to blindness, a visual disability, a physical limitation, or an organic dysfunction. In all of these cases, Accessible Instructional Materials (AIM) provide the bridge with alternative formats of Braille, large print, audio, or digital text and defined within IDEA (2004). The IEP team determines if a student needs AIM.

Thus, having materials in an accessible format will allow for greater levels of independence. Materials will no longer need to be read to the student by a special education teacher, paraprofessional, parent, or peer. Further, to prepare students with disabilities for post-secondary options, as required in the CCSS, assistive technology is needed for students to access curriculum with increased reading levels and text complexity (National Governors Association Center for Best Practices, & Council of Chief State School Officers, 2010b).

Guiding the student toward the road of independence and empowerment is a key component of the secondary transition IEP meeting and the reason behind the statutory requirement of student participation. It is critical for students to understand their disability and the role of AT and, specifically, AIM in their success.

As part of the transition process, the team is able to focus on helping the student understand his/her own disability in relation to the need for print materials in accessible formats so that when the student exits special education he or she will be able to advocate for himself/herself in other settings, including post-secondary

education. At the post-secondary level, because individuals with disabilities are no longer under the entitlement of special education and related services through IDEA, they must be able to communicate sufficient information about the nature of their disability to the post-secondary institution and to request the particular aids or services that will enable them to have an equal opportunity to achieve at the same level as students without disabilities. (Karger, 2010, p. 19)

The students should guide the IEP team with regard to which AT they prefer as well as the AIM formats needed for the task or environment in which he or she is working, such as a student who is blind studying for a test: He or she may prefer both the Braille copy and an audio copy of the textbook. Not only is the student input required and critical for an AIM integrated approach, Wehmeyer and Field (2007) indicate student participation in education and transition planning are key in the development of self-determination.

Accessible instructional materials, like all items on an IEP, must be examined and engineered in the program design to meet the individual needs of the student to ensure a Free Appropriate Public Education (FAPE). Once a specialized format has been determined, an additional AT interface is often required for the student to interact with the accessible instructional material. An example is text-to-speech software interfacing with digital text. Thus, the consideration does not just stop at the AIM format; the team must also determine if additional AT devices are appropriate. Frequently, the team members, including the special education teacher, do not have the background to support these considerations (Ko, 2007; Marino, Marino, & Shaw, 2006). This is due, in part, to lack of training (Bausch & Hasselbring, 2004; Messenger-William & Marino, 2010; Sharpe, 2010). Access to this background knowledge, provided through teacher education programs, is a concern in Idaho, as well. There are nine special education programs offered in the state through colleges and universities. A review of special education

curricula indicates four of the programs offer an assistive technology course; however, only two list it as a requirement.

Until more teacher education programs require an assistive technology course, other means of training will be required. Idaho's vast geographic region makes it difficult to offer face-to-face assistive technology training across the state for special education teachers (Ludlow & Brannan, 2010). There are approximately 1,100 special education K12 teachers in Idaho who will need to be trained in the area of AT. Over the last few years, approximately 230 teachers have been introduced to AT and AIM during 45-minute presentations at conferences and within professional development; however, the expectation of the presentations was to provide awareness, not implementation techniques.

Training to meet the demands of such a large audience that is dispersed across the state will take herculean efforts. Unfortunately, due to budget constraints, face-to-face training has been, and will continue to be, limited. Further, trainers with the expertise needed in federal statute, assistive technology, and curriculum are also limited.

Considering all of these constraints, an online professional development interface seems optimal. There are many benefits to online instruction, including flexible scheduling, self-pacing, and telecommuting (Lei & Gupta, 2010; Macon, 2011). Online learning—for students and for teachers—is one of the fastest growing trends in education for integration of technology (United States Department of Education, 2010), and it holds great potential for distance learning (McCarthy & Samors, 2009). This potential for online instruction is not lost on in-service special education teachers (Jones, 2010; Ludlow & Brannan, 2010; McLinden, McCall, Hinton, & Weston, 2007).

Statement of Problem

Current educational reform includes an accountability system in which all students participate in standard based assessments. Ergo, access to the curricular content aligned to the standards is necessary for the students to learn the content in which they will be evaluated. Students with print disabilities cannot access these print based educational materials without the support of AT and AIM. The special education teacher, as the case manager, is in a position to take the lead on the IEP team to design plans that include these academic supports, although research indicates (Bausch, et al., 2004; Ko, 2007; Messinger-William, et al., 2010; Sharpe, 2010) they do not have the knowledge, skills, and abilities to facilitate this process. The result will be continued inaccessibility to curriculum and a disadvantage for high stakes testing.

Purpose of the Study

This research effort has four goals: (1) determine the knowledge acquisition level through a pretest-posttest design of AT for in-service special education teachers participating in a professional development course delivered in an online format; (2) examine the attitudes and insights of special education teachers who completed the online professional development training; (3) assess the ability of the participants to codify the AT consideration process by developing a final AT plan prototype; and (4) evaluate the compliance level for the analyze and design phases of the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model for the online training.

Research Questions

The following research questions were presented for the dissertation investigation:

1. Is there a significant difference in AT content knowledge for in-service teachers participating in an online professional development course as measured by a researcher-created pretest/posttest achievement instrument?
2. What are the attitudes of the in-service teacher participants related to the online professional development course as measured by the Distance Education Learning Environments Survey (DELES) instrument and as communicate during a post-treatment focus group session?
3. What is the ability of the in-service teacher participants, as teacher-leaders, in codifying the consideration process through the development of a systematic AT plan for a student with a disability as measured by a researcher-created rubric?
4. What is the instructional design evaluation compliance level for the Analyze and Design phases of the ADDIE instructional design model in the creation of the online AT professional development course as measured by a modified Delphi Technique?

Research Design

A single-case study design was used for this research (see Figure 1).

	Knowledge Pretest	Treatment	Assistive Technology Plan	Attitude Survey	Knowledge Posttest
Group	O ₁	X	O ₂	O ₄	O ₆

Figure 1. This graphical representation of a one-group pretest-posttest research design represents the timing during the research in which the tests, the AT Plan, and attitude survey were administered during the research (Gall, Gall, & Borg, 2003).

Limitations

A limitation is “an aspect of the study which the researcher knows may negatively affect the results or generalizability of the results, but over which he or she has no control” (Gay & Airasian, 2000, p. 625). The researcher acknowledges the following limitations of this study.

Prior Knowledge. Prior knowledge can have substantial effects on the knowledge acquisition outcomes. However, while each of the participants in the research

study had degrees or continuing education in special education, the colleges and universities vary in their provision of instruction in assistive technology. Although two institutions of higher education require an AT class, at best, others include instruction through vignettes within current courses. It is important to note, again, that the topic of Accessible Instructional Materials (AIM), which is a large portion of this training, is new under the umbrella of AT; thus, background knowledge was limited. Therefore, this was not an area of concern for the proposed study.

Sample. This study used a sample of convenience, which limited the scope for which the study can be generalized. Although the sample size was limited, there was sufficient power to distinguish effect.

Maturation. The research covered a six-week period. Due to the short research schedule, it is unlikely there was a threat due to maturation that affected the internal validity of the research. In addition, all participants were adult professionals for which physical maturation was not an issue.

Testing. There was a six-week interval between the pretest and the posttest during this research; thus, the effect on the testing instrument was reduced. Further, the test instrument used during the pretest had the questions randomly re-ordered by the learning management system software prior to the posttest to lower the influence of testing to the internal validity.

Instrumentation. This study included five types of instruments: a knowledge acquisition instrument, an online attitudinal survey, focus group questions based on the attitudinal survey, an AT plan, and Delphi surveys on the content and design of the distance-learning format. There were a total of 17 questions available for the focus

groups; six of which were initially asked, while the other 11 were available in order to seek clarification if there were negative responses within the Likert results.

The questions used to measure knowledge acquisition were developed for use in a professional development AT course. Content and face validity was established when the instrument was reviewed by content experts. The knowledge acquisition instrument contained no fewer than 26 items to improve strength (Worthen, White, Fan, & Sudweeks, 1999).

Experimental Mortality. This study centered on professional development for which participants already had an interest due to work-related duties and roles. As professional educators, it is unlikely participants will drop out of the study.

Delimitations

Delimitations are decided upon by the researcher and limit the scope of the study and affect the external validity (Creswell, 2003). The researcher controlled the following:

Population Validity. Participants were limited to in-service teachers in Idaho who enrolled in the online professional development course. It is a sample of convenience and “technically speaking we cannot generalize from a convenience sample to a population” (Johnson & Christensen, 2000, p. 174).

Definitions of Terms

Accessible Instructional Materials (AIM). “Accessible instructional materials are specialized formats of curricular content that can be used by and with print-disabled learners and include Braille, audio, large print, and electronic text” (National Center on Accessible Instructional Materials, 2011, ¶ 5).

Accessible Media Producer (AMP). “Accessible media producers (AMPs) produce specialized formats of instructional materials such as braille, audio, digital text, or large print for use by blind or other persons with print disabilities. Accessible media producers are eligible to download files directly from the NIMAC as agents of authorized users. Major AMPs supported by the U.S. Department of Education and involved in NIMAS work include the American Printing House for the Blind (APH), Bookshare, and Learning Ally (formerly RFB&D)” (National Center on Accessible Instructional Materials, 2011, ¶ 7).

ADDIE Model. “...the ADDIE model (an acronym derived from the key steps in the model: Analyze, Design, Develop, Implement, and Evaluate” (Molenda, Reigeluth, & Nelson, 2006, p. 576).

Assistive Technology (AT) Device. “Any item, piece of equipment, or product system whether acquired commercially, off a shelf, modified, or customized that is used to increase, maintain, or improve the functional capabilities of a student with a disability. Excludes surgically implanted medical devices” (Idaho State Department of Education, 2007, p. xii).

Free Appropriate Public Education (FAPE). “A basic IDEA 2004 requirement which states that special education and related services are provided at public expense (free); in conformity with an appropriately developed IEP (appropriate); under public supervision and direction (public); and include preschool, elementary, and secondary education that meets the education standards, regulations, and administrative policies and procedures issued by the State Department of Education (education)” (Idaho State Department of Education, 2007, p. xix).

Least Restrictive Environment (LRE). “The IDEA 2004 requirement that students with disabilities, including those in public or private institutions or other care facilities, be educated with students who are nondisabled to the maximum extent appropriate (Idaho State Department of Education, 2007, p. xxiii).

Individualized Education Program (IEP). “A written document (developed collaboratively by parents and school personnel) which outlines the special education program for a student with a disability. This document is developed, reviewed and revised at an IEP meeting at least annually” (Idaho State Department of Education, 2007, p. xxi).

Instructional Design (ID). “Instructional Design is a construct that refers to the principles and procedures by which instructional materials, lessons, and whole systems can be developed in a consistent and reliable fashion “(Molenda, Reigeluth, & Nelson, 2006, p. 574).

Multimedia Learning. “Multimedia learning occurs when students use information presented in two or more formats—such as a visually presented animation and verbally presented narration—to construct knowledge” (Mayer & Sims, 1994, p. 390).

National Instructional Materials Access Center (NIMAC). “The National Instructional Materials Access Center (NIMAC) is a central national repository established at the American Printing House for the Blind (APH) to store and to maintain NIMAS filesets [sic]. It features an automated system for allowing publishers to deposit NIMAS-conformant files within the repository. Files are checked to confirm that they are valid NIMAS-conformant files and then cataloged in a web-based database. Those who

have been authorized for access have user identifications and passwords. These authorized users may search the NIMAC database and directly download the fileset(s) [sic] they need to convert into accessible instructional materials for those students who are in elementary and secondary schools and have qualifying disabilities” (National Center on Accessible Instructional Materials, 2011, ¶ 55).

National Instructional Materials Access Standard (NIMAS). “NIMAS refers to a technical standard used to produce XML-based source files. From these well-structured source files, accessible, student-ready alternate-format versions of textbooks and core materials (e.g., Braille, e-text, Digital Talking Book, large print, etc.) can subsequently be created and distributed to qualified students with print disabilities. NIMAS files are not student-ready versions. IDEA 2004, P.L. 108-446, establishes the NIMAS as a national standard and requires states and local districts to adopt the NIMAS for providing textbooks and instructional materials to students who are blind or print-disabled” (National Center on Accessible Instructional Materials, 2011, ¶ 56).

Significance of the Study

It is estimated by the United States Department of Education, Office of Special Education Programs (OSEP), that approximately 40% of students in the United States with disabilities have a print disability and qualify as copyright exempt (J. Zabala, personal communication, June 27, 2011). These students need accessible instructional materials to support their progress in the general education curriculum. In Idaho, this affects approximately 11,000 students, who, according to OSEP, would qualify to have their curriculum obtained, without charge to the district, through the National Instructional Materials Access Center (NIMAC). The NIMAC is a national repository of

curriculum files that are produced by publishers following the National Instructional Materials Standard (NIMAS). These are not student ready files; but, because they are developed using the NIMS layout, they can be quickly converted into accessible formats. In order to access the files from the NIMAC, the local education agency must contact one of the State's Accessible Media Producers (AMP) who works as a "middle man" to contact the repository to request the files. The AMP converts the files into the desired student-ready AIM format prior to sending it to the district. The Idaho State Department of Education has designated *Bookshare* and Idaho Education Services for the Deaf and Blind (IESDB) as the main AMPs for local agencies to access instructional materials. Of the approximately 11,000 students with disabilities who would qualify as print disabled, there are only about 1,000 in Idaho registered as a member of *Bookshare* (K. Cohen, personal communication, April 15, 2014).

The special education teacher, as the case manager, is in a position to take the lead in considering AT; yet research indicates they are lacking the background necessary to provide oversight in this process. In this study, which included educational professionals, there was an examination of learning outcomes and attitudes toward online professional development to assist in a statewide scale-up in this critical and growing area of equitable education for all Idaho students with disabilities served under the umbrella of IDEA (2004).

CHAPTER II

Review of Literature

Introduction

The purpose of this study was to develop an effective online learning environment in which to conduct training for special education teachers. This study analyzed the effectiveness of learning outcomes for professional development on assistive technology, the ability of participants to codify a systematic AT consideration process, and the attitudes toward online instruction. This training was created using the instructional design model ADDIE (Analyze, Design, Develop, Implement and Evaluate) (Gagné, Wager, Golas, & Keller, 2005).

The following review of literature serves as the blueprint in the construction of this study and investigates (a) assistive technology knowledge, (b) online learning, and (c) instructional systems design.

Assistive Technology Knowledge

The definition of assistive technology is broad: “Any item, piece of equipment, or product system whether acquired commercially, off a shelf, modified, or customized that is used to increase, maintain, or improve the functional capabilities of a student with a disability...” (Idaho Special Education Manual, 2007, p. xii).

The Individuals with Disabilities Education Act (IDEA) of 2004 stipulates that assistive technology (AT) must receive “special consideration” in that the Individual Education Program (IEP) team must examine the use of AT devices and services to

support the needs of the student in an intentional way. The task of considering assistive technology can only be accomplished when there is a member of the IEP team who is knowledgeable about AT and recognizes an assessment is needed. Nelson (2006) explains it like this:

Teacher candidates need a background in the range of devices and services that are available. They should be well versed in the legal parameters of the provision and use of AT and have experience in bringing AT considerations into the IEP process. (p. 486)

Although this knowledge is imperative, Bausch and Hasselbring (2004) affirm that there is “a shortage of school personnel trained to make AT recommendations or provide the necessary support when an AT device is adopted” (p. 101).

As mandatory members of the IEP team, general educators participate in the decision-making process, including consideration of AT. Researchers Jost and Mosley (2011) examined the AT knowledge of 224 general education preservice and inservice teachers participating in ten different teacher education courses. The self-reported Likert survey measured three types of knowledge levels: “awareness, working knowledge, and transformative practice” (p. 5). Of the 224 participants, 144 worked in schools, while 80 were in preservice programs. The first level, awareness, included six items to determine the participants’ understanding of AT devices, services, and legal mandates. The results indicated 81.7% of the participants rated themselves from “Not At All” to “Somewhat” on their awareness of AT devices and services. Further, when asked about legal obligations in State and Federal statutes, 67.9% of the respondents indicated an awareness level from “Not At All” to “Somewhat.” The researchers included seven items within the “working knowledge” section of the survey. When questioned about their confidence to consider AT within the IEP framework, 83% indicated their ability levels

were from “Not At All” to “Somewhat.” In addition, when queried about their “working knowledge” of AT to the extent they could participate in an evaluation process, 81.7% rated their abilities from “Not At All” to “Somewhat.” In the final level, “transformative use of assistive technology,” seven survey items measured teachers’ attitudes toward the need to use AT to support students with disabilities for access and function within the curriculum. When asked if school personnel must help match students with disabilities to the appropriate AT, 70.1% indicated agreement to the statement by choosing “A lot” or “To a great extent” on the survey. Further, when asked if they believed students must have access to AT if it can help them access the curriculum, 66.9% indicated agreement with this statement with a choice of “A lot” or “To a great extent.” The study indicated teachers believed using AT was important if it could assist the students in accessing the curriculum; however, they did not feel they had the knowledge, skills, and abilities to participate in the decision making process of considering AT during the IEP meeting. The researchers (Jost et al., 2011) explain it like this:

Our findings show that both preservice and inservice teachers have moderate awareness of AT, low levels of working knowledge, but high degrees of interest and openness to AT, which has implications for teacher education, teacher professional development, and potential to handle the needs of struggling learners. (p. 12)

In another study, Ko (2007) surveyed 1,050 IEP team members who worked in 3rd to 5th grade programs. The participants included school administrators, general education teachers, special education teachers, diagnosticians, and speech/language pathologists from three districts in the southern United States. The data were analyzed using Multivariate Analysis of Variance (MANOVA) and Tukey’s HSD. The study examined the participants’ knowledge level in four focus areas, which included both the

characteristics of learning disabilities and the AT statute, devices, and services. A Likert survey served as the research instrument and included four response options: 1) Not Knowledgeable; 2) Somewhat Knowledgeable; 3) Knowledgeable; and 4) Very Knowledgeable. In each of the four focus areas, special education teachers were found to be significantly higher in their knowledge level than any of the other groups; however, as a whole, the participants rated themselves at the “somewhat knowledge” level for each of the focus areas.

The previous studies (Ko, 2007; Jost et al., 2011) indicate many of the IEP team members do not generally have the background necessary to consider AT devices and services during the IEP meeting for their students with disabilities. However, when considered separately, special education teachers seem to have a “somewhat” stronger background than other education professionals. Further, due to their academic focus, special education teachers should be in the position to take the AT leadership role for the team. Yet in an exploratory study (Marsters, 2011), 42 randomly selected special education professionals were surveyed to determine if they have the knowledge and skills necessary to implement AT and AT services. A self-reported, web-based questionnaire was administered and analyzed using descriptive and inferential statistical techniques. The participants were separated into four groups: (1) special education teachers who work with students with emotional impairment or mild to moderate disabilities; (2) occupational and physical therapists; (3) preschool and special education teachers who work with students with moderate to severe disabilities; and (4) speech and language pathologists. The results indicated that the special education teachers lack essential AT skills and knowledge. Further, although the related service providers, occupational

therapists, physical therapists, and speech and language providers have AT knowledge specific to their profession, the quality and depth of AT knowledge were limited. This study, like previous research, indicated the need for training.

The research, from this review of literature, indicates inservice special education teachers have a limited background in assistive technology, and there is a need for professional development. A national study of special education teacher preparation programs (Judge & Simms, 2009) sheds some light regarding the reasons teachers are completing their formal educations without the knowledge and skills they need to fulfill the federal mandate in IDEA. This research focused on 375 publicly funded institutions of higher education in all 50 States that offered undergraduate and graduate degrees in special education with initial certification. A random stratified sample of programs was selected across urban, suburban, and rural areas from each state from the National Clearinghouse for Professionals in Special Education online database. Using contact information for 40%, or 162 programs, the researchers conducted an archival document analysis of the websites of the selected programs being used by collecting and reviewing the plans of study. If the plan was not available online, the course catalog was reviewed. Interrater reliability was established at 100%. Further, a random sample of 20%, or 32 of 162 programs, from which data were collected, verified the accuracy of the data listed on the Internet. Only 4 of the 32 programs indicated the data needed updating. The results indicate approximately one third of undergraduate special education licensure programs and less than 25% of master's degree programs require AT course work. The researchers summarize their study as follows:

The findings from this study indicate that AT training at the pre-service level may not be adequately addressed. The call is for special education university programs

to address AT competencies, because otherwise, it is questionable whether the consideration mandate of IDEA is going to be met. (p. 43)

Online Learning

Research indicates special education teachers need access to training to enable them to take the leadership role of considering AT during the IEP meeting (Bausch & Hasselbring, 2004; Messinger-William & Marino, 2010; Sharpe, 2010). Since access to this content knowledge is not occurring consistently at the preservice level (Judge et al. 2009), a logical answer to close this knowledge gap is a distance learning format in which educators have access to a just-in-time format (Jones, 2010; Ludlow & Brannan, 2010; McCarthy & Samors, 2009; McLinden, McCall, Hinton, & Weston, 2007).

Courses. There are over 6.1 million students taking at least one online course (Allen & Seamons, 2011). But, are online courses a viable environment for learning? Researchers (O'Brien, Hartshorne, Beattie, & Jordan, 2012) compared three sections of an introduction to special education course for preservice teachers: (1) a traditional large lecture class, (2) a fully online asynchronous course, and (3) a hybrid course with lecture and asynchronous instruction. There were 297 students distributed throughout the three sections with 159 in the traditional lecture section, 69 in the online section, and 69 in the hybrid section.

The fully online section, presented using the Blackboard learning management system (LMS), paralleled the face-to-face course through the implementation of online technologies, such as weekly quizzes, interactive discussions, learning modules with notes, and archived video of traditional lectures. The hybrid section employed the same online technologies except the traditional lecture presentations were not recorded. The

researchers collected data on course performance data, instructional effectiveness, and perceptions of preparedness as a future special education teacher.

During the final week of class, students received a 12-item, 5-point Likert-type survey to measure their perceptions toward being prepared as a future special education teacher. There was an overall response rate of 82%. Further, during the week of final exams, a semi-structured survey was conducted across three focus groups comprised of a targeted sample of students in each section, which was reflective of the typical student composition.

A series of univariate ANOVAs for the survey items was completed to determine statistically significant differences and a Scheffe post hoc analysis was used to look for significant main effects. Additionally, the researchers compared the final course grades. The results of the data analysis indicate students in “both the traditional and hybrid classes reported significantly greater levels of confidence in their future work with students with disabilities” (O’Brien et al., 2012, p. 26). The survey items, which measured effectiveness of mode of instruction, did not indicate a level of significance; however, the online “class reported significantly higher perceptions of flexibility for adapting the course to their personal schedules compared to students in the lecture class” (p. 26).

Finally, in all three sections – lecture, hybrid, and online – over 90% of the students completed the course satisfactorily in order to progress in the teacher education program with levels at 91.8%, 97.1%, and 94.2%, respectively. In addition, approximately 60% of the students received A’s in all three sections. At the conclusion of the study, the researchers (O’Brien et al., 2012) provided the following footnote:

In an era of rapidly growing technology, increased communication options broaden the capabilities for teaching and learning around the globe. The desire for options on the part of students also should create options for teacher educators, both in teaching and research. (p. 30)

Researchers Means, Toyoma, Murphy, and Baki (2013) conducted a meta-analysis aimed at developing a synthesis of 45 studies, which contrasted learning outcomes of the face-to-face classroom instruction to fully online courses, as well as face-to-face to hybrid courses. The studies in the research included experimental and quasi-experimental designs, controlling for preexisting group differences. Researchers only analyzed effects based on objectives and direct measures of learning and discarded all effects based on satisfaction, attendance, or perceptions of learning. The effect estimate was “determined by using the estimated standard error of the mean to calculate the 95% confidence interval for each effect” (p. 17). However, during the data extraction phase the researchers found some of the studies did not provide sufficient data to calculate effect size.

To avoid eliminating the studies, since some were quite large, the analysts used a “conservative estimate of the pretest-posttest correlation ($r = .70$)” (p.17). Further, in studies in which the pretest was the same measure as the posttest, the researchers used a correlation of ($r = .50$). These effect sizes were coded as “estimated effect sizes” (p.17). The overall finding of the research indicated online learning, face-to-face, and blended learning produce stronger student learning outcomes compared to solely face-to-face instruction with a mean effect size of $+0.20$, $p < .001$. The researchers (Means et al., 2013) explain it like this:

The corpus of 50 effect sizes extracted from 45 studies meeting meta-analysis inclusion criteria was sufficient to demonstrate that in recent applications, purely online learning has been equivalent to face-to-face instruction in effectiveness,

and blended approaches have been more effective than instruction offered entirely in face-to-face mode. (p. 35)

The same conclusions were found by O'Brien et al. (2012) with teacher education candidates. When measuring their attitudes toward learning environments, the online participants reported significantly higher levels of satisfaction, due to the flexibility of adapting the course to meet their personal schedules. This research begins to build a foundation for this study, which asserts both distance and face-to-face options are viable environments for learning; however, posing the same question of viability toward professional development is the next layer in the instructional environment discussion for this review of literature.

Professional Development. Teacher training presented as professional development versus a full academic course has also carved out an online presence. Fishman et al. (2013) compared online and face-to-face professional development designed to facilitate the adoption of new curriculum materials, and found the online modality an effective means to deliver instruction. The study measured teacher knowledge, beliefs, and student learning outcomes with 49 secondary teachers from across the country who were randomly assigned to the face-to-face or online condition with 24 and 25 teacher participants, respectively. The average number of students in each teacher participant's classroom was 23, with a total of 1,132 in all, 522 face-to-face and 610 online. The research included 45 schools from urban ($n = 6$), suburban ($n = 22$), and rural ($n = 17$) areas.

A pre- and posttest model was employed to measure teacher content knowledge in environmental science through a 25-item assessment. The pretest/posttest data indicated an increase in content knowledge for both the online and face-to-face conditions. A self-

efficacy survey instrument, focused on teaching in the content area, was also employed with a pre and post treatment. The results indicated teachers in both groups believed their ability to teach environmental science had increased, post training. Student learning was measured by using a 29-item multiple-choice content assessment. Teachers administered the test prior to and immediately after the instruction. Students in the online group gained an average of three points; the students in the face-to-face group gained an average of two points from pre to post. It is important to note that, although the data from the three instruments did not indicate statistical significance toward the online format, the results from each instrument indicated an increase in either content knowledge or self-efficacy for participants in both the face-to-face and online conditions.

Fisher, Schumaker, Culbertson, and Deshler (2010) examined knowledge acquisition and satisfaction for teachers participating in a virtual workshop (experimental group) and an actual workshop (control group) focused on an instructional practice. A total of 59 teachers participated, with 30 teachers placed into the experimental group and 29 into the control group. All of the instructional materials were the same for both workshops. Using a pretest/posttest design, the researchers tested teacher knowledge using two instruments: a seven-item short-answer questionnaire and a 26-item concept diagram. The pretest/posttest scores for the seven-item indicated significance $t(28) = -29.67, p < .00$. The pretest/posttest scores for the virtual workshop (experimental group) also indicated significance $t(29) = -35.15, p < .00$. Posttest scores between the actual and virtual groups did not indicate significance. The second instrument, the Concept Diagram, was scored on 22 items. A percentage for each participant was calculated for this instrument. The pretest/posttest data indicated significance within groups; however,

when employing an ANCOVA, significance was not found between groups. The data from this study found there was not a significant difference between groups on either instrument, indicating both learning environments were viable options for this professional development.

Russell, Carey, Kleiman, and Venable (2009) compared the effects of mathematics professional development delivered in an online and face-to-face format. They examined the changes in teachers' pedagogical beliefs, instructional practices, and understanding of content concepts. A total of 6 sections of the course were delivered, three online and three face-to-face. Three facilitators with content-area expertise each taught one online section and one face-to-face section. The participants were K12 mathematics teachers who taught in grades first to fifth and were stratified by geographic location and gender and assigned to either an online or face-to-face group. Five instruments were employed for data collection: (1) a background survey; (2) a pedagogical beliefs and practices survey; (3) mathematics understanding; (4) a student survey; and (5) a teacher log. The results from all five instruments indicated significance within each group but not between the groups. The researchers summarize the study like this:

The study presented here compared the effects that a face-to-face and an online version of the same course had on the intended outcomes of that course. For both versions, participants engaged in the same reading material, learning activities, writing assignments, and instructional activities in their own classrooms. The length of the course was also the same across both conditions (8 weeks) and the level of participation and interaction among participants was designed to be equivalent. The fundamental difference between the two versions was the medium in which participants interacted with each other and their facilitator, namely face-to-face or online. The intended learning outcomes of both courses were identical. (p. 83)

The previously reviewed research (Fishman et al., 2013; Means et al., 2013; O'Brien et al., 2012; Russell et al., 2009) did not find differences between learning outcomes for online and face-to-face training.

Gaumer Erickson, Noonan, and McCall (2012) found similar results when they analyzed learning solely focused on the online environment. More specifically, the researchers explored the effect of asynchronous online professional development for 86 special education teachers. They compared the results between participants from rural and non-rural settings. Researchers began the discussion of their results by explaining:

In rural schools, it is particularly difficult for special educators to access and implement research-based practices due to a lack of professional development and limited interactions with colleagues with expertise. Online professional development can alleviate these challenges by virtually connecting rural special education teachers with both higher education institutions and rural peer teachers as they learn about, discuss, and implement research-based strategies. (p. 23)

The researchers used a variety of measures to collect data, including: (a) a demographic survey; (b) competency pre/post survey; (c) quality indicators of transition status; (d) goal attainment scaling; (e) case-based learning pre/post assessment; and (f) a satisfaction survey.

Prior to training, educators were asked to rate their competency on transition-related skills using a 4-point Likert scale. The participants (all from rural areas) rated themselves significantly lower than the non-rural participants; however, there was not a difference in post-competency levels. On the next measure, teachers focused on local need and developed an improvement goal based on the secondary transition quality indicators. After the teachers implemented improvement activities to support their goals, they completed an outcomes analysis employing a goal attainment scale. The results indicated all the educators from both groups made progress on their goals. Further, the

case-based learning pre/post assessment data indicated there was a significant increase in knowledge within groups; however, there was not a difference between groups. Finally, at the end of the professional development, the rural educators reported high levels of satisfaction with the online professional development as measured on a 5-point Likert scale and on an open-ended question; example response indicated here:

I think that online learning is a wonderful avenue for college students to continue their educational experience, especially for nontraditional, professional, working students, like myself, who live in rural areas that do not have convenient access to universities and [who] are unable to commute. (p. 30)

Instructional System Design

The summation of the previous research indicates that online instruction is an equitable, positive, and convenient format for learning. These studies lay the critical cornerstone in the foundational argument that an online format is a viable option for just-in-time learning for educators. Thus, this study will shift from looking at differences between groups and look specifically at the learning outcomes of educators when the professional development is analyzed, designed, developed, implemented, and evaluated using an instructional system design (ISD) model, which is “built on the profound understanding of how people learn” (Fang, Zheng, Hu, & Shen, 2011, p. 1542). Briggs (1977) supports this with a definition of ISD as:

A systematic approach to the planning and development of a means to meet instructional needs and goals; all components of the system are considered in relation to each other in orderly but flexible sequence of processes; the resulting delivery system is tried out and improved before widespread use is encouraged. (p. xxi)

The implementation roots for ISD are grounded in the military, which then moved into the business and education arenas (Richey, Fields, & Foxon, 2001), with the genesis conceptually coming out of General Systems Theory (Von Bertalanffy, 1972).

ADDIE. There have been many ISD models developed throughout the years (Richey, Fields, & Foxon, 2001); however, this study will employ the ADDIE (Analysis, Design, Develop, Implement, and Evaluate) model, which has been successfully used in education research (Jones, 2013; Richey, Fields, & Foxon, 2001; Shibley, Amaral, Shank, & Shibley, 2011).

Administrators, at rural community college, determined their process to prepare incoming students for an online course was not robust enough to meet their needs (Jones, 2013). Through the guidelines of the ADDIE model, a mandatory online training was developed and implemented. In the Analyze phase, the researcher, through an evaluation of faculty, staff and students, discovered that although the voluntary face-to-face training, used historically, included all the correct information, the delivery method presented two problems: (1) the training completed in the college's computer lab with software-updated computers did not mirror home computers not ready for the online interface; and (2) a lecture format presentation did not prepare the students for the self-guided online experience awaiting them. The Design phase provided the following three solutions to meet the students' needs to prepare for their first online course: (1) orientation training was mandatory; (2) it was self-paced with 10-interactive learning modules; and (3) the students completed a cumulative final in which they had unlimited opportunities to reach the final required score of 80%. After implementation, the researchers analyzed the final data during the Evaluation phase, which included a student survey, Online Help Desk information, and retention rates for online courses. The post student survey data indicated over 86% of the students felt: (a) the orientation was helpful; (b) confident to very confident that their computers were updated and ready for their online course; (c)

confident to very confident in their understanding of how to be successful in an online course; and (d) confident to very confident in their ability to navigate the college's learning management system (LMS). Further, the online retention rates improved from 72% to 84%, and the need for students to access course support via the Online Help Desk was reduced.

In a second educational study, the ADDIE model "was applied to help redesign a General Chemistry course to improve student success in the course" (Shibley et al., 2011, p. 80). The need for the redesign was discovered during data analysis of the college's courses by the administration, and indicated this first-semester, multi-sectional, chemistry course had the lowest average grades. Six professionals – two chemistry faculty, the Center for Learning and Teaching director, an instructional designer, a multimedia specialist, and the Planning, Research, and Assessment director – were given the task by the administration to redesign the course. During the Analysis phase, the team analyzed student learner characteristics and identified learning objectives for the course. The learning objectives were shared among other chemists at the college to arrive at an agreed upon set of learning goals. Once they reached consensus, the team focused on identifying the objectives in which students struggled by means of an analysis of previous course assessment results.

In the Design Phase, although the team recognized that blended courses often have very limited face-to-face time, they maintained a 25% ratio of in-class time because the subject matter was difficult. The online course materials included multimedia videos and animations specifically to support the challenging curricular concepts. In addition, the Shibley et al. (2011) team included a content guide to organize the material for

students as they moved through concepts, which were first introduced online and then with follow-up activities in class. The guide also included interactive curricular content, such as 3-5 minute mini-lecture podcasts, graphics, tutorials, and weekly quizzes.

The Shibley et al. (2011) researchers' Implementation Phase included 15-sections with approximately 65 students per section. The team decided to maintain the same grading system that had already been in place prior to the changes.

Finally, in the Evaluation Phase, Shibley et al. (2011) calculated the grade point average (GPA) of all sections from over a 7-year period. The data included 5 years of GPA data from the original course prior to the redesign, and 2 years of data from the hybrid redesigned course. Using an independent samples z -test, students in the blended format had a significantly higher GPA (2.15) than did those in the old lecture format (1.77 GPA, $p = .000$). Finally, on an end-of-course survey, the students were asked if the blended design was effective in helping them to understand course concepts; 90% marked either "strongly agree" or "somewhat agree" on a 5-point Likert-type scale. Because of the results, the researchers indicated the course will continue to be taught following the redesigned hybrid format. The researchers explain it like this:

Most of the course was altered by applying the ADDIE model, including the creation of online class guides, associated learning objects (multimedia course content resources), and collaborative base groups. The design elements seemed to work synergistically; the use of class guides allowed the instructor to move lecture content online and freed up class time to allow students to work collaboratively in the classroom. (p. 84)

Delphi. The data from the previous studies (Jones, 2013; Shibley et al., 2011) indicate the redesign of courses using the ADDIE model increased student performance and comfort with online learning. It is interesting to note that the second study (Shibley et al., 2011) detailed the implementation of an interdisciplinary team, which included

subject matter and instructional design experts. The collaboration with SMEs and IDEs to develop higher education distance learning courses is growing traction across the country (Moulton, Strickland, Strickland, White, & Zimmerly, 2010). Formalization of expert opinions in the instructional design process can be done through the use of the Delphi technique. Nworie (2011) describes it like this:

The Delphi Technique is a research methodology that is used to elicit, distill, and determine the opinions of a panel of experts from a given field, seek consensus among the experts, and make predictions or decisions using the expert opinions of the panelists involved in the study. The Delphi Technique also highlights areas of divergence of opinions. This research methodology is based on the premise that the collective opinions of expert panelists are of richer quality than the limited view of an individual. (pp. 24-25)

However, what does formalization of a Delphi Technique and instructional design look like? In the first study, Strickland, Moulton, Strickland, and White (2010) harnessed the collective opinions of expert panelists in the Delphi technique. Their goal was to demonstrate how this research methodology can be used as an evaluation tool to improve the design of an e-learning curriculum. “To demonstrate the diversity and robustness of the Delphi Technique process, five studies were selected that range from fashion design forecasting to the online development of an introduction to dance” (p. 2203). The researchers examined the Delphi technique within each of the five projects as a method to establish face and/or content validity of the analyze phase in the ADDIE instructional design method. “Inter-Rater reliability was established for each study” (p. 2203).

In the first project, (as cited in Strickland et al., 2010) following the ADDIE model, Lin (2007) created a Multimedia Assisted Learning (MAL) module to assist undergraduate fashion design students in improving their fashion performance portfolios. The researcher employed a 24-item Delphi Survey instrument, with a forced choice four

point Likert scale so 13 SMEs could evaluate each student's Fashion Design Performance Assessment (FDPA) in six areas. The mean of the Interclass Correlation Coefficient was determined for the 24 items on the survey. The inter-rater reliability for the six areas included a mean that ranged from .883 to .941.

In the second project, Springer (2002) (as cited in Strickland et al., 2010) developed an e-learning curriculum to train preservice teachers how to create metric area units and employed five SMEs to evaluate the content. In the implementation pilot study, a 25-item achievement test yielded a reliability of .65. Further, five IDEs used a 4-item, Likert-type format instrument as part of a Delphi technique "to assess the degree to which the ADDIE instructional design process was followed" (p. 2207). The mean value for the five IDEs across all five phases of the ADDIE model was 3.874 with a standard deviation of .14. "The Interclass Correlation Coefficient statistical method was computed for all 19 items; the mean inter-rater reliability was 0.948" (p. 2207).

In the third project, Lee (2005) (as cited in Strickland et al., 2010) evaluated the effectiveness of three-dimensional spatial relational concepts in a sculpture curriculum for college freshmen art students. Following a Delphi Technique, seven IDEs evaluated "the degree to which all five phases of the ADDIE model were followed" (p. 2208). The Delphi survey instrument was in a 4-item, Likert-type format. The mean value for the survey was 3.972, with a standard deviation of .07. "The Interclass Correlation Coefficient statistical method was computed for all 26 items, and the mean inter-rater reliability was 0.987" (p. 2208).

In the fourth project, Kuo (2008) (as cited in Strickland et al., 2010) examined the performance attitude of hotel personnel in an e-learning training course; the ADDIE

model was followed. Using two 4-item Likert surveys, a Delphi technique was employed with IDEs to assess the degree to which ADDIE was followed and with SMEs to analyze content. The mean value for the IDEs was 3.741, with a standard deviation of .10. “The Interclass Correlation Coefficient statistical method was computed for all items evaluated by the five experts; the mean inter-rater reliability was 0.908” (p. 2208). The mean value for the SMEs was also computed across each of the four domains, and they ranged from 3.26 to 3.98. “The Interclass Correlation Coefficient statistical method was computed for all 60 items (60 subjects) and five experts on the Delphi survey instrument, and the mean inter-rater reliability was 0.845” (p. 2208).

In the fifth project, Zimmerly (2010) (as cited in Strickland et al., 2010) utilized the ADDIE model to create online instructional modules for dance curriculum. The SMEs and IDEs utilized a Delphi technique to evaluate documents created for 14 tasks for the analyze phase to determine content and face validity. The 14 tasks were evaluated through five survey instruments, which each used a four-point Likert scale. “The Interclass Correlation Coefficient statistical method was computed for all 22 items on the Delphi 01survey instrument, and the mean inter-rater reliability was 0.821” (p. 2209). The inter-rater reliability the four remaining survey instruments included a mean that ranged from 0.947 to 0.999.

Looking back at the Strickland et al. (2010) study’s goals, the researchers were able to argue the diversity of the Delphi Technique as an evaluation tool by presenting the results from five separate projects, which spanned a broad base of content areas. They also were able to show the robustness of the Delphi Technique as a systematic evaluation tool to establish face and content validity for online e-learning.

In a second study, Strickland, Strickland, Wang, Zimmerly, and Moulton (2013) centered on poor instructional outcomes as a result of weak instructional design. The authors developed a structured process that employs the Delphi Technique to ameliorate the problem. The root of the issue, according to the researchers, was found in the lack of “attention to detail within recognized design practices,” specifically an absence of “structure in relation to the design phase” (p. 2651).

In this study, the researchers developed a “blueprint for consistent replication” (p. 2652) of the design phase in the ADDIE model by developing seven definitive tasks that would be subsequently validated by a modified Delphi technique. This was an expansion on previous work in which their focus was on 14 definitive tasks for the analysis phase of the ADDIE model.

To codify the structured process, two distinctly separate instructional design studies (Wang, 2011; Zimmerly, 2012) that compared online and face-to-face environments utilized the structured design phase tasks. Due to the differences in content focus between the two, the panels of SMEs were not the same for the studies. However, both studies used the same panel of IDEs. The 14 tasks from the analysis phase were scrutinized through one of the five Delphi survey instruments, as well as the seven tasks from the design phase. A total of 21 tasks were judged through 10 Delphi instruments. The Interclass Correlational Coefficient statistical method was computed for both implementation studies. The analysis phase results, for inter-rater reliability, for the first study were: “Delphi 01 = 0.869; Delphi 02 = 0.943; Delphi 03 = 0.789; Delphi 04 = 0.746; Delphi 05 = 0.864. The Delphi technique required three judging iterations” (p. 2654). The results from the second study were: “Delphi 01 = 0.821; Delphi 02 = 0.947;

Delphi 03 = 0.999; Delphi 04 = 0.999; Delphi 05 = 0.999. Multiple iterations were also required, with three iterations for Delphi 1, Delphi 2, and Delphi 3” (p. 2654). Similar results for each of the implementation studies were found in the design phase.

Delphi 06 = 0.948; Delphi 07 = 0.931; Delphi 08 = 0.987; Delphi 09 = 0.746; Delphi 09 = 0.999. Wang’s Delphi technique included three judging iterations. The mean inter-rater reliability for Zimmerly’s (2012) analysis was as follows: Delphi 06 = 0.957; Delphi 07 = 0.961; Delphi 08 = 0.968; Delphi 09 = 0.968; Delphi 10 = 0.999. Zimmerly’s Delphi Survey process included two judging iterations for two surveys; consensus was reached for the other surveys. (p. 2656)

Following the structured design process, both studies (Wang, 2011; Zimmerly, 2012) had positive online and face-to-face instructional outcomes. Cross walking the ADDIE model and the Delphi Technique Strickland et al. (2013) provided a platform in which two instructional designers on separate studies (Wang, 2011; Zimmerly, 2012) could consistently consider both pedagogical and technological areas in designing online and face-to-face learning environments conducive for positive instructional outcomes.

Developing the online instruction is not a simple matter. Well-designed online content involves knowledge of both online design and content. No longer can the instructor look into the eyes of the learner and see the despair of confusion and quickly adapt during the instruction. Simply moving a face-to-face course to an online mode does not provide the instructional design time necessary to allow for adapting to learner variances; instead, the online course becomes the “one-shoe-fits-all model” (Moulton et al., 2010, p. 2047)

Although research indicates distance and face-to-face formats are equally effective learning environments (Fisher, Schumaker, Culbertson, & Deshler, 2010; Fishman et al., 2013; Means, Toyoma, Murphy, & Baki, 2013; O’Brien et al., 2012), only one study (Shibley et al., 2011) discussed the importance of complementary

interdisciplinary teams, which included SMEs and IDEs. This collaborative distinction is very important since faculty members are SMEs and are not expected to be the IDEs. On the other hand, IDEs may lack the background in learning theory or in the details associated with instructional design models (Moulton et al., p. 2045). Thus, to fill the gap and provide a structured format to ensure both content and design is addressed consistently, researchers (Moulton et al., 2010; Strickland et al., 2013) have provided a scaffolding of support in the form of a Delphi Technique. These studies have shown the robust nature of the process through an implementation across subject matters. This study continued to test this process and provided emergent data within the context of professional development.

Summary

Development of online assistive technology professional development, which can produce positive instructional outcomes through the use of the Delphi Technique and the ADDIE model (Strickland et al., 2010; Strickland et al., 2013), is critical to Idaho's special education teachers. Students with disabilities need access to assistive technology to "increase, maintain, or improve" (Idaho Special Education Manual, 2007, p. xii) their functional capabilities. Ensuring access to the correct assistive technology that will meet their individual needs is the job of the Individual Education Program (IEP) team (Individuals with Disabilities Education Act, 2004). However, choosing the correct assistive technology can only be accomplished when there is a member of the IEP team who is knowledgeable about AT and recognizes an assessment is needed (Nelson, 2006). Further, there is a shortage of teachers who have been trained to make AT recommendations (Bausch et al., 2004; Messinger-William et al., 2010; Sharpe, 2010).

Although training at the pre-service level is a logical answer, research indicates access to this content knowledge is not occurring (Judge et al., 2009). This is true for Idaho as well. A review of special education curricula indicates access to an assistive technology course in Idaho's education programs has been inconsistent for the approximately 1,100 special education K12 teachers. Moreover, Idaho's vast geographic region makes it difficult to offer face-to-face training. Closing this knowledge gap must occur through professional development (Jones, 2010; Ludlow et al., 2010; McCarthy et al., 2009) offered in a just-in-time, distance learning format.

CHAPTER III

METHOD

Introduction

The purpose of this study was to determine whether professional development on assistive technology was effective in an online format. The data collection and analysis to answer the study's research questions included: (1) a pretest-posttest design was to be employed to determine the achievement level by the education professionals who participated in the online professional development with significance determined through a *t* test. (2) Attitudes toward the online training were measured through a survey instrument and follow-up Focus Group Questions with the results analyzed using descriptive statistics and categorical distributions, respectively. (3) An assessment of the participants' ability to codify the AT consideration process through the development of a systematic AT plan was also examined through descriptive statistics. (4) A modified Delphi technique using SMEs and IDEs was used to support the analyze and design phases of the instructional design process with the results evaluated through Intraclass and interclass correlations.

The following research questions guided this study:

Research Questions

1. Is there a significant difference in AT content knowledge for in-service teachers participating in an online professional development course as measured by a researcher-created pretest/posttest achievement instrument?

2. What are the attitudes of the in-service teacher participants related to the online professional development course as measured by the Distance Education Learning Environments Survey (DELES) instrument and as communicate during a post-treatment focus group session?
3. What is the ability of the in-service teacher participants, as teacher-leaders, in codifying the consideration process through the development of a systematic AT plan for a student with a disability as measured by a researcher-created rubric?
4. What is the instructional design evaluation compliance level for the Analyze and Design phases of the ADDIE instructional design model in the creation of the online AT professional development course as measured by a modified Delphi Technique?

Research Sample

In-service education professionals who work in Idaho local education agencies (LEA) served as the participants. The educators participated in an online professional development unit. The training was available in six learning modules on the University of Idaho's learning management system (LMS) Blackboard.

The participants were provided an informed consent document prior to implementation of the study. The researcher followed the procedures outlined by both Idaho State University and the University of Idaho's Institutional Review Board (IRB) protocols.

Research Design

This study used a mixed methods analysis including a one-group pretest-posttest design, which included three steps: "(1) administration of a pretest measuring the dependent variable; (2) implementation of the experimental treatment (independent

variable) for participants; and (3) administration of a posttest that measures the dependent variable gain” (Gall, Gall, & Borg, 2003, p. 389). Specifically, the five data collection procedures included: (1) a researcher-created achievement instrument; (2) the DELES survey instrument focused on teachers’ attitudes about the online learning; (3) follow-up focus group questions to delve deeper into the participants’ responses to the DELES instrument; (4) a researcher-created AT plan rubric; and (5) a modified Delphi technique.

Achievement Instrument. One of the areas of analysis in the study was to quantify outcomes for the participating educational professionals, as measured by an achievement instrument. The research-created achievement instrument (see Appendix A) was administered online to the subjects preceding instruction. A posttest assessment was delivered online after completion of the instructional modules. The researcher analyzed the data using a one-tail, paired t-test to compare the difference in the results of the pretest and posttest. In addition, the p-value, $p < 0.05$, was calculated to determine the probability of the differences in the data occurring from the same population by chance. Yet it is important to note, since the study utilized a one-group pretest/posttest research design, which lacks a control group, a conclusion that the experimental treatment was responsible for any significant difference cannot be reached. Although it is possible the treatment is responsible for the observed difference, the researcher can only conclude “that there is a significant statistical association/correlation between the experimental treatment and the dependent variable” (Sheskin, p. 602).

DELES Survey Instrument. The Distance Education Learning Environments Survey (DELES) (see Appendix B) instrument, completed post instruction by the participating teachers, measured their attitudes toward the online learning environment.

This attitudinal survey was completed prior to administration of the knowledge acquisition posttest.

The Distance Education Learning Environments Survey (DELES), a 42-item attitudinal survey instrument, was designed to “aid the investigators and practitioners in measuring and researching the psychosocial learning environment in post-secondary distance education” (Walker & Fraser, 2004 p. 289). The development of the instrument was constructed based on an extensive literature review and expert content validation. The seven constructs format includes: (1) Instructor Support; (2) Student Interaction and Collaboration; (3) Personal Relevance; (4) Authentic Learning; (5) Active Learning; (6) Student Autonomy; and (7) Enjoyment.

This instrument was tested on 680 pre-service and in-service teachers, 76% being graduate students enrolled in distance learning education courses. Validity and reliability were completed through item and factor analysis. “Data were analyzed for internal consistency reliability using Cronbach’s alpha (α) coefficient to measure internal consistency in terms of intercorrelations among items” (Walker & Fraser, 2005, p. 297).

Focus Group Questions. After the DELES attitudinal survey was completed, focus group questions were provided to delve deeper into the DELES responses. There were a total of 17 questions; six of them served as the base questions, with the additional 11 posed in order to seek clarification if, after reviewing the results of the DELES, there are negative responses within the Likert results (see Appendix C).

AT Plan Rubric. To bolster the experimental design, since one of the objectives of this study was for the participants to be able to generalize the content to lead the IEP team in considering, choosing, implementing, and analyzing AT as part of an organized

plan, the participants developed a structured AT plan for a student of their choice. The participants used a non-identifiable student from their professional practice in a case study format, and the AT plan was evaluated through the lens of a researcher-created rubric (see Appendix D).

Delphi Technique. The purpose of this study was to determine whether online professional development on assistive technology, which includes Accessible Instructional Materials (AIM), was effective in an online format. The researcher designed the online training through the lens of the ADDIE model of instructional design (Gagné, Wager, Golas, & Keller, 2005). Further, through the Delphi Technique research model, a panel of Subject Matter Experts (SMEs) and a panel of Instructional Design Experts (IDEs) evaluated documents created for the analyze and design phases of the ADDIE model to determine content and/or face validity.

Treatment Development

The assistive technology training on Blackboard was divided into modules. Each module was based on learning objectives designed by the researcher and completed in an asynchronous format.

The technology-based instructional modules included real-world, problem-based instruction (Knowles, Holton, & Swanson, 2011) including a multimedia video and student examples (Zhang, Lundeberg, Koehler, & Eberhardt, 2011). This multimedia video assisted in building the schema of assistive technology analysis and implementation for the education professionals (Gagné, Wagner, Golas, & Keller 2005).

Research Timeline

As with most projects, the research timeline was elongated to accommodate the analysis, design, and development of materials required for the study. (see Figure 2.)

Research Timeline		
ADDIE Phase	Schedule	Activity
Analysis	January 2014 to May 2014	The researcher will develop a process to review the scope and instructional sequence for the training. Further, two panels of SMEs and IDEs will provide content and/or face validity feedback via a Delphi technique.
Design	April 2014 to May 2014	IDEs and SMEs will provide input to the researcher through a Delphi technique, for the Design Phase Tasks.
Develop	April 2014 to June 2014	The Delphi data will guide the formalization of the instructional materials for the Development phase.
Implement	June 16, 2014 to July 28, 2014	The teachers will participate in the professional development during Implementation phase will occur from June 16, 2014, to July 28, 2014.
Evaluate	August 2014 to December 2014	The final step will be a formative investigation through the lens of an analysis of the achievement scores by the researcher and an evaluation of the implementation of the ADDIE model by a panel of ISD experts using a Delphi method.

Figure 2. Research Timeline.

The ADDIE (Analyze, Design, Develop, Implement and Evaluate) instructional design model was the foundation from which the study was built. The ADDIE model is a systems approach in which information, data, and theoretical principles are used at each planning stage. Gagné, Wagner, Golas, and Keller (2005) encapsulated the essence of the entire process like this: “It is within this framework that we seek to apply what is known about the conditions of human learning to instructional design” (p. 12).

Construction of the Instructional Modules

It was important to outline the sequence and organization for the research project to assure all aspects were covered and that appropriate time was allocated to each. (see Figure 3.)

Instructional Sequence and Timeline	
Session	Content
Pretest	
One	Module One-Introduction
Two	Module Two-Reading Supports for Students with Higher Needs
Three	Module Three-Reading Supports for Students with Higher Needs (Continued)
Four	Module Four-Reading Supports for Struggling Readers and Students with Print Disabilities as AIM Introduction
AT Plan	
Five	Module Five-Selecting, Acquiring , Using AIM & Retro Fitting Curriculum
Six	Module Six-Universal Design for Learning
DELES	
Posttest	

Figure 3. Instructional Sequence and Timeline

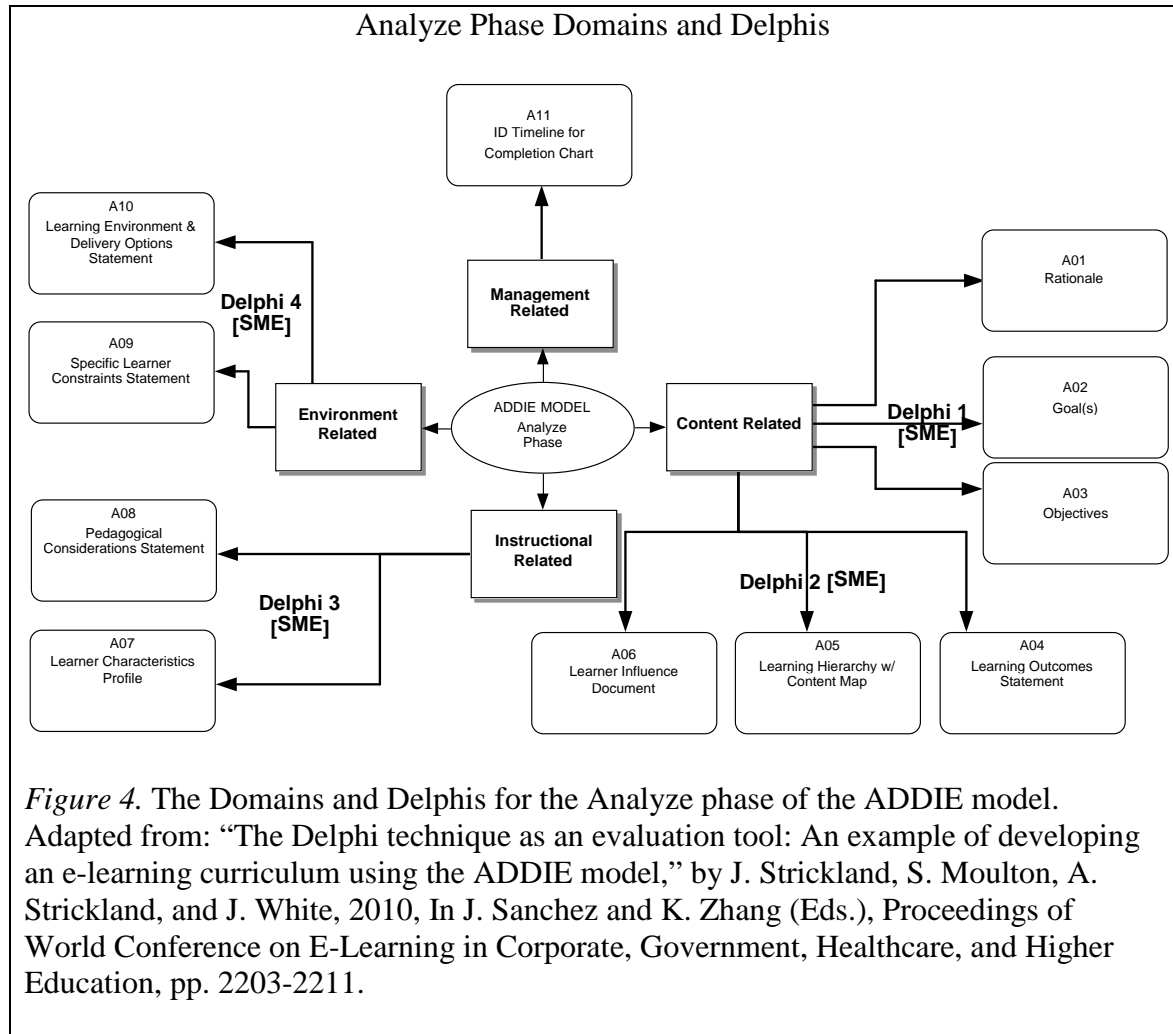
The delivery of the professional development occurred over a six-week period. The content was divided into six modules, one per week. It was designed so that participants would average two hours per module.

Analyze Phase

There were 11 tasks completed during the Analyze phase for this study (See Figure 4). This process was originally designed, verified, and implemented by researchers (Moulton, Strickland, Strickland, White, & Zimmerly, 2010) who are Instructional Design Experts (IDEs). In the ADDIE model, there is a continued flow of evaluation, analysis, and refinement within each phase.

The face validity and content validity of the tasks were established by using the Delphi Technique (Moulton, et al., 2010) with a panel of Instructional Design Experts (IDEs). A 30-item, four choice Likert scale instrument was created so the IDEs could judge a diagram of the Analyze phase, as well as additional documents that represented a total of 14 tasks from the original design (Strickland, Moulton, Strickland, and White, 2010). The Delphi process was carried out until a consensus was reached.

The tasks are divided into four domains (see Figure 4): (1) Content Related Tasks (A01-06); (2) Instructional Related Tasks (A07-08); (3) Environment Related Tasks (A09-10); and, (4) Management Related Task (A11). Content validity and face validity will be established for the study using five Delphi Technique Surveys with Subject SMEs and IDEs (see Figure 4).



The Delphi research method has been used for many years (Nworie, 2011). Linstone and Turoff (1975) established that a “Delphi may be characterized 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). This research

used a purposeful structure for the communication and iterations (Moulton, Strickland, Strickland, White & Zimmerly, 2010).

A group of SMEs comprised of three judges were asked to evaluate the face and content validity of Tasks A01 – A10 until a consensus was reached. An IDE was asked to evaluate the Timeline for the study. A Likert scale of 1 (*Strongly Disagree*) to 4 (*Strongly Agree*) was employed for Tasks A01-A10. A summary of the results for the tasks of the Analyze Phase is shown in Table 1.

Table 1

Comprehensive Survey Results: Delphi Analyze Phase A01-A11

Survey	# of Items	Score Range	Mean	Median	SME Consensus
Tasks A01-A03	15 + 6(x6)	45-204	203.33	204	Yes
Tasks A04-A06	20	20-80	80.00	80	Yes
Tasks A07-A08	14	14-56	56.00	56	Yes
Tasks A09-A10	12	12-48	48.00	48	Yes

Task A01. The Rationale (Task A01) was a statement that sets the focus for the study. Goals and objectives for the training were developed based upon this statement. The SMEs each received the Rationale along with the survey instrument. They selected a rating, using a four-point Likert scale, which reflected their level of agreement to statements regarding the rational statement. (See Appendix E-1 for the Delphi instrument and raw data.) The rationale crafted by the researcher for the study was as follows:

This professional development, a technology-based online training, will provide a platform to reach across the state to Idaho's special education teachers, to afford them the opportunity to access training in assessment and implementation of assistive technology (AT) supports for reading. Consideration and provision of AT is required under the Individuals with Disabilities Education Act as amended in 2004. This training will provide the special education teacher with the capacity to lead the IEP team in considering assistive technology reading supports for the students with disabilities as well as understand the role assistive technology plays with regard to the expectations of the Common Core State Standards.

The Idaho Assistive Technology Project (IATP), housed at the Center for Disabilities and Human Development (CDHD) at the University of Idaho, has been

designated by the Idaho State Department of Education as the State lead in training and technical assistance on AT for Idaho's K12 programs. The CDHD, has an affiliation with the university's College of Education, and houses approximately 70 staff and six teaching faculty who also conduct research and provide technical assistance across the State to support individuals with disabilities, their families, educators, and other stakeholders. This professional development, like all training provided through CDHD, will assist in-service special education teachers with the knowledge necessary to carry out their legal obligations of instructional supports for students with disabilities on an IEP.

Task A02. The Goal statement (A02) paints the picture of what the AT professional development was intended to accomplish. This training introduced special education teachers to the legal context, analysis method, and implementation process for AT reading supports for students with disabilities. The participant summative knowledge acquisition was assessed through a content knowledge assessment. Completion of this training provided the participants with the knowledge needed to facilitate, assess, and implement AT reading supports for their students. The SMEs will be given the Goal statement and survey instrument. They selected a rating using a four-point Likert rating, which reflects their level of agreement to statements regarding the Goal statement. The instructional goals for the training, developed by the research, are:

1. To increase the special education teacher's understanding of the role assistive technology plays with regard to the expectations outlined in the Common Core State Standards;
2. To increase the special education teacher's understanding of their position as a teacher leader in guiding the IEP team as they fulfill their obligation of considering assistive technology; and
3. To increase the special education teacher's knowledge of assistive technology reading supports for students with disabilities.

Task A03. The Objectives were developed using Mager's (1975, 1977) Four-Part Behavior Type Objective Method. There are four components included in each objective: Audience (A); Behavior (B); Condition (C); and Degree (D). A learning objective is a statement that describes what the learner will know or do in specific measurable terms. The objectives in Task A03 aligned to the goal(s) in Task A02. The SMEs received the objectives as well as the survey instrument and selected the level to which they agreed with the objectives on a four-point Likert scale. The Objectives for this study developed by the researcher are below:

1. Given the content in the assistive technology professional development training the in-service teacher participants will be able to identify the role assistive technology plays to support the expectations outlined in the Common Core State Standards by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
2. Given the content in the assistive technology professional development training, the in-service teacher participants will be able to identify the characteristics of a teacher leader, who guides the IEP team as they fulfill their obligation of considering assistive technology by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
3. Given the content in the assistive technology professional development training, the in-service teacher participants will be able to select assistive technology reading supports for students with higher needs by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
4. Given the content in the assistive technology professional development training, the in-service teacher participants will be able to choose assistive technology reading supports for struggling readers by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
5. Given the content in the assistive technology professional development training, the in-service teacher participants will be able to design an

Accessible Instructional Materials (AIM) program for students with a print disability by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.

6. Given the content in the assistive technology professional development training, the in-service teacher participants will be able to distinguish the role reading technology plays in a universally designed general education classroom curriculum by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.

Each of the six Objectives included a total of five questions each. The posttest cumulative average for the in-service teacher participants, for each one of the Objectives ranged from a low of 73% for Objective 2 and a high of 89% for Objective 6. This indicates the target of a cumulative average of 70% for each Objective area was met.

Table 2 exhibits the data from the three SMEs level of agreement to the Project Rationale statement Task A01, Project Goal statement Task A02, and Project Objectives Task A03 using a four-point Likert scale as follows: 4=*Strongly Agree*, 3=*Agree*, 2=*Disagree*, and 1=*Strongly Disagree*. The possible scores ranges from 45 (if all 15 items on Tasks A01-A02 and 6 items representing the six objectives found in Task A03 were marked a value of one or Strongly Disagree by the panel member) to 204 (if all 15 items on Tasks A01-A02 and 6 items representing the six objectives found in Task A03 were marked a value of four or Strongly Agree by the panel member). Although the total scores for all 15 items could range from 45 to 204, the actual scores for the judges were 202, 204, and 204. The total score for the three panel members was 610 (see Table 2).

Table 2
Delphi Survey: Face & Content Validity Tasks A01-03 (SME Panel)

Item	SME 1	SME 2	SME 3	Total Item Score
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	4	12
5. The project's subject matter is clearly stated.	4	4	4	12
6. The project's approach to the problem is clearly stated.	3	4	4	11
7. The project's expected outcome is clearly stated.	4	4	4	12
8. The goal(s) of this project is clearly stated.	4	4	4	12
9. The goal(s) of this project states what the project is to accomplish.	4	4	4	12
10. The goal(s) of this project clearly indicates how the success will be indicated.	4	4	4	12
11. The goal(s) of this project appears to be achievable.	4	4	4	12
12. The goal(s) of this project appears to be significant to the field of knowledge indicated by the rationale.	4	4	4	12
13. The goal(s) of this project appears to be measurable.	4	4	4	12
14. Considering the target population, the goal(s) of this project appears to be realistic.	4	4	4	12
15. The outcomes of the project appear to be obtainable.	3	4	4	11
16. Each objective of this project module is aligned to the goal statement.	24	24	24	72
17. Each objective of this project module contains a behavior/action verb that is measureable.	24	24	24	72
18. Each objective of this project module has an identified audience.	24	24	24	72
19. Each objective of this project module contains a degree/constraint that is clearly stated.	24	24	24	72
20. Each objective of this project module contains a condition/situation that is clearly stated.	24	24	24	72
21. Each objective of this project is aligned to the identified audience.	24	24	24	72
TOTAL SME SCORES:	202	204	204	610

The data indicate there was consistent agreement among the experts regarding the 21 questions.

Task A04-A06. These two tasks continued the process of analysis in the Content Related domain for the Analyze phase of the ADDIE Model. Task A04, Learning Outcomes, discussed the cognitive process of memory and learning. It also described the learner outcomes. Task A05, Learning Hierarchy with Concept Maps, showed the order and process that the teachers would move through to obtain this knowledge (see Appendix E-2). Task A06, Learning Influences, explained the techniques and activities that were used to support the teachers' learning (see Appendix E-2).

The SMEs were given Tasks A04, A05, and 06 along with the Delphi survey instrument to select the level to which they agreed with the statements on a four-point Likert scale. Possible scores ranged from 20 (if all items were scored with a value of 1, *Strongly Disagree*) on all 20 questions to 80 (if all items were scored a value of 4, *Strongly Agree*). Table 3 exhibits the total scores for Tasks A04-06 and indicates a consistent agreement among the SMEs on the 20 questions (see Table 3).

Table 3
Delphi Survey: Face & Content Validity Tasks A04-A06 (SME Panel)

Item	SME 1	SME 2	SME 3	Total Item Score
1. There is an accurate description of the short-term learning effect for each of the objectives for each RLO/Module.	4	4	4	12
2. There is an accurate description of the long-term learning effect for each of the objectives for each RLO/Module.	4	4	4	12
3. There is an accurate description of how the learner is expected to change as a result of each objective.	4	4	4	12
4. There is an accurate description of what is expected to change as a result of the instruction.	4	4	4	12
5. 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
6. 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
7. Using the project goal(s) and the project objectives [Task A02 and Task A03] as references, it appears the concept map accurately links each goal with its corresponding primary objective(s).	4	4	4	12
8. Using the project objectives as reference, it appears the concept map accurately presents each of the secondary objectives.	4	4	4	12
9. 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
10. The total concept map presents an accurate depiction of the project.	4	4	4	12
11. The total concept map displays appropriate linkages among all elements.	4	4	4	12
12. The essential prerequisite learner knowledge/skills to achieve the objectives are identified.	4	4	4	12
13. 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
14. There is an accurate description for gaining the learner's attention within each RLO/Module.	4	4	4	12
15. There is an accurate description for maintaining the learner's attention within each RLO/Module.	4	4	4	12
16. There is an accurate description for assessing the learner's satisfaction within the instruction for each RLO/Module.	4	4	4	12
17. There is an accurate description of how each RLO/Module will include a focus on specific learner capabilities.	4	4	4	12
18. There is an accurate description of how each RLO/Module will stimulate the learner's prerequisite knowledge (or skills).	4	4	4	12
19. There is an accurate description of how each RLO/Module will accommodate identified learner disabilities.	4	4	4	12
20. There is an accurate description of how each RLO/Module will respond to a participant's particular learning traits.	4	4	4	12
TOTAL SME SCORES:	80	80	80	240

Tasks A07-A08. These two tasks are in the Instruction Related domain in the Analyze phase of the ADDIE Model. Task A07, Learner Characteristics, addressed the specific demographics of the population of learners (see Appendix E-3). Task A08, Pedagogical Considerations Statement, explained the instructional sequence and learner requirements (see Appendix E-3).

The SMEs were given Tasks A07 and A08 along with the Delphi survey instrument to record the level to which they agree with the statements on Task A07-A08 on a four-point Likert scale. Possible scores ranged from 14 (if all items were scored with a value of 1, *Strongly Disagree*) on all 14 questions to 56 (if all items were scored a value of 4, *Strongly Agree*). Table 4 exhibits the total scores for Tasks A07-08 and indicate a consistent agreement among the SMEs on the 14 questions (see Table 4).

Table 4

Delphi Survey: Face & Content Validity Tasks A07-A08 (SME Panel)

Item	SME 1	SME 2	SME 3	Total Score
1. It appears the general characteristics accurately describe the target population of the project.	4	4	4	12
2. It appears the age range accurately represents target population of the project	4	4	4	12
3. It appears the gender distribution accurately represents target population of the project	4	4	4	12
4. It appears the ethnic/cultural distribution accurately represents target population of the project	4	4	4	12
5. It appears the language distribution accurately represents target population of the project	4	4	4	12
6. It appears the entry behavior is appropriate for target population of the project	4	4	4	12
7. It appears the time frame for completion is reasonable for target population of the project	4	4	4	12
8. It appears the list of prior knowledge needed for completion of the project is complete.	4	4	4	12
9. It appears the statement of prerequisite cognitive skills for completion of the project is complete.	4	4	4	12
10. It appears the statement of prerequisite motor skills for completion of the project is complete.	4	4	4	12
11. It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional sequencing.	4	4	4	12
12. It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional motivation.	4	4	4	12
13. It appears that the Pedagogical Considerations Statement has addressed issues student-centered learning.	4	4	4	12
14. 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
TOTAL SME SCORES:	56	56	56	168

Tasks A09-A10. These three tasks in the Analyze phase of the ADDIE Model are in the Environment Related and the Management Related domains.

Task A09, Learner Constraints Statement, identifies the barriers that may influence the participants reaching the learning outcomes (see Appendix E-4). Task A10, the Learning Environment and Deliver Options Statement, defines the conditions and environment for this training in order for it to be successful.

The SMEs were given Tasks A09 and A10 along with the Delphi survey instrument to record the level to which they agree with the statements on Tasks A09-A10

on a four-point Likert scale. Possible scores ranged from 11 (if all items were scored with a value of 1, *Strongly Disagree*) on all 11 questions to 44 (if all items were scored a value of 4, *Strongly Agree*). Table 5 exhibits the total scores for Tasks A07-08 and indicates a consistent agreement among the SMEs on the 11 questions (see Table 5).

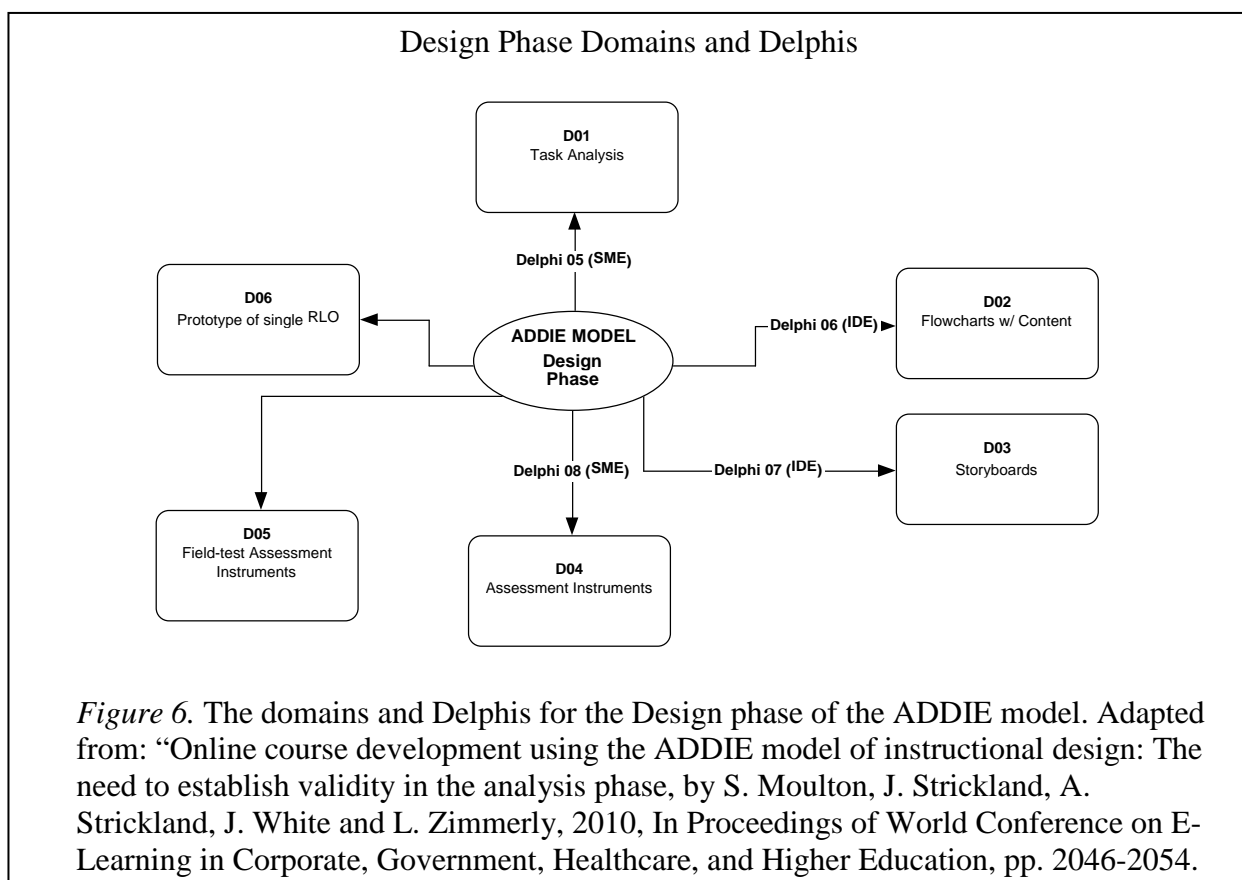
Table 5
Delphi Survey: Face & Content Validity Tasks A09-A10 (SME Panel)

Item	SME 1	SME 2	SME 3	Total Score
1. 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
2. It appears the learner constraints regarding ADA considerations have been reasonable addressed for target population of the project.	4	4	4	12
3. It appears the learner constraints regarding network software have been reasonable addressed for target population of the project.	4	4	4	12
4. It appears the specific hardware requirements have been accurately described for the project.	4	4	4	12
5. It appears the specific requirements to navigate the content materials have been accurately described for the project.	4	4	4	12
6. It appears the specific software requirements have been accurately described for the project.	4	4	4	12
7. It appears the specific learner requirements have been accurately described for the project.	4	4	4	12
8. It appears the specific learner requirements for students with physical disabilities have been accurately described for the project.	4	4	4	12
9. 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
10. It appears the specific learner requirements for students with cognitive disabilities have been accurately described for the project.	4	4	4	12
11. It appears the specific delivery plan for content assignments has been accurately described for the project.	4	4	4	12
TOTAL SME SCORES:	44	44	44	132

Task A11. The Timeline for Completion Chart set the parameters for completion of the Analyze phase artifacts and the Delphi surveys (see Appendix E-5). The chair of the dissertation committee reviewed and approved the timeline as outlined in Task A11.

The ADDIE Design Phase			
Task	Description	Face Validity	Content Validity
Task D01	Task Analysis	SME	SME
Task D02	Flowcharts with Content	IDE	n/a
Task D03	Storyboards	IDE	n/a
Task D04	Assessment Instruments	SME	SME
Task D05	Field-Test of Assessment Instruments	n/a	n/a
Task D06	Prototype Field Test of RLO	n/a	n/a

Figure 5. ADDIE Design Phase: Required tasks, by types, for Delphi panels. Adapted from: "Online course development using the ADDIE model of instructional design: The need to establish validity in the analysis phase, by S. Moulton, J. Strickland, A. Strickland, J. White and L. Zimmerly, 2010, In Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education, pp. 2046-2054. Copyright 2010 by the American Psychological Association.



Two groups of SMEs and IDEs comprised of three judges each were asked to evaluate the content and/or validity of Tasks D01 – D04 until a consensus was reached. A Likert scale of 1 (*Strongly Disagree*) to 4 (*Strongly Agree*) was employed for Tasks D01-D04. The SMEs reviewed Tasks D01 and D04 whereas the IDEs analyzed Tasks D02 and D03. A summary of the results for the tasks of the Design Phase are shown in Table 6.

Table 6

Comprehensive Survey Results: Delphi Design Phase D01- D04 (SME/IDE Panels)

Survey	Number of Items	Score Range	Mean	Median	SME/IDE Consensus
Task D01	16	16-64	64.00	64	Yes
Task D02	5	5-20	18.33	19	Yes
Task D03	12	12-48	43.67	47	Yes
Task D04	8	8-32	32.00	32	Yes

Task D01. A task analysis broke down the learning objectives into step-by-step activities that can be observed. The researcher deconstructed each of the six objectives outlined in Task A03. The task analysis document was reviewed by SDEs for content and face validity through a Delphi technique. The SDEs were given the Objectives, Task Analysis, and Delphi survey instrument (see Appendix F-1).

The SMEs were given Task D01 along with the Delphi survey instrument to record the level to which they agree with the statements on Task D01 on a four-point Likert scale. Possible scores ranged from 16 (if all items were scored with a value of 1, *Strongly Disagree*) on all 16 questions to 64 (if all items were scored a value of 4, *Strongly Agree*). Table 7 exhibits the total scores for Tasks D01 and indicates a consistent agreement among the SMEs on the 16 questions (see Table 7).

Table 7
Delphi Survey: Content & Face Validity Task D01 (SME Panel)

Item	SME 1	SME 2	SME 3	Total Score
1. The objectives for the tasks are clearly stated.	4	4	4	12
2. The listed tasks are aligned with each objective.	4	4	4	12
3. The knowledge identification types are aligned with each task.	4	4	4	12
4. The prerequisite decisions (Y/N) are aligned with each task.	4	4	4	12
5. The environmental factors identified are aligned with each task.	4	4	4	12
6. The domain types are aligned with each task.	4	4	4	12
7. The importance levels are aligned with each task.	4	4	4	12
8. The difficulty levels are aligned with each task.	4	4	4	12
9. The listed sub-tasks appear to be aligned with the tasks.	4	4	4	12
11. The knowledge identification types are aligned with each subtask.	4	4	4	12
12. The prerequisite decisions (Y/N) are aligned with each subtask.	4	4	4	12
13. The environmental factors are aligned with each subtask.	4	4	4	12
14. The domain types are aligned with each subtask.	4	4	4	12
15. The importance levels are aligned with each subtask.	4	4	4	12
16. The difficulty levels are aligned with each subtask.	4	4	4	12
TOTAL SME SCORES:	64	64	64	192

Task D02. The flowcharts show the process to reach the goals and objectives, including decision points (evaluation and remediation, if warranted). The flowcharts were developed as a graphical representation for each of the Modules. The D02 Flowcharts were evaluated by the IDEs for face validity using a Delphi survey instrument (see Appendix F-2).

The IDEs were given Task D02 along with the Delphi survey instrument to record the level to which they agree with the statements on Task D02 on a four-point Likert scale. Possible scores ranged from 5 (if all items were scored with a value of 1, *Strongly Disagree*) on all 5 questions to 20 (if all items were scored a value of 4, *Strongly Agree*). Table 8 exhibits the total scores for Task D02 and indicates a consistent agreement among the IDEs on the 4 questions (see Table 8).

Table 8
Delphi Survey: Face Validity Task D02 (IDE Panel)

	Item	IDE 1	IDE 2	IDE 3	Total Score
1.	Each objective for the module is represented in the flowchart.	4	4	4	12
2.	Appropriate content in support of each objective is represented in the flowchart.	3	4	4	11
3.	Assessments for each objective are represented in the flowchart.	3	4	4	11
4.	Appropriate decision points are represented in the flowchart.	3	4	4	11
5.	The content within the flowchart is appropriately sequenced for the module.	3	3	4	10
TOTAL IDE SCORES:		16	19	20	55

Task D03. The storyboard is a visual representation of the instructional content. It includes the text parameters, voice-over script, multimedia, hyperlinks, and interaction elements. As part of the Design phase, this study will include storyboards representative of each module. The IDEs will examine the storyboards to establish face validity through a Delphi survey instrument (see Appendix F-3).

The IDEs were given Task D03 along with the Delphi survey instrument to record the level to which they agree with the statements on Task D03 on a four-point Likert scale. Possible scores ranged from 12 (if all items were scored with a value of 1, *Strongly Disagree*) on all 12 questions to 48 (if all items were scored a value of 4, *Strongly Agree*). It is important to note, one panelist initially rated items four, six, and seven with a 2. The IDE was seeking clarification on the storyboard to include a specific designation for the graphical elements, as well as the font and text styles. After these items were correct, the IDE agreed to move the three ratings from a 2 to a 3. Post these adjustments, Table 9 exhibits the total scores for Task D03 and indicates a consistent agreement among the IDEs on the 12 questions (see Table 9)

Table 9
Delphi Survey: Face Validity Task D03 (IDE Panel)

Item	IDE 1	IDE 2	IDE 3	Total Score
1. There is a series of storyboards aligned with the flowcharts (Task D02).	3	4	4	11
2. The placement for graphical elements is included in the storyboards.	3	4	4	11
3. The type of graphical elements is identified in the storyboards.	3	4	4	11
4. The size parameters of graphical elements are identified in the storyboards.	3	3	4	10
5. The placement for textual elements is included in the storyboards.	3	4	4	11
6. The font style for textual elements is included in the storyboards.	3	4	4	11
7. The font size for textual elements is included in the storyboards.	3	4	4	11
8. Hypertext links (where needed) are indicated in the storyboards.	3	4	4	11
9. The placement of hypertext links is indicated in the storyboards.	3	4	4	11
10. Navigation buttons (where needed) are indicated in the storyboards.	3	4	4	11
11. The placement of navigation buttons is indicated in the storyboards.	3	4	4	11
12. The style of navigation buttons is indicated in the storyboards.	3	4	4	11
TOTAL IDE SCORES:	36	47	48	131

Task D04. The multiple-choice knowledge acquisition assessment instrument was generated based on the study's goals and objectives. An AT implementation rubric was also developed to measure each participant's ability to implement what they learned in the online format. The SMEs evaluated the pretest/posttest instrument as well as the AT implementation rubric for content and face validity using the Delphi survey instrument (see Appendix F-4).

The SMEs were given Task D04 along with the Delphi survey instrument to record the level to which they agree with the statements on Task D04 on a four-point Likert scale. Possible scores ranged from 8 (if all items were scored with a value of 1, *Strongly Disagree*) on all 8 questions to 32 (if all items were scored a value of 4, *Strongly Agree*). Table 10 exhibits the total scores for Task D04 and indicates a consistent agreement among the SMEs on the 8 questions (see Table 10).

Table 10

Delphi Survey: Face & Content Validity Task D04 (SME Panel)

	Item	SME 1	SME 2	SME 3	Total Score
1.	The multiple-choice assessment Knowledge Acquisition Pretest has item (question) stems related to the Objectives.	4	4	4	12
2.	The multiple-choice assessment Knowledge Acquisition Pretest has logical distractors for each item related to the Objectives.	4	4	4	12
3.	The multiple-choice assessment Knowledge Acquisition Pretest has items with random distribution, as expected, in the Posttest.	4	4	4	12
4.	The multiple-choice assessment Knowledge Acquisition Pretest is formatted for readability.	4	4	4	12
5.	The assessment Knowledge Acquisition Pretest/Posttest includes a sufficient number of items related to each Objective.	4	4	4	12
6.	The rubric has items related to the Objectives.	4	4	4	12
7.	The rubric is formatted for readability.	4	4	4	12
8.	The rubric assessment includes a sufficient number of items related to the Objectives.	4	4	4	12
TOTAL SME SCORES:		32	32	32	96

Tasks D05-D06. The field-test of the multiple-choice knowledge acquisition assessment instrument and the Prototype of a Single RLO was where two individuals who “mirror” the participants interacted with a single RLO, including the assessment, to inform the researcher of any potential problems that need to be addressed prior to implementation.

The two individuals agreed the assessment instrument was sufficiently robust and included adequate distractors. Their comments on the RLO included such things as the format was easy to navigate; however, it would be beneficial to provide an overview of activities that needed to be completed in each module as well as guidance to the participants that it was in their best interest to edit their comments in a word processing software prior to adding them to the discussion forum; so that they would not risk losing them if the LMS timed out. The research incorporated their ideas into the training.

Develop phase. As part of the ADDIE instructional design model, the researcher developed the online instructional materials using *Camtasia*, *PowerPoint*, *Word*,

Inspiration, and video to enable the participating teachers to achieve the learning objectives. The materials for the online training were loaded onto the Blackboard LMS. The materials were developed with consideration of the results of the various Delphi surveys from the Analysis and Design phases.

Implement phase. The delivery of the professional development was completed over a six-week period. As part of a pre-instruction strategy (Morrison, Ross, & Kemp, 2004), a pretest was completed one-week prior to instruction. A posttest was completed after completion of the modules. It is important to note, an online DELES attitudinal survey and Focus Group Questions were completed after last instructional module and before prior to taking the posttest.

Evaluate phase. The ADDIE instructional design model emphasizes continuous formative evaluation (Gagné, Wager, Golas, Keller, & Russell, 2005). Using a Delphi technique with Subject Matter Experts (SMEs) and Instructional Design Experts (IDEs) during the Analysis and Design phases provided the platform for continued feedback from the tasks associated with the study. A summative evaluation process (Gagné, Wager, Golas, Keller, & Russell, 2005) was implemented through the use of a pretest and posttest knowledge acquisition instrument, an AT implementation rubric, the DELES online attitudinal survey, and Focus Group Questions based on the DELES results.

Summary

The investigator developed training on assistive technology for reading, including AIM, for education professionals to answer the four research questions, including one sub question 2.1, posed in this study. This research was crafted through the lens of the ADDIE instructional design model.

There were 11 tasks in the Analyze phase (see Figure 4) that were evaluated by SMEs using a Delphi technique as well as one IDE through a document review of the Timeline. The Delphi process continued into the Design phase with 4 tasks being assessed (see Figure 5).

Instructional design models are often discussed within the context of online courses. However, understanding professional development is a primary method to transition from research to practice for in-service professionals (Messenger-Willman & Marino, 2010). The researcher believes this study shows the importance of using this instructional design process in the development of online training to develop an environment in which participants can achieve the instructional goals.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to design an online professional development on assistive technology (AT) and measure its effectiveness through an online, researcher-developed knowledge acquisition pretest/posttest. The ADDIE instructional design model and the Delphi technique were employed to provide a structured approach to the analysis and design phases. In addition, the DELES online attitudinal survey and follow-up focus group questions were administered to determine the participants' attitudes toward the online instruction. Finally, a rubric was utilized to assess the implementation plan that was developed toward the end of the professional development by the participants.

Research Questions

The following research questions were presented for the dissertation investigation:

1. Is there a significant difference in AT content knowledge for in-service teachers participating in an online professional development course as measured by a researcher-created pretest/posttest achievement instrument?
2. What are the attitudes of the in-service teacher participants related to the online professional development course as measured by the Distance Education Learning Environments Survey (DELES) instrument and as communicate during a post-treatment focus group session?
3. What is the ability of the in-service teacher participants, as teacher-leaders, in codifying the consideration process through the development of a systematic AT plan for a student with a disability as measured by a researcher-created rubric?

4. What is the instructional design evaluation compliance level for the Analyze and Design phases of the ADDIE instructional design model in the creation of the online AT professional development course as measured by a modified Delphi Technique?

Data Sample

There was a total of 19 educational professionals enrolled in the AT professional development (PD) course; however, one participant dropped out of the course after completing the pretest due to work obligations. A second participant completed the course requirements to receive the PD credit, but elected not to have the resulting data included in the study. Thus, the participants for this study were 17 in-service educational professionals who work in Idaho local education agencies (LEA). Table 11 summarizes the demographic data, including gender and professional position.

Table 11

Demographic Data for Research Sample (N=17)

Gender:	Participants
Male	4
Female	13
Professional Position:	
Education Administrator	4
Teacher	8
Special Services Provider	5

The data in Table 11 show the gender distribution is skewed in favor of females over males (13 females to 4 males). Although the study was designed for in-service teachers, the participants represented a varied educational stakeholder group: educational administrators (three special education directors and one technology director); in-service teachers (seven special education teachers and one general education teacher; and special service providers (three speech and language pathologists, two blind/visually impaired specialists, and one deaf/hearing impaired specialist).

Data Analysis for Research Question One

The 30-item researcher-created pretest/posttest instrument includes three broad topic areas: AT Requirements and Process (Questions 1-10), AT Devices (Questions 11-20), and AT in General Education (Questions 21-30). Since the test as a whole did not address one common topic, the analysis was completed using a random split-half measure of internal consistency (D. Coffland, personal communication, September 17, 2014; C. Mahler, personal communication, September 24, 2014). The reliability of the pretest instrument was established through a Guttman's Lambda 4 reliability coefficient analysis. The internal consistency reliability was 0.68. This is just below an acceptable level of reliability of $r = 0.70$ for a classroom exam (Wells & Wollack, 2003).

This section of Chapter IV reports data gathered during the study pertaining to Research Question 1.

1. Is there a significant difference in AT content knowledge for in-service teachers participating in an online professional development course as measured by a researcher-created pretest/posttest achievement instrument?

The results of the study with regard to Research Question 1 indicate there is a significant difference in AT content knowledge for these in-service teachers as measured by the researcher-created pretest/posttest instrument. Achievement was assessed by comparing pretest and posttest scores collected one week prior and one week post the professional development training. The pretest and posttest instruments included 30 multiple-choice questions (see Appendix A for the Pretest/Posttest Instrument). The test items were validated through the analysis and design phases (see Chapter 3). Achievement was compared between the pretest and posttest by comparing the sums of the dependent t-test scores.

Pretest Analysis. The data displayed in Table 12 are the frequency distribution of teachers' pretest achievement scores. The data are exhibited as the number of correct responses on assessed knowledge of assistive technology (see Appendix A for the Pretest raw data). The data were collected one week prior to the professional development training with a 30-item multiple-choice instrument.

Table 12

Frequency Distribution of Teacher Pretest Achievement Scores for Modules 1 through 6 (N=17)

Range Scores	Participant Group
0 to 5	0
6 to 10	0
11 to 15	10
16 to 20	6
21 to 25	1
26 to 30	0

Table 12 indicates the distribution of the pretest scores for the 17 teachers had the majority of scores in the bottom half of the frequency distribution; i.e., raw scores between 0 and 15 (N = 10) with six participants scoring in the 16 to 20 range and one scoring in the 21-25 range (see Appendix A for the Pretest raw data). These data indicate a low level of assistive technology knowledge, yet, not completely void.

Table 13 contains the descriptive statistics for the participants' pretest results on the items for Module One of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Pretest instrument, items 1-5).

The mean score for Module One was 2.58, with a standard deviation of 1.06.

Table 13

Pretest for Module 1: Items 1-5 (N=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	2.58	.00	4.00	4.00	1.06

Table 14 contains the descriptive statistics for the participants' pretest results on the knowledge items for Module Two of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Pretest instrument, items 6-10). The mean pretest knowledge score for Module Two was 2.11, with a standard deviation of 1.11.

Table 14
Pretest for Module Two: Items 6-10 (N=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	2.11	.00	4.00	4.00	1.11

Table 15 contains the descriptive statistics for the participants' pretest results on the knowledge items for Module Three of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Pretest instrument, items 11-15). The mean pretest knowledge score for Module Three was 2.47, with a standard deviation of 1.07.

Table 15
Pretest for Module Three: Items 11-15 (N=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	2.47	.00	4.00	4.00	1.07

Table 16 contains the descriptive statistics for the participants' pretest results on the knowledge items for Module Four of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Pretest instrument, item 16-20). The mean pretest knowledge score for Module Four was 3.18, with a standard deviation of .64. It is interesting to note that this was one-of-two modules that did not have a minimum score of zero. After reviewing the results of the data and questions from this section of the pretest, there it is evident there were two questions whose answers included fairly typical AT used in classrooms, highlighters and speech-to-

text software. Although, not all of the participants were able to answer both of those questions correctly, the group as a whole, scored very high on each of those questions individually. As indicated in the literature, the participants are not completely void of AT content knowledge (Marsters, 2011).

Table 16
Pretest for Module Four: Items 16-20 (N=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	3.18	2.00	4.00	2.00	.64

Table 17 contains the descriptive statistics for the participants' pretest results on the knowledge items for Module Five of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Pretest instrument, items 21-25). The mean pretest knowledge score for Module Five was 1.35, with a standard deviation of 1.17.

Table 17
Pretest for Module Five: Items 21-25 (N=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	1.35	0.00	4.00	4.00	1.17

Table 18 contains the descriptive statistics for the participants' pretest results on the knowledge items for Module Six of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Pretest instrument, items 26-30). The mean pretest knowledge score for Module Six was 3.71, with a standard deviation of .92. This module, like Module Four, did not have a minimum of zero. Further, this was the only module that had two perfect scores on the pretest and the highest mean by ~.6. The focus of Module Six was Universal Design for Learning (UDL). This instructional design process has been the subject of statewide training by an

Idaho State Department of Education staff member two years ago; thus, it is not a completely uncommon topic.

Table 18

Pretest for Module Six: Items 26-30 (N=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	3.71	2.00	5.00	3.00	.92

Table 19 contains the descriptive statistics for the participants' pretest results on the knowledge items (N = 30) for all modules (One through Six) of the professional development (see Appendix A for the Pretest instrument). The mean pretest knowledge score of the participant group was 15.52, with a standard deviation of 2.85.

Table 19

Pretest for All Modules (One through Six) (N =17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	15.52	12.00	23.00	11.00	2.85

Posttest Analysis. It is important to note, the pretest/posttest contained identical content; however, items were randomly reordered for the posttest to reduce pretest/posttest interference. The researcher then repositioned the test items in sequential order for discussion related to the posttest data.

Table 20 displays the frequency distribution of participants' posttest achievement scores. The data are exhibited as the number of correct responses on assessed knowledge of assistive technology (see Appendix A for the raw data for the Posttest). The data were collected one week after the professional development training using a 30-item multiple-choice instrument.

|

Table 20

Frequency Distribution of Teacher Posttest Achievement Scores for Module 1-6 (N=17)

Score by Range	Participant Group
0 to 5	0
6 to 10	0
11 to 15	2
16 to 20	1
21 to 25	8
26 to 30	6

Table 20 indicates the distribution of the posttest scores for the 17 teachers with the majority of scores ranging from 21 to 30 (N = 14) with two participants scoring in the 11 to 20 range and one in the 16 to 20 range; all other participants were in the higher end of scoring (21 to 30) (see Appendix A for the Posttest raw data).

Table 21 contains the descriptive statistics for the participants' posttest results on the knowledge items for Module One of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Posttest instrument). The mean posttest knowledge score was 3.88, with a standard deviation of 1.11.

Table 21

Posttest for Module 1: Items 1-5 (n=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	3.88	2.00	5.00	3.00	1.11

Table 22 contains the descriptive statistics for the participants' posttest results on the knowledge items for Module Two of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Posttest instrument, items 1-5). The mean posttest knowledge score was 3.65, with a standard deviation of 1.36. When reviewing the posttest data, there was one participant who scored a zero. The focus of this module was on the AT consideration process.

Table 22
Posttest for Module Two: Items 6-10 (N=17)

	N	Mean	Minimum	Maximum	Range	SD
Participants	17	3.65	.00	5.00	5.00	1.36

Table 23 contains the descriptive statistics for the participants' posttest results on the knowledge items for Module Three of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Posttest instrument, items 6-10). The mean posttest knowledge score was 3.82, with a standard deviation of 1.07.

Table 23
Posttest for Module Three: Items 11-15 (N=17)

	N	Mean	Minimum	Maximum	Range	SD
Participants	17	3.82	2.00	5.00	3.00	1.07

Table 24 contains the descriptive statistics for the participants' posttest results on the knowledge items for Module Four of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Posttest instrument, items 11-15). The mean posttest knowledge score was 3.94, with a standard deviation of 1.08.

Table 24
Posttest for Module Four: 16-20 (N=17)

	N	Mean	Minimum	Maximum	Range	SD
Participants	17	3.94	2.00	5.00	3.00	1.08

Table 25 contains the descriptive statistics for the participants' posttest results on the knowledge items for Module Five of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Posttest instrument, items 16-20). The mean posttest knowledge score was 4.00, with a standard deviation of

1.41. This module, like Module Two, had a separate participant who scored a zero. The focus for this part of the posttest was on Accessible Instructional Materials.

Table 25

Posttest for Module Five: Items 21-25 (N=17)

	N	Mean	Minimum	Maximum	Range	SD
Participants	17	4.00	0.00	5.00	5.00	1.41

Table 26 contains the descriptive statistics for the participants' posttest results on the knowledge items for Module Six of the professional development training, which consisted of five multiple-choice questions (see Appendix A for the Posttest instrument, items 21-25). The mean posttest knowledge score was 4.47, with a standard deviation of .52.

Table 26

Posttest Module Six: Items 26-30 (N=17)

	N	Mean	Minimum	Maximum	Range	SD
Participants	17	4.47	4.00	5.00	1.00	.52

Table 27 contains the descriptive statistics for the participants' posttest results on the knowledge items for all of the Modules of the professional development training, which consisted of 30 multiple-choice questions (see Appendix A for the Posttest instrument, items 26-20). The mean pretest knowledge score was 23.76, with a standard deviation of 5.45.

Table 27

Posttest for All Modules (One through Six) (N=17)

Group	N	Mean	Minimum	Maximum	Range	SD
Participants	17	23.76	12.00	30.00	17.00	5.45

The participants improved their knowledge of AT with a mean of 23.76 (an increase from 15.52 on the Pretest).

Table 28 contains the results of the t-test for the AT Pretest/Posttest.

Table 28

t-test Comparing the Sums of the Pretest and Posttest Group Scores (N=17)

Group	<u>Knowledge Pretest</u>		<u>Knowledge Posttest</u>		<u>t</u> (16)
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Participants	15.53	2.85	23.76	5.45	-5.70*

* $p \leq .05$.

There was a significant difference for the pretest ($M=15.53$; $SD=2.85$) and posttest ($M=23.76$; $SD=5.45$) conditions ($t(16) = -5.70$, $p = 0.000$). These results of the t-test indicate the training had a statistically significant effect on the knowledge (Gravetter & Wallnau, 2000) as measured by this test

Data Analysis for Research Question Two

This section of Chapter IV reports the data gathered during the study pertaining to Research Question 2.

2. What are the attitudes of the in-service teacher participants related to the online professional development course as measured by the Distance Education Learning Environments Survey (DELES) instrument and as communicated during a post-treatment focus group session?

The results of the study with regard to Research Question 2 indicate there was an overall positive sentiment toward the online learning environment. Attitudes were assessed prior to administration of the Posttest through the DELES instrument (see Appendix B for the DELES survey) and the Focus Group Questions (see Appendix C, Focus Group Questions). The DELES was analyzed using descriptive statistics.

The Focus Group Questions were formulated from the scales within the DELES to delve deeper into the survey results. The responses were reviewed and categorized. Further, each DELES scale was analyzed based on frequency distribution and then compared to the categorized responses to check for relationship.

The DELES is an instrument that was developed and validated (Walker & Fraser, 2005) to support the investigation of post-secondary distance education learning environments. Walker and Fraser melded social ecology and distance education to provide a theoretical basis to examine asynchronous distance education. The 42-item instrument is divided into seven scales: (1) Instructor Support; (2) Student Interaction and Collaboration; (3) Personal Relevance; (4) Authentic Learning; (5) Active Learning; (6) Student Autonomy; and (7) Enjoyment.

The researchers field-tested the instrument on 680 distance education students as part of the validation process. The coefficient alphas for the seven scales were: (1) Instructor Support = .87; (2) Student Interaction and Collaboration = .94; (3) Personal Relevance = .92; (4) Authentic Learning = .89; (5) Active Learning = .75; (6) Student Autonomy = .79; and (7) Enjoyment = .95 (Walker et. al, 2005).

The DELES was developed as a 5-point Likert scaled instrument (1 = *Never* to 5 = *Always*). Possible scores ranged from 42 (if all items were scored with a value of 1, and the in-service teacher participant responded *Never* on all 42 questions) to 210 (if all items were scored with a value of 5, and the in-service teacher participant responded *Always* on all 42 questions).

Table 29 exhibits the frequency distribution of the total scores by in-service teacher participants from the post-course attitudinal surveys (see Appendix B for the DELES survey) used in this current study.

Table 29
Frequency Distribution of Teacher Attitudes toward Online Professional Development (N=17)

Likert Scale	Score of Ranges	Participant Group
Never	42 to 81	0
Seldom	82 to 125	0
Sometimes	126 to 167	2
Often	168 to 209	15
Always	210	0
Total:		17

The frequency distribution ranged from 150 to 195 (*Sometimes* to *Often*). There was a concentration of scores in the range of 168-209 (*Often*). This distribution of scores indicated 15 of the in-service teacher participants had a positive attitude (*Often*) toward the online professional development and two held a neutral tone (*Sometimes*).

The data displayed in Table 30 contains the descriptive statistics for the participants' responses to each of the scales of the DELES (see Appendix B for the DELES raw data). Scales 2 (*Student Interaction and Collaboration*) and 7 (*Enjoyment*) had the largest standard deviation results; 3.64 and 4.45, respectively. In addition, these two scales also showed the lowest item mean of 3.41 and 3.81, respectively, which is further indication of variability in the participant's responses.

Table 30
DELES Scales 1-7 Descriptive Statistics (N=17)

	Items	Item M	M	Range		SD	Mdn
				Min	Max		
<i>Instructor Support</i>	8	4.68	37.41	31	40	2.87	38
<i>Student Interaction & Collaboration</i>	6	3.41	20.47	10	25	3.64	20
<i>Personal Relevance</i>	7	4.68	32.53	27	35	2.98	34
<i>Authentic Learning</i>	5	4.56	22.82	19	25	2.46	24
<i>Active Learning</i>	3	4.18	12.53	9	15	1.59	12
<i>Student Autonomy</i>	5	4.80	24.00	20	25	1.22	24
<i>Enjoyment</i>	8	3.81	30.47	21	39	4.45	31

Focus group responses provided the platform to delve deeper into the DELES responses. There were 17 focus group questions based on the DELES scales (see Appendix C). Six of these were initially asked, and the remaining 11 were available for use, if needed, to seek clarification if there were negative responses within the Likert results. The six questions corresponded to the *Instructor Support*, *Personal Relevance*, *Authentic Learning*, *Active Learning*, *Student Autonomy*, and *Enjoyment* scales. Although there were individual negative responses to DELES items within the seven scales, they were somewhat limited in scope and did not indicate a need for clarification beyond what the initial six Focus Group Questions would provide. Yet, it is important to note, although the researcher did not use the remaining 11 questions, a clarification question was posed within the context of Focus Group Question 2 to address the variability of participant responses in the DELES Scale 2. The 11 questions available for further investigation did not address the specific area of variability of scores found in Scale 2 (see Appendix C, Focus Group Questions).

Analysis of the responses from the Focus Group Questions was conducted through a methodical process that included multiple readings of the replies, one question

at a time (M. Wappett, personal communication, September 24, 2014). Through this procedure, categories emerged which logically distributed the participants' reactions and provided an enhanced understanding for the DELES results. The categories and their responses were also reviewed by a qualitative research expert who agreed with the logical distribution (M. Wappett, personal communication, March 9, 2015).

Instructor Support. Table 31 contains the frequency responses for the eight questions within Scale 1 of the DELES (see Appendix B for the DELES raw data). There were 2 negative responses (*Seldom*), 5 neutral responses (*Sometimes*), and 129 positive responses (*Often* and *Always*).

Table 31
DELES Scale 1: Instructor Support Frequency Responses (N=17)

Question	Never	Seldom	Sometimes	Often	Always
1	0	0	0	2	15
2	0	0	2	6	9
3	0	0	0	2	15
4	0	1	0	6	10
5	0	0	0	4	13
6	0	0	0	2	15
7	0	0	0	1	16
8	0	1	3	5	8
Total:	0	2	5	28	136

The DELES Scale 1 included eight questions focused on the level of instructor, including ease of contact. Thus, Focus Group Question 1 delved deeper into this line of questioning by asking the participants to compare the level of contacting the instructor as compared to a face-to-face class:

1. In responding to the DELES survey, there were seven areas represented. The first of these related to Instructor Support. I would like to talk about some of the items in this category in order to gain additional insight for future online courses such as the one you have just completed.

How did you feel about the ease of contacting your instructor; in comparison to a face-to-face class, was it as easy to contact your instructor?

Fourteen participants provided responses to Focus Group Question 1 (see Appendix C for the Focus Group Questions raw data). As indicated in Table 32, the two categories that evolved from the responses for this question included “Ease of Contact” and “Office Hours.” The participants found the process of contacting the instructor easy and preferred the option of not having to wait for “office hours” commonly found with face-to-face faculty. Further, they indicated that even though the course was at a distance, they received the instructional support necessary to be successful in the class. The positive responses found in the results of Scale 1 of the DELES indicate agreement with the comments provided in Focus Group Question 1.

Table 32

Focus Group Question 1 Example Quotes (N=14)

Categories	Example Quotes
Ease of Contact	<p>It was very easy to contact you. You give clear instructions in a very fun, comfortable way.</p> <p>Janice Carson was very easy to contact during this coursework. Since she is a favorite on my school e-mail already, all I had to do was start typing and hit send. Replies were quick. Thank you.</p> <p>As with what many of you have said, it was very easy and you responded quickly to any questions that I had. Thanks again.</p> <p>It was extremely [sic] easy to contact the instructor and I felt that I always received necessary and quick feedback.</p>
Office Hours	<p>It was always easy to contact the instructor. Having both email and telephone contact options made it just as easy as contacting the instructor in a face-to-face class, because we did not have to wait for office hours. Responses were always VERY promptly provided.</p> <p>The instructor was readily available. I contacted her both through course discussion boards and messaging as well as personal email.</p> <p>Face- to- face classroom instructors always post office hours and encourage visits, but many times their schedules are in conflict with your own. Online instructors are ALWAYS available.</p>

Personal Relevance. Table 33 contains the frequency responses for the seven questions within Scale 3 of the DELES (see Appendix B for the DELES raw data). There were 2 neutral responses (*Sometimes*) and 117 positive responses (*Often* and *Always*).

Table 33
DELES Scale 3: Personal Relevance (N=17)

Question	Never	Seldom	Sometimes	Often	Always
15	0	0	0	6	11
16	0	0	0	5	12
17	0	0	0	5	12
18	0	0	2	5	10
19	0	0	0	7	10
20	0	0	0	4	13
21	0	0	0	6	11
Total:	0	0	2	38	79

The DELES Scale 3 included seven questions focused on the personal relevance of the course content to the participants, including connecting the content to their individual profession. Thus, Focus Group Question 2 delved deeper into this line of questioning by asking the participants how the course related to their role as a professional educator:

2. Another category of the DELES survey addressed *Personal Relevance*. In this section, while the items were designed for a variety of courses, I would like to ask about the relevance to you as a professional in education, and in particular, as one who is involved with supporting students with special needs.

Can you explain how this course relates to your professional educator role?

There were 14 participants who provided a response to Focus Group Question 3 (see Appendix C for the Focus Group Questions raw data). As indicated in Table 34, the two categories from the responses for this question included “In Practice” and “In Leadership.” Several of the participants expressed they would implement the resources into their own classroom practice. In addition, many were looking forward to sharing

information with their peers in their district. The positive DELES results from Scale 3 indicated an agreement with the focus group comments.

Table 34

Focus Group Question 2: Category Example Quotes (N=14)

Categories	Example Quotes
In Practice	<p>This course related directly to my professional educator role as a speech- language pathologist. I believe the assistive technology presented in the course, whether low or high tech, all related somehow to students' with disabilities ability to receive and express thoughts and/or ideas. Therefore, as an SLP it was important for me to learn about the various ways a student can access information and express information so I can provide those avenues of opportunities. I also feel that learning about and using AT was important to my role as an instructor so that as I teach I can increase accessibility [sic] to all types of learners with and without disabilities as part of the UDL framework.</p> <p>As a special educator with no experience in AT I now know what AT is, what I have already been using that I didn't call AT, and what more is available and where I can get it. So many questions have been answered. I have especially like the info on text compacting. I really need that for my students who struggle with reading. This is going to have a big impact on how I use, label, and look for AT.</p>
In Leadership	<p>I found from class some great resources to utilize in my teaching position, some for students and some for staff to create a quality education for special needs students. This will be my first year as the Assistive Technology Specialist for my school district. This class was extremely [sic] helpful in providing a multitude of resources to be able to share with district staff.</p> <p>As a director, I appreciated the wide variety of information presented, and the MANY resources shared, because these will help me in developing training for administrators, sp ed [sic] teachers, IEP teams, and even students and parents. Because AT is such a changing field, that training will have to be ongoing, but I am excited to have so many new resources to approach the task!</p>

It is important to note, as the participants were responding to Focus Group Question 2, which addressed Scale 3: *Personal Relevance*, three of the students inserted comments that related to Scale 2: *Student Interaction and Collaboration*, of the DELES. Although the researcher did not develop a question to delve deeper into this section, the responses provided important instructional design feedback.

Table 35 contains the frequency responses for the six questions within Scale 2 of the DELES (see Appendix B for the DELES raw data). There were 12 negative responses

(*Never* and *Seldom*), 41 neutral responses (*Sometimes*) and 49 positive responses (*Often* and *Always*).

Table 35
DELES Scale 2: Student Interaction and Collaboration (N-17)

Question	Never	Seldom	Sometimes	Often	Always
9	2	1	10	4	0
10	0	0	3	12	2
11	1	0	5	7	4
12	1	1	7	5	3
13	1	3	9	4	0
14	1	1	7	7	1
Total:	6	6	41	39	10

As indicated in Table 36 the three categories that emerged from the responses for this question included “More Guidance,” “Disconnected,” and “Flexibility.” The participants expressed that additional guidance on the expectations for the group project would have been helpful. Further, one of the participants would have preferred an opportunity for the class to meet in a synchronous environment to increase peer collaboration. They also indicated a preference for the flexibility of the asynchronous environment, which allowed them to complete their group project in a timeframe that fit their schedules. Finally, one participant would have wanted to take the concept of “flexibility” further by choosing the group project week. The results from Scale 2 of the DELES indicated a relationship to the comments found in the follow-up group question.

Table 36
Scale 2 Responses (N=3)

Categories	Example Quotes
More Guidance	Having limited experience with on-line courses and being in the first group to present, I had initially expected the group process to be more collaborative. I'm wondering if it might have been helpful to have a bit more guidance on expectations for group work. I agree with Cheryl's comments about guidance.
Disconnected	I appreciated the asynchronous flexibility of the course which allowed us to log on and complete work at different times. However, that made it very difficult to feel connected with a group for the group project. I unfortunately only had internet availability for the first half of the week for my group project, so I was able to post but had no chance for group sharing or communication because my other group members were not available until the end of the week. A colleague has shared that in her on-line course there is a scheduled time to meet on a regular basis via Microsoft link. She has indicated that this has made her feel more connected and she enjoys learning from her classmates. It also ensures that there'll be time for sharing ideas, asking questions and providing feedback.
Flexibility	...being summer and off doing summer things, it was really nice to have an open format to contribute when and how it was convenient. Perhaps, in a summer course like this, we could have some flexibility for selecting our group project week to try to work around windows of unavailability. If I had known what the group project involved, I would [sic] have picked to do mine one week earlier, rather than trying to complete it the one week I was camping in Canada! My group members would probably have appreciated that as well.

Authentic Learning. Table 37 contains the frequency responses for the five questions within Scale 4 of the DELES (see Appendix B for the DELES raw data). There were 2 neutral responses (*Sometimes*) and 83 positive responses (*Often* and *Always*).

Table 37
DELES Scale 4: Authentic Learning (N=17)

Question	Never	Seldom	Sometimes	Often	Always
22	0	0	2	7	8
23	0	0	0	7	10
24	0	0	0	5	12
25	0	0	0	7	10
26	0	0	0	7	10
Total:	0	0	2	33	50

The DELES Scale 4 included five questions focused on authentic learning in which course content would be connected to real examples. Thus, Focus Group Question

3 delved deeper into this line of questioning by asking the participants how the real-world examples impacted their experience during the class:

3. The *Authentic Learning* section of the survey related to real-world connections of the class.

Were real-world situations presented in this course?

- *If yes, can you relate one specific example that was most impacting to your experience during the class?*
- *Why was this especially meaningful for you?*

A total of 16 participants provided a response to the focus group question (see Appendix C for the Focus Group Questions raw data). As indicated in Table 38, the three categories from the responses for this question included “In Practice,” “Visualize AT Impact,” and “Personal Impact.” Several of the participants expressed that the real-world examples assisted them in generalizing the use of AT into their professional practice and they were now able to bring solutions to support specific students. In addition, through the use of real-world video examples, participants explained they were now able to visualize how the AT impacted the lives of individuals with disabilities. Some participants viewed the use of real-world examples from a more personal level, they found AT solutions to support their own children. The positive DELES results from Scale 3 indicated an agreement with the focus group comments that further demonstrates the real-world situations supported them in moving beyond a knowledge level of AT into a deeper understanding of how AT is critical in the everyday lives of individuals with disabilities. Further, they were able analyze the functional use of the AT examples and generalize that information with their students or their own children.

Focus Group Question 3 Category: Example Quotes (N=16)

Categories	Example Quotes
In Practice	<p>Oh my, where to start! I loved the AIM explorer and Navigator, the MySTudyBar feature, the YouDescribe app. All of these are so practical in addressing some of the needs of my blind/VI students. They are meaningful because they are so practical.</p> <p>Yes, in every module there was at least one new idea that I came away thinking that I could use this idea for a particular student. However, what really got me excited was learning about the new technology that will coming [sic] our way. I loved seeing how 3d [sic] printers and google glass [sic] can be used to help our students!</p>
Visualize AT Impact	<p>I think the video that stood out to me the most was the young woman with the glasses navigating on her own who is blind. How amazing is that! Being able to go out into the world and live her life like everyone else.</p> <p>The interview with the young woman who has dyslexia (with the whiteboard drawings) is a good example. It was meaningful because in her own words she told how she had used and benefited from AT and special services.</p>
Personal Impact	<p><i>Together We Can Get There</i> was truly inspiring. It was relevant to my experiences as a parent and as a teacher. So often we do not adequately prepare our students with additional disabilities and their families for post-secondary experiences.</p> <p>Yes! Learning that my son is hearing impaired while taking this course made it very real-world to me.</p>

Active Learning. Table 39 contains the frequency responses for the three questions within Scale 5 of the DELES (see Appendix B for the DELES raw data). There were 5 neutral responses (*Sometimes*) and 46 positive responses (*Often* and *Always*).

Table 39

DELES Scale 5: Active Learning (N=17)

Question	Never	Seldom	Sometimes	Often	Always
27	0	0	2	11	4
28	0	0	1	10	6
29	0	0	2	11	4
Total:	0	0	5	32	14

The DELES Scale 5 included three questions focused on active learning in which the student maintained a level of independence. Thus, Focus Group Question 4 delved deeper into this line of questioning by asking the participants what learning strategies they employed and if they were different compared to a face-to-face class:

4. The *Active Learning* section of the survey related to independent learning. As adult learners who are also professional educators, it is particularly important for the instructor/designer to know about your level of comfort in course participation.

What learning strategies did you employ while taking this online course?

- *Were these strategies different from those that you would have employed in a face-to-face class? If so, why? If not, why?*

There were 15 participants who provided at least one response to Focus Group Question 4 (see Appendix C for the Focus Group Questions raw data). As indicated in Table 40, the four categories from the responses for this question included “Standard Class Participation,” “Flexibility,” “Speaker Notes Support,” and “Further Exploration.” The learning strategies identical to those used in a face-to-face class included note taking during lectures and reading materials. However, there were strategies unique to the online learning environment. These included flexibility in chunking the instructional materials as well as time and location. The participants also discussed the benefits of being able to access the speaker notes prior to or during the lecture. Finally, being able to access recommended websites and materials, which extended instruction beyond the modules, provided a richer learning environment than what could be provided in face-to-face training. The positive DELES results from Scale 4 indicated an agreement with the focus group comments, that the online environment was designed in such a way to allow choice and employment of beneficial learning strategies that were either the same as face-to-face training or unique to a distance format.

Table 40

Focus Group Question 4 Category: Example Quotes (N=15)

Categories	Example Quotes
Standard Class Participation	I used the standard note- taking strategy...
Flexibility	<p>I started by printing off the outline for note taking.</p> <p>I think there were similarities to a face-to-face in that I read and reviewed materials, watched videos and collaborated with classmates.</p> <p>I think the biggest difference for me was the flexibility for when and where to complete class activities.</p> <p>I was able to work at the times that fit my schedule, and didn't need to plan around full days of instruction in a face-to-face seminar-type setting.</p>
Speaker Notes Support	<p>I really enjoyed the flexibility of taking an on-line course as my schedule was unexpectedly busy this summer.</p> <p>One nice feature which I really appreciated, but had never had available in a face-to-face class, was having the speaker notes available IN ADVANCE. I found that I preferred reading the speaker notes BEFORE listening to the lecture.</p>
Further Exploration	<p>One of the modules was about 46 minutes but the it [sic] took me half a day to get through it because I was going to each of the apps or websites and checking them out. All I had to do was pause the module and it was a piece of cake to find the items I wanted and investigate them. I would have definitely not done that in a face- to- face. By the time I left class I would have forgotten to do it. Being able to do it in the moment was key for me. I really liked this method of learning and I can see why students like it as well.</p> <p>I agree with Deb that the structure of the class really made it conducive to meaningful, individual exploration of the information presented. She is right that having time to explore right during the lesson, and being able to go back to the information as many times as we wanted to, really helped process the huge amount of great information being presented.</p>

Student Autonomy. Table 41 contains the frequency responses for the five questions within Scale 6 of the DELES (see Appendix B for the DELES raw data). There were 85 positive responses (*Often* and *Always*).

Table 41

DELES Scale 6: Student Autonomy (N=17)

Question	Never	Seldom	Sometimes	Often	Always
30	0	0	0	7	10
31	0	0	0	4	13
32	0	0	0	2	15
33	0	0	0	2	15
34	0	0	0	2	15
Total:	0	0	0	17	68

The DELES Scale 6 included five questions focused on autonomy in which the students were asked about their level of control in the course. Thus, Focus Group Question 5 delved deeper into this line of questioning by asking the participants about the flexibility of the course:

5. The next category is labeled *Student Autonomy*. This section primarily relates to learner-control during the course.

Did you perform class work (e.g., assignments, discussion postings, etc.) outside of class?

- *If yes, did this flexibility allow you to select the times that were convenient for your personal life?*
- *If no, why were you unable to do this? What suggestions do you have for facilitating learners in doing this?*

There were 15 participants who provided a response to Focus Group Question 5 (see Appendix C for the Focus Group Questions raw data). As indicated in Table 42, the two categories from the responses for this question included “Personal Schedules” and “Learner Control Advice.” All of the participants expressed they appreciated the flexibility in being able to work on the course during times that matched their schedules. In addition, some mentioned that without this option, they would not have been able to enroll in the training. Lack of student control issues ranged from the group project being at an inconvenient time to iPads not interfacing well with the learning management system (LMS). The positive DELES results from Scale 6 indicated an agreement with Focus Group 5 comments that the online asynchronous design of the course allowed them to synchronize the module activities to fit their schedules.

Table 42

Focus Group Question 5 Category: Example Quotes (N=15)

Categories	Example Quotes
Personal Schedules	<p>The flexibility allowed me to take take [sic] this class when and where I needed. I would not have been able to take this course if I was required to be in a certain place and certain time each week.</p> <p>I loved the4 [sic] flexibility-to work when I had the time and fit my schedule. I enjoyed being able to review the information when I needed it. I would not have been able to take this course if it were in a brick and motor setting.</p> <p>The flexibility of this course made it great. Without that flexibility, I would not have been able to take this course and access this information. Some weeks, I was able to log on multiple times each week, for brief amounts of time, and that worked well with my summer schedule.</p>
Learner Control Advice	<p>I did experience some frustration with the functionality of different devices interacting with Blackboard. (I used a combination of Ipad [sic], smart phone, laptop, netbook, and desktop computer.) My initial goal had been to use my IPAD for course access while traveling, but that didn't work well for me. I finally figured out that it was almost impossible for me to compose a coherent discussion board reply on my IPAD, so after a couple weeks of frustration I figured out how to have PC access for the discussion board postings, and that improved my ability to keep up in the course.</p> <p>I tend to be a procrastinator so it helped that there was a structure with certain things required each week, so I couldn't let myself get behind and then try to play catch up. As it happened my group project week wasn't the most convenient for me as I was travelling the first part of that week, then returned home and spent two full days in a workshop, and then it was Friday!</p>

Enjoyment. Table 43 contains the frequency responses for the eight questions within Scale 7 of the DELES (see Appendix B for the DELES raw data). There were 9 negative responses (*Never* and *Seldom*), 33 neutral responses (*Sometimes*), and 94 positive responses (*Often* and *Always*).

Table 43
DELES Scale 7: Enjoyment (N=17)

Question	Never	Seldom	Sometimes	Often	Always
35	0	0	4	12	1
36	0	1	8	7	1
37	0	0	6	10	1
38	0	0	1	13	3
39	0	1	3	9	4
40	0	1	5	9	2
41	2	4	6	3	2
42	0	0	0	4	13
Total:	2	7	33	67	27

The DELES Scale 7 included eight questions focused on the participants' enjoyment of distance education. Thus, Focus Group Question 6 delved deeper into this line of questioning by asking the participants to explain "why they prefer" or "do not prefer" distance delivery:

6. The final category on the DELES survey relates to Enjoyment. Because this course was via distance through a learning management system (Blackboard), the items relate specifically to your experience under this design and delivery mode.

Some of you probably answered that you prefer a professional development course through distance delivery methods, while others did not express a preference for this.

- *Can you relate a specific example of why you prefer distance delivery?*
- *Please relate an example of why you do not prefer distance delivery? How can the instructor/designer increase your preference for distance delivery of this course?*

There were 14 participants who provided a response to Focus Group Question 6 (see Appendix C for the Focus Group Questions raw data). As indicated in Table 44, the three categories from the responses for this question included "Flexible Scheduling," "No Traveling," and "Missed Face-to-Face Interactions." Flexible scheduling to complete module activities and spend time with family came forward, again, as a positive answer

for asynchronous online training. Participants, particularly from rural areas, appreciated not having to travel to attend professional development. Yet some participants did express that they missed the interaction of a face-to-face course and suggested scheduled opportunities for individuals to login and chat in a face-to-face distance format. The variability found in the DELES results from Scale 7 (see Table 30) was also evident in the focus group comments. The participants discussed both the positive and negative characteristics of distance education courses; however, overall they appreciated the flexibility and convenience of the platform.

Table 44

Focus Group Question 6 Category: Example Quotes (N=14)

Categories	Example Quotes
Flexible Scheduling	Distance learning allows me to still meet all of my other obligations as a wife, mom, fitness instructor, small business owner!
	The flexibility of being able to watch the lectures and do the classwork on my own schedule was what made it possible for me to take this class.
No Traveling	As with the rest of my classmates, distance learning made it possible for me to take this very meaningful and educational course.
	Second, distance delivery is really nice for someone from a rural district. Having to drive several hours to reach a course site to take a class makes it much less appealing.
	It's very difficult these days to drive 20 miles then spend 3 hours in class for several weeks.
Missed Face-to-Face Interactions	It is really nice not having to spend time traveling to and from class- - more time that I can spend with my family!
	Having live discussion promotes new opportunities for exchange of professional discussion and growth and real time learning and problem solving opportunities.
	I know that some people are more apt to socialize online and meet their classmates, but I am more of a f2f [sic] social person.
	... an idea to explore might be to use the IEN network to connect with people who want a more "face- to- face" experience. Because it is available in every district in Idaho, it might be an option. Or perhaps there could be virtual "office hours" when people who are available and want to could log on together for real-time interaction.

Data Analysis for Research Question Three

This section of Chapter IV reports data gathered during the study pertaining to Research Question 3.

3. What is the ability of the in-service teacher participants, as teacher-leaders, in codifying the consideration process through the development of a systematic AT plan for a student with a disability as measured by a researcher-created rubric?

The results of the study with regard to Research Question 3 indicate the participants were able to codify the consideration process through the development of a systematic AT plan for a student with a disability (see Appendix D for the AT Plan raw data). The AT Plan was analyzed using descriptive statistics.

The AT Plan is an instrument that was developed by the researcher to support the investigation of the participant's ability to codify the consideration process through the development of a plan. The rubric included eight items of analysis: (1) Present Level of Performance; (2) Annual Goal; (3) Tasks Associated with Goal; (4) Student's Functional Capabilities; (5) AT Supports and Services; (6) Choose and Trial; (7) Implementation; and (8) Progress Monitoring.

The instrument was constructed with a 3-item rubric (0 = *Not Evident* to 3 = *Advanced*). Possible scores ranged from 0 (if all items were scored with a value of 0, and the in-service teacher participant scored *Not Evident* on all 8 items) to 24 (if all items were scored with a value of 3, and the in-service teacher participant scored *Advanced* on all 8 items).

The researcher scored each of the AT Plans against the 3-item rubric over a period of three days. One week later, the researcher spent two hours comparing each plan to the corresponding 3-item rubric to make sure there was consistency in the scoring process.

The review did not indicate a grading difference from one AT Plan to another; thus, the marks stood as originally recorded.

Table 45 exhibits the frequency distribution of the total scores by in-service teacher participants from the rubric (see Appendix D for the AT Plan rubric) used in this current study.

Table 45
Frequency Distribution of AT Plan Results (N=17)

Rubric Scale	Score of Ranges	Participant Group
Not Evident	0	0
Intermediate	2 to 16	0
Advanced	17 to 24	17
Total:		17

The frequency distribution ranged from 17 to 24 (*Advanced*). There was a concentration of scores in the range of 21-24 (*Advanced*). This distribution of scores indicated 17 of the in-service teacher participants were able to codify the consideration process through the development of an AT Plan.

Table 46 contains the descriptive statistics for the scores from the AT Plan (see Appendix D for the AT Plan raw data). The data indicates there was marginal variance in the participant's ability to write an AT plan with a standard deviation of 1.39 and a Median of scores of 24.

Table 46
AT Plan Descriptive Statistics (N=17)

	Items	Mean	Range		SD	Median
			Min	Max		
Areas 1-8	8	23.06	21	24	1.39	24

Data Analysis for Research Question Four

This section of Chapter IV reports data gathered pertaining to Research Question 4 (see Appendices E & F for the instruments and raw data).

4. What is the instructional design evaluation compliance level for the Analyze and Design phases of the ADDIE instructional design model in the creation of the online AT professional development course as measured by a modified Delphi Technique?

Following a structured approach, established by instructional design researchers Moulton, Strickland, Strickland, White, and Zimmerly (2010), this study sought the professional opinions of SMEs and IDEs through a Delphi technique in all 14 tasks of the Analyze and Design phases of the ADDIE model. Through Likert scaled instruments the results of the study, with regard to Research Question 4, indicate the Analyze and Design phases of the online professional development training course met the ADDIE criteria. Through this process, content and face validity were established, as was inter-rater reliability among the panel of experts. The panel members were sent the 14 tasks via separate emails to maintain membership anonymity to facilitate independent results from each expert.

The 10 tasks of the Analyze phase were distributed through four surveys (Delphi 01, Delphi 02, Delphi 03, and Delphi 04). Table 47 contains descriptive statistics for the SME scores for the Analyze phase (see Appendix E for the raw data).

Table 47

ADDIE Model: Analyze Phase Summary of Delphi Experts

Survey	Tasks	Mean	SD
Delphi 01	A01-A03	203.33	1.15
Delphi 02	A04-A06	80.00	.00
Delphi 03	A07-A08	56.00	.00
Delphi 04	A09-A10	60.00	.00

The four tasks of the Design phase were distributed through four surveys (Delphi 05, Delphi 06, Delphi 07, and Delphi 08). Table 48 contains descriptive statistics for the SME and IDE scores for the Design phase (see Appendix F for the raw data). The deviation in D02 and D03 is the result of one of the IDE panel members who maintained

a consistent positive rating of 3, while the other two panel members maintained a consistent positive rating of 4.

Table 48

ADDIE Model: Design Phase Summary of Delphi Experts

Survey	Tasks	Mean	SD
Delphi 05	D01	64.00	.00
Delphi 06	D02	18.33	2.08
Delphi 07	D03	47.00	6.66
Delphi 08	D04	32.00	.00

Further examination of the opinions of the experts was also conducted through an analysis of inter-rater reliability. “The importance of rater reliability lies in the fact that it represents the extent to which the data collected in the study are correct representations of the variables measured” (McHugh, 2012, p. 276).

The intraclass correlation coefficient statistical method was employed for the Likert scale data from the four Delphi survey instruments for the Analyze and Design phases. The inter-rater reliability of the Delphi judges was calculated using SPSS software for intraclass correlation coefficient (r ,) (Boone & Boone, 2012).

The data displayed in Table 49 represents the inter-rater reliability of the panel members (SMEs; see Figure 4) from the Analysis Phase of the ADDIE model.

Table 49

ADDIE Model: Analysis Phase Summary of Delphi Experts Inter-rate Reliability

		Rater 1	Rater 2	Rater 3
Rater 1	Pearson Correlation Sig. (2-Tailed)	1	1.000* .000	1.000* .000
Rater 2	Pearson Correlation Sig. (2-Tailed)	1.000* .000	1	1.000* .000
Rater 3	Pearson Correlation Sig. (2-Tailed)	1.000* .000	1.000* .000	1

* Correlation is significant at the 0.01 level (2-tailed).

Table 49 displays the inter-rater reliability of the experts on all four Delphi instruments as 1.000. These data indicate consistency among the judges; thus, indicating a high level of agreement that the tasks within the Analysis phase were highly reliable. In addition, the intraclass correlation coefficient (r), using SPSS software, was calculated as $r=1.000$. The results indicate the panel experts were highly reliable in their scoring of the surveys.

Table 50 represents the inter-rater reliability of the judges from the Design Phase of the ADDIE model. The panel members (SMEs or IDEs; see Figure 5) were asked to rate each of the tasks independently.

Table 50

ADDIE Model: Design Phase Summary of Delphi Experts Inter-rater Reliability

		Rater 1	Rater 2	Rater 3
Rater 1	Pearson Correlation	1	.966*	.959*
	Sig. (2-Tailed)		.034	.041
Rater 2	Pearson Correlation	.966*	1	1.000**
	Sig. (2-Tailed)	.034		.000
Rater 3	Pearson Correlation	.959*	1.000**	1
	Sig. (2-Tailed)	.041	.000	

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 50 displays the inter-rater reliability of the experts on all four Delphi instruments ranging from a low of .959 to a high of 1.000 with a mean of $r=.975$. These data indicate consistency among the judges; thus, indicating a high level of agreement that the tasks within the Design phase were highly reliable. In addition, the intraclass correlation coefficient (r), using SPSS software, was calculated as $r=.989$. The results indicate the panel experts were highly reliable in their scoring of the surveys.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine the effectiveness of online professional development training on assistive technology by comparing knowledge acquisition pretest/posttest scores; examining the Analysis and Design phases of the ADDIE model through a Delphi technique; measuring participant attitudes toward the online instructional interface gauged by the DELES online survey with follow-up Focus Group Questions; and assessing the participants' assistive technology implementation plans by means of a researcher designed rubric. The professional development course was offered by the College of Education at a public university in the intermountain western part of the United States.

The conclusions based on the findings in Chapter IV are detailed. Implications from the research, as well as the strengths, weaknesses, and recommendations for further inquiry are also included.

Discussion of Findings

Research Question 1

Research question:

1. Is there a significant difference in AT content knowledge for in-service teachers participating in an online professional development course as measured by a researcher-created pretest/posttest achievement instrument?

There was a significant difference for the pretest ($M=51.71$; $SD=9.59$) and posttest ($M=79.29$; $SD=18.24$) conditions ($t(16) = -5.72$, $p = 0.000$), indicating the training had a statistically significant effect on the knowledge (Gravetter & Wallnau, 2000) as measured by this test. Thus, the null hypothesis was rejected $H_o: \mu_{\text{pretest}} =$

μ posttest indicating an increase in participant achievement. The result was consistent with the findings in previous studies (Wang, 2011; Zimmerly 2012) in which a structured design process (Strickland et al., 2013) allowed for both pedagogical and technological analysis for online learning environments.

Yet, it is important to note, when looking at the breakdown of the posttest module results, two separate participants scored a zero on Module Two and Module Five. The researcher wonders if the participants were busy with their summer plans and hurried through materials; thus, not learning the material well.

Further, since the pretest, as a whole, did not address one common topic, but instead addressed three topic areas, the researcher employed the Guttman's Lambda 4 reliability coefficient analysis, which yielded an internal consistency reliability level of $r = 0.68$. This is just below an acceptable level of reliability of $r = 0.70$ for a classroom exam (Wells & Wollack, 2003); thus, a further examination of the pretest instrument was conducted, as part of the Evaluation phase of the ADDIE model.

In the first topic area, AT Requirements and Process (Questions 1-10), the participants were tested on their knowledge of the interplay between IDEA and the Common Core State Standards, as well as the AT process. The participants were unable to correctly answer two questions that addressed IDEA statute statements. Rewriting these two questions to gather statute intent through the use of simpler language may assist in clarifying the meaning for the participants.

The second topic area, AT Devices (Questions 11-20), included questions to assess the participants' basic AT knowledge and their ability to match and procure the type of AT needed, which is based on the functional need of a student. Assistive

technology to support students with higher needs, such as those who are blind, deaf, or have an intellectual disability, is very difficult. When paired with a lack of assistive technology formal training in academic programs, the depth and breadth of content knowledge needed is missing (Bausch & Hasselbring, 2004; Jost & Mosley, 2011; Ko, 2007; Marsters, 2011; Nelson, 2006). Taking all of this into consideration, the researcher added additional questions to include some of the more commonly used assistive technologies across disabilities (Wells et al., 2003).

In the third topic area, AIM and AT in General Education (Questions 21-30), there was a mix of general educational questions focused on typical technology and concepts such as Universal Design, as well as detailed questions on AIM formats and acquisition. The participants had much lower mean scores with regard to AIM questions and higher scores for those items addressing typical general education technology and concepts. This is not surprising, since educational technology pre-service and in-service training has been at the heart of Idaho's educational community for several years; yet only a limited number of in-service teachers have received AIM training prior to this professional development. The researcher will adjust the pretest for future trainings and provide questions that cover broader concepts within AIM, versus specific regulatory language.

Research Question 2

2. What are the attitudes of the in-service teacher participants related to the online professional development course as measured by the Distance Education Learning Environments Survey (DELES) instrument and as communicated during a post-treatment focus group session?

The frequency distribution of the in-service teachers' responses ranged from 150 to 209 (*Sometimes to Often*) with a concentration of 15 out of 17 scores in the range of

168-209 (*Often*). Although, this distribution of scores indicated the in-service teacher participants had a positive attitude toward the online professional development course; a deeper investigation of the DELES scaled scores were analyzed through the Focus Group Questions.

DELES scale 1: *Instructor Support* entailed eight questions. The responses from the 17 participants included 164 positive, 5 neutral, and 2 negative responses (see Appendix B for the DELES raw data). The focus group responses from 14 of the participants fell into two categories “Ease of Contact” and “Office Hours.”

Comments included, “very easy to contact,” “responded quickly,” and “just as easy as contacting the instructor in a face-to-face class” (see Appendix C for the Focus Group Questions raw data). Two of the statements from the DELES, “The instructor gives me valuable feedback on my assignments” and “The instructor provides me positive and negative feedback on my work” both received one score each of “*Seldom*.” However, further insight through the in-service teachers’ responses did not reveal additional detail regarding why each question received one negative response of “*Seldom*.” It is important to note the main assignment, the AT Plan, had just been handed in and had not been graded at the time the participants took the survey and responded to the Focus Group Questions. Prior to this point, the participants had participated in online discussions focused on the modules.

DELES scale 2: *Student Interaction and Collaboration* was comprised of six questions. The responses from the 17 participants included 49 positive (*Often* to *Always*), 41 neutral (*Sometimes*), and 12 negative (*Never* to *Seldom*) responses (see Appendix B for the DELES raw data). Out of the six questions, four received either two or three

negative responses (*Never* and *Seldom*), which spoke to group work and collaboration: “I work with others,” “I collaborate with other students in the class,” and “Group work is part of my activities.” Again, although this scale did not include a planned Focus Group Question, three participants provided insight that corresponded to the DELES scale 2, *Student Interaction and Collaboration*. These responses fit into three categories: “More Guidance,” “Disconnected,” and, “Flexibility.”

Their corresponding responses were, “I’m wondering if it might have been helpful to have a bit more guidance on expectations for group work,” “Perhaps, in a summer course like this, we could have some flexibility for selecting our group project week to try to work around windows of unavailability,” and “I appreciated the asynchronous flexibility of the course which allowed us to log on and complete work at different times. However, that made it very difficult to feel connected with a group for the group project.” (see Appendix C for the Focus Group Questions raw data.). These responses spoke to the need within the instructional design to include a guided, yet flexible, collaborative structure, and clearer guidelines for group work. Each workgroup did have a designated “members only work area,” which included email, group discussion board, group journal, and file exchange. Since the design was meant to be asynchronous, they were not given the opportunity to use a synchronous distance platform such as *Collaborate* for virtual meetings. This type of solution was posed as part of one of the responses: “A colleague has shared that in her on-line course there is a scheduled time to meet on a regular basis via Microsoft link. She has indicated that this has made her feel more connected and she enjoys learning from her classmates. It also ensures that there’ll be time for sharing ideas, asking questions and providing feedback.” (see Appendix C

for the Focus Group Questions raw data). In the future, the researcher will include the availability for scheduled face-to-face online meetings with webcams to add the personal element of connectedness for the participants (Martin, Parker, & Deale, 2012).

DELES scale 3: *Personal Relevance* consisted of seven questions. The responses from the 17 participants included 117 positive (*Often to Always*) and 2 neutral (*Sometimes*) (see Appendix B for the DELES raw data). Focus Group Question 2, which corresponded to the DELES scale 3, *Personal Relevance*, received responses from 14 of the participants that fell into two categories “In Practice” and “In Leadership.”

Responses included comments such as, “This course was very relevant for me as a special education director;” and “As a sped teacher and not much knowledge on AT, this was a great class” (see Appendix C for the Focus Group Questions raw data). The two neutral responses were from the same question, “I apply my everyday experiences in class.” In reviewing the responses, no one expressed a disconnect between the content and their practice; however, the participants spoke to an excitement to implement their new knowledge of AT into their practices, “The simple ideas I was reminded of like turning on the closed captioning for videos will be something easy I can do to help my students” and “As a sped teacher and not much knowledge on AT, this was a great class. I learned so much and am so excited to try some of the apps and devices out there for a couple of my students this year.” Overall, the participants indicated they were able to generalize the information they learned into their profession.

DELES scale 4: *Authentic Learning* contained seven questions. The responses from the 17 participants included 117 positive (*Often to Always*) and 2 neutral

(*Sometimes*). (see Appendix B for the DELES raw data). Focus Group Question 3, which corresponded to the DELES scale 4: *Authentic Learning*, received responses from 16 of the participants, which fell into three categories “In Practice,” “Visualize AT Impact,” and “Personal Impact.”

The participants’ responses included comments such as, “Yes! I have a student this year that is severely Autistic and one that is higher functioning- I now have several tools at my fingertips,” “Watching how to use the different AT gave me insight into how it really does work,” and “I have several students that are hard of hearing and that just made realize how much I am not helping them in my class and I now have a bunch of tools I can offer.” (see Appendix C for the Focus Group Questions raw data). Their comments indicated that providing video examples of individuals using the technology they were learning about in each module assisted them in moving from knowledge of a technology into how to use it to support their student’s access and learning in the classroom.

DELES scale 5: *Active Learning* included three questions. The responses from the 17 participants included 46 positive (*Often to Always*) and 5 neutral (*Sometimes*) (see Appendix B for the DELES raw data). Focus Group Question 4, which corresponded to the DELES scale 5: *Active Learning*, received responses from 15 of the participants, which fell into three categories “Standard Class Participation,” “Flexibility,” “Speaker Notes Support,” and “Further Exploration.”

The participants’ responses included comments such as, “I used the standard note-taking strategy but the fact that the modules was [sic] recorded was extra helpful because I was able to go back to something in the module for clarification and to go to the

hyperlinks or the websites mentioned,” “I really enjoyed the flexibility of taking an on-line course as my schedule was unexpectedly busy this summer,” “One nice feature which I really appreciated, but had never had available in a face-to-face class, was having the speaker notes available IN ADVANCE. I found that I preferred reading the speaker notes BEFORE listening to the lecture,” and “One of the modules was about 46 minutes but the it [sic] took me half a day to get through it because I was going to each of the apps or websites and checking them out” (see Appendix C for the Focus Group Questions raw data). The participants’ use of the variety of content presentation methods, to best fit their instructional needs or preferences, was clearly evident. The online format, warehousing these tools, allowed for this individualization, which is something that could not be done in a traditional face-to-face format.

DELES scale 6: *Student Autonomy* included five questions. All of the responses from the 17 participants fell within the positive range to include 85 (*Often to Always*) replies. (See Appendix B for the DELES raw data.) Focus Group Question 5, which corresponded to the DELES scale 6: *Student Autonomy*, received responses from 15 of the participants, which fell into two categories “Personal Schedules,” and “Learner Control Advice.”

The participants’ responses contained such thoughts as, “The flexibility of this class was really key [sic] in my ability to finish the course,” and “I am a last minute kind of girl. For future learners I would suggest that you complete the module in the week it is given so you don't get backed up.” (see Appendix C for the Focus Group Questions raw data). The participants consistently indicated the importance of the online flexibility to match their busy summer schedules versus an instructor-selected face-to-face schedule.

DELES scale 7: *Enjoyment* included eight questions. The responses from the 17 participants included 94 positive responses (*Often* and *Always*), 33 neutral responses (*Sometimes*), and 9 negative responses (*Never* and *Seldom*) (see Appendix B for the DELES raw data). Focus Group Question 6, which corresponded to the DELES scale 7: *Enjoyment*, received responses from 14 of the participants, which fell into three categories “Flexible Scheduling,” “No Traveling,” and “Missed Face-to-Face Interactions.”

The participants’ responses included comments such as, “My life is very busy and I have to schedule everything- having a class where I can choose my schedule allows me to fit it in- I can't tell you how many times I had not been able to take a class because I have something set in stone during class time,” “It’s very difficult these days to drive 20 miles then spend 3 hours in class for several weeks,” and “If there was a synchronous ‘real live time’ discussion opportunity with two- way video exchange, I feel the distance learning would meet my needs” (see Appendix C for the Focus Group Questions raw data). The responses were, overall, very positive toward distance delivery; however, when comments were made toward an enjoyment or preference toward face-to-face, they were always balanced by logical arguments toward the benefits and often enjoyment of the distance option. Reflecting back, it is interesting to note that of the nine negative responses on the DELES scale 7: *Enjoyment*, four of the *Seldom* responses could be attributed to one individual. However, since there were only 14 participants who provided comments, they may not have provided feedback regarding why they felt so strongly and marked four of their eight questions with negative values. The researcher was not able to match the strong opinion expressed in the DELES to those provided in the focus group

question. Further, one question within this scale, “I would enjoy my education more if all my classes were by distance,” was met with six of the nine negative responses; yet 11 of the participants responded in the positive to this statement. Further, since there was an overwhelming positive comment response toward the distance delivery, perhaps this statement simply “reached” too far for some of the participants.

In summary, the DELES paired with the Focus Group Questions provided valuable insight into the benefits of a distance delivery method. The participants felt the same level of support, or at times, even better access to the instructor. The content was applicable to their profession (Knowles et al., 2011) and the use of video examples enabled them to visualize the implementation of the technology (Gagné et al., 2005; Zhang et al., 2011). Further, because of the flexibility afforded within the distance format, they were able to match the course to their personal preferences (Gaumer et al., 2012; O’Brien et al., 2012). Yet, there were also participants who expressed missing the face-to-face interaction with peers that traditional trainings afford. However, they provided solutions which could meet this preference while maintaining all of the positives they enjoyed about the distance delivery, such as face-to-face online meetings via webcams (Martin, Parker, & Deale, 2012). Overall, the positive attitudes expressed by the participants in this study were consistent with the findings in previous studies (Gaumer et al., 2012; O’Brien et al., 2012).

Research Question 3

3. What is the ability of the in-service teacher participants, as teacher-leaders, in codifying the consideration process through the development of a systematic AT plan for a student with a disability as measured by a researcher-created rubric?

The previous results of the study indicated the participants gained knowledge and enjoyed the process. Yet the question remains: Are they able to codify the consideration process through the design of an AT plan for a student with a disability, thus indicating as teacher-leaders that they are able to assess and implement assistive technology in the K12 setting (Bausch et al., 2004; Nelson, 2006)? The instrument for this research question was constructed with a three point rubric: 0 = *Not Evident*, 2 = *Intermediate*, 3 = *Advanced*. There was marginal variance in the participant's ability to write an AT plan with a standard deviation of 1.39 and a Median of scores of 24. This data paired with all participants scoring in the advanced range of 17 to 24, indicates they learned the information in the training and are advanced in their skills to assess and implement assistive technology as measured by the AT Rubric.

Research Question 4

4. What is the instructional design evaluation compliance level for the Analyze and Design phases of the ADDIE instructional design model in the creation of the online AT professional development course as measured by a modified Delphi Technique?

The level of agreement among the experts for the Analyze and Design phases of the ADDIE model indicates to the researcher that these two phases were aligned to the instructional design guidelines (Strickland, 2013). The levels of agreement attained for the Analyze and Design phases assured the researcher the development, implementation and evaluation phases would be strong, as well

The ADDIE instructional design model and the Delphi technique (Strickland et al., 2013) harnessed the collective opinions of the expert panelists. This orderly approach allowed the researcher a large field of support for each step in the decision making process (Strickland et al., 2010). Yet the question arises, is this extensive process

practical for research which does not involve a new instructional designer? Looking back at the review of literature (Shipley et al, 2011; Strickland et al, 2010; & Strickland et al, 2013) indicate the collaboration of the SMEs and IDEs provide positive outcomes for online instruction. Yet, without this partnership, there is a risk of “shovelware,” as historically indicated, during the growth of online curriculum (Morrison & Anglin, p. 241). The researcher believes a collaborative process between SMEs and IDEs should be used when developing online curriculum; however, the extent to which the process could be paired down would need to involve further research.

Conclusion

The purpose of this study was to develop online professional development training focused on assistive technology for in-service teachers. The development of the course followed an expert-supported approach, which successfully guided the researcher through the ADDIE model by means of a Delphi technique (Strickland et al., 2013). The design included effective pedagogical and technological methodologies (Gagné et al., 2005; Knowles et al., 2011; Zhang et al., 2011), which were foundational in the design, development, and implementation of the training. The data collected through multiple instruments indicate the participants learned the targeted information, had a favorable rating for the process and interfaced design used, and were able to demonstrate their ability to consider and implement AT in general education and special education environment for students with disabilities.

This study targeted educational professionals who lack the skills needed to take the lead in the IEP process or to guide the IEP team in developing and implementing a plan with appropriate assistive technology (Bausch et al., 2004; Nelson, 2006). The major

outcome from the study is the confirmation that the online professional development approach was an effective and much needed alternative approach to face-to-face implementation, particularly for a large geographic and rural state such as Idaho. Further, the method utilized in the training may lead to future online training for Idaho educators to fill a possible gap in teacher professional development within the state.

Recommendations for Future Research

A weakness of this study was the small sample size. The data were collected from voluntary in-service teachers taking a six-week online professional development course. Thus, the findings of the study cannot be generalized to other in-service teachers in other online professional development offerings.

Recommendations for future studies would be to replicate this research to gather longitudinal data as well as expand the training into areas of AT not covered, such as Augmentative and Alternative Communication (AAC). Additional revisions, specifically for data gathering, should be considered, such as using a post-training survey to explore “if” and “how” the knowledge, skills, and abilities learned in the training are being used in the K12 environment. Finally, a comparison between the fully online and a hybrid/blended training employing both face-to-face and online components should be explored.

Online professional development to train in-service special education teachers has reached a critical need. Idaho special education teachers graduating with “generalist” certifications need specialized training, such as AT or how to support students with low incidence disabilities. Although the “generalist” certification provides students with a range of information, completing their undergraduate degrees with 120 credits does not

allow instructional time for depth of information in specialized areas. This is indicated in the lack of AT courses offered in Idaho's teacher education programs, resulting in assistive technology professional development training in lieu of higher education coursework. Yet, practically speaking, without AT many students with disabilities are unable to access content, write, read, or even speak.

The results of the data gathered from this study may add to the field of emergent research in the design and development of online professional development focused on specialized training for special education teachers. It is the researcher's intention to continue this important research.

REFERENCES

References marked with an asterisk indicate studies included in the meta-analysis.

- Allen, I. E., & Seaman, J. (2011). *Going the Distance: Online Education in the United States, 2011*. Babson Survey Research Group and Quahog Research Group, LLC. Retrieved from http://sloanconsortium.org/publications/survey/going_distance_2011
- Bausch, M. E., & Hasselbring, T. S. (2004). Assistive technology: Are the necessary skills and knowledge being developed at the preservice and inservice levels? *Teacher Education and Special Education*, 27(2), 97-104.
- Boone, H. N., Jr., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension [On-line]*, 50(2), Article 2TOT2.
- Briggs, L. J. (1977). *Instructional design: Principles and applications*. Englewood Cliffs, N.J: Educational Technology Publications
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed method approaches* (2nd edition), Thousand Oaks, CA: Sage Publications.
- Data Accountability Center (2007). *Part B educational environments*. Retrieved from <https://www.ideadata.org/PartBEnvironments.asp>.
- Data Accountability Center (2009). *Part B educational environments*. Retrieved from <https://www.ideadata.org/PartBEnvironments.asp>.
- Gagné, R. M., Wager, W. W., Golas, K. C., Keller, J. M., & Russell, J. D. (2005). *Principles of instructional design* (5th edition). Belmont, CA: Wadsworth.
- Gaumer Erickson, A. S., Noonan, P. M., & McCall, Z. (2012) Effectiveness of online professional development for rural special education teachers. *Rural Special Education Quarterly* 31(1), 23-31.
- Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational Research* (6th edition). New York: Pearson Education, Inc.
- Gay, L. R., & Airasian, P. (2000). *Educational research: Competencies for analysis and application* (6th edition). New Jersey: Prentice Hall.

- Gravetter, F. J., & Wallnau, L. B. (2000). *Statistics for the behavioral sciences* (5th edition). Belmont, CA: Wadsworth.
- Fang, M., Zheng, X., Hu, W., & Shen, J. (2011). On the ADDIE-based effective instructional design for higher education classrooms. *Advanced Materials Research*, 271-273, 1542-1547.
- Fisher, J. B., Schumaker, J. B., Culbertson, J., & Deshler, D. D. (2010). Effects of a computerized professional development program on teacher and student outcomes. *Journal of Teacher Education*, 61(4), 301-312.
- Fishman, B., Konstantopoulos, S., Kubitskey, B. W., Vath, R., Park, G., Johnson, H., & Edelson, D. (2013). Comparing the impact of online and face-to-face professional development in the context of curriculum implementation. *Journal of Teacher Education*, 64(5), 426-438.
- Idaho State Department of Education. (2007). *Idaho special education manual, 2007*. Boise, ID: Author.
- Idaho State Department of Education. (2010). *Special education profiles*. Retrieved from <https://www.sde.idaho.gov/SpecialEd/DDR/SPEDPortal.asp>
- Individuals with Disabilities Act of 2004, Pub. L. No 108-446, 118 Stat. 2647 (2004).
- Johnson, B., & Christensen, L. (2000). *Education research: Quantitative and qualitative approaches*. Needham Heights: Allyn & Bacon.
- Jones, K. R. (2013). Developing and implementing a mandatory online student orientation. *Journal of Asynchronous Learning Networks*, 17(1), 43-45.
- Jones, P. (2010). My peers have also been an inspiration for me: Developing online learning opportunities to support teacher engagement with inclusive pedagogy for students with severe/profound intellectual developmental disabilities. *International Journal of Inclusive Education*, 14(7) 681-696.
- Jost, M. B., & Mosley, B. F. (2011). Where it's at? Teachers, assistive technology and instructional technology. *Journal of Technology Integration in the Classroom*, 3(2), 5-16.
- Judge, S., & Simms, K. A. (2009). Assistive technology training at the pre-service level: A national snapshot of teacher preparation programs. *Teacher Education and Special Education*, 32 (1), 33-44.
- Kale, U., & Whitehouse, P. (2012). Structuring video cases to support future teachers' problem solving. *Journal of Research on Technology in Education*, 44(3), 177-204.

- Karger, J. (2010). *NIMAS and NIMAC: A discussion of the legal issues associated with the provision of accessible instructional materials to students with disabilities*. Boston, MA: National AIM Center.
- Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2011). *The adult learner: The definitive classic in adult education and human resource development*. New York: Elsevier, Inc.
- *Kuo, H. (2007). IEP team's knowledge about student characteristics, legislation, AT devices and AT services on considering assistive technology in the IEP development for 3rd to 5th grade students with learning disabilities in reading and writing. In Strickland, J., Moulton, S., Strickland, A., & White, J. (2010). The Delphi technique as an evaluation tool: An example of developing and e-learning curriculum using the ADDIE model. In J. Sanchez & K. Zhang (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010* (pp. 2203-2211).
- *Lee, S. (2005). Interface efficiency designed to enhance students' three-dimensional spatial cognition and spatial relations in the sculpture unit of a fundamentals of arts course by integrating digital content into a higher education curriculum in Taiwan. In Strickland, J., Moulton, S., Strickland, A., & White, J. (2010). The Delphi technique as an evaluation tool: An example of developing and e-learning curriculum using the ADDIE model. In J. Sanchez & K. Zhang (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010* (pp. 2203-2211).
- Lei, S. A., & Gupta, R. K. (2010) College distance education courses: Evaluating benefits and costs from institutional faculty and students' perspectives. *Education*. 130(4), 616-631.
- *Lin, C. (2007). Evaluating fashion design information: The creation of assessment measures for the evaluation of fashion design using a MAL module to enhance fashion design information and analysis of fashion curriculum at a Taiwan university. In Strickland, J., Moulton, S., Strickland, A., & White, J. (2010). The Delphi technique as an evaluation tool: An example of developing and e-learning curriculum using the ADDIE model. In J. Sanchez & K. Zhang (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010* (pp. 2203-2211).
- Linstone, H. A., & Turoff, M. (1975). *The Delphi method: Techniques and applications*. Reading, MA: Addison-Wesley Publishing Co.
- Ludlow, B. L., & Brannan, S. A. (2010). Distance education programs preparing personnel for rural areas: Current practices, emerging trends, and future directions. *Rural and Special Education Quarterly*, 29(3), 4-15.

- Macon, D. K. (2011). Student satisfaction with online courses versus traditional courses: A meta-analysis. *Dissertation Abstractions International*, 72(05), 88A. (UMI No. 3447725)
- Mager, R. (1975). *Preparing instructional objectives* (2nd ed.). Belmont, CA: Fearon.
- Mager, R. (1997). *Preparing instructional objectives* (3rd ed.). Atlanta, GA: The Center for Effective Performance, Inc. ISBN: 1-879-618-03-6
- Marino, M. T., Marino, E.C., & Shaw, S.F. (2006). Making informed assistive technology decisions for students with high incidence disabilities. *Teaching Exceptional Children*, 38(6), 18-25.
- Martin, F. Parker, M. A. & Deale, D.F. (2012). Examining interactivity in synchronous virtual classrooms. *International Review of Research in Open and Distance Learning*, 13(2), 227-261.
- Marsters, A. E. (2011). An exploratory study of the assistive technology knowledge, skills, and needs among special education teachers and related service personnel. Retrieved from *Dissertation Abstractions International: Section A. Special Education*, 72(09). (UMI Number: 3461554)
- Mayer, R. E. (2003). The promise of multimedia learning: Using the same instructional design methods across different media. *Learning and Instruction*, 13(2), 125-139.
- Mayer, R. E., & Sims, V. K. (1994). For whom is a picture worth a thousand words? Extensions of a dual-coding theory of multimedia learning. *Journal of Educational Psychology*, 86 (3), 289-401.
- McCarthy, S., & Samors, R. (2009). *Online learning as a strategic asset, Vol. 1: A resource for campus leaders*. Washington DC: Association of Public and Land-Grant Universities. Retrieved from Association of Public and Land-Grant Universities: <http://www.aplu.org/NetCommunity/Document.Doc?id=1877>
- McLinden, M., McCall, S., Hinton, D., & Weston, A. (2007). Embedding online problem-based learning case scenarios in a distance education programme for specialist teachers of children with visual impairment. *European Journal of Special Needs Education*, 22(3), 275-293.
- McHugh, M., L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica*, 22(3), 276-282.
- Means, B., Toyama, Y., Murphy, R. & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record*, 115(3), 1-47.

- Messinger-William, J., & Marino, M. T. (2010). Universal design for learning and assistive technology: Leadership considerations for promoting inclusive education in today's secondary schools. *NAASP Bulletin*, 94(1), 5-16.
- Molenda, M., Reigeluth, C.M., & Nelson, L.M. (2003). Instructional design. In *Encyclopedia of Cognitive Science*, (Vol. 2, pp. 574-578), ed. L. Nadel. London: Nature Publishing Group.
- Morrison, G.R. & G.J. Anglin (2012) An analysis of success and failures: Focusing on learner-content interactions for Next Generation of Distance Education. In L. Moller & J.B. Huett. (Eds.), *The next generation of distance education* (pp. 235-250), New York: Springer.
- Morrison, G. R., Ross, S. M., & Kemp, J. E. (2004). *Designing effective instruction* (4th edition). Hoboken, NJ: J. Wiley & Sons.
- Moulton, S., Strickland, J., Strickland, A., White, J. & Zimmerly, L. (2010). Online course development using the ADDIE model of instructional design: The need to establish validity in the analysis phase. In *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010* (pp. 2046-2054). Chesapeake, VA: AACE.
- National Center on Accessible Instructional Materials at CAST. (2011, June 27). Glossary. Retrieved from <http://aim.cast.org/glossary>
- National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010b). *Application to students with disabilities*. National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C. Retrieved from <http://www.corestandards.org/assets/application-to-students-with-disabilities.pdf>
- National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010a). *English language arts & literacy in history/social studies, science, and technical subjects appendix A: Research supporting key elements of the standards*. National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C. Retrieved from http://www.corestandards.org/assets/Appendix_A.pdf
- Nelson, B. (2006). On your mark, get set, wait! Are your teacher candidates prepared to embed assistive technology in teaching and learning? *College Student Journal*, 40(3), 485-494.
- Nworie, J. (2011). Using the Delphi technique in educational technology research. *TechTrends: Linking Research & Practice to Improve Learning*, 55(5), 24-30.

- O'Brien, C., Hartshorne, R., Beattie, J., & Jordan, L. (2012). A comparison of large lecture, fully online, and hybrid sections of introduction to special education. *Rural Special Education Quarterly*, 30(4), 19-31.
- Powell, D. R., Diamond, K. E., Burchinal, M. R., & Koehler, M. J. (2010). Effects of an early literacy professional development intervention on head start teachers and children. *Journal of Educational Psychology*, 102(2), 299-312.
- Richey, R. C., Fields, D. C., & Foxon, M. (2001). *Instructional Design Competencies: The Standards*, 3rd ed. Syracuse, NY: ERIC Clearinghouse.
- Russell, M., Carey, R., Kleiman, G., & Venable, J. D. (2009). Face-to-face and online professional development for mathematics teachers: A comparative study. *Journal of Asynchronous Learning Networks*, 13(2), 71-87.
- Rose, D., Meyer, A., & Hitchcock, C. (Eds.). (2006). *The universally designed classroom: Accessible curriculum and digital technologies*. Cambridge: Harvard Education Press.
- Sharpe, M. E. (2010). Assistive technology attrition: Identifying why teachers abandon assistive technologies. Retrieved from *Dissertation Abstractions International*, Section A. *Special Education*, 71(09). (UMI No. 3413620)
- Sheskin, D. J. (2003). *Handbook of parametric and nonparametric statistical procedures*, 3rd ed. Boca Raton, FL: CRC Press.
- Shibley, I., Amaral, K. E., Shank, J. D., & Shibley, L. R. (2011). Designing a blended course: Using ADDIE to guide instructional design. *Journal of College Science Teaching*, 40(6), 80-85.
- *Springer, J.M. (2002) The formative evaluation of a computer-assisted instruction module for metric area instruction for pre-service teachers: Its effect on student achievement and its congruence with the ADDIE instructional design model. In Strickland, J., Moulton, S., Strickland, A., & White, J. (2010). The Delphi technique as an evaluation tool: An example of developing and e-learning curriculum using the ADDIE model. In J. Sanchez & K. Zhang (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010* (pp. 2203-2211).
- Strickland, J., Moulton, S., Strickland, A., & White, J. (2010). The Delphi technique as an evaluation tool: An example of developing and e-learning curriculum using the ADDIE model. In J. Sanchez & K. Zhang (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010* (pp. 2203-2211). Chesapeake, VA: AACE.

- Strickland, J., Strickland, A., Wang, P., Zimmerly, L., & Moulton, S. (2013). Online course development using the ADDIE instructional design model: The need to establish validity. In *Society for Information Technology & Teacher Education International Conference* (pp. 2651-2658).
- United States Department of Education 2010, Office of Planning, Evaluation, and Policy Development. *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies*, Washington, D.C. Retrieved from <http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>
- Von Bertalanffy, L. (1972). The history and status of general systems theory. *Academy Of Management Journal*, 15(4), 407-426.
- Walker, S. L., & Fraser, B. J. (2005). Development and validation of an instrument for assessing education learning environments in higher education: The distance education learning environments survey (DELES). *Learning Environments Research*, 8(3), 289-308.
- Wang, P. (2011). *The production of reusable learning objects in Chinese culinary arts online instruction*. Retrieved from *Dissertation Abstractions International, Section A. Humanities and Social Sciences*, 72(10). (UMI No. 3464521)
- Wehmeyer, M. L., & Field, S. (2007). *Self-determination: Instructional and assessment strategies*. Thousand Oaks, CA: Corwin Press.
- Wells, S.C. & Wollack, J.A. (2003). An instructor's guide to understanding test reliability. Testing & Evaluation Services Publication, University of Wisconsin. Retrieved February, 7 2014 from: <http://testing.wisc.edu/Reliability.pdf>
- Worthen, B. R., White, K. R., Fan, X., & Sudweeks, R. R. (1999). *Measurement and assessment in schools*. New York, NY: Addison Wesley Longman, Inc.
- *Zimmerly, L. (2012). *Dancing online: Can the students still follow the steps? A rationale for online delivery methods in dance*. Retrieved from *Dissertation Abstractions International*, Retrieved from *Dissertation Abstractions International, Section A. Humanities and Social Sciences*, 73(12). (UMI No. 3528074)
- Zhang, M., Lundeberg, M., Koehler, M. J., & Eberhardt, J. (2011). Understanding affordances and challenges of three types of video for teacher professional development. *Teaching and Teacher Education*, 27(2), 454-462.

Appendix A

Pretest/Posttest Instrument

Pretest Raw Data

Posttest Raw Data

**AT for Reading
Professional Development
Knowledge Test**

1. What is assistive technology (AT)?
 - a. Any technology to meet a functional need for a person with a disability
 - b. Any technology
 - c. An assistive technology service
 - d. An assistive technology device
2. As stated in 300.308 of the Individuals with Disabilities Education Act 2004, each local education agency (LEA) is required to insure that assistive technology devices and services are provided if needed. Which statement is included in the definition of an assistive technology service?
 - a. The evaluation of needs, primarily in the general education setting
 - b. Related Services
 - c. Training or technical assistance for employers
 - d. An evaluation for eligibility for assistive technology
3. Common Core Content Standards:
 - a. Define how teachers should teach
 - b. Speaks to grade level text which instruction is centered
 - c. Include a list with a full range of supports for students with special needs
 - d. Define the interventions needed for students with disabilities
4. A shift in expectations is one of the hallmarks from the previous standards to the Common Core. Which one of these statements is reflected in this shift?
 - a. Reading complexity levels have changed
 - b. Students accessing content from fiction and nonfiction materials is now equally represented
 - c. Specific academic vocabulary is less emphasized within the problem solving emphasis
 - d. Students are expected to take a more independent role by reaching outside of the classroom content from which the instruction is centered
5. Assistive technology (AT) which supports the higher levels of reading complexity found in the Common Core English Language Arts/literacy (ELA) Standards include:
 - a. Dragon Dictation App
 - b. Echo SmartPen
 - c. Proloquo2Go
 - d. Reading Pen
6. Which statement is part of Step 1- Considering AT in the AT Cycle?
 - a. Develop Annual Goals and Objectives
 - b. Include in the IEP, the Specific Type of Assistive Technology Needed
 - c. Match AT Device to the Annual Goal
 - d. Train the Support Staff

7. Functional capabilities are the abilities to perform tasks as independently as possible. What is a functional capability that needs to be considered for the task of reading a printed textbook?
 - a. Environment
 - b. Responding to questions
 - c. Access
 - d. Accommodations
8. Although, AT has been documented in multiple places in an IEP, according to IDEA 2004, each LEA ensures AT devices and services are made available to a child with a disability, if required as part of the child's IEP. Which statement is listed, in statute, as a location to document AT?
 - a. Special Education
 - b. Accommodations
 - c. Education Environment
 - d. LRE
9. A common reason that assistive technology fails to help students meet their needs is due to poor communication and ineffective implementation of the AT. Successful implementation, within an AT plan, can be accomplished by:
 - a. Using AT which is intuitive and does not need training
 - b. Include a lot of data collection
 - c. Using AT which is available in the classroom
 - d. Data based decisions for adjustments to the AT use or type
10. Which statement represents an appropriate data gathering method, to monitor the progress of an AT implementation plan;
 - a. Interviewing the student
 - b. Detailed Classroom Notes
 - c. Primarily through formative assessments
 - d. Data which removes bias, such as data gathered within the AT
11. A 17 year old student, who has been blind for one year, needs to be able to access his grade-level general education curriculum. What is a possible AT solution?
 - a. Embossed Braille
 - b. Audio Book
 - c. Tar Heel Reader
 - d. Refreshable Braille Reader
12. Which statement includes the AT, which is indicated through research, to support reading comprehension for students who are deaf:
 - a. Sign Language Pictures
 - b. Closed Captioning
 - c. Reading Pen
 - d. Open Captioning

13. You have a new student who has been deaf/blind from a very young age, what AT will support his/her access to reading content?
- BrailleNote
 - Reading Pen
 - MyStudyBar
 - Speech-to-Text
14. What are typical types of AT reading supports for students with Autism?
- Speech-to-Text
 - Isolating the Text
 - CAST BookBuilder
 - MyStudyBar
15. A student struggles to read the grade level science text, and does not understand the content when it is read to them. What are AT possible solutions?
- Text-to-Speech
 - Tar Heel Reader
 - Reading Pen
 - MyStudyBar
16. A student struggles to read the grade level science text; however, when it is read to her, she understands it. When considering AT for this student, what is a possible AT solution?
- Reading Pen
 - Text-to-Speech Software
 - Dragon
 - MyStudyBar
17. What is the federal statute that is braided with IDEA and speaks directly to AIM implementation?
- American Disabilities Act
 - Rehabilitation Act
 - Copyright Act
 - Elementary and Secondary Education Act
18. A student needs single-word support when reading printed text. What is an AT solution?
- NaturalReader
 - Reading Pen
 - MyStudyBar
 - Echo SmartPen
19. Which item listed below would be considered low-tech AT?
- MyStudyBar
 - High Lighter
 - Talking Word Processors
 - Reading Pen

20. A student needs support for large content? Which AT solution could be tried?
- Text Compactor
 - Text-to-Speech Software
 - Reading Pen
 - Echo SmartPen
21. Which statement includes an Accessible Instructional Materials (AIM) format?
- PDF book
 - Traditional Textbooks
 - Large Print
 - Text-to-Speech
22. Where can you acquire Accessible Instructional Materials (AIM)?
- Traditional Textbooks
 - NIMAC
 - NIMAS
 - National AIM Center
23. A student is on a 504 plan and needs Accessible Instructional Materials (AIM), where can the LEA acquire Accessible Instructional Materials (AIM) for this student?
- Traditional Textbooks
 - National AIM Center
 - Publishers
 - NIMAS
24. A student is on an IEP and needs Accessible Instructional Materials (AIM), where can the LEA access Accessible Instructional Materials (AIM) for this student?
- Traditional Textbooks
 - National AIM Center
 - Publishers
 - NIMAS
25. Who is an Accessible Media Producer (AMP) for Idaho?
- NIMAS
 - Bookshare
 - NIMAC
 - Idaho State Department of Education
26. What is Universal Design for Learning (UDL)?
- Just good teaching
 - An instructional design model
 - Support primarily for students with disabilities
 - Technology usage in the general education classroom
27. What is one of the Principles of Universal Design for Learning (UDL)?
- Multiple Means of Access
 - Multiple Means of Interest
 - Multiple Means of Representation
 - Multiple Means of Input

28. Why is some technology both assistive technology and instructional technology?
- a. It meets the functional need for a student with a disability
 - b. Some students use it to support their preferences in learning
 - c. It is assistive technology which has been used so much in the general education setting, it is now looked at as instructional technology
 - d. It can serve the same purpose for students with disabilities and those without
29. Which AT support for reading is considered Universal Design for Learning (UDL)?
- a. Audio Books
 - b. Echo SmartPen
 - c. Dragon
 - d. Reading Pen
30. A common misunderstanding of Universal Design for Learning (UDL)?
- a. Technology focused to help students with disabilities
 - b. Pre-instructional design
 - c. Access to learning is foundational
 - d. Student engagement is critical

		Pretest Raw Data Questions 1-15														
PRETEST Questions 1-15	N=17	PreQ1	PreQ2	PreQ3	PreQ4	PreQ5	PreQ6	PreQ7	PreQ8	PreQ9	PreQ10	PreQ11	PreQ12	PreQ13	PreQ14	PreQ15
	1	1	0	1	0	0	1	1	0	1	1	1	0	1	0	1
	2	1	0	1	1	0	1	1	0	0	0	1	0	1	0	0
	3	1	0	1	1	0	0	1	0	1	0	1	0	1	1	1
	4	1	1	1	0	1	1	1	0	1	1	1	0	1	1	0
	5	1	1	0	0	0	1	0	0	0	0	1	1	1	1	0
	6	1	0	1	0	1	1	1	0	1	0	1	0	1	0	0
	7	1	1	1	1	0	1	1	0	0	0	1	0	1	0	0
	8	0	1	0	0	0	1	1	0	0	0	1	0	1	1	1
	9	1	0	1	0	0	0	1	0	0	0	1	0	1	1	0
	10	1	0	1	1	0	0	0	0	1	0	1	1	1	0	0
	11	1	0	1	1	1	1	1	0	1	0	1	0	1	0	0
	12	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0
	13	1	0	1	0	0	0	0	0	0	0	1	1	1	0	0
	14	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0
	15	1	0	1	1	0	1	1	0	1	0	1	0	0	0	0
	16	1	0	1	0	0	0	1	0	1	0	1	0	1	0	0
	17	1	0	1	1	0	1	1	0	1	0	1	0	1	0	0

		Pretest Raw Data Questions 16-30															
		N=17	PreQ16	PreQ17	PreQ18	PreQ19	PreQ20	PreQ21	PreQ22	PreQ23	PreQ24	PreQ25	PreQ26	PreQ27	PreQ28	PreQ29	PreQ30
PRETEST Questions 16-30	1		0	0	1	1	1	0	0	0	0	0	1	0	1	1	1
	2		1	0	1	0	1	1	0	1	0	0	0	1	0	1	1
	3		1	0	1	1	0	1	0	0	0	0	1	1	1	1	1
	4		1	0	1	1	0	1	1	1	0	1	1	1	1	1	1
	5		1	0	1	1	0	1	0	0	0	0	1	0	1	1	1
	6		1	0	1	1	0	0	0	0	0	0	1	0	1	0	0
	7		1	0	1	1	0	1	0	1	1	0	1	1	1	1	1
	8		1	0	1	1	1	0	1	1	1	0	1	0	1	1	0
	9		1	0	1	1	1	0	0	1	0	1	1	1	0	1	1
	10		1	0	1	1	1	1	0	0	0	0	1	1	1	1	0
	11		1	0	0	1	1	1	0	0	0	0	1	0	1	1	1
	12		1	0	1	1	0	0	0	1	1	0	1	0	1	1	1
	13		1	0	0	1	0	0	0	0	0	1	1	0	1	1	1
	14		1	0	1	1	1	0	1	0	0	1	1	0	0	1	1
	15		1	0	1	1	0	0	0	0	0	0	1	0	0	1	1
	16		1	1	1	1	0	0	1	0	0	0	1	0	1	1	1
	17		0	0	1	1	0	0	0	0	0	0	1	0	0	1	0

		Posttest Raw Data Questions 1-15																
		N=17	PostQ1	PostQ2	PostQ3	PostQ4	PostQ5	PostQ6	PostQ7	PostQ8	PostQ9	PostQ10	PostQ11	PostQ12	PostQ13	PostQ14	PostQ15	
POSTTEST Questions 1-15	1	1	0	1	0	0	1	1	0	1	1	1	1	0	1	0	1	
	2	1	0	1	1	0	1	1	0	0	0	0	1	0	1	0	0	
	3	1	0	1	1	0	0	1	0	0	1	0	1	0	1	1	1	
	4	1	1	1	0	1	1	1	0	1	1	1	1	0	1	1	0	
	5	1	1	0	0	0	1	0	0	0	0	0	1	1	1	1	0	
	6	1	0	1	0	1	1	1	0	1	1	0	1	0	1	0	0	
	7	1	1	1	1	0	1	1	0	0	0	0	1	0	1	0	0	
	8	0	1	0	0	0	0	1	1	0	0	0	1	0	1	1	1	
	9	1	0	1	0	0	0	0	1	0	0	0	1	0	1	1	0	
	10	1	0	1	1	0	0	0	0	0	1	0	1	1	1	0	0	
	11	1	0	1	1	1	1	1	1	0	1	0	1	0	1	0	0	
	12	1	0	1	0	1	0	0	0	0	1	0	1	0	1	0	0	
	13	1	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	
	14	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0
	15	1	0	1	1	0	1	1	1	0	1	0	1	0	0	0	0	0
	16	1	0	1	0	0	0	0	1	0	1	0	1	0	0	1	0	0
	17	1	0	1	1	0	1	1	1	0	1	0	1	0	0	1	0	0

		Posttest Raw Data Questions 16-30															
POSTTEST Questions 16-30	N=17	PostQ16	PostQ17	PostQ18	PostQ19	PostQ20	PostQ21	PostQ22	PostQ23	PostQ24	PostQ25	PostQ26	PostQ27	PostQ28	PostQ29	PostQ30	
	1	0	0	1	1	1	0	0	0	0	0	1	0	1	1	1	
	2	1	0	1	0	1	1	0	1	0	0	0	1	0	1	1	
	3	1	0	1	1	0	1	0	0	0	0	1	1	1	1	1	
	4	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1	
	5	1	0	1	1	0	1	0	0	0	0	1	0	1	1	1	
	6	1	0	1	1	0	0	0	0	0	0	1	0	1	0	0	
	7	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	
	8	1	0	1	1	1	0	1	1	1	0	1	0	1	1	0	
	9	1	0	1	1	1	0	0	1	0	1	1	1	0	1	1	
	10	1	0	1	1	1	1	0	0	0	0	1	1	1	1	0	
	11	1	0	0	1	1	1	0	0	0	0	1	0	1	1	1	
	12	1	0	1	1	0	0	0	1	1	0	1	0	1	1	1	
	13	1	0	0	1	0	0	0	0	0	0	1	1	0	1	1	
	14	1	0	1	1	1	0	1	0	0	0	1	1	0	0	1	1
	15	1	0	1	1	0	0	0	0	0	0	0	1	0	0	1	1
	16	1	1	1	1	1	0	0	1	0	0	0	1	0	1	1	1
	17	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0

Appendix B**Distance Education Learning Environments (DELES) Instrument****Permission Letter****Raw Data**

Scott L. Walker, ScEdD
397 S. Willow Ave.
New Braunfels, TX 78130
USA
walkstx@gmail.com

DELES Permission Letter

Janice Carson has been granted permission to use the Distance Education Learning Environments Survey (DELES) for the purpose of the proposed doctoral study:

A STRUCTURED APPROACH IN THE DEVELOPMENT OF AN ONLINE ASSISTIVE TECHNOLOGY PROFESSIONAL DEVELOPMENT TRAINING

through Idaho State University, with the following usage rights being granted.

- One time U.S. rights for Web posting of the Preferred, Actual, and Instructor forms of the DELES to be removed or archived from the Web no later than August 31, 2015.

The DELES and its versions and derivatives are copyright protected. When the DELES is published or presented in non-commercial use, you must mention Scott L. Walker as the copyright holder of the instrument in this format:

© 2004-2014 Scott L. Walker Used with permission

Scott L. Walker, ScEdD

May 13, 2014



Distance Education Learning Environments Survey (DELES)

Actual Form

This survey contains 34 statements about practices that take place in this class, followed by eight statements regarding your opinion about distance education.

There are no 'right' or 'wrong' answers. Your opinion is what is wanted on each item. Please think about how well each statement describes what this class is like for you.

In this class	Never	Seldom	Sometimes	Often	Always
1. If I have an inquiry, the instructor finds time to respond.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The instructor helps me identify problem areas in my study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The instructor responds promptly to my questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The instructor gives me valuable feedback on my assignments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. The instructor adequately addresses my questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The instructor encourages my participation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. It is easy to contact the instructor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The instructor provides me positive and negative feedback on my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this class...	Never	Seldom	Sometimes	Often	Always
9. I work with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I relate my work to other's work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I share information with other students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I discuss my ideas with other students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I collaborate with other students in the class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Group work is a part of my activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this class...	Never	Seldom	Sometimes	Often	Always
15. I can relate what I learn to my life outside of university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I am able to pursue topics that interest me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I can connect my studies to my activities outside of class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I apply my everyday experiences in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I link class work to my life outside of university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I learn things about the world outside of university.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I apply my out-of-class experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this class...	Never	Seldom	Sometimes	Often	Always
22. I study real cases related to the class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I use real facts in class activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I work on assignments that deal with real-world information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I work with real examples.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I enter the real world of the topic of study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this class...	Never	Seldom	Sometimes	Often	Always
27. I explore my own strategies for learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I seek my own answers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. I solve my own problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this class...	Never	Seldom	Sometimes	Often	Always
30. I make decisions about my learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. I work during times I find convenient.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. I am in control of my learning.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

33. I play an important role in my learning.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

34. I approach learning in my own way.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

The following items refer to your satisfaction with distance education.

Never	Seldom	Sometimes	Often	Always
-------	--------	-----------	-------	--------

35. Distance education is stimulating.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

36. I prefer distance education.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

37. Distance education is exciting.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

38. Distance education is worth my time.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

39. I enjoy studying by distance.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

40. I look forward to learning by distance.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

41. I would enjoy my education more if all my classes were by distance.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

42. I am satisfied with this class.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

DELES Raw Data.sav

	q0001	q0002	q0003	q0004	q0005	q0006
1	5.00	3.00	5.00	4.00	5.00	5.00
2	5.00	5.00	5.00	5.00	5.00	5.00
3	5.00	5.00	5.00	5.00	5.00	5.00
4	5.00	4.00	5.00	4.00	5.00	5.00
5	5.00	5.00	5.00	4.00	4.00	5.00
6	5.00	4.00	5.00	5.00	5.00	5.00
7	4.00	4.00	5.00	2.00	4.00	5.00
8	5.00	5.00	5.00	5.00	5.00	5.00
9	4.00	3.00	4.00	4.00	4.00	4.00
10	5.00	4.00	5.00	5.00	5.00	5.00
11	5.00	5.00	5.00	5.00	5.00	5.00
12	5.00	5.00	5.00	5.00	5.00	5.00
13	5.00	4.00	5.00	4.00	5.00	5.00
14	5.00	5.00	5.00	5.00	5.00	5.00
15	5.00	4.00	4.00	5.00	4.00	5.00
16	5.00	5.00	5.00	4.00	5.00	4.00
17	5.00	5.00	5.00	5.00	5.00	5.00

10/17/14 10:00 PM

DELES Raw Data.sav

	q0007	q0008	q0009	q0010	q0011	q0012
1	5.00	3.00	3.00	4.00	3.00	3.00
2	5.00	5.00	3.00	4.00	4.00	3.00
3	5.00	3.00	3.00	4.00	3.00	2.00
4	5.00	4.00	3.00	3.00	4.00	3.00
5	5.00	5.00	3.00	4.00	3.00	3.00
6	5.00	4.00	4.00	4.00	4.00	4.00
7	5.00	2.00	2.00	5.00	5.00	5.00
8	5.00	5.00	3.00	4.00	5.00	5.00
9	4.00	4.00	1.00	4.00	1.00	1.00
10	5.00	5.00	3.00	3.00	3.00	3.00
11	5.00	5.00	3.00	3.00	3.00	4.00
12	5.00	5.00	4.00	5.00	5.00	4.00
13	5.00	3.00	4.00	4.00	4.00	3.00
14	5.00	5.00	2.00	4.00	5.00	4.00
15	5.00	4.00	3.00	4.00	4.00	3.00
16	5.00	5.00	3.00	4.00	4.00	5.00
17	5.00	4.00	4.00	4.00	4.00	4.00

Deles Raw Data.sav

	q0013	q0014	q0015	q0016	q0017	q0018
1	3.00	3.00	5.00	5.00	5.00	5.00
2	3.00	3.00	4.00	4.00	4.00	4.00
3	3.00	3.00	4.00	5.00	4.00	3.00
4	3.00	4.00	5.00	5.00	5.00	5.00
5	2.00	3.00	4.00	4.00	4.00	4.00
6	4.00	4.00	5.00	4.00	5.00	5.00
7	2.00	1.00	5.00	5.00	5.00	5.00
8	4.00	3.00	5.00	5.00	5.00	5.00
9	1.00	2.00	4.00	4.00	4.00	4.00
10	3.00	3.00	4.00	4.00	4.00	3.00
11	3.00	4.00	5.00	5.00	5.00	5.00
12	3.00	4.00	5.00	5.00	5.00	5.00
13	3.00	4.00	5.00	5.00	5.00	5.00
14	3.00	3.00	4.00	5.00	5.00	4.00
15	2.00	4.00	5.00	5.00	5.00	5.00
16	4.00	5.00	5.00	5.00	5.00	4.00
17	4.00	4.00	5.00	5.00	5.00	5.00

10/17/14 10:00 PM

Deles Raw Data.sav

	q0019	q0020	q0021	q0022	q0023	q0024
1	5.00	5.00	5.00	4.00	4.00	4.00
2	4.00	4.00	4.00	3.00	4.00	4.00
3	4.00	5.00	4.00	4.00	5.00	5.00
4	5.00	5.00	5.00	4.00	5.00	5.00
5	4.00	5.00	5.00	5.00	5.00	5.00
6	5.00	5.00	5.00	5.00	5.00	5.00
7	5.00	5.00	5.00	5.00	5.00	5.00
8	5.00	5.00	5.00	4.00	4.00	5.00
9	4.00	4.00	4.00	3.00	4.00	4.00
10	4.00	4.00	4.00	4.00	4.00	4.00
11	5.00	5.00	5.00	4.00	4.00	4.00
12	5.00	5.00	5.00	5.00	5.00	5.00
13	5.00	5.00	5.00	5.00	5.00	5.00
14	5.00	5.00	5.00	5.00	5.00	5.00
15	5.00	5.00	5.00	5.00	5.00	5.00
16	4.00	5.00	4.00	5.00	5.00	5.00
17	4.00	4.00	4.00	4.00	4.00	5.00

Deles Raw Data.sav

	q0025	q0026	q0027	q0028	q0029	q0030
1	4.00	4.00	4.00	4.00	4.00	5.00
2	4.00	4.00	3.00	3.00	3.00	4.00
3	4.00	4.00	4.00	4.00	4.00	5.00
4	5.00	5.00	5.00	5.00	4.00	4.00
5	5.00	5.00	3.00	4.00	4.00	4.00
6	5.00	5.00	4.00	5.00	5.00	5.00
7	5.00	5.00	5.00	5.00	4.00	5.00
8	5.00	5.00	4.00	4.00	4.00	5.00
9	4.00	4.00	4.00	4.00	4.00	5.00
10	4.00	4.00	4.00	4.00	4.00	4.00
11	4.00	4.00	4.00	4.00	4.00	4.00
12	5.00	5.00	5.00	5.00	5.00	5.00
13	5.00	5.00	4.00	4.00	4.00	4.00
14	5.00	5.00	4.00	5.00	5.00	5.00
15	5.00	5.00	4.00	4.00	3.00	4.00
16	5.00	5.00	5.00	5.00	5.00	5.00
17	4.00	4.00	4.00	4.00	4.00	5.00

10/17/14 10:00 PM

Deles Raw Data.sav

	q0031	q0032	q0033	q0034	q0035	q0036
1	5.00	5.00	5.00	5.00	3.00	3.00
2	4.00	4.00	4.00	4.00	3.00	2.00
3	5.00	5.00	5.00	5.00	5.00	4.00
4	5.00	5.00	5.00	5.00	4.00	4.00
5	4.00	5.00	5.00	5.00	4.00	5.00
6	4.00	5.00	5.00	5.00	4.00	4.00
7	5.00	5.00	5.00	5.00	3.00	3.00
8	5.00	5.00	4.00	5.00	4.00	3.00
9	4.00	5.00	5.00	5.00	3.00	3.00
10	5.00	5.00	5.00	5.00	4.00	4.00
11	5.00	5.00	5.00	4.00	4.00	3.00
12	5.00	5.00	5.00	5.00	4.00	3.00
13	5.00	5.00	5.00	5.00	4.00	3.00
14	5.00	4.00	5.00	5.00	4.00	3.00
15	5.00	5.00	5.00	5.00	4.00	4.00
16	5.00	5.00	5.00	5.00	4.00	4.00
17	5.00	5.00	5.00	5.00	4.00	4.00

10/17/14 10:00 PM

Deles Raw
Data.sav

	q0037	q0038	q0039	q0040	q0041	q0042
1	3.00	4.00	3.00	3.00	3.00	4.00
2	3.00	3.00	2.00	2.00	2.00	4.00
3	4.00	5.00	5.00	5.00	5.00	5.00
4	4.00	4.00	4.00	3.00	4.00	5.00
5	5.00	5.00	5.00	5.00	5.00	5.00
6	4.00	5.00	4.00	4.00	3.00	5.00
7	3.00	4.00	3.00	3.00	1.00	5.00
8	3.00	4.00	3.00	4.00	3.00	5.00
9	3.00	4.00	4.00	3.00	2.00	4.00
10	4.00	4.00	4.00	4.00	3.00	4.00
11	3.00	4.00	4.00	3.00	3.00	5.00
12	4.00	4.00	4.00	4.00	2.00	5.00
13	4.00	4.00	5.00	4.00	2.00	5.00
14	4.00	4.00	4.00	4.00	3.00	5.00
15	4.00	4.00	4.00	4.00	4.00	5.00
16	4.00	4.00	5.00	4.00	1.00	5.00
17	4.00	4.00	4.00	4.00	4.00	5.00

10/17/14 10:00 PM

Appendix C

Focus Group Questions Based on DELES Scales

Focus Group Questions Asked & Participant Responses

1. In responding to the DELES survey, there were seven areas represented. The first of these related to *Instructor Support*. I would like to talk about some of the items in this category in order to gain additional insight for future online courses such as the one you have just completed.

How did you feel about the ease of contacting your instructor; in comparison to a face-to-face class, was it as easy to contact your instructor?

2. Another category of the DELES survey addressed *Personal Relevance*. In this section, while the items were designed for a variety of courses, I would like to ask about the relevance to you as a professional in education, and in particular, as one who is involved with supporting students with special needs.

Can you explain how this course relates to your professional educator role?

3. The *Authentic Learning* section of the survey related to real-world connections of the class.

Were real-world situations presented in this course?

- *If yes, can you relate one specific example that was most impacting to your experience during the class?*
- *Why was this especially meaningful for you?*

4. The *Active Learning* section of the survey related to independent learning. As adult learners who are also professional educators, it is particularly important for the instructor/designer to know about your level of comfort in course participation.

What learning strategies did you employ while taking this online course?

- *Were these strategies different from those that you would have employed in a face-to-face class? If so, why? If not, why?*

5. The next category is labeled *Student Autonomy*. This section primarily relates to learner-control during the course.

Did you perform class work (e.g., assignments, discussion postings, etc.) outside of class?

- *If yes, did this flexibility allow you to select the times that were convenient for your personal life?*
- *If no, why were you unable to do this? What suggestions do you have for facilitating learners in doing this?*

6. The final category on the DELES survey relates to *Enjoyment*. Because this course was via distance through a learning management system (*Blackboard*), the items relate specifically to your experience under this design and delivery mode.

Some of you probably answered that you prefer a professional development course through distance delivery methods, while others did not express a preference for this.

- *Can you relate a specific example of why you prefer distance delivery?*
- *Please relate an example of why you do not prefer distance delivery? How can the instructor/designer increase your preference for distance delivery of this course?*

Additional Optional Questions:

7. Can you relate an instance where the instructor was particularly helpful in resolving a question related to the course?
- *Was this assistance at a different level than you would receive in a face-to-face setting for a similar course?*
8. Can you relate an instance where the instructor was particularly helpful in providing feedback for one or more assignments in the class?
- *Was this assistance at a different level than you would receive in a face-to-face setting for a similar course?*
9. How did you connect your professional experiences to the course content?
- *Can you relate one specific example of this occurring during the course?*
10. Were you able to seek answers on your own?
- *If yes, how did you go about doing this?*
 - *If no, why were you unable to do this? What suggestions do you have for facilitating learners in doing this?*
11. Were you able to solve problems you encountered on your own?
- *If yes, how did you go about doing this?*
 - *If no, why were you unable to do this? What suggestions do you have for facilitating learners, such as yourself, in doing this?*

12. Is distance learning worth your time?

- *Why is it worth your time?*
- *Why is it NOT worth your time? How can the instructor/designer make a course such as this worth your time in a distance-learning mode?*

13. What role did you have in learning this course content in an online environment?

- *Were you able to approach the learning experience in your own way?*
- *If so, can you provide an example of this?*
- *If not, why?*

14. Did you find the distance delivery method (e.g., *Blackboard*, video, discussions, etc.) stimulating for you in learning this content?

- *If yes, can you relate one particular example of how the online delivery method made this stimulating?*
- *If not, why?*
- *Whether you answered yes or no, is there one particular way the instructor/designer could improve the delivery method to make it more stimulating for the learner?*

15. Do you enjoy studying by distance more than in a face-to-face environment?

- *Why do you enjoy studying in this way?*
- *Why do you NOT enjoy studying via distance? How can this instructor/designer make studying at distance more enjoyable?*

16. Would you enjoy your academic courses more if they were all via distance?

- *Why would you prefer all your courses to be via distance?*
- *Why would you NOT prefer to have all your courses via distance?*

17. Were you satisfied – overall – with this class?

- *Is there one specific example that you can relate that points to your satisfaction with this class?*
- *Can you relate a reason why you were not overall satisfied with this class? How can the instructor/designer revise the course to make it more satisfactory for you, as a learner?*

Focus Group Questions & Feedback Based on DELES Scales

Scale	Questions & Reponses
1	<p>Prompt: <i>In responding to the DELES survey, there were seven areas represented. The first of these related to Instructor Support. I would like to talk about some of the items in this category in order to gain additional insight for future online courses such as the one you have just completed.</i></p> <p><i>How did you feel about the ease of contacting your instructor; in comparison to a face-to-face class, was it as easy to contact your instructor?</i></p>
Responses	<p>Very easy!!! I had several obstacles in my way while taking this course and through each and every one I had no issue contacting you!</p> <p>Ease of access to y our guidance, whether it be "nuts and bolts" such as setting up a Vandal account and learning to use Blackboard, etc. or questions concerning the class was great. I felt very supported and would not hesitate [sic] to take another on- line course.</p> <p>It was easy to contact you via email, and you repoded [sic] promptly with clear information. Even though there wasn't a set class time where we would meet face- to- face, I felt that as I was completing course requirements I knew how to reach you with questions.</p> <p>While I would rather be in a face- to- face classroom I felt that I always had access to and feedback from you in a timely manner. I thought you went out of y our way to make sure we knew how to get ahold of you at any time during the class. Thank you!</p> <p>I had a very easy time contacting my instructor via email and and [sic] during discussion boards activities.</p> <p>It was very easy to contact you. You give clear instructions in a very fun, comfortable way.</p> <p>I felt that Dr. Carson made contact very easy and in a timely manner. She helped me as I am computer challenged, and she was very encouraging, easy to talk to and a wealth of information. The design of the class was great! I could work as I was able, and it was very educational, informational and interesting. I would love to met [sic] and have face to face discussions, but I felt that I learned a lot in this course.</p> <p>Janice Carson was very easy to contact during this coursework. Since she is a favorite on my school e-mail already, all I had to do was start typing and hit send. Replies were quick. Thank you.</p> <p>Janice Carson was very easy to contact during this coursework. Since she is a favorite on my school e-mail already, all I had to do was start typing and hit send. Replies were quick. Thank you.</p> <p>Very easy! Though I think that reminder emails through regular email channels were the best. I do not know how best to make that happen, but having to go through the Idaho Website slows responses.</p> <p>As with what many of you have said, it was very easy and you responded quickly to any questions that I had. Thanks again.</p> <p>Janice, you were great to work with. You were always quick to respond and very helpful. It was nice to have an instructor that was so involved.</p> <p>It was always easy to contact the instructor. Having both email and telephone contact options made it just as easy as contacting the instructor in a face-to-face class, because we did not have to wait for office hours. Responses were always VERY promptly provided. I especially appreciated Janice's proactive approach to communicating. When she understood that there may some challenges with our initial log-in procedures, she was sure to communicate those up-front and offer support, which I greatly appreciated.</p> <p>The instructor was readily available. I contacted her both through course discussion boards and messaging as well as personal email. Face- to- face classroom instructors always post office hours and encourage visits, but many times their schedules are in conflict with y our own. Online instructors are ALWAYS available.</p> <p>It was extrememly [sic] easy to contact the instructor and I felt that I always received necessary and</p>

Scale	Questions & Responses
	quick feedback.
2	<p>Prompt: <i>I am wondering if some of you could talk about how I could improve the group project or sharing your ideas with the other students in the course. The survey showed this was an area which could use some work. I would love your guidance on this area.</i></p>
Responses	<p>I appreciated the asynchronous flexibility of the course which allowed us to log on and complete work at different times. However, that made it very difficult to feel connected with a group for the group project. I unfortunately only had internet availability for the first half of the week for my group project, so I was able to post but had no chance for group sharing or communication because my other group members were not available until the end of the week.</p> <p>Perhaps, in a summer course like this, we could have some flexibility for selecting our group project week to try to work around windows of unavailability. If I had known what the group project involved, I would [sic] have picked to do mine one week earlier, rather than trying to complete it the one week I was camping in Canada! My group members would probably have appreciated that as well.</p> <p>Having limited experience with on-line courses and being in the first group to present, I had initially expected the group process to be more collaborative. I'm wondering if it might have been helpful to have a bit more guidance on expectations for group work. A colleague has shared that in her on-line course there is a scheduled time to meet on a regular basis via Microsoft link. She has indicated that this has made her feel more connected and she enjoys learning from her classmates. It also ensures that there'll be time for sharing ideas, asking questions and providing feedback.</p> <p>I see two sides to this one. I agree with Cheryl's comments about guidance. On the other hand, being summer and off doing summer things, it was really nice to have an open format to contribute when and how it was convenient.</p>
3	<p>Prompt: <i>Another category of the DELES survey addressed Personal Relevance. In this section, while the items were designed for a variety of courses, I would like to ask about the relevance to you as a professional in education, and in particular, as one who is involved with supporting students with special needs.</i></p> <p>• <i>Can you explain how this course relates to your professional educator role?</i></p>
Responses	<p>I now have a far better understanding of AT and how to appropriately use it with y [sic] students. I also feel far more confident in my knowledge so I can better approach the general education teachers with the AT needed and have the ability to explain why. (I hope this is all making sense-I am typing it on my phone and it is not liking the program)</p> <p>As a sped teacher and not much knowledge on AT, this was a great class. I learned so much and am so excited to try some of the apps and devices out there for a couple of my students this year. It still feels a little overwhelming with all the information, but I am organizing my thoughts and prioritizing [sic] where I want to start. Great class</p> <p>This course related directly to my professional educator role as a speech- language pathologist. I believe the assistive technology presented in the course, whether low or high tech, all related somehow to students' with disabilities ability to receive and express thoughts and/or ideas. Therefore, as an SLP it was important for me to learn about the various ways a student can access information and express information so I can provide those avenues of opportunities. I also feel that learning about and using AT was important to my role as an instructor so that as I teach I can increase accessibility [sic] to all types of learners with and without disabilities as part of the UDL framework.</p> <p>I teach Life skills at the Jr High level. Since I am technology challenged, I was greatly appreciative of all of the AT info I learned. All of my students can use at least 3-4 different AT apps, devices or technological advances that I just learned about. I feel better prepared to access this information to make sure that all of my kiddos learn to their potential and become as independent as possible.</p> <p>This course was very relevant for me as a special education director. I believe it is important for me as a director to have a good awareness of current AT resources, and also the needs of students in our district, so that I can help support teams in investigating and selecting appropriate AT. Unfortunately, I have heard team members say "AT is too expensive," and this course clearly showed that there are</p>

Scale	Questions & Responses
	<p>options available to remove that barrier. Also, if appropriate AT can reduce the need for individual aide support for students, then it really isn't so "expensive" after all.</p> <p>As a director, I appreciated the wide variety of information presented, and the MANY resources shared, because these will help me in developing training for administrators, sp ed teachers, IEP teams, and even students and parents. Because AT is such a changing field, that training will have to be ongoing, but I am excited to have so many new resources to approach the task!</p> <p>I am Gen Ed classroom teacher. This class was so helpful for me. I have only a few SpEd students in my classroom, but I teach at an alternative school and really all of my students are in need of SpEd services. The simple ideas I was reminded of like turning on the closed captioning for videos will be something easy I can do to help my students. I also feel like I will be able to participate more in my IEP meetings as I can offer suggestions for technology for students to use. I did not know about all of the technology we can borrow and try out. I am excited to take this information back to my staff.</p> <p>As an Educational Specialist for the Blind and Visually Impaired, I use technology and alternative formats on a daily basis. This course has provided a more generalized view of available technology as well as expanded my knowledge of resources. Focusing on educational supports as well as access was a strength [sic] of the course. With so many new ideas, strategies, apps and programs to share, I cannot wait for the year to begin!</p> <p>As a Technologist [sic] Director I need to know what software and hardware are potentially available for teachers and students. Staff training, network infrastructure and realistic software/hardware acquisition become a primary function of my job to support teachers. I need a working knowledge of this field to accommodate teacher requests.</p> <p>The contents of this course will be of great use in there [sic] areas carrying out my roles as: Advocate, Sped Administrator/K-12 Administrator, Consultant, and Parent. Each of these roles will be stronger and more able to train, assist, and push for AT access needed for qualified students. The materials and discussion with colleagues was most helpful and thought provoking. I have increased my general knowledge of AT's role in providing access, selection of hardware & software, and AT advocacy at the IEP table.</p> <p>I work with blind/visually impaired children at ISDB. Learning more about broad topics relating to IDEA, AIM and UDL coupled with specific technologies made this class very interesting. There are many ideas clanging around in my head to try out when school starts, also I shared many ideas and links in this course with my colleagues at the school.</p> <p>As a special educator with no experience in AT I now know what AT is, what I have already been using that I didn't call AT, and what more is available and where I can get it. So many questions have been answered. I have especially like the info on text compacting. I really need that for my students who struggle with reading. This is going to have a big impact on how I use, label, and look for AT.</p> <p>I found from class some great resources to utilize in my teaching position, some for students and some for staff to create a quality education for special needs students.</p> <p>This will be my first year as the Assistive Technology Specialist for my school district. This class was extremely [sic] helpful in providing a multitude of resources to be able to share with district staff.</p> <p>I'm the one-stop special ed shop for an elementary school so I have all kinds of students with varying levels of need. The information from this course was broad enough to encompass all sorts of special needs, with specific solutions for different students as well as alternatives. I feel like I have a good understanding of what's available, and where to find it. The background info on laws and the AT Cycle approach are helpful to consider as I also work with general ed teachers to address and implement AT with students.</p>
4	<p>Prompt: The <i>Authentic Learning</i> section of the survey related to real-world connections of the class.</p> <p><i>Were real-world situations presented in this course?</i></p> <ul style="list-style-type: none"> <i>If yes, can you relate one specific example that was most impacting to your experience</i>

Scale	Questions & Responses
	<p><i>during the class?</i></p> <ul style="list-style-type: none"> • <i>Why was this especially meaningful for you?</i>
Responses	<p>Yes! I have a student this year that is severely Autistic and one that is higher functioning- I now have several tools at my fingertips!!! I also have a few students this coming year that have been behavior problems- not because they are really behavior kids, I think they are just not getting all of what they need to succeed and so I plan on utilizing several of the AT programs/plans/tools that you have shown.</p> <p>I think the video that stood out to me the most was the young woman with the glasses navigating on her own who is blind. How amazing is that! Being able to go out into the world and live her life like everyone else.</p> <p>Yes, there were several real-world examples that were presented in the course. However, the one that was most meaningful to me was the glasses for the visually impaired where the girl was walking around the city, at home, and in the restaurant. I guess it was meaningful to me for two reasons: 1) I really didn't know anything about AT for the visually impaired other than Braille before this course so the ideas was very new to me; and 2) I felt like it was the ultimate real-world example of how AT can give someone complete independence to act and do for themselves and ask for assistance when they felt they needed it.</p> <p>Yes. I believe that in every module there was at least one instance of real life situations. I had no idea that teaching reading to deaf was so involved, watching the people with vision issues navigate their communities was exciting to me, learning about how there are options for higher education for people with disabilities was awesome. Watching how to use the different AT gave me insight into how it really does work. This was meaningful to me as I need to learn how to access AT and then actually use it in my classroom. I plan on accessing My study bar, AIM, and many of the apps. I like watching the videos to get a better idea of the AT available.</p> <p>Every module was filled with real-world situations which I was able to consider and then apply the knowledge to students in our own district. Some of our students with vision impairments have considerable amounts of AT which they access and use now. However, there are many other students in our district whose needs could be better met with further exploration of AT.</p> <p>I was greatly impacted by Module 6. I really needed that explanation on selecting and acquiring AIM, the different qualifications of students, and the district responsibilities for requesting AIM from publishers. I had been aware of that in the past, but after the budget challenges of the past few years in which we made no materials purchases, I had forgotten that districts need to be active in requesting accessible materials from publishers. That was a great "real- world" reminder for me which I need to act on immediately when I get back to the district.</p> <p>Every module offered some real world authentic applications. I love the online reader tools (Natural Readers and My Study Bar) I was able to share those with my online students and will do so with my f2f students. Someone else mentioned the difficulty of learning to read for children that are hard of hearing and that was also something I had not realized. I am working on a literacy masters and that was something that had not been addressed in any of my classes. I have several students that are hard of hearing and that just made realize how much I am not helping them in my class and I now have a bunch of tools I can offer.</p> <p><i>Together We Can Get There</i> was truly inspiring. It was relevant to my experiences as a parent and as a teacher. So often we do not adequately prepare our students with additional disabilities and their families for post- secondary experiences. It is so heartbreaking that it is still the exception for a student to have the option to continue to pursue their education after their public school experience has ended. So, sad that Idaho was not listed as a state that provides a post-secondary experience for all our students. Perhaps, as parents and educators, we need to gather together and explore how the surrounding states are creating and supporting programs to meet that need. Project, anyone?</p> <p>I also loved the <i>Simply Said</i> videos as they're very user friendly and will come in handy throughout the year.</p> <p>The use of videos was very productive and gave real-world "visions" of potential issues. The creation of actual AT Plan forced me back into a classroom to examine and analyze student behaviors and learning styles.</p>

Scale	Questions & Responses
	<p>Every module provided me with a new learning experience. I really looked forward to the power points and the videos! The time for this class was not a chore at all but something that made me think, "I can use this or try this in my classroom!" I really am excited to use a reading pen with a few severe LD students. I want them to feel success in a classroom where they haven't been able to before unless someone read the material to them. I want them to be as independent as the other students are. I am excited to try many of the web based computer programs to help make this happen!</p> <p>With every class module, I always had an "Ah Ha!" take away moment to two. Even though I have a strong working knowledge of AT and the use in accessing general education content and materials, I still leaned about Google Glasses, new smart software from BYU, and more about UDL and brain studies. I think the take away moment have put me on brain overload with knowledge and the wanting to have an play with some of the new AT devices and software!</p> <p>Oh my, where to start! I loved the AIM explorer and Navigator, the MyStudyBar feature, the YouDescribe app. All of these are so practical in addressing some of the needs of my blind/VI students. They are meaningful because they are so practical.</p> <p>I liked the UDL information, not only for working with my b/vi students but it has been interesting to apply to my daughters learning issues and how we as parents can understand her needs and support her teachers.</p> <p>I felt that real world questions were addressed in multiple ways. I learned what AT is out there, what AT is, and how I can use AT with my students. I think the thing that sticks out most is the video called. The video in the introduction has stayed with me the entire course. I was so impressed with those students. They self-advocate and understand both their limits and their potential. I defy anyone to call them disabled instead of differently abled after watching that video. This course along with that video has changed the way I oerceive [sic] my students and the ways I will approach my job in the future.</p> <p>Some quality video resources that could be used for training or inspiration were introduced to me. Would love for those resources to stay available past the class. Possible transfer to another website?</p> <p>Yes, in every module there was at least one new idea that I came away thinking that I could use this idea for a particular student. However, what really got me excited was learning about the new technology that will coming [sic] our way. I loved seeing how 3d printers and google glass can be used to help our students!</p> <p>Yes! Learning that my son is hearing impaired while taking this course made it very real-world to me.</p> <p>The video modules incorporated videos and interviews with individuals using or affected by AT--it was always helpful to see it being used in a real situation, or hearing from someone who uses AT how it helped them. The interview with the young woman who has dyslexia (with the whiteboard drawings) is a good example. It was meaningful because in her own words she told how she had used and benefited from AT and special services.</p>
5	<p>Prompt: <i>The Active Learning section of the survey related to independent learning. As adult learners who are also professional educators, it is particularly important for the instructor/designer to know about your level of comfort in course participation.</i></p> <ul style="list-style-type: none"> • <i>What learning strategies did you employ while taking this online course?</i> • <i>Were these strategies different from those that you would have employed in a face-to-face class? If so, why? If not, why?</i>
Responses	<p>I used the standard note- taking strategy but the fact that the modules was [sic] recorded was extra helpful because I was able to go back to something in the module for clarification and to go to the hyperlinks or the websites mentioned. One of the modules was about 46 minutes but the it [sic] took me half a day to get through it because I was going to each of the apps or websites and checking them out. All I had to do was pause the module and it was a piece of cake to find the items I wanted and investigate them. I would have definitely not done that in a face- to- face. By the time I left class I would</p>

Scale	Questions & Responses
	<p>have forgotten to do it. Being able to do it in the moment was key for me. I really liked this method of learning and I can see why students like it as well.</p> <p>I was able to schedule it into blocks-or small pieces-of time that for in my schedule. We are a very very [sic] busy family in the summer and if this was a face to face class, I highly doubt that I would have had th [sic] opportunity to take it. Even with not having internet and a computer readily available to me this summer, I was till [sic] able to take the course and make adjustments when necessary.</p> <p>I agree with Deb that the structure of the class really made it conducive to meaningful, individual exploration of the information presented. She is right that having time to explore right during the lesson, and being able to go back to the information as many times as we wanted to, really helped process the huge amount of great information being presented.</p> <p>I started by printing off the outline for note taking. I would then read the speaker notes, download those to my flash drive, to print at a later date, then listen to the presentation. After reading first then the presentation worked best for me. I still took notes, but there were so many apps and websites, I started a list for only websites and one for apps and put notes next to them for myself. If this was a face to face class, I think I would have been overwhelmed with everything, doing it online made it so I could go back and review whenever I needed to.</p> <p>Learning Strategies:</p> <ol style="list-style-type: none"> 1. Chunked some of the assignments into smaller pieces depending on my schedule for the day. 2. Printed off the slides to help me with note taking--with all of technology I still need to write with pen and paper or I just don't store what I learn in my memory. (This is where I get fearful of technology in education). p.s.--would have loved an outline of critical information instead of all of the mini slides-- they were really difficult to read. And [sic] took a lot of paper. 3. Read other students' discussion board responses if I didn't understand the assignment or question. 4. Emailed instructor for individual adaptations, when needed and she was always responded quickly and in a helpful way. <p>I was able to work when I was able; like the rest of you I was very busy this summer. If the class was in a face to face, schedule format, I would not have been able to take it. I liked that I could go back on previous modules and re watch them. I too, would like to have a copy of the critical information. I did not figure out how to take notes on line, so I have half a notebook of notes. I liked reading the modules, then going back and reading them with the CC, while listening to Dr. Carson, so I got the information 3 times. I do want to be able to save all of this information,; could you give me direction on how to do so?</p> <p>I agree with so many of the other comments that having this course on-line, where we could log in at a convenient time, and revisit the info as many times as I wanted, really made the course helpful. I found that I was more relaxed and able to process the information better knowing that I could go back to review it again. In face-to-face classes, the stress of note-taking can make it hard to process all the information, [sic] and I know I miss a great deal.</p> <p>One nice feature which I really appreciated, but had never had available in a face-to-face class, was having the speaker notes available IN ADVANCE. I found that I preferred reading the speaker notes BEFORE listening to the lecture. Maybe this is because I am more of a whole-to-part thinker, but this really worked for me. I think it helped me activate prior knowledge and gave me an overview of what was to come, and then when I listened to the lecture, I seemed to hear things more clearly and understood the information better. Thank you for providing those.</p> <p>The one thing I did in this class that I had never done before is have the lecture notes while listening to the lecture. I placed used the split screen on my computer and had my PDF right next to the lecture. That was so helpful. It allowed me to focus more on the content and not to get as distracted by the images or start thinking about the material and heading off in a different direction in my head. That was a cool thing I learned. This was more than just having the slides in front of me. I have had those multiple times before. I liked having the actual speaking notes.</p> <p>I really enjoyed the flexibility of taking an on-line course as my schedule was unexpectedly busy this summer. Also, having the materials and resources available for easy access and review was very helpful as I would frequently return to previous weeks presentations for information and/or resources to share. A face-to-face class would have been difficult and stressful as I have quite a large infant/toddler caseload</p>

Scale	Questions & Responses
	<p>this summer as well as family activities. Being able to attend class whenever it was convenient for my schedule was great. I'm not sure if it was planned or not, but having the information and resources shared during the IATP and DB Project workshops dovetailed beautifully into this class.</p> <p>This was yet another learning process. After procrastinating all week and then panicking for the first module, I realized the best way to attack this class was by breaking it up into parts. The lecture PDF allowed me to take notes while I listened to lessons and watched videos. The review by the end of the week was then much easier and probably had more value. I really appreciated those lecture notes and lecture with note taking ability.</p> <p>Putting the all the pieces of the class requirements, busy summer family life, and a small flood in the basement living space of my home. This created a need to relocate seven family members and two dogs to temporary housing for repairs to be complete. I think the asynchronous course design was a true life raft for my life with all that I have dealt with the past two weeks! I was able to adjust my schedule to monitor the repairs, shuttle children to and from summer activities, and burn the midnight oil to complete the modules for the class. The flexibility of asynchronous classes is great, but I miss the face-to-face interactions and live discussion with the instructor. In addition, we all know incidental learning takes place with students interact with one another and their teacher. You never know when a teachable moment is going to pop up in a live classroom or synchronous online delivery. I will take away a new respect for putting together an asynchronous class and keeping twenty or so students engaged at different learning modalities and AT knowledge levels available in the real world! Janice you are a Rock Star in my book!</p> <p>I think there were similarities to a face-to-face in that I read and reviewed materials, watched videos and collaborated with classmates. The collaborative element if different than if I would have taken this class on a campus. I think that if it had not been summer, we would have likely been more on the same schedule.</p> <p>Yes, teacher constantly need more resources and techniques for special needs students. There are almost no tech resources provided by school districts and state that are very helpful. Again, Please transfer all 6 modules to another website to not only be available to us, but also any teachers in need of these resources</p> <p>I think the biggest difference for me was the flexibility for when and where to complete class activities. I travel quite a bit in the summer so it is nice to be able to still take a class even when I'm on the other side of the country!</p> <p>I can relate with Heather's post. I was a bit nervous of taking an online class because I am not very high tech but there were easy to follow instructions and help when I was not quite sure about something. I really liked the flexibility of getting the coursework done when I could fit it in around reunions and camping.</p> <p>I was able to work at the times that fit my schedule, and didn't need to plan around full days of instruction in a face-to-face seminar-type setting. I prefer to read and think about things on my own so being in a lecture hall or a big workshop isn't my favorite thing. Having discussion board topics tied explicitly to each week's module content created a virtual discussion that was helpful for processing what I had learned, so I didn't feel like we were missing out by not being in the same room.</p>
6	<p>Prompt: <i>The next category is labeled "Student Autonomy." This section primarily relates to learner-control during the course.</i></p> <p><i>Did you perform class work (e.g., assignments, discussion postings, etc.) outside of class?</i></p> <ul style="list-style-type: none"> <i>If yes, did this flexibility allow you to select the times that were convenient for your personal life?</i> <i>If no, why were you unable to do this? What suggestions do you have for facilitating learners in doing this?</i>
Responses	<p>I think I touched on this with my answer to question 4- without the flexibility I would not have been able to take this course.</p>

Scale	Questions & Responses
	<p>Having the flexibility was convenient for me. I could work around my schedule and my families.</p> <p>Absolutely. The flexibility allowed me to take take [sic] this class when and where I needed. I would not have been able to take this course if I was required to be in a certain place and certain time each week.</p> <p>Yes. I loved the4 [sic] flexibility-to work when I had the time and fit my schedule. I enjoyed being able to review the information when I needed it. I would not have been able to take this course if it were in a brick and motor setting.</p> <p>The flexibility of this course made it great. Without that flexibility, I would not have been able to take this course and access this information. Some weeks, I was able to log on multiple times each week, for brief amounts of time, and that worked well with my summer schedule.</p> <p>I did experience some frustration with the functionality of different devices interacting with Blackboard. (I used a combination of Ipad, smart phone, laptop, netbook, and desktop computer.) My initial goal had been to use my IPAD for course access while traveling, but that didn't work well for me. I finally figured out that it was almost impossible for me to compose a coherent discussion board reply on my IPAD, so after a couple weeks of frustration I figured out how to have PC access for the discussion board postings, and that improved my ability to keep up in the course.</p> <p>During the class, I just tried to work through the issues, but that may not have been the best approach. In the future, perhaps a "FAQ hints for different devices" resource may be helpful. I'm sure other participants, or the instructor, could have helped me work through the technology challenges. I think it is just the Blackboard system that was causing me frustration, mostly in the discussion board, but also some of the videos that I was unable to access.</p> <p>Overall, this course was AWESOME in its flexibility of times. What a great way to learn in the summer :)</p> <p>The flexibility of this class was really key [sic] in my ability to finish the course. Even though I tried to keep a set schedule for working, it didn't really pan out. I was able to work on this around my family schedule and that was so helpful.</p> <p>Being able to attend class whenever it was convenient for my schedule was great. I'm not sure that I would have enjoyed it as much if it were presented on a "fixed" schedule.</p> <p>This kind of class with its "guided exploration" motivates you to explore further a topic of interest. The class put several topics in context to learning and allowed me to refine and explore additional features of a product or concept.</p> <p>Yes, I did other educational items outside of class in my role of starting up an educational consulting business and working with outside professionals to pick up certification as a PMP in Project Management from the Professional Management Institute Inc. Boy more letters behind my name! Putting that aside, the asynchronous course design allowed me to flex to best schedule personal, family, and professional duties. Having the flexibility and freedom to set my own schedule for class module completions was a plus in design.</p> <p>If I had a magic wand, I would have liked a face-to-face class with Janice as instructor and a close second would be an online synchronous real time class and video contact with classmates. Having live discussion promotes new ideas, exchange of professional discussion, and real time learning and problem solving opportunities.</p> <p>Yes. It was great to be able to do assignments and postings around my schedule this summer. I have been out of town for about ½ of the class so being able to do assignments in the early morning or late evening has been very helpful.</p> <p>I loved learning this way. I was able to seclude myself in my office at home and work on things. After viewing the materials and modules I was able to go back to some of the things I was more interested in and look at them later. This would have only worked better for me if I had been more focused on studying and less on relaxing or playing with my grandkids. I have had fun and it seems in all I will finish the course on time. This definitely gave me the flexibility to tackle the work on my own. I am a last minute kind of girl. For future learners I would suggest that you complete the module in the week it is given so you don't get backed up.</p>

Scale	Questions & Responses
	<p>Flexibility was very important, I had a lot on my plate right now, but was able to keep up somewhat, I still want to go through in a more though manner when I have more quality time.</p> <p>Yes, the flexibility to select times that were convenient helped quite a bit!</p> <p>Yes, I liked the flexibility to have a week to do the assignment and I liked that I knew what needed to be done that week.</p> <p>I definitely did. Sometimes the module video would be running while I went to the discussion board for that week (or a Word doc so I could copy-paste) to type up part of my response as I thought of it--it didn't feel disruptive, I could just do what worked. I tend to be a procrastinator so it helped that there was a structure with certain things required each week, so I couldn't let myself get behind and then try to play catch up. As it happened my group project week wasn't the most convenient for me as I was travelling the first part of that week, then returned home and spent two full days in a workshop, and then it was Friday! I felt a little frazzled and fried getting through everything that week. I made it work but that was the closest the course got to being inconvenient for me.</p>
7	<p>Prompt: <i>The final category on the DELES survey relates to Enjoyment. Because this course was via distance through a learning management system (Blackboard), the items relate specifically to your experience under this design and delivery mode.</i></p> <p><i>Some of you probably answered that you prefer a professional development course through distance delivery methods, while others did not express a preference for this.</i></p> <ul style="list-style-type: none"> • <i>Can you relate a specific example of why you prefer distance delivery?</i> • <i>Please relate an example of why you do not prefer distance delivery? How can the instructor/designer increase your preference for distance delivery of this course?</i>
Responses	<p>This was the first experience for me using Blackboard and I had a difficult time navigating through it at first but slowly caught on to the format and eventually liked how it worked. I prefer distance delivery because of the flexibility it provides as accessing the material at various times of day and night. Sometimes I wasn't able to watch a class until 11 PM while other day s it would access it at 3:30 AM- - depending on my Summer schedule.</p> <p>Distance learning worked great for me during the summer.</p> <p>Why I would prefer: The flexibility of being able to watch the lectures and do the classwork on my own schedule was what made it possible for me to take this class. I really liked how Janice presented the material, how available she was if you needed help or more information and the materials were all very relevant to the job that I do with school- aged children. I think that any teacher could learn a lot by taking this class.</p> <p>If I were [sic] to have any input as to preferring a face- to- face class is that I think it would be really fun to take a class from Janice Carson.</p> <p>As with the rest of my classmates, distance learning made it possible for me to take this very meaningful and educational course. This summer I have very busy with farming, 4- H, children and grand kids! When I had issues with technology, Dr. Carson helped me and I was able to navigate most of the computer technology.</p> <p>Thanks for being so patient and kind, you seemed to truly care.</p> <p>I like the flexibility of distant delivery method, but do miss the interaction which I believe expands the mastery of content. Possible improvement could be a wrapping course before a statewide training or conference were many of us could meet in a session and expand our mastery through face to face discussion.</p> <p>AS before distance delivery works for me to get to it when the house is quiet. Being able to work around family made it possible for me to take this class and learn lots.</p> <p>I prefer distance delivery for two reasons. First, I appreciate the flexibility in being able to do the course</p>

Scale	Questions & Responses
	<p>when it fits into my schedule. Second, distance delivery is really nice for someone from a rural district. Having to drive several hours to reach a course site to take a class makes it much less appealing. The instructor did a fantastic job of being available and helping out future, an idea to explore might be to use the IEN network to connect with people who want a more "face- to- face" experience. Because it is available in every district in Idaho, it might be an option. Or perhaps there could be virtual "office hours" when people who are available and want to could log on together for real- time interaction. Some of my students who have taken IDLA virtual courses have done some interaction that way. I'm not sure how IDLA set it up, but there must be some way to facilitate that for people who really need real- time contact to learn more effectively.</p> <p>Thank you so much for all you did to make this a T ERRIFIC class!</p> <p>Obviously, distance delivery offers the complete flexibility of working on y our own time schedule. It's very difficult these days to drive 20 miles then spend 3 hours in class for several weeks. Distance delivery allows me to complete in sections on my time schedule. This particular class utilized several techniques that encouraged different sty les of exploration. You have to be self-disciplined with distance delivery instruction. It is VERY easy to put class assignments off for a more convenient time.</p> <p>Distance learning is a very efficient and flexible way for me to learn content. This summer I am very busy and I actually was taking a weekly class to finish up my masters [sic] program. I don't think I would have even looked at this class if it wasn't totally on line and asynchronous [sic].</p> <p>I think online classes are great for learning content and allowing students to complete work on a time frame that works for them. Online classes do lack the interaction between the instructor and the students as a group. There is so much that goes on in a classroom that doesn't happen online. The social part of the classroom allows for networks of learning to develop [sic]. I know that some people are more apt to socialize online and meet their classmates, but I am more of a f2f [sic] social person. I think both types of learning are helpful for students.</p> <p>I like having the option of both distance delivery and liv e classes. I think each have an appeal. One of the advantages that I most prefer about distance delivery is the fact that I can take the class wherever I am and whenever I want. It is really nice not having to spend time traveling to and from class- - more time that I can spend with my family!</p> <p>Yes- I think I distance learning could grow on me! If there was a synchronous "real live time" discussion opportunity with two- way video exchange, I feel the distance learning would meet my needs. I like to see people which whom I am exchanging information and posts. What lost is the intent and non-verbal expressions, which gives life to an individual and his/her discussion posts. The technology is available, but one would have to commit to following a traditional school time schedule for class. I would probable find myself in the office for being tardy or not present due to being tugged every which way by family, life, and friends!</p> <p>Not- I prefer the ole school method of face- to- face class with an instructor especially one as knowledgably as Janice in AT applications in special education. Having live discussion promotes new opportunities for exchange of professional discussion and growth and real time learning and problem solving opportunities. This I feel would help build a support network and bond with classmate in which to continue growing and exchanging ideas to support AT in Idaho's public schools. Now I have names without a face and didn't have a chance to grow a new professional colleague and friend!</p>

Appendix D**AT Plan Rubric****AT Raw data**

Implementation of the AT Plan-Rubric

Name:

Area	Description	Advanced 3	Intermediate 2	Not Evident 0
Consideration	Present Level of Performance- It must include: how does the student's disability affect his or her involvement in and progress in the general education curriculum. In addition to, listing the student's current level (baseline data) and the assessment where the data was obtained.	Includes how the student's disability affects his or her involvement in and progress in the general education curriculum. AND Lists the student's current level (baseline data) and the assessment where the data was obtained	Includes how the student's disability affects his or her involvement in and progress in the general education curriculum. OR Lists the student's current level (baseline data) and the assessment where the data was obtained	Missing how the student's disability affects his or her involvement in and progress in the general education curriculum. AND The student's current level (baseline data) and the assessment where the data was obtained
	Annual Goal: Must list the condition or level of instruction, the behavior or skill, and the criteria (must be aligned to baseline data identified in the Present Level of Performance	Includes the level of instruction, skill, and criteria. AND Aligned to the PLOP	Includes the level of instruction, skill, and criteria. BUT NOT Aligned to the PLOP	Missing the level of instruction, skill, or criteria.
	Task(s) Associated with Goal: The specific task(s) are outlined, which are required to meet the goal across all environments. This step includes a careful examination of the expectations that are unique to different settings. The IEP team considers all the variations of the specific skills required to accomplish the goals and make progress in all environments.	Includes task(s) associated with the goal AND Consideration of the variation of needs in other environments	Includes task(s) associated with the goal DID NOT Consider variation of needs in other environments	Missing task(s) associated with the goal

Area	Description	Advanced 3	Intermediate 2	Not Evident 0
	Student's Functional Capabilities: Functional capabilities are the abilities needed to perform tasks as independently as possible. What might prevent him/her from accomplishing the task independently? What are the skills, strengths, and abilities the student brings to the complete the task?	Includes information on what might prevent the student from accomplishing the task independently. AND Includes the skills, strengths, and abilities the student brings to complete the task.	Includes information on what might prevent the student from accomplishing the task independently. OR Includes the skills, strengths, and abilities the student brings to complete the task.	Missing the information on what might prevent the student from accomplishing the task independently. AND The skills, strengths, and abilities the student brings to complete the task.
	AT Supports and Services: A broad description of AT (low-to high tech) which supports the student's functional needs to accomplish the task(s).	Includes a broad description of AT (low to high tech) which supports the student's functional needs to accomplish the task(s).		Missing a broad description of AT (low to high tech) which supports the student's functional needs to accomplish the task(s).
Choose and Trial AT	Choose and Trial AT: AT chosen to trial to determine which item meets the student's needs and increases independence.	AT chosen to trial to determine which item meets the student's needs and increases independence. AND A plan to gather data.	AT chosen to trial to determine which item meets the student's needs and increases independence. BUT NOT A plan to gather data.	Missing AT choice to trial to determine which item meets the student's needs and increases independence.
Implementation		Specific AT chosen to match on skills, strengths, abilities, and needs. AND A training and data collection	Specific AT chosen to match on skills, strengths, abilities, and needs. BUT NOT A training and data collection	Missing specifically chosen AT to match on skills, strengths, abilities, and needs. AND The training and

		plan.	plan.	data collection plan.
Progress Monitoring		<p>A progress monitoring plan is developed which explains who and how often data will be collected.</p> <p>AND</p> <p>Method to collect student level data included.</p>	<p>A progress monitoring plan is developed which explains who and how often data will be collected.</p> <p>BUT NOT</p> <p>A method to collect student level data.</p>	<p>Missing a progress monitoring plan developed to explain who and how often data will be collected.</p> <p>AND</p> <p>Method to collect student level data included.</p>

AT Plan Raw data

	I1	I2	I3	I4	I5	I6
1	3.00	3.00	3.00	3.00	3.00	3.00
2	3.00	3.00	2.00	3.00	3.00	3.00
3	3.00	3.00	3.00	3.00	3.00	2.00
4	3.00	3.00	3.00	3.00	3.00	3.00
5	3.00	3.00	3.00	3.00	3.00	3.00
6	3.00	3.00	3.00	3.00	3.00	2.00
7	3.00	3.00	3.00	3.00	3.00	3.00
8	3.00	3.00	3.00	3.00	3.00	2.00
9	3.00	3.00	3.00	3.00	3.00	3.00
10	3.00	3.00	3.00	3.00	3.00	2.00
11	3.00	3.00	3.00	3.00	3.00	2.00
12	3.00	3.00	3.00	3.00	3.00	3.00
13	3.00	3.00	3.00	3.00	3.00	3.00
14	3.00	3.00	3.00	3.00	3.00	3.00
15	3.00	3.00	3.00	3.00	3.00	3.00
16	3.00	3.00	3.00	3.00	3.00	3.00
17	3.00	3.00	3.00	3.00	3.00	3.00

	I7	I8	Total_Sum
1	3.00	3.00	24.00
2	3.00	3.00	23.00
3	2.00	2.00	21.00
4	3.00	3.00	24.00
5	3.00	3.00	24.00
6	2.00	2.00	21.00
7	3.00	3.00	24.00
8	2.00	2.00	21.00
9	3.00	3.00	24.00
10	2.00	2.00	21.00
11	2.00	2.00	21.00
12	3.00	3.00	24.00
13	3.00	3.00	24.00
14	3.00	3.00	24.00
15	3.00	3.00	24.00
16	3.00	3.00	24.00
17	3.00	3.00	24.00

Appendix E:

ADDIE Analyze Phase

Appendix E-1:**Tasks A01 – A03:****Delphi Panel Letters****Delphi 01 Survey Instrument & Artifacts****Raw Data**

Janice Carson
Ed.D Candidate, Educational Leadership
Idaho State University
April 7, 2014

Dear Panel Member,

Thank you for your willingness to participate in this panel process toward the completion of my doctoral dissertation. I will be asking you to lend your expertise in the area of assistive technology (AT) to verify some instructional design questions about professional development focused on AT. There will be approximately 14 questionnaires distributed via email and each will take approximately ten minutes each to complete. I expect that the total involvement in this process will take no more than three hours of your time. The initial survey will be distributed the beginning of April 2014, with the goal of completing the process by the first week of May. I will maintain contact with each of you via email and/or cell phone, to alert you when a new questionnaire has been posted to your inbox.

The research tool I will employ is called The Delphi Technique. It is a means and method for consensus building by using a series of survey questionnaires to collect data from a panel of experts in a given area of inquiry. One of the essential features of this process is the anonymity of the participants when giving their survey responses to allow participants to express their opinion without undue pressure to conform to others in the group. Confidentiality will be facilitated by the use of electronic communication (e-mail) to solicit and exchange information. The data from each round of surveys will be summarized by the investigator (me) and the results will be returned to you to review for the second round of the survey, and so forth and so on. Theoretically, the Delphi process can be continuously iterative until consensus amongst experts is reached.

Your volunteer commitment along with your expertise and informed judgment will add greatly to my research. I thank you in advance for your participation and ask that you send me a response email verifying your dedication to the completion of this process.

Should you have any questions, please contact me at (208) 212-2143 or janicec@uidaho.edu.

Sincerely,
Janice Carson

Janice Carson
Ed.D Candidate, Educational Leadership
Idaho State University
April 28, 2014

Dear Panel Member,

Thank you for your willingness to participate in this panel process toward the completion of my doctoral dissertation. I will be asking you to lend your expertise in the area of assistive technology (AT) to verify some instructional design questions about professional development focused on AT. There will be 2 questionnaires distributed via email and each will take approximately 20 minutes each to complete. I expect that the total involvement in this process will take no more than an hour of your time. The initial survey will be distributed in the next couple of days, with the goal of completing the process by the third week of May. I will maintain contact with each of you via email and/or cell phone, to alert you when a new questionnaire has been posted to your inbox.

The research tool I will employ is called The Delphi Technique. It is a means and method for consensus building by using a series of survey questionnaires to collect data from a panel of experts in a given area of inquiry. One of the essential features of this process is the anonymity of the participants when giving their survey responses to allow participants to express their opinion without undue pressure to conform to others in the group. Confidentiality will be facilitated by the use of electronic communication (e-mail) to solicit and exchange information. The data from each round of surveys will be summarized by the investigator (me) and the results will be returned to you to review for the second round of the survey, and so forth and so on. Theoretically, the Delphi process can be continuously iterative until consensus amongst experts is reached.

Your volunteer commitment along with your expertise and informed judgment will add greatly to my research. I thank you in advance for your participation and ask that you send me a response email verifying your dedication to the completion of this process.

Should you have any questions, please contact me at (208) 212-2143 or janicec@uidaho.edu.

Sincerely,
Janice Carson

TO: Delphi Panel
FROM: Janice Carson
RE: Tasks A01-A03
DATE: April 7, 2014

Good Afternoon Delphi Panel Subject Matter Experts (SME's):

Attached to this email you will find the first documents Project Rationale Statement (A01), Goals (A02), and Objectives (A03) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as SME's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached documents and then complete the survey questionnaire. Return the completed survey to me via email by Monday, April 14, 2014.

Thank You,
Janice Carson

ADDIE Analyze Phase
Task A01 – A03: Rationale/Goal/Objectives
Delphi Survey 01

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 rationale, the goal, and the objectives.
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 **Monday, April 14, 2014**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
Project Rationale (Task A01):				
1. The benefit of this project to the institution or organization is clearly stated.				
2. The benefit of this project to the targeted learners is clearly stated.				
3. The need for this project is clearly stated.				
4. The geographical scope for this project is clearly stated.				
5. The project's subject matter is clearly stated.				
6. The project's approach to the problem is clearly stated.				
7. The project's expected outcome is clearly stated.				
Project Goal(s) (Task A02):				
8. The goal(s) of this project is clearly stated.				
9. The goal(s) of this project states what the project is to accomplish.				
10. The goal(s) of this project clearly indicates how the success will be indicated.				
11. The goal(s) of this project appears to be achievable.				
12. The goal(s) of this project appears to be significant to the field of knowledge indicated by the rationale.				
13. The goal(s) of this project appears to be measurable.				
14. Considering the target population, the goal(s) of this project appears to be realistic.				
15. The outcomes of the project appear to be obtainable.				
Project Objectives (Task A03):				
16. Each objective of this project module is aligned to the goal statement.				
17. Each objective of this project module contains a behavior/action verb that is measureable.				
18. Each objective of this project module has				

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
an identified audience.				
19. Each objective of this project module contains a degree/constraint that is clearly stated.				
20. Each objective of this project module contains a condition/situation that is clearly stated.				
21. Each objective of this project is aligned to the identified audience.				

Task A01: Rationale

Assistive Technology Professional Development

This professional development, a technology-based online training, will provide a platform to reach across the state to Idaho's special education teachers, to afford them the opportunity to access training in assessment and implementation of assistive technology (AT) supports for reading. Consideration and provision of AT is required under the Individuals with Disabilities Education Act as amended in 2004. This training will provide the special education teacher with the capacity to lead the IEP team in considering assistive technology reading supports for the students with disabilities as well as understand the role assistive technology plays with regard to the expectations of the Common Core State Standards.

The Idaho Assistive Technology Project (IATP), housed at the Center for Disabilities and Human Development (CDHD) at the University of Idaho, has been designated by the Idaho State Department of Education as the State lead in training and technical assistance on AT for Idaho's K12 programs. The CDHD, has an affiliation with the university's College of Education, and houses approximately 70 staff and six teaching faculty who also conduct research and provide technical assistance across the State to support individuals with disabilities, their families, educators, and other stakeholders. This professional development, like all training provided through CDHD, will assist in-service special education teachers with the knowledge necessary to carry out their legal obligations of instructional supports for students with disabilities on an IEP.

Task A02: Instructional Goal

The Goal Statement paints the picture of what the assistive technology professional development is intended to accomplish. The special education teachers in Idaho will be introduced to assistive technology reading supports for students with disabilities. They will understand the role of assistive technology to meet the requirements of the Common Core State Standards and their position as teacher leaders in the IEP consideration process. The participant's knowledge acquisition will be assessed through examinations and reflective writing. Completion of this training will provide the participants with the three points of knowledge: 1) an insight to the role assistive technology plays with regard to the expectations outlined in the Common Core State Standards; 2) an understanding of their role as a teacher leader in guiding the IEP team through the assistive technology consideration process; and, 3) a foundation in the types of assistive technology reading supports available to assist students with disabilities progress in the general education curriculum and toward their IEP goals (refer to Task A01 Rationale). The instructional goals of the assistive technology professional development are:

1. To increase the special education teacher's understanding the role assistive technology plays with regard to the expectations outlined in the Common Core State Standards.
2. To increase the special education teacher's understanding of their position, as a teacher leader, in guiding the IEP team as they fulfill their obligation of considering assistive technology.
3. To increase the special education teacher's knowledge of assistive technology reading supports for students with disabilities.

Task A03: Objectives

1. Given the content in the assistive technology professional development training the special education teacher will be able to identify the role assistive technology plays to support the expectations outlined in the Common Core State Standards by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
2. Given the content in the assistive technology professional development training the special education teacher will be able to identify the characteristics of a teacher leader, who guides the IEP team as they fulfill their obligation of considering assistive technology by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
3. Given the content in the assistive technology professional development training the special education teacher will be able to select assistive technology reading supports for students with higher needs by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
4. Given the content in the assistive technology professional development training the special education teacher will be able to choose assistive technology reading supports for struggling readers by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
5. Given the content in the assistive technology professional development training the special education teacher will be able to design an Accessible Instructional Materials (AIM) program for students with a print disability by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.
6. Given the content in the assistive technology professional development training the special education teacher will be able to distinguish the role reading technology plays in a universally designed general education classroom curriculum by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.

Mager, R. (1975). *Preparing Instructional objectives* (2nd ed.). Belmont, CA: Fearon.

Mager, R. (1997). *Preparing Instructional Objectives* (3rd ed.). Atlanta, GA: The Center for Effective Performance, Inc. ISBN: 1-879-618-03-6

Table 51
 Experts' Responses to the Delphi Survey
 ADDIE Analyze Phase - Tasks A01 – A03: Rationale/Goal/Objectives
 Mean Score of SME's Individual Scoring

Item	SME 1	SME 2	SME 3	Mean
Project Rationale (Task A01):				
1. The benefit of this project to the institution or organization is clearly stated.	4	4	4	4.0
2. The benefit of this project to the targeted learners is clearly stated.	4	4	4	4.0
3. The need for this project is clearly stated.	4	4	4	4.0
4. The geographical scope for this project is clearly stated.	4	4	4	4.0
5. The project's subject matter is clearly stated.	4	4	4	4.0
6. The project's approach to the problem is clearly stated.	3	4	4	3.66
7. The project's expected outcome is clearly stated.	4	4	4	4.0
Project Goal(s) (Task A02):				
8. The goal(s) of this project is clearly stated.	4	4	4	4.0
9. The goal(s) of this project states what the project is to accomplish.	4	4	4	4.0
10. The goal(s) of this project clearly indicates how the success will be indicated.	4	4	4	4.0
11. The goal(s) of this project appears to be achievable.	4	4	4	4.0
12. The goal(s) of this project appears to be significant to the field of knowledge indicated by the rationale.	4	4	4	4.0
13. The goal(s) of this project appears to be measurable.	4	4	4	4.0
14. Considering the target population, the goal(s) of this project appears to be realistic.	4	4	4	4.0
15. The outcomes of the project appear to be obtainable.	3	4	4	3.66
Project Objectives (Task A03):				
16. Each objective of this project module is aligned to the goal statement.	4	4	4	4.0
17. Each objective of this project module contains a behavior/action verb that is measureable.	4	4	4	4.0
18. Each objective of this project module has an identified audience.	4	4	4	4.0
19. Each objective of this project module contains a degree/constraint that is clearly stated.	4	4	4	4.0
20. Each objective of this project module contains a condition/situation that is clearly stated.	4	4	4	4.0
21. Each objective of this project is aligned to the identified audience.	4	4	4	4.0

Appendix E-2

Task A04-A06:

Delphi Panel Letters

Delphi 02 Survey Instrument & Artifacts

Raw Data

TO: Delphi Panel
FROM: Janice Carson
RE: Tasks A04-A06
DATE: April 19, 2014

Good Afternoon Delphi Panel Subject Matter Experts (SME's):

Attached to this email you will find the documents Learning Outcome Statement (A04), Concept Map (A05), Learning Hierarchy (A05), and Learning Influence (A06) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as SME's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached documents and then complete the survey questionnaire. Return the completed survey to me via email by Sunday, April 27, 2014.

Thank You,
Janice Carson

ADDIE Analyze Phase
Tasks A04 – A06: Learning Outcomes Statement/Learning Hierarchy w/
Content Map/
Learning Influence Document
Delphi Survey 02

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 concept map, learning influences, expected learning outcomes, and learning hierarchy.
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 **April 27, 2014**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
Learning Outcomes Statement (Task A04):				
1. There is an accurate description of the <u>short-term</u> learning effect for each of the objectives for each RLO/Module.				
2. There is an accurate description of the <u>long-term</u> learning effect for each of the objectives for each RLO/Module.				
3. There is an accurate description of how the learner is expected to change as a result of each objective.				
4. There is an accurate description of what is expected to change as a result of the instruction.				
Learning Hierarchy w/ Content Map (Task A05):				
5. It appears the concept map accurately presents each goal of the project. (Refer to Task A02 for the goal(s), if needed.)				
6. It appears the concept map accurately presents each of the primary objectives. (Refer to Task A03 for the objectives, if needed.)				
7. Using the project goal(s) and the project objectives [Task A02 and Task A03] as references, it appears the concept map accurately links each goal with its corresponding primary objective(s).				
8. Using the project objectives as reference, it appears the concept map accurately presents each of the secondary objectives.				
9. Using the project objectives as reference, it appears the concept map accurately links each of the secondary objectives to its corresponding primary objective.				
10. The total concept map presents an accurate depiction of the project.				
11. The total concept map displays appropriate linkages among all elements.				
12. The essential prerequisite learner knowledge/skills to achieve the objectives are identified.				
13. 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.				
Learner Influence Document (Task A06):				
14. There is an accurate description for gaining the learner's attention within each RLO/Module.				
15. There is an accurate description for maintaining the learner's attention within each RLO/Module.				

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
16. There is an accurate description for assessing the learner's satisfaction within the instruction for each RLO/Module.				
17. There is an accurate description of how each RLO/Module will include a focus on specific learner capabilities.				
18. There is an accurate description of how each RLO/Module will stimulate the learner's prerequisite knowledge (or skills).				
19. There is an accurate description of how each RLO/Module will accommodate identified learner disabilities.				
20. There is an accurate description of how each RLO/Module will respond to a participant's particular learning traits.				

Task A04: Expected Learning Outcomes

1. Short Term Memory

Short term memory (STM) receives information from sensory registers. Working memory selects the sensory information and provides an organizational structure that interacts with long-term memory to attach to scaffolding (Mayer, 2008). Attention (Morey & Bieler, 2013; Mayer, 2008) to the information is needed for sensory input. The assistive technology professional development will employ video, sound, images, and other information which will move through the sensory registers into working memory where it will be organized. Video, sound, images, and questioning will be used as a means of accessing the special education teacher's attention.

2. Long Term Memory

"Long-Term Memory—the learner can activate prior knowledge to be integrated with the verbal and pictorial models in working memory and can store the resulting knowledge in long-term memory" (Mayer, 2008).

The assistive technology professional development will use instructional methods such as video, audio, graphic organizer, presentations and questioning will provide a platform for learning which will allow the special education teachers to develop a deep understanding of the concepts and critical thinking skills.

3. Learner Change

Learning depends on the learner's cognitive processing during learning and includes (a) selecting—attending to the relevant incoming material; (b) organizing—organizing the incoming material into a coherent mental representation; and (c) integrating—relating the incoming material with existing knowledge from long-term memory (Mayer, 2008).

The desired outcome for the in-service teachers in this training is to develop an understanding of the role assistive technology reading supports play in assisting students with disabilities. To that end, the special education teachers will have: 1) an insight to the role assistive technology places with regard to the expectations outlined in the Common Core State Standards; 2) an understanding of their role as a teacher leader in guiding the IEP team through the assistive technology consideration process; and, 3) a foundation in the types of assistive technology reading supports available to assist students with disabilities progress in the general education curriculum and toward their IEP goals Mayer, R.E. (2008). Applying the science of learning: Evidence-based principles for the design of multimedia instruction. *American Psychologist*, 63(8), 760-769.

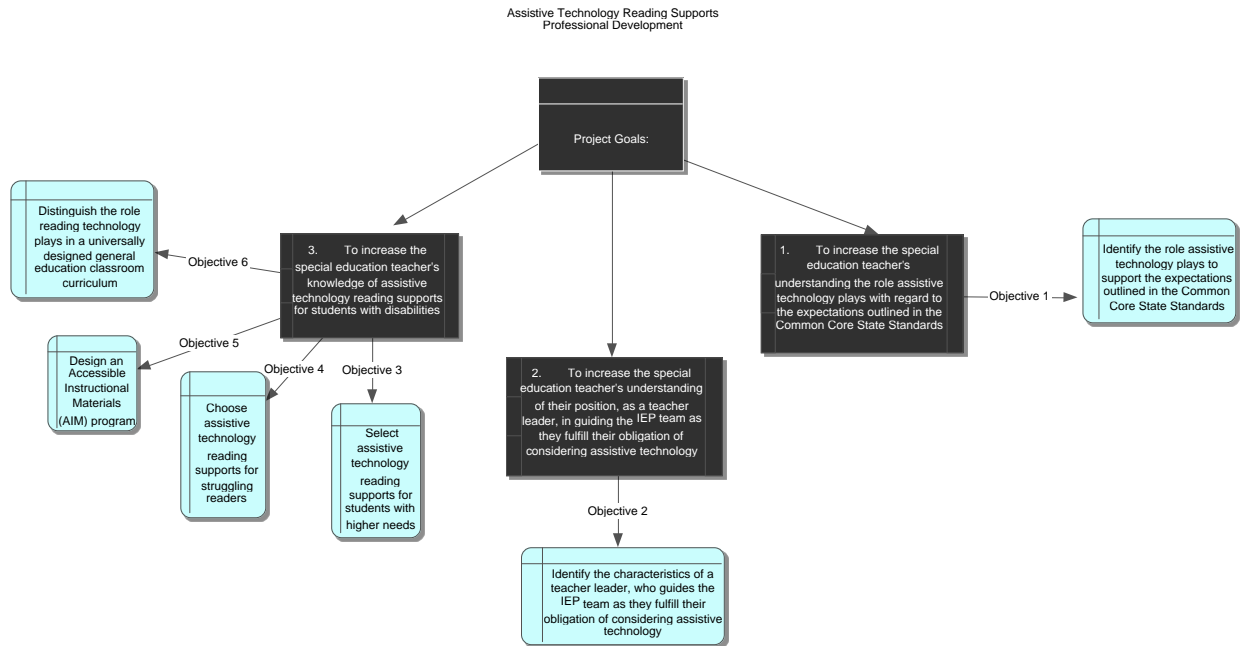
Morey, C. C. & Bieler, M. (2013). Visual short-term memory always requires general attention. *Psychonomic Bulletin & Review*, 20(1), 163-170.

Task A05-Concept Maps

Assistive Technology Reading Supports

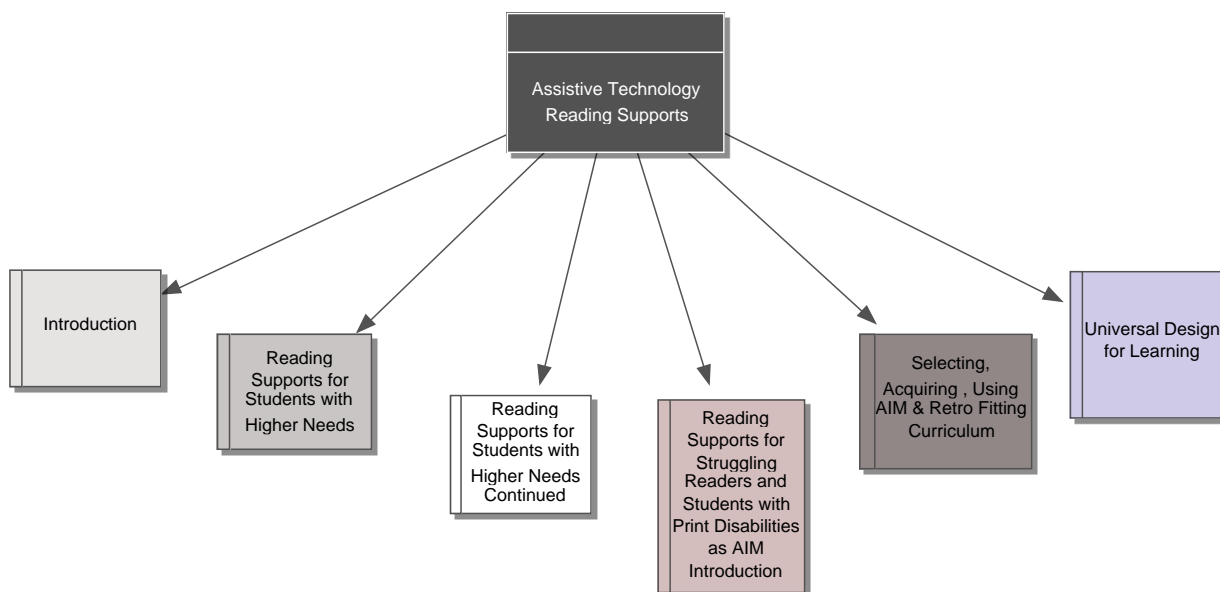
Professional Development

Goals & Objectives:



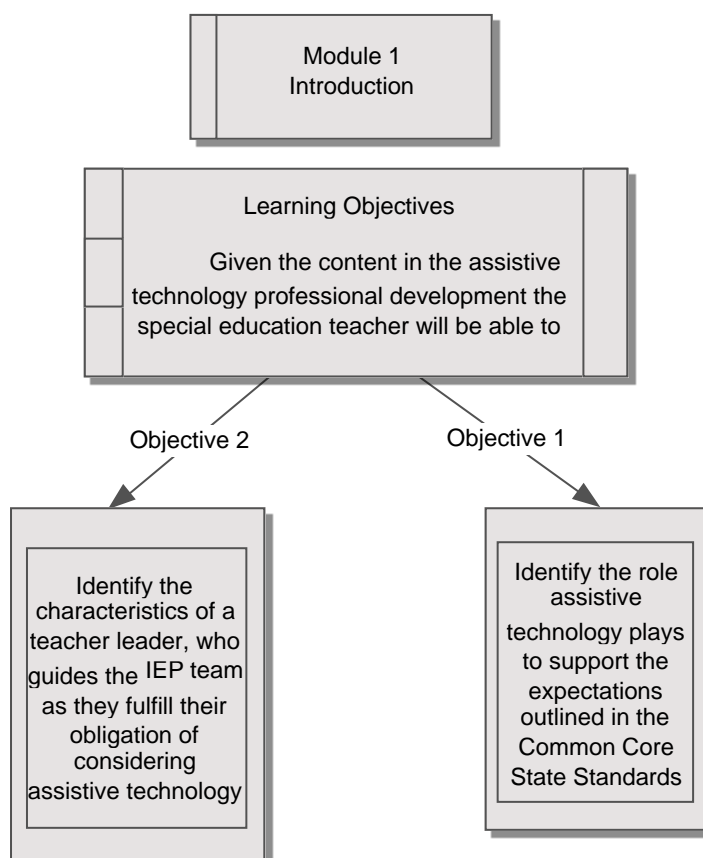
Assistive Technology Reading Supports Professional Development Overview:

Assistive Technology Reading Supports
Professional Development
Overview



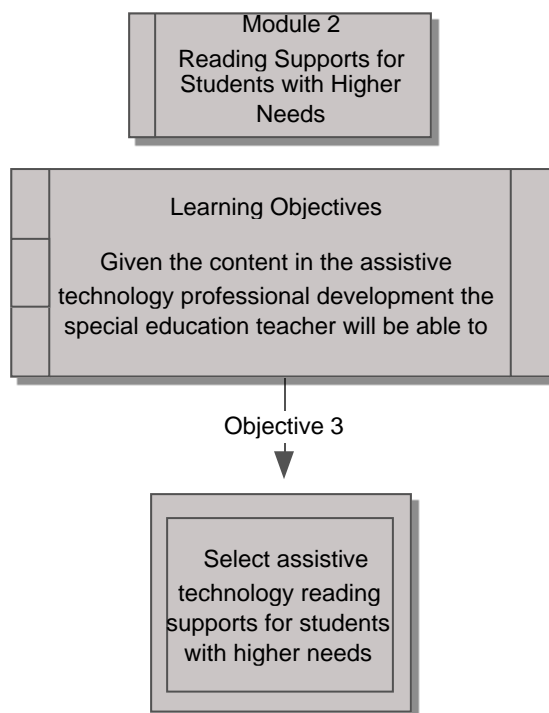
Assistive Technology Reading Supports
Professional Development
MODULE 1 OBJECTIVES:

Assistive Technology Reading Supports
Professional Development
Module 1 Objectives:



Assistive Technology Reading Supports
Professional Development
MODULE 2 OBJECTIVES:

Assistive Technology Reading Supports
Professional Development
Module 2 Objectives:



Assistive Technology Reading Supports
Professional Development

Module 3 Objectives:

Module 3
Reading Supports for Students with Higher Needs Continued

Learning Objectives
Given the content in the assistive technology professional development the special education teacher will be able to

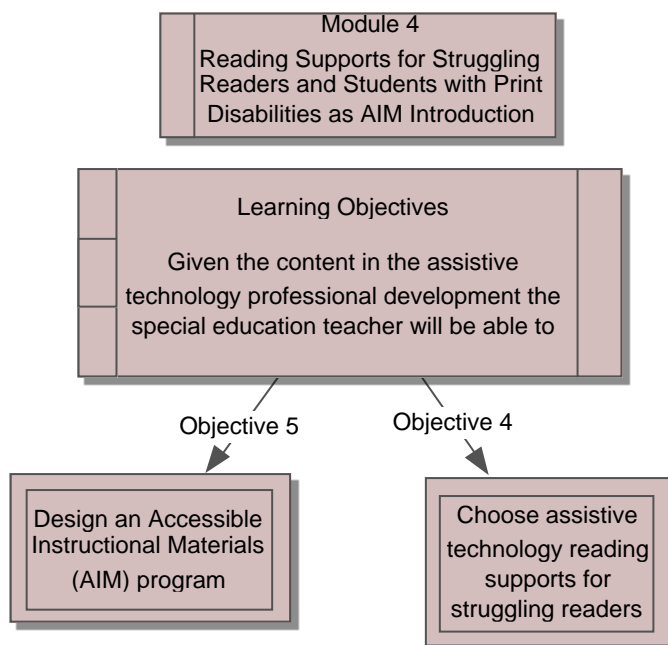
Objective 3



Select assistive technology reading supports for students with higher needs
--

Assistive Technology Reading Supports
Professional Development

Module 4 Objectives:



Assistive Technology Reading Supports
Professional Development

Module 6 Objectives:

Module 6
Universal Design for
Learning

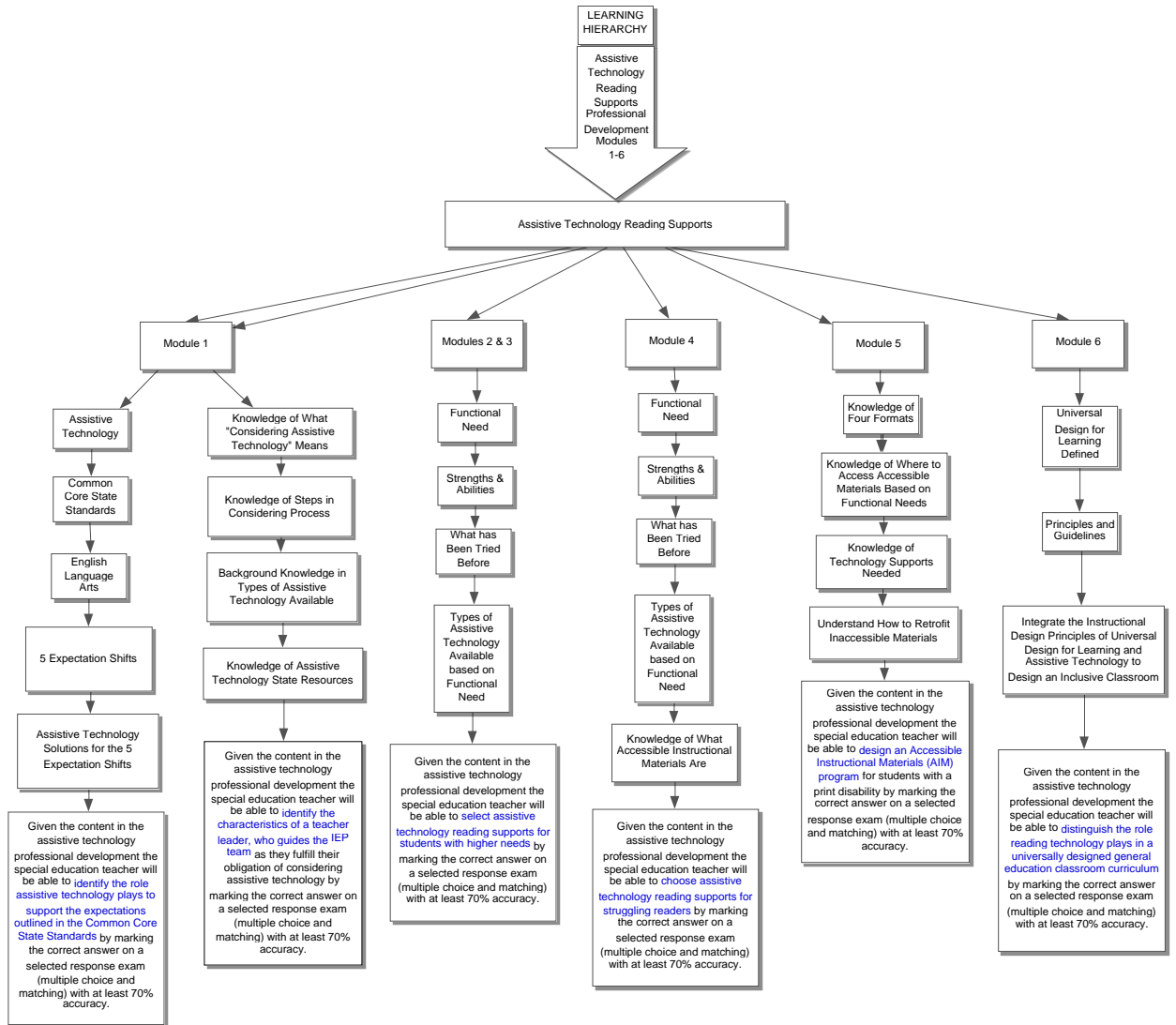
Learning Objectives

Given the content in the assistive
technology professional development the
special education teacher will be able to

Objective 6

Distinguish the role reading
technology plays in a
universally designed
general education
classroom curriculum

A05: Learning Hierarchy



ADDIE Analyze Phase
Task A06: Learning Influence Document (LID)

Based on the project Objectives (Task A03) address the following:

Item/Event	Strategies
1. What events will the instructional designer utilize to gain the learner's attention?	In each Module the instructor will gain the attention of the secondary special education teachers by setting the stage of what is going to be learned during the training module with a question. "...a fundamental and frequently used method of gaining attention is to appeal to the learner's curiosity, for example, by means of a verbal question..." (Gagné, Wager, Golas, Keller, & Russell, 2005, p. 195).
2. What techniques will the instructional designer use to maintain the learner's attention?	In each Module, multimedia technology presentations including videos and <i>PowerPoint</i> presentations will be employed as a means to maintain the participating teachers' attention (Kale, & Whitehouse, 2012; Zhang, Lundeborg, Koehler, & Eberhardt, 2011; Mayer, 2003).
3. What events will the instructional designer provide to stimulate recall of prerequisite knowledge?	Within the instructional process of each Module, referral to previous knowledge will be used to add to the instructional scaffolding by asking the participating teachers to think back on what they know and then use that information to build upon. "Much of new learning (some might say all) is building on what we already know" (Gagné, Wager, Golas, Keller, & Russell, 2005, p. 196).
4. How will the instructional designer communicate the learner's responsibility?	Within the professional development Modules, the special education teachers will be provided the goal(s), objective(s), and directions both in written and verbal form. There will be asked to reflect on what they are learning and to apply that to their own educational environment and provide short responses. Further, a formative assessment process will be implemented to support their learning with positive feedback on correct answers and guided feedback on incorrect answers (Gagné, Wager, Golas, Keller, & Russell, 2005).
5. What techniques will the instructional designer use to inform the learner of expected instructional outcomes?	At the beginning of the instruction for each Module, the special education teachers will be provided the goal(s) and objective(s) both in written and verbal form. This will be done during the multimedia presentation in addition to separate organizers represented as a list and as a graphic.

Item/Event	Strategies
	<p>“Lacking guidance, the learners will establish their own expectations, which is not necessarily a bad thing. However, the objective constructed by the student may not be consistent with what the teacher had in mind and could lead to a miscommunication” (Gagné, Wager, Golas, Keller, & Russell, 2005, p. 196).</p>
<p>6. What techniques will the instructional designer employ to produce inquiry?</p>	<p>For each of the Modules, the instructor will provide a multimedia presentation that can be reviewed over and over again. There will be additional materials, videos, and links to content rich websites to provide an opportunity for further investigation. Thoughtful questions and comments will provide learning guidance to the participating teachers as they move through the instructional Modules. (Gagné, Wager, Golas, Keller, & Russell, 2005).</p>
<p>7. How will the instructional designer enhance the learner’s recall of the material (i.e., short-term memory)?</p>	<p>Short term memory (STM) receives information from sensory registers. Working memory selects the sensory information and provides an organizational structure that interacts with long-term memory to attach to scaffolding (Mayer, 2008). Attention (Morey & Bieler, 2013; Mayer, 2008) to the information is needed for sensory input. Each Module will employ video, sound, images and other information, which will move through the sensory registers into working memory where it will be organized. “Long-Term Memory—the learner can activate prior knowledge to be integrated with the verbal and pictorial models in working memory and can store the resulting knowledge in long-term memory” (Mayer, 2008).</p>
<p>8. How will the instructional designer elicit learner participation?</p>	<p>The technology-based instructional modules will include real-world, problem-based instruction (Knowles, Holton, & Swanson, 2011) including multimedia video (Zhang, Lundeberg, Koehler, & Eberhardt, 2011) and case study examples. The examples will assist in building the schema of assistive technology use based on consideration of strengths and functional need for the special education professionals (Gagné, Wager, Golas, Keller, & Russell, 2005). The participating teachers will be asked to reflect on what they are learning and to apply that to their own district and</p>

Item/Event	Strategies
	provide short synthesized responses.
9. How will the instructional designer utilize feedback gathered from the instructional and the practice materials?	In each Module, the instructor will provide feedback to the written responses and formative evaluation questions as an additional means to guide learning. "...as a minimum, there should be feedback confirming the correctness or degree of correctness of the learner's performance" (Gagné, Wager, Golas, Keller, & Russell, 2005, p. 200).
10. What learner capabilities will the instructional designer develop as an outcome?	The instructional designer will provide an opportunity for participating teachers to "Stimulate Recall of Prerequisite Knowledge or Skills" by asking them to reflect on what they have learned and apply it to their own professional practice. They will also participate in a respond formative assessment process (Gagné, Wager, Golas, Keller, & Russell, 2005, p. 203).
11. How has the instructional designer responded to any particular learning trait?	Using multiple means of instruction, including graphical, video, and case studies, will support the variability in learner acquisition. Further, multimedia video and case studies examples will assist in building the schema of assistive technology consideration as teacher leaders (Gagné, Wagner, Golas, & Keller 2005).
12. How will the instructional designer assess learner satisfaction with the instruction?	Prior to completing the knowledge acquisition assessment, the participating teachers will complete an attitudinal survey to assess the online instructional process.
13. How will the instructional designer accommodate any learner disability (psychomotor, cognitive, emotional)?	Based on the individual needs of the participating teacher, the instructor will work with them to access what assistive technology supports might be needed to access the professional development on BBLearn. Further, to maximize participant access and support learner variability, the instructor is considering the Principles of Universal Design for Learning in the design process (CAST, 2011) see chart below.

Universal Design for Learning Guidelines		
I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
1: Provide options for perception	4: Provide options for physical action	7: Provide options for recruiting interest

The multimedia presentation software, which includes the ability to imbed Close Captioning.	Participants will be provided alternatives to input as needed.	The presentations will be multimedia based and include a case study examples.
2: Provide options for language, mathematical expressions, and symbols A glossary will be available for each Module	5: Provide options for expression and communication Participants can respond to the reflective questions via an audio response or slide presentation.	8: Provide options for sustaining effort and persistence Goals and objectives will be consistently provided as well as the ability for further investigation of additional resources
3: Provide options for comprehension Critical features in the presentation will be highlighted Previously learned information will be reviewed prior to new learning	6: Provide options for executive functions The participants will be provided the goal(s) and objective(s) both in written and verbal form	9: Provide options for self-regulation Formative assessment questions will be available to assist the learner in regulating their learning

Reference List

- CAST (2011). *Universal design for learning guidelines version 2.0*. Wakefield, MA: Author.
- Gagné, R. M., Wager, W. W., Golas, K. C., Keller, J. M. and Russell, J. D. (2005). *Principles of instructional design* (5th edition). Belmont, CA: Wadsworth.
- Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2011). *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development*. New York: Elsevier, Inc.
- Kale, U., & Whitehouse, P. (2012). Structuring video cases to support future teachers' problem solving. *Journal of Research on Technology in Education*, 44(3), 177-204.
- Mayer, R.E. (2008). Applying the science of learning: Evidence-based principles for the design of multimedia instruction. *American Psychologist*, 63(8), 760-769.
- Mayer, R.E. (2003). The promise of multimedia learning: Using the same instructional design methods across different media. *Learning and Instruction*. 13(2), 125-139.
- Zhang, M., Lundeberg, M., Koehler, M. J., & Eberhardt, J. (2011). Understanding affordances and challenges of three types of video for teacher professional development. *Teaching and Teacher Education*, 27(2), 454-462.

Table 52
Experts' Responses to the Delphi Survey
ADDIE Analyze Phase - Tasks A04 – A06
Mean Scores Tabulation with SME's Individual Scoring

Item	SME 1	SME 2	SME 3	Mean
Learning Outcomes Statement (Task A04):				
1. 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	4.0
2. 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	4.0
3. There is an accurate description of how the learner is expected to change as a result of each objective.	4	4	4	4.0
4. There is an accurate description of what is expected to change as a result of the instruction.	4	4	4	4.0
Learning Hierarchy w/ Content Map (Task A05):				
5. 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	4.0
6. It appears the concept map accurately presents each of the primary objectives. (Refer to Task A03 for the objectives, if needed.)	4	4	4	4.0
7. Using the project goal(s) and the project objectives [Task A02 and Task A03] as references, it appears the concept map accurately links each goal with its corresponding primary objective(s).	4	4	4	4.0
8. Using the project objectives as reference, it appears the concept map accurately presents each of the secondary objectives.	4	4	4	4.0
9. 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	4.0
10. The total concept map presents an accurate depiction of the project.	4	4	4	4.0
11. The total concept map displays appropriate linkages among all elements.	4	4	4	4.0
12. The essential prerequisite learner knowledge/skills to achieve the objectives are identified.	4	4	4	4.0
13. 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	4.0
Learner Influence Document (Task A06):				
14. There is an accurate description for gaining the learner's attention within each RLO/Module.	4	4	4	4.0
15. There is an accurate description for maintaining the learner's attention within each RLO/Module.	4	4	4	4.0
16. There is an accurate description for assessing the learner's satisfaction within the instruction for each RLO/Module.	4	4	4	4.0
17. There is an accurate description of how each RLO/Module will include a focus on specific learner capabilities.	4	4	4	4.0
18. There is an accurate description of how each RLO/Module will stimulate the learner's prerequisite knowledge (or skills).	4	4	4	4.0
19. There is an accurate description of how each RLO/Module will accommodate identified learner disabilities.	4	4	4	4.0
20. There is an accurate description of how each RLO/Module will respond to a participant's particular learning traits.	4	4	4	4.0

Appendix E-3**Task A07-A08:****Delphi Panel Letters****Delphi 03 Survey Instrument & Artifacts****Raw Data**

TO: Delphi Panel
FROM: Janice Carson
RE: Tasks A07-A08
DATE: April 29, 2014

Good Morning Delphi Panel Subject Matter Experts (SME's):

Attached to this email you will find the documents Learner Characteristics Profile (A07) and Pedagogical Guidelines (A08) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as SME's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached documents and then complete the survey questionnaire. Return the completed survey to me via email by Monday, May 5, 2014.

Thank You,
Janice Carson

ADDIE Analyze Phase
Task A07 – A08: Learner Characteristics Profile/Pedagogical
Considerations Statement
Delphi Survey 03

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 targeted learner characteristics, audience, constraints, and pedagogical considerations.
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 **May 5, 2014**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
Learner Characteristics Profile (Task A07):				
1. It appears the general characteristics accurately describe the target population of the project.				
2. It appears the age range accurately represents target population of the project				
3. It appears the gender distribution accurately represents target population of the project				
4. It appears the ethnic/cultural distribution accurately represents target population of the project				
5. It appears the language distribution accurately represents target population of the project				
6. It appears the entry behavior is appropriate for target population of the project				
7. It appears the time frame for completion is reasonable for target population of the project				
8. It appears the list of prior knowledge needed for completion of the project is complete.				
9. It appears the statement of prerequisite cognitive skills for completion of the project is complete.				
10. It appears the statement of prerequisite motor skills for completion of the project is complete.				
Pedagogical Considerations Statement (Task A08):				
17. It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional sequencing.				
18. It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional motivation.				
19. It appears that the Pedagogical Considerations Statement has addressed issues student-centered learning.				
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/				

ADDIE Analyze Phase
Task A07: Learner Characteristics Profile (LCP)

GENERAL INFORMATION

	Data	Resources Used
1.0 General Characteristics of the Target Population	The target population for this study would include any special education teacher in Idaho.	
1.1 Age Range	The age ranges for Idaho teachers range from 21 to over 60 with the majority of teachers 46.	Idaho State Department of Education (2010a)
1.2 Gender Distribution	The gender distribution for Idaho teachers is 73% female and 23% male.	Idaho State Department of Education (2010b)
1.3 Special Needs	The materials for this study are being developed following the ADDIE instructional design model in addition to the Principles of Universal Design for Learning to support the access needs of most learners. If any of the participating teachers need additional support such as flexible responses to reflective questions, the researcher will work with them individually to provide those supports.	Messenger-Willman & Marino (2010)
1.4 Ethnic/Cultural Background	The Ethnic/Cultural background, for Idaho teachers is primarily white at 98% of the population.	Idaho State Department of Education (2010c)
1.5 Language Distribution	59% of Idaho teachers completed their higher education in Idaho institutions. If an individual attends an institution of higher education where their native language is not the predominate language, scores such as the TOFEL are required to show adequate mastery of a language. Either English is the native language for the teachers or they have adequate master of English.	Idaho State Department of Education (2010e)

ACADEMIC INFORMATION

	Data	Resources Used
2.0 What entry behavior(s) is needed for learner success?	The participating teachers need to be self-motivated to complete this professional development. It would be reasonable to believe they do possess academic motivation, since 71% have bachelor's degrees the rest have graduate degrees.	Idaho State Department of Education (2010d)
2.1 What is the attitude toward target content material?	Lack of knowledge around assistive technology has been a barrier to implementation; however, when professionals are provided with professional development, which provides instruction on considering assistive technology in the IEP team process and device knowledge, it maximizes the potential for increased assistive technology for students.	Messenger-Willman & Marino (2010)
2.2 What is the learning preference(s) or modality?	Following Universal Design for Learning principles, information will be presented using multiple modalities to support learning preferences. The instructional modalities will include graphical, video, and case studies examples.	CAST, 2011
2.3 Is it reasonable to expect that the material to be cognitively learned by these learners?	The target population from where the sample will be drawn has completed some level of higher education.	Idaho State Department of Education (2010d)
2.4 What is a reasonable time frame for the targeted content to be mastered?	The training will be available for six weeks for the participants to complete.	
2.5 What is the motivation for the learner to complete this targeted content?	This training provides a systematic method for the teachers to follow a team based consideration of assistive technology that will support their students in the Common Core State Standards, so they can progress in the general education curriculum.	

PRIOR INFORMATION NEEDED

	Data	Resources Used
3.0 What prior knowledge is needed for learner success?	The instruction assumes there is not a base of knowledge on assistive technology.	
3.1 What prerequisite cognitive skills are needed for learner success?	Since the target population has completed some level of higher education, the cognitive skills necessary for learning the training objectives seems reasonable.	Idaho State Department of Education (2010d)
3.2 What prerequisite motor skills are needed for learner success?	There are not special prerequisite motor skills needed for learner success.	Gagné, Wagner, Golas, & Keller (2005)
3.3 What previous experience would the learner have that would inhibit success?	Perhaps a bad experience in an online education course. However, participation in the professional development is voluntary and if one of the participants had a “bad” experience online, they probably would not participate in on the training.	

Reference List

- CAST (2011). *Universal design for learning guidelines version 2.0*. Wakfield, MA: Author.
- Gagné, R. M., Wager, W. W., Golas, K. C., Keller, J. M. and Russell, J. D. (2005). *Principles of instructional design* (5th edition). Belmont, CA: Wadsworth.
- Idaho State Department of Education. (2010a). 32 statewide certified staff age [Data file]. Retrieved from http://www.sde.idaho.gov/site/finance_tech/staffing.htm
- Idaho State Department of Education. (2010b). 09 statewide certified staff FTE [Data file]. Retrieved http://www.sde.idaho.gov/site/finance_tech/staffing.htm
- Idaho State Department of Education. (2010c). 35 statewide certified staff ethnicity gender [Data file]. Retrieved http://www.sde.idaho.gov/site/finance_tech/staffing.htm
- Idaho State Department of Education. (2010d). 33 statewide certified staff education level [Data file]. Retrieved http://www.sde.idaho.gov/site/finance_tech/staffing.htm

Idaho State Department of Education. (2010e). 34 statewide certified staff place of education [Data file]. Retrieved http://www.sde.idaho.gov/site/finance_tech/staffing.htm

Messinger-Willman, J. & Marino, M.T. (2010). Universal design for learning: Leadership considerations for promoting inclusive education in today's secondary schools. *NAASP Bulletin*, 94(1), 5-16.

ADDIE Analyze Phase

Task A08: Pedagogical Considerations Statement

Profession development is often met with frustration from the education community when the information does not seem applicable to their classroom (Muzaffar & Malik, 2012). Adult learners need to know what they are going to learn and how it can be implemented in their world (Knowles, Holton, & Swanson, 2011). The shift to a more challenging general education curriculum, through the requirements of the Common Core State Standards, can be a challenge for students with disabilities. Providing assistive technology solutions to assist in meeting these requirements will set the stage for engaged learning for the special education teachers.

The assistive technology reading supports professional development will include case study examples, which will highlight problem-based instruction (Knowles, et al., 2011) and include multimedia video (Zhang, Lundeberg, Koehler, & Eberhardt, 2011). These professional development presentations will assist the participating teachers in building a schema for their own professional practice (Gagné, et al., 2005) to include: 1) an insight to the role assistive technology places with regard to the expectations outlined in the Common Core State Standards; 2) an understanding of their role as a teacher leader in guiding the IEP team through the assistive technology consideration process; and, 3) a foundation in the types of assistive technology reading supports available to assist students with disabilities progress in the general education curriculum and toward their IEP goals.

References

- Gagné, R. M., Wager, W. W., Golas, K. C., Keller, J. M. and Russell, J. D. (2005). *Principles of instructional design* (5th edition). Belmont, CA: Wadsworth.
- Knowles, M. S., Holton III, E. F., & Swanson, R. A. (2011). *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development*. New York: Elsevier, Inc.
- Muzaffar, M. & Malik, S.Y. (2012). Attitude of teachers towards professional development trainings. *Language in India*, 12(8), 304-322.
- Zhang, M., Lundeberg, M., Koehler, M. J., & Eberhardt, J. (2011). Understanding affordances and challenges of three types of video for teacher professional development. *Teaching and Teacher Education*, 27(2), 454-462.

Table 53
ADDIE Analyze Phase - Tasks A07 – A08: Learner Characteristics Profile/Pedagogical
Considerations Statement
Mean Score Tabulation with SME's Individual Scoring

Item	SME 1	SME 2	SME 3	MEAN
Learner Characteristics Profile (Task A07):				
1. It appears the general characteristics accurately describe the target population of the project.	4	4	4	4.0
2. It appears the age range accurately represents target population of the project	4	4	4	4.0
3. It appears the gender distribution accurately represents target population of the project	4	4	4	4.0
4. It appears the ethnic/cultural distribution accurately represents target population of the project	4	4	4	4.0
5. It appears the language distribution accurately represents target population of the project	4	4	4	4.0
6. It appears the entry behavior is appropriate for target population of the project	4	4	4	4.0
7. It appears the time frame for completion is reasonable for target population of the project	4	4	4	4.0
8. It appears the list of prior knowledge needed for completion of the project is complete.	4	4	4	4.0
9. It appears the statement of prerequisite cognitive skills for completion of the project is complete.	4	4	4	4.0
10. It appears the statement of prerequisite motor skills for completion of the project is complete.	4	4	4	4.0
Pedagogical Considerations Statement (Task A08):				
11. It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional sequencing.	4	4	4	4.0
12. It appears that the Pedagogical Considerations Statement has addressed issues regarding instructional motivation.	4	4	4	4.0
13. It appears that the Pedagogical Considerations Statement has addressed issues student-centered learning.	4	4	4	4.0
14. 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	4.0

Appendix E-4

Tasks A09-A10:

Delphi Panel Letters

Delphi 04 Survey Instrument & Artifacts

Raw Data

TO: Delphi Panel
FROM: Janice Carson
RE: Tasks A09-A10
DATE: May 7, 2014

Good Morning Delphi Panel Subject Matter Experts (SME's):

Attached to this email you will find the documents Learner Constraints (A09) and Learning Environments & Delivery Options (A10) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as SME's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached documents and then complete the survey questionnaire. Return the completed survey to me via email by Monday, May 12, 2014.

Thank You,
Janice Carson

ADDIE Analyze Phase
Tasks A09 & A10: Specific Learner Constraints Statement/Learning
Environment & Delivery Options
Delphi Survey 04

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 learning environment and delivery options.
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 **May 12, 2014**.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
Learner Constraints Statement (Task A09):				
11. 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.				
12. It appears the learner constraints regarding ADA considerations have been reasonable addressed for target population of the project.				
13. It appears the learner constraints regarding network software have been reasonable addressed for target population of the project.				
Learning Environment & Delivery Options Statement (Task A10):				
1. It appears the specific hardware requirements have been accurately described for the project.				
2. It appears the specific requirements to navigate the content materials have been accurately described for the project.				
3. It appears the specific software requirements have been accurately described for the project.				
4. It appears the specific learner requirements have been accurately described for the project.				
5. It appears the specific learner requirements for students with physical disabilities have been accurately described for the project.				
6. It appears the specific learner requirements for students with English as a second language have been accurately described for the project.				
7. It appears the specific learner requirements for students with cognitive disabilities have been accurately described for the project.				
8. It appears the specific delivery plan for content assignments has been accurately described for the project.				
9. It appears the specific delivery plan for content activities has been accurately described for the project.				

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
10. It appears the specific delivery plan for content assessments has been accurately described for the project.				
11. It appears the specific delivery plan for content assessment feedback has been accurately described for the project.				
12. It appears the specific delivery plan for student-to-instructor communication has been accurately described for the project.				

ADDIE Analyze Phase
Task A09: Learner Constraints Statement (LCS)

The learner constraints are as follows for the assistive technology professional development:

Time Constraints

- Not being able to complete the training in six weeks: Although, this would be highly unlikely, since the teachers will be on summer break. Further, there will only be a time requirement of about 3 hours a week to complete the modules.

Technology Constraints

- Technology function of the Learning Management System (LMS) will be elevated through a mandatory training on how to use Blackboard before they begin the professional development.
- Technology failure such as Internet or limited connectivity to LMS: The modules will also be available in zipped content packages which would be available by email.

Accommodations for People with Disabilities

- Accessibility to the instructional material is being considered within the design. However, the researcher cannot plan for every type of disability need that may occur; thus, the participants will be encouraged to contact the researcher in an effort to work collaboratively to problem solve any areas of need.

Task A10: Learning Environment & Delivery Options Statement

Prompt	Response
1. What is the delivery plan for the targeted content's assignments (online, blended, LMS, synchronous, asynchronous, etc.)?	The assistive technology reading supports online professional development will be delivered through the BBLearn Learning Management System (LMS). The assignments will include asynchronous reflective responses and multiple formative assessments.
2. What are the specific hardware/peripheral requirements for this project's delivery and learning environment?	Participating teachers will have to have basic computer literacy skills. Further, they will need access to a computer with an Internet connection through broadband for the duration of the professional development. Additional hardware requirements are: Hardware <ul style="list-style-type: none"> Disk space: 160MB free (min) plus as much as you need to store your materials. 5GB is probably a realistic minimum. Memory: 256MB (min), 1GB or more is strongly recommended.
3. What are the specific software requirements for this project's delivery and learning environment?	Software <ul style="list-style-type: none"> Windows XP/2000/2003, Solaris 10 (Sparc and x64), Mac OS X and Netware 6 operating systems. Minimum browser for accessing Moodle: Firefox 4, Internet Explorer 8, Safari 5, Google Chrome 11, Opera 9 Browser Plug-in: Real Player, Adobe Acrobat Reader, QuickTime, Adobe Flash Player. Microsoft Office 2000 or higher including PowerPoint. Anti-Virus Software. You must have cookies and JavaScript enabled on your computer in order for you to log on to Moodle.
4. What is the delivery plan for the targeted content's activities (individual, paired, group, etc.)?	The activities will be completed independently by the participating teachers.
5. What is the delivery plan for the targeted content's assessments?	See question 1.
6. What is the plan for the availability of auxiliary formats for assignments, activities, and assessments (e.g., printed, p-	All of the assignments and assessments can be downloaded and reviewed, either on a computer or in hard copy, prior to completion. Further, the multimedia presentations will include copies of

cast/v-cast, Wiki, blog, twitter, proctored location, etc.)?	the presentations with speaker notes that can be downloaded and printed.
7. What is the plan for access to learner self-directed materials (e.g. homework, out-of-class assignments)?	This professional development will not have out-of-class assignments.
8. What is the plan for student-to-instructor communication and interactions (e.g., email, forums, chat, video conferencing, wikis, etc., in face-to-face, synchronous, and/or asynchronous connections)?	The participating teacher-to-instructor communication will be done via email.
9. What is the plan for student-to-student communication and interactions (e.g., email, forums, chat, video conferencing, wikis, etc., in face-to-face, synchronous, and/or asynchronous connections)?	The special education teachers will be completing the training independently. They will not be communicating with the other participants.
10. What is the plan for any remedial learning based on pre-test assessment feedback?	The researcher is designing the training to assume the participating teachers do not have a prior knowledge in assistive technology.
11. What are the specific learner requirements for successful use of the materials (e.g., time for out-of-class work, testing protocols such as proctoring, password log on, alternative formats for instruction and materials, etc.)? (You may wish to refer back to your response for item #13 in Task A06, Learner Influence.)	<p>As stated in Task A06 response #13, to maximize participant access and support learner variability, the instructor is considering the Principles of Universal Design for Learning in the design process (CAST, 2011). Such as:</p> <ul style="list-style-type: none"> • The presentations will be multimedia based and include a case study approach; • Formative assessment questions will be available to assist the learner in regulating their learning; • A glossary will be available for each Module; • Critical features in the presentation will be highlighted; • Previously learned information will be reviewed prior to new learning.

The assistive technology reading supports online professional development will be delivered through BBLearn a Learning Management System (LMS). The assignments will include asynchronous reflective responses and formative assessments.

All of the assignments and assessments will be downloadable, either on a computer or in hard copy, to review prior to completion. Further, the multimedia presentations will

include copies of the presentations with speaker notes that can be downloaded and printed.

This training will be completed independently by the participating teachers; however, if questions arise, they are welcome to communicate with the instructor through email. It is important to note, the training is designed on the assumption the participants do not have prior knowledge of assistive technology.

The training has been designed using the ADDIE instructional design model with consideration toward the Principles of Universal Design for Learning (UDL) (CAST, 2011) to maximize participant access and support learner variability.

UDL supports include:

- The presentations will be multimedia based and include a case study approach;
- Formative assessment questions will be available to assist the learner in regulating their learning;
- A glossary will be available for each Module;
- Critical features in the presentation will be highlighted;
- Previously learned information will be reviewed prior to new learning.

In order for the special education teachers to participate they will have to have basic computer literacy skills. Further, they will need access to a computer with an Internet connection through broadband for the duration of the professional development.

Recommended Hardware:

- Disk space: 160MB free (min) plus as much as you need to store your materials. 5GB is probably a realistic minimum;
- Memory: 256MB (min), 1GB or more is strongly recommended.

Recommended Software:

- Windows XP/2000/2003, Solaris 10 (Sparc and x64), Mac OS X and Netware 6 operating systems;
- Minimum browser for accessing Moodle: Firefox 4, Internet Explorer 8, Safari 5, Google Chrome 11, Opera 9;
- Browser Plug-in: Real Player, Adobe Acrobat Reader, QuickTime, Adobe Flash Player;
- Microsoft Office 2000 or higher including PowerPoint;
- Anti-Virus Software.
-

Table 54
ADDIE Analyze Phase
Tasks A09 & A10: Specific Learner Constraints Statement/Learning Environment & Delivery Options
Mean Score Tabulation with SME's Individual Scoring

Item	SME 1	SME 2	SME 3	Mean
Learner Constraints Statement (Task A09):				
1. 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	4.0
2. It appears the learner constraints regarding ADA considerations have been reasonable addressed for target population of the project.	4	4	4	4.0
3. It appears the learner constraints regarding network software have been reasonable addressed for target population of the project.	4	4	4	4.0
Learning Environment & Delivery Options Statement (Task A10):				
4. It appears the specific hardware requirements have been accurately described for the project.	4	4	4	4.0
5. It appears the specific requirements to navigate the content materials have been accurately described for the project.	4	4	4	4.0
6. It appears the specific software requirements have been accurately described for the project.	4	4	4	4.0
7. It appears the specific learner requirements have been accurately described for the project.	4	4	4	4.0
8. It appears the specific learner requirements for students with physical disabilities have been accurately described for the project.	4	4	4	4.0
9. It appears the specific learner requirements for students with English as a second language have been accurately described for the project.	4	4	4	4.0
10. It appears the specific learner requirements for students with cognitive disabilities have been accurately described for the project.	4	4	4	4.0
11. It appears the specific delivery plan for content assignments has been accurately described for the project.	4	4	4	4.0
12. It appears the specific delivery plan for content activities has been accurately described for the project.	4	4	4	4.0
13. It appears the specific delivery plan for content assessments has been accurately described for the project.	4	4	4	4.0
14. It appears the specific delivery plan for content assessment feedback has been accurately described for the project.	4	4	4	4.0
15. It appears the specific delivery plan for student-to-instructor communication has been accurately described for the project.	4	4	4	4.0

Appendix E-5

Task A11: Timeline

A11: ID Project Timeline

Task	Time Allocation	Notes
Content Domain:		
A01 – A03	January 2014 to May 2014	Create Rationale, Goal(s), & Objectives
Delphi 01	April 2014 to May 2014	Create & Send to appropriate expert panel members; receive feedback & analyze data; revise, if needed; send to panel for 2 nd iteration; repeat, if necessary
A04 – A06	January 2014 to May 2014	Create Learning Outcomes Statement; Learning Hierarchy with Content Map; Learner Influence Document
Delphi 02	April 2014 to May 2014	Create & Send to appropriate expert panel members; receive feedback & analyze data; revise, if needed; send to panel for 2 nd iteration; repeat, if necessary
Instructional Domain:		
A07 – A09	January 2014 to May 2014	Create Learner Characteristics Profile; Learner Constraints Statement; Pedagogical Considerations Statement
Delphi 03	April 2014 to May 2014	Create & Send to appropriate expert panel members; receive feedback & analyze data; revise, if needed; send to panel for 2 nd iteration; repeat, if necessary
Environmental Domain:		
A10	January 2014 to May 2014	Create Learning Environment & Delivery Options Statement
Delphi 04	April 2014 to May 2014	Create & Send to appropriate expert panel members; receive feedback & analyze data; revise, if needed; send to panel for 2 nd iteration; repeat, if necessary
Management Domain:		
A11	January 2014 to May 2014	Create ID Project Timeline; have A11 reviewed & approved by dissertation chair

ADDIE Phase	Schedule	Activity
Analysis	January 2014 to May 2014	The researcher will develop a process to review the scope and instructional sequence for the training. Further, two panels of SMEs and IDEs will provide content and face validity feedback via a Delphi technique.
Design	April 2014 to May 2014	IDEs and SMEs will provide input to the research, through a Delphi technique, by on the Design Phase Tasks.
Develop	April 2014 to June 2014	The Delphi data will guide the formalization of the instructional materials for the Development phase.
Implement	June 16, 2014 to July 28, 2014	The teachers will participate in the professional development during Implementation phase will occur from June 16, 2014 to July 28, 2014.
Evaluate	August 2014 to December 2014	The final step will be a formative investigation through the lens of an analysis of the achievement scores by the researcher and an evaluation of the implementation of the ADDIE model by a panel of ISD experts using a Delphi method.

Appendix F:

ADDIE Design Phase

Appendix F-1

Task D01:

Delphi Panel Letters

Delphi 05 Survey Instrument & Artifacts

Raw Data

TO: Delphi Panel
FROM: Janice Carson
RE: Tasks D01
DATE: May 13, 2014

Good Morning Delphi Panel Subject Matter Experts (SME's):

Attached to this email you will find the documents Task Analysis (D01) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as SME's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached documents and then complete the survey questionnaire. Return the completed survey to me via email by Monday, May 19, 2014.

Thank You,
Janice Carson

ADDIE Design Phase
Task D01: Task analysis
Delphi Survey 05

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

- Carefully and thoroughly review the documents attached related to the project's tasks and subtasks (if included).
- Mark the rating that most represents your expert evaluation for each item in the survey.
- Return your completed instrument via reply email as an attachment no later than Monday, May 19, 2014.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1. The objectives for the tasks are clearly stated.				
Project Tasks:				
2. The listed tasks are aligned with each objective.				
3. The knowledge identification types are aligned with each task.				
4. The prerequisite decisions (Y/N) are aligned with each task.				
5. The environmental factors identified are aligned with each task.				
6. The domain types are aligned with each task.				
7. The importance levels are aligned with each task.				
8. The difficulty levels are aligned with each task.				
Project Subtasks (if included):				
9. The listed sub-tasks appear to be aligned with the tasks.				
11. The knowledge identification types are aligned with each subtask.				
12. The prerequisite decisions (Y/N) are aligned with each subtask.				
13. The environmental factors are aligned with each subtask.				
14. The domain types are aligned with each subtask.				
15. The importance levels are aligned with each subtask.				
16. The difficulty levels are aligned with each subtask.				

D01 Task Analysis

Task/Subtask	Knowledge Type (D, P, S)	Prerequisite (Y/N)	Environmental Factors (T, E, M, P, L)	Domain Type (C, M, A, MO)	Importance (H, M, L)	Difficulty (H, M, L)
Objective 1: Given the content in the assistive technology professional development training the special education teacher will be able to identify the role assistive technology (AT) plays to support the expectations outlined in the Common Core State Standards (CCSS) by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.						
Task 1.1: Define AT	D	Y	T, M, L	C	H	L
Task 1.2: Define CCSS	D	Y	T, M, L	C	H	L
Task 1.3: Identify the shifts in higher expectations in reading for students in the CCSS	D	Y	T, M, L	C	H	L
Task 1.4: Identify an example of an assistive technology solutions for the high expectations for reading in the CCSS	D	Y	T, M, L	C	H	M
Objective 2: Given the content in the assistive technology professional development training the special education teacher will be able to identify the characteristics of a teacher leader, who guides the IEP team as they fulfill their obligation of considering assistive technology by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.						
Task 2.1: Define what “considering AT for an IEP” means	D	Y	T, M, L	C	H	L
Task 2.2: Define Functional Need	D	Y	T, M, L	C	M	L
Task 2.3: Identify Environments	D	Y	T, M, L	C	M	L
Task 2.4 Identify AT	D	Y	T, M, L	C	H	M
Task 2.5: Determine Data Gathering	P	Y	T, M, L	C	H	M
Task 2.6 Determine how to add AT to IEP	P	Y	T, M, L	C	H	L
Task 2.7 State Resources for Assistive Technology	P	Y	T, M, L	C	H	L
Objective 3: Given the content in the assistive technology professional development training the special education teacher will be able to select assistive technology reading supports for students with higher needs by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.						
Task 3.1 Determine Functional Need	P	Y	T, M, L	C	H	M
Task 3.2 Determine Strengths, Abilities & Previous AT Usage	P	Y	T, M, L	C	H	M
Task 3.3: Identify AT for reading-students who are blind/visually impaired	P	Y	T, M, L	C	H	M
Task 3.4: Identify AT for reading-students who are deaf/hearing impaired	P	Y	T, M, L	C	H	M
Task 3.5: Identify AT for reading-students who are deaf/blind	P	Y	T, M, L	C	H	M
Task 3.6: Identify AT for reading-students who with autism	P	Y	T, M, L	C	H	M
Task 3.7: Identify AT for reading-students who with cognitive impairments	P	Y	T, M, L	C	H	M
Objective 4: Given the content in the assistive technology professional development training the special education teacher will be able to choose assistive technology reading supports for struggling readers by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.						

Task/Subtask	Knowledge Type (D, P, S)	Prerequisite (Y/N)	Environmental Factors (T, E, M, P, L)	Domain Type (C, M, A, MO)	Importance (H, M, L)	Difficulty (H, M, L)
Task 4:1 Determine Functional Need	D	Y	T, M, L	C	H	M
Task 4:2 Determine Strengths, Abilities & Previous AT Usage	D	Y	T, M, L	C	H	M
Task 4.3: Identify Low-tech AT reading supports	D	Y	T, M, L	C	H	L
Task 4.4: Identify Single Word AT reading supports	D	Y	T, M, L	C	H	L
Task 4:5: Identify Auditory and Visual AT reading supports	D	Y	T, M, L	C	H	L
Task 4:6: Identify Content Volume AT reading supports	D	Y	T, M, L	C	H	L
Task 4:7: Define AIM	D	Y	T, M, L	C	H	L
Task 4:8: Define AIM Legal Context	D	Y	T, M, L	C	H	M
Task 4:9: Define AIM Need	D	Y	T, M, L	C	H	M
Objective 5: Given the content in the assistive technology professional development training the special education teacher will be able to design an Accessible Instructional Materials (AIM) program for students with a print disability by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.						
Task 5:1 Select AIM Format(s)	P	Y	T, M, L	C	H	M
Task 5:2 Acquiring AIM	P	Y	T, M, L	C	H	M
Task 5:3 Retrofit Instructional Materials	P	Y	T, M, L	C	H	H
Objective 6: Given the content in the assistive technology professional development training the special education teacher will be able to distinguish the role reading technology plays in a universally designed general education classroom curriculum by marking the correct answer on a selected response exam (multiple choice and matching) with at least 70% accuracy.						
Task 6:1 Define Universal Design for Learning (UDL)	D	Y	T, M, L	C	H	M
Task 6:2 Identify the Principles and Guidelines in UDL	D	Y	T, M, L	C	H	M
Task 6:3 Explain how AT reading supports can be designed into a classroom learning environment to make it an inclusive classroom	P	Y	T, M, L	C	H	M

Explanation of Terms (Legend):

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.

Table 55
Experts' Responses to the Delphi Survey
ADDIE Design Phase - Task D01: Task analysis
Mean Score Tabulation with SME's Individual Scoring

Item	SME 1	SME 2	SME 3	Mean
1. The objectives for the tasks are clearly stated.	4	4	4	4.0
Project Tasks:				
2. The listed tasks are aligned with each objective.	4	4	4	4.0
3. The knowledge identification types are aligned with each task.	4	4	4	4.0
4. The prerequisite decisions (Y/N) are aligned with each task.	4	4	4	4.0
5. The environmental factors identified are aligned with each task.	4	4	4	4.0
6. The domain types are aligned with each task.	4	4	4	4.0
7. The importance levels are aligned with each task.	4	4	4	4.0
8. The difficulty levels are aligned with each task.	4	4	4	4.0
Project Subtasks (if included):				
9. The listed sub-tasks appear to be aligned with the tasks.	4	4	4	4.0
11. The knowledge identification types are aligned with each subtask.	4	4	4	4.0
12. The prerequisite decisions (Y/N) are aligned with each subtask.	4	4	4	4.0
13. The environmental factors are aligned with each subtask.	4	4	4	4.0
14. The domain types are aligned with each subtask.	4	4	4	4.0
15. The importance levels are aligned with each subtask.	4	4	4	4.0
16. The difficulty levels are aligned with each subtask.	4	4	4	4.0

Appendix F-2

Task D02:

Delphi Panel Letters

Delphi 06 Survey Instrument & Artifacts

Raw Data

TO: Delphi Panel
FROM: Janice Carson
RE: Task D02
DATE: May 1, 2014

Good Evening Delphi Panel Instructional Design Experts (IDE's):

Attached to this email you will find the document Flowchart with Content (D02) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as IDE's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached document and then complete the survey questionnaire. Return the completed survey to me via email by Monday, May 12, 2014.

Thank You,
Janice Carson

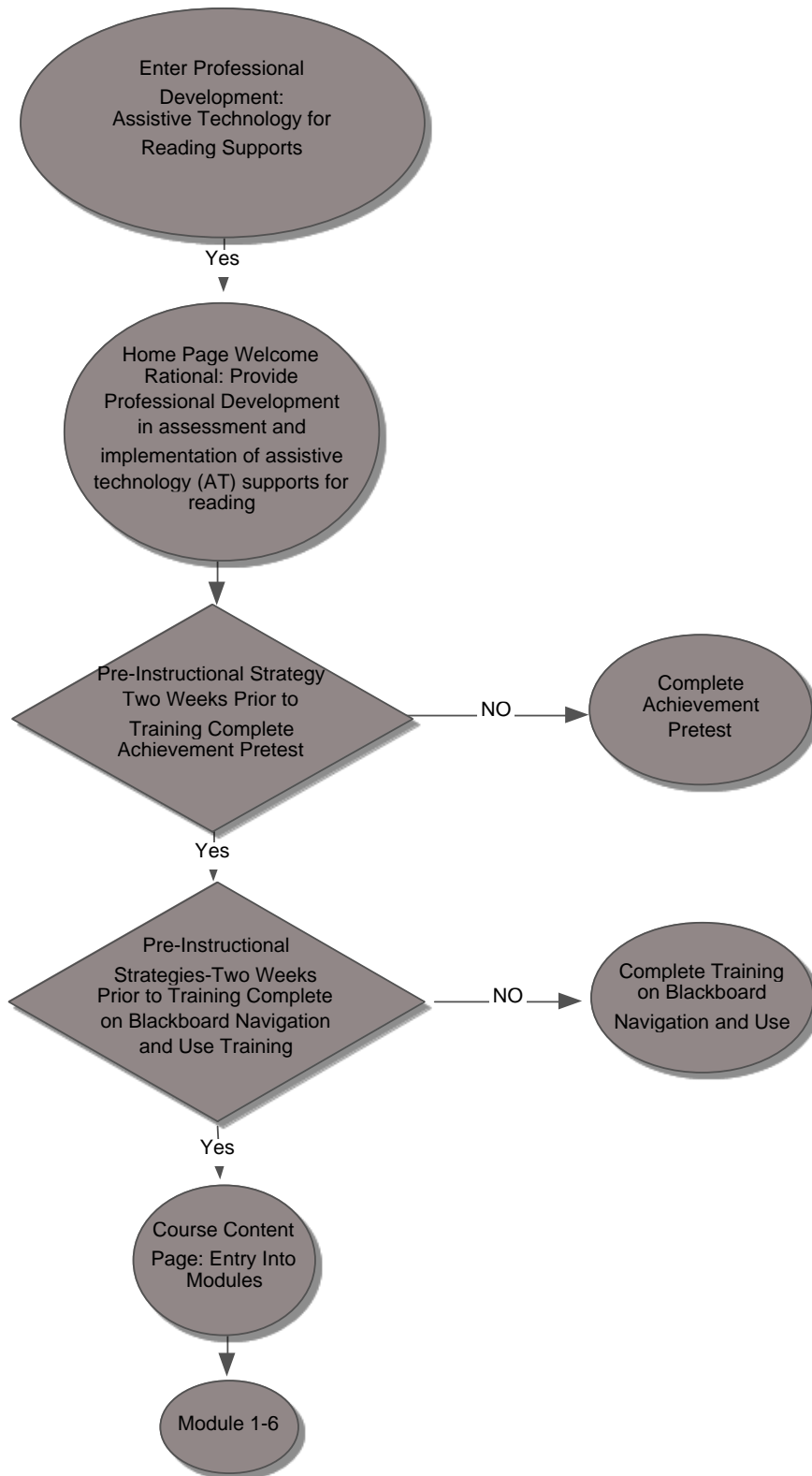
ADDIE Design Phase
Task D02: Flowcharts with Content
Delphi Survey 06

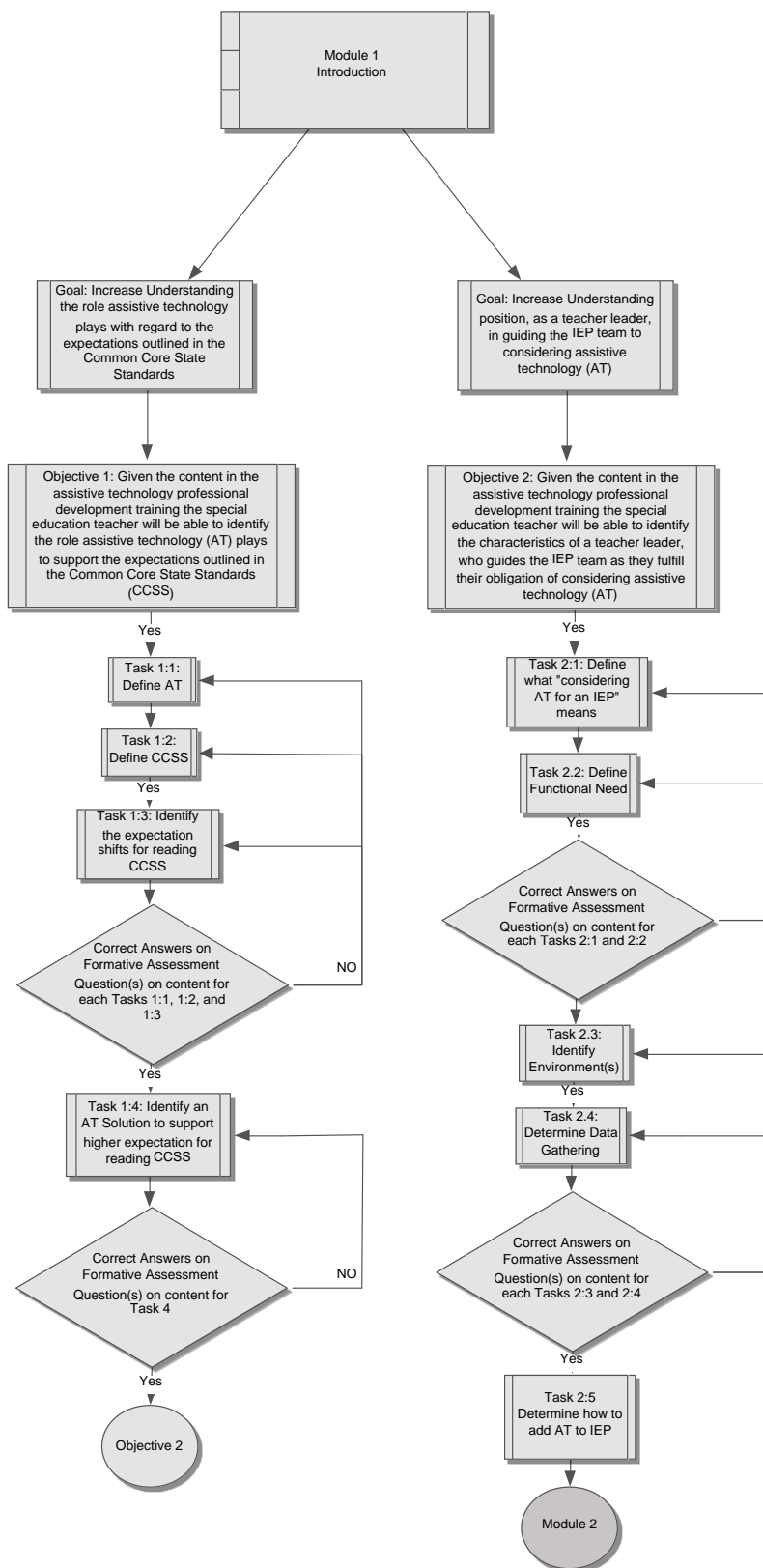
In order to best represent your feedback on the project, I ask that you proceed as follows:

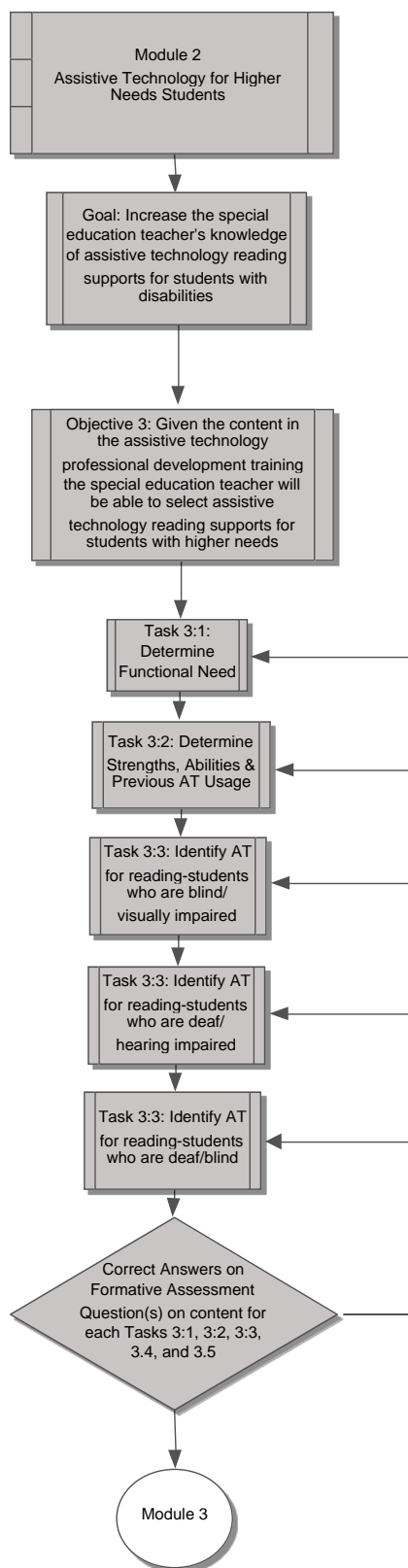
- Carefully and thoroughly review the documents attached.
- Mark the rating that most represents your expert evaluation for each item in the survey.
- Return your completed instrument via reply email as an attachment no later than May 12, 2014.

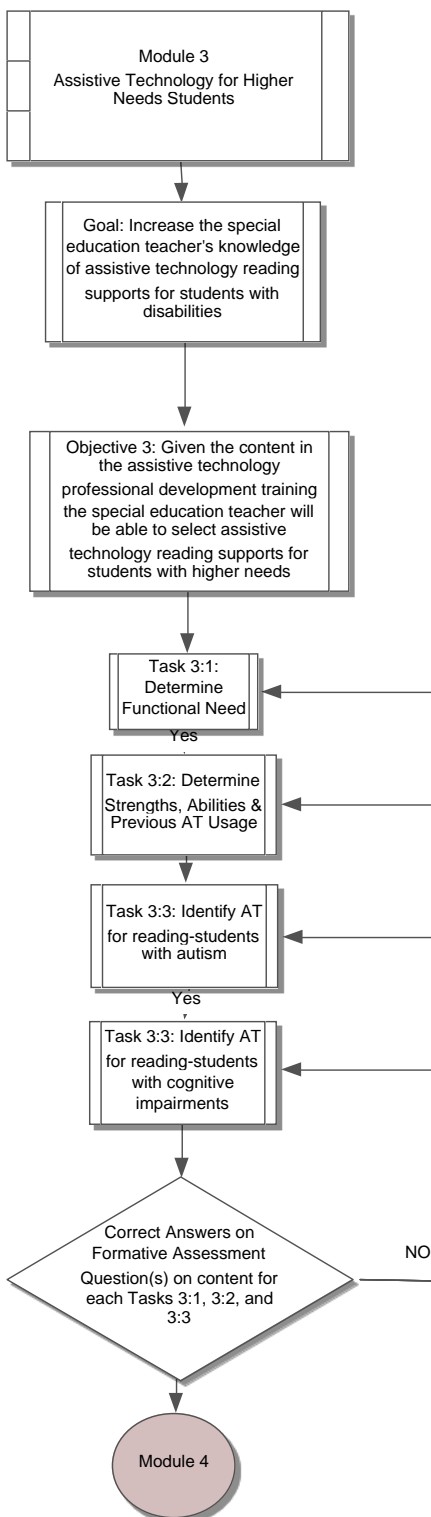
Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1. Each objective for the module is represented in the flowchart.				
2. Appropriate content in support of each objective is represented in the flowchart.				
3. Assessments for each objective are represented in the flowchart.				
4. Appropriate decision points are represented in the flowchart.				
5. The content within the flowchart is appropriately sequenced for the module.				

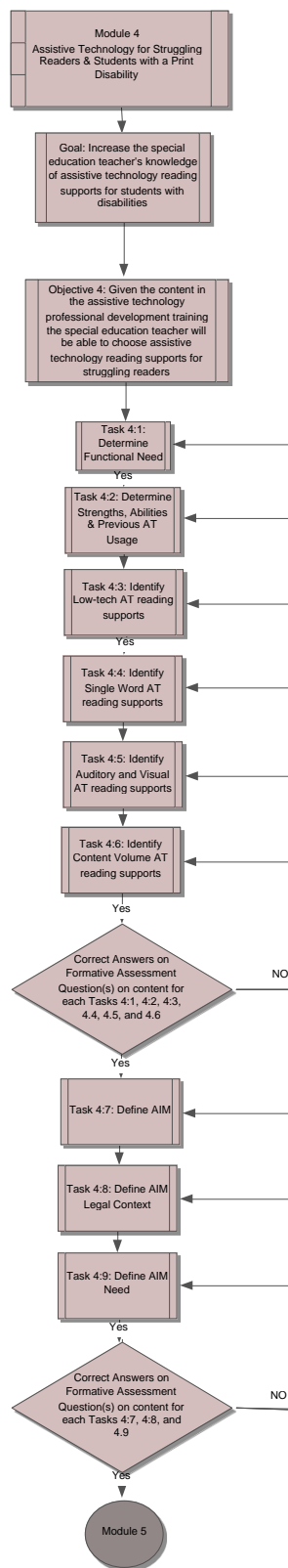
D02 Flowchart with Content

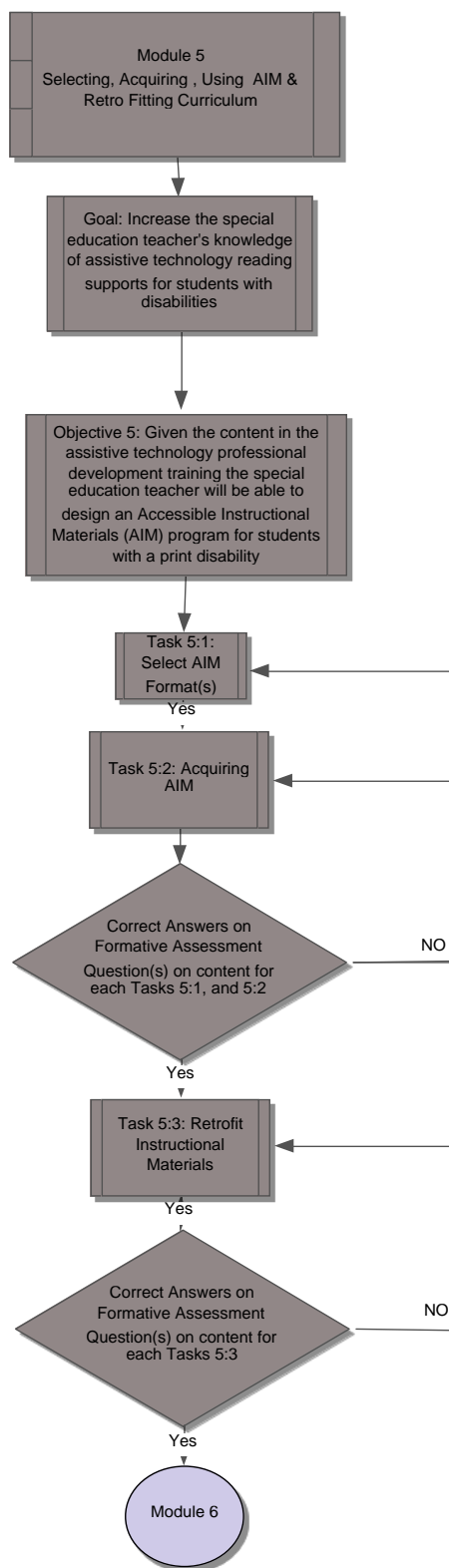


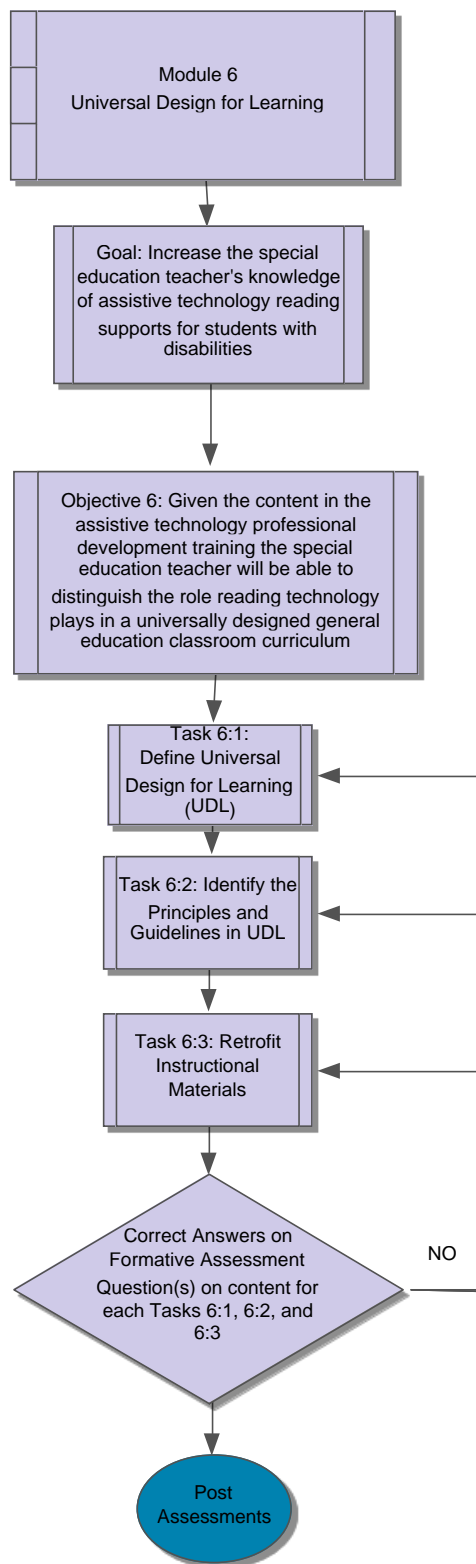












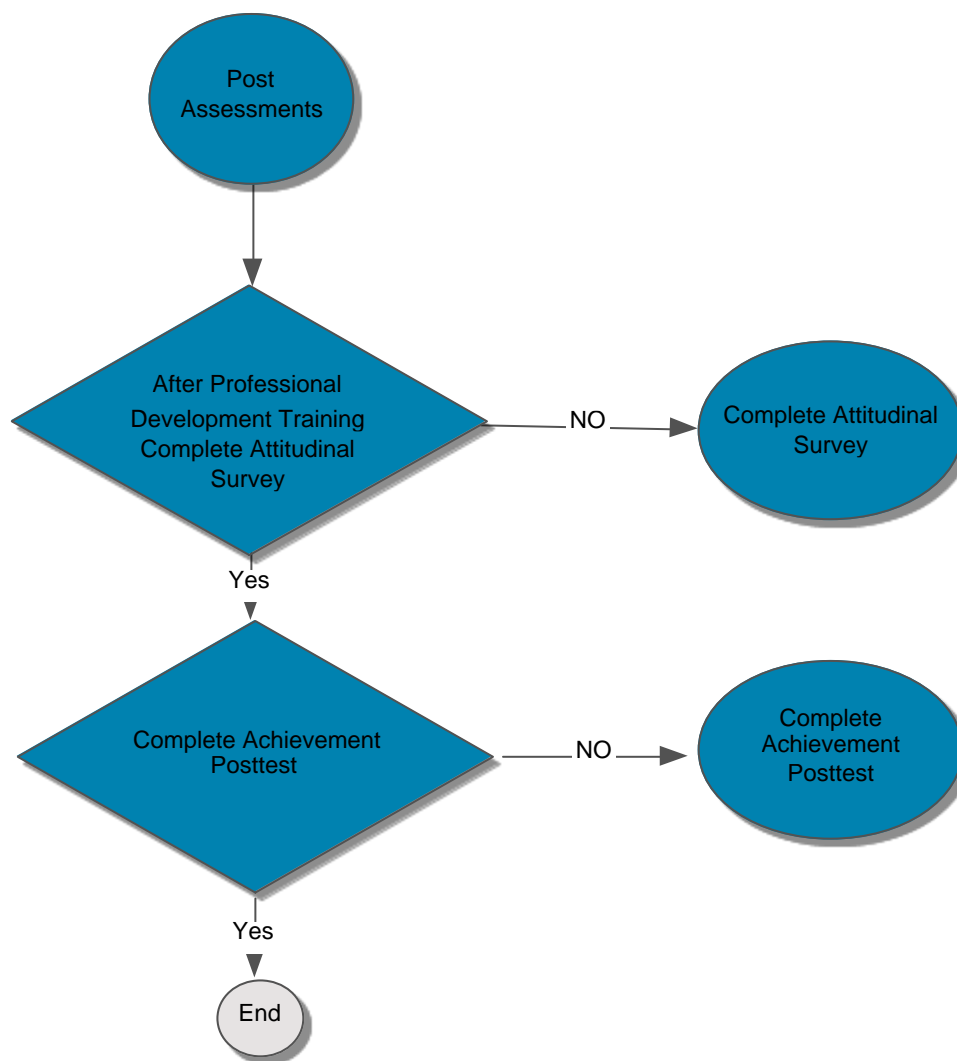


Table 56
 Experts' Responses to the Delphi Survey
 ADDIE Design Phase
 Task D02: Flowcharts with Content - Delphi Survey 06
 Mean Score Tabulation with IDE's Individual Scoring

Item	IDE 1	IDE 2	IDE 3	Mean
1. Each objective for the module is represented in the flowchart.	4	4	4	4.0
2. Appropriate content in support of each objective is represented in the flowchart.	3	4	4	3.67
3. Assessments for each objective are represented in the flowchart.	3	4	4	3.67
4. Appropriate decision points are represented in the flowchart.	3	4	4	3.67
5. The content within the flowchart is appropriately sequenced for the module.	3	3	4	3.33

Appendix F-3

Task D03:

Delphi Panel Letters

Delphi 07 Survey Instrument & Artifacts

Raw Data

TO: Delphi Panel
FROM: Janice Carson
RE: Task D03
DATE: May 13, 2014

Good Morning Delphi Panel Instructional Design Experts (IDE's):

Attached to this email you will find the document Storyboards (D03) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as IDE's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached document and then complete the survey questionnaire. Return the completed survey to me via email by Friday, May 23, 2014.

Thank You,
Janice Carson

ADDIE Design Phase
Task D03: Storyboards
Delphi Survey 07

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.
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 May 23, 2014.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1. There is a series of storyboards aligned with the flowcharts (Task D02).				
2. The placement for graphical elements is included in the storyboards.				
3. The type of graphical elements is identified in the storyboards.				
4. The size parameters of graphical elements are identified in the storyboards.				
5. The placement for textual elements is included in the storyboards.				
6. The font style for textual elements is included in the storyboards.				
7. The font size for textual elements is included in the storyboards.				
8. Hypertext links (where needed) are indicated in the storyboards.				
9. The placement of hypertext links is indicated in the storyboards.				
10. Navigation buttons (where needed) are indicated in the storyboards.				
11. The placement of navigation buttons is indicated in the storyboards.				
12. The style of navigation buttons is indicated in the storyboards.				

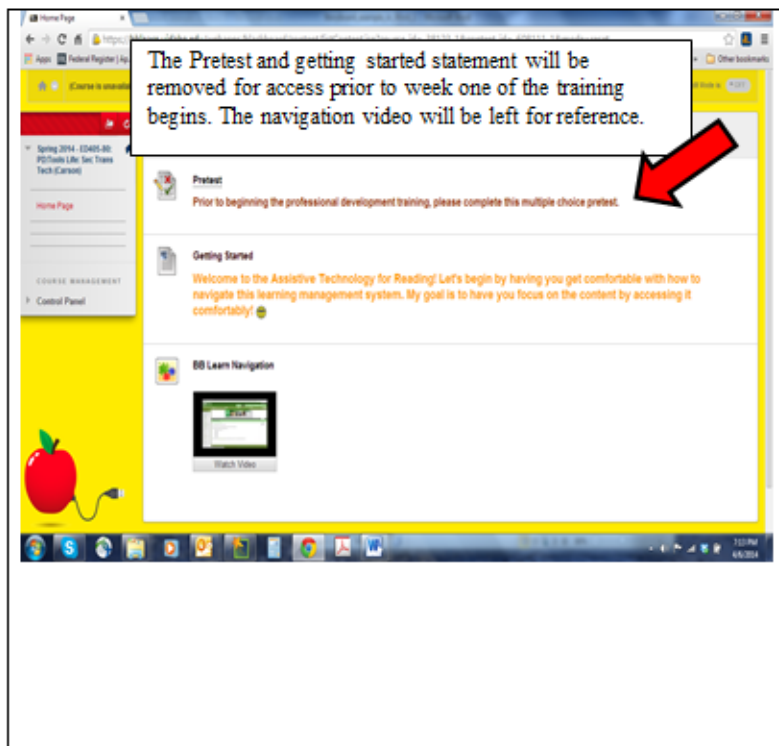
Storyboard for Assistive Technology Professional Development - Main

Name:	Janice Carson	Media:	Blackboard LMS, text, presentation software, videos
Project Name:	Assistive Technology Professional Development	Concept Map/Flowchart Reference:	Enter Professional Development
Screen Name:	Home Page	Screen #:	1
Topic:	Assistive Technology for K12	Subtopic:	Getting Started

File Name(s)	Type
Getting Started message	.txt
BBLearn Navigation	video
Pretest	

Navigation
Two weeks prior to beginning the training, the participants login to Blackboard with their username and password. They choose which they want to complete first, read the message and watch the video to learn how to navigate the LMS or complete the pretest.

HTML Code File



Button Name	Button Type	Places to Go
Pretest	Internal Test	To Pretest within the LMS site.
BBLearn Navigation	Embedded Video	http://www.youtube.com/watch?v=4jHL1-sK7U

Text Field Name	Contents File Name	Font	Style	Color	Size
Getting Started	Label	Ariel	Paragraph	#FF9900	18

Storyboard for Assistive Technology Professional Development - Main

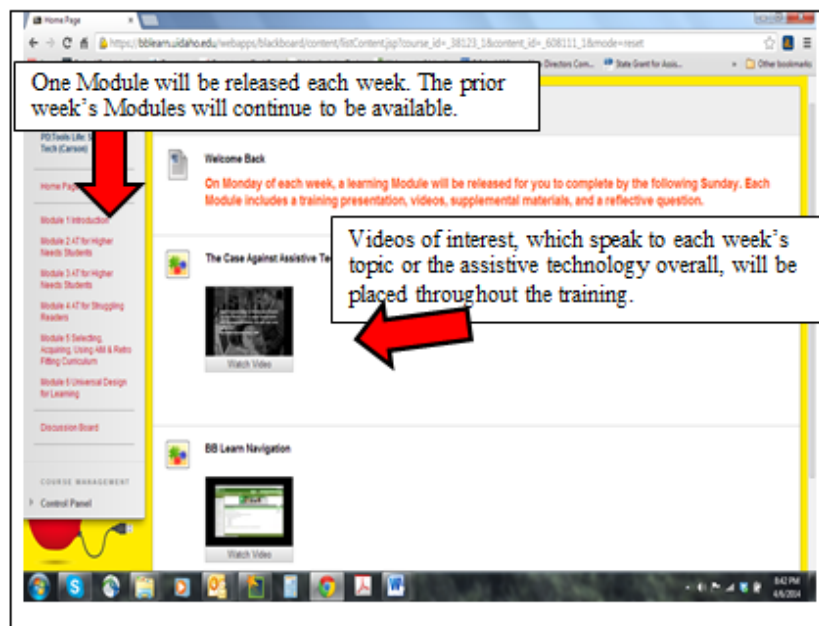
Name:	Janice Carson	Media:	Blackboard LMS, text, presentation software, videos
Project Name:	Assistive Technology Professional Development	Concept Map/Flowchart Reference:	Enter Professional Development
Screen Name:	Home Page	Screen #:	2
Topic:	Assistive Technology for K12	Subtopic:	Welcome Back

File Name(s)	Type
Welcome Back Message	.txt
The Case Against Assistive Technology	video
BBLearn Navigation	video

Navigation

The participants will be able to access each Module from the menu link on the left side. Within the Discussion Board, a reflective question will be available weekly. The participants will be able to access them either through this link or with each week's Module.

HTML Code File



Button Name	Button Type	Places to Go
The Case Against Assistive Technology	Embedded Video	http://www.youtube.com/watch?v=lNs88Ki1WSo
BBLearn Navigation	Embedded Video	http://www.youtube.com/watch?v=4jHL1-sK7U
Home Page	Internal Link	Home Page
Module 1-6	Internal Link	Specific Learning Module
Discussion Board	Internal Link	Reflective Questions

Text Field Name	Contents File Name	Font	Style	Color	Size
Welcome Back	Label	Ariel	Paragraph	#ff4500	18

Storyboard for Assistive Technology Professional Development - Main

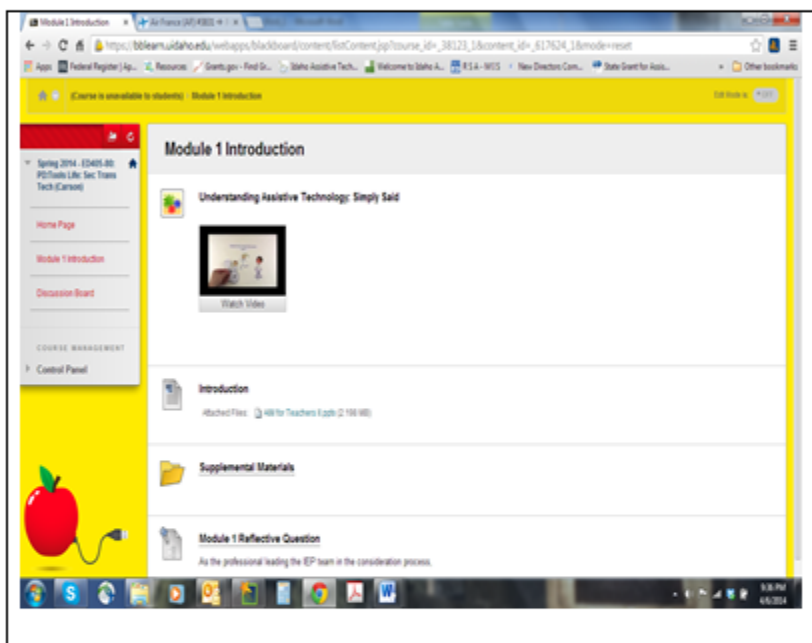
Name:	Janice Carson	Media:	Blackboard LMS, text, presentation software, videos
Project Name:	Assistive Technology Professional Development	Concept Map/Flowchart Reference:	Module 1-6
Screen Name:	Module 1	Screen #:	3
Topic:	Introduction	Subtopic:	Modules

File Name(s)	Type
Understanding Assistive Technology: Simply Said	video
Introduction	PPT
Supplemental Materials	File

Navigation

The participants will work their way through the instructional materials which includes a video of interest, a recorded presentation and supplemental materials. They will then respond the reflective question.

HTML Code File



Button Name	Button Type	Places to Go
Assistive Technology: Simply Said	Embedded Video	http://www.youtube.com/watch?v=DB9pKkZoJDc
Introduction	PowerPoint Presentation	Recorded Presentation
Home Page	Internal Link	Home Page
Module 1	Internal Link	Introduction
Discussion Board /Module 1 Reflective Question	Internal Link	Reflective Questions

Text Field Name	Contents File Name	Font	Style	Color	Size

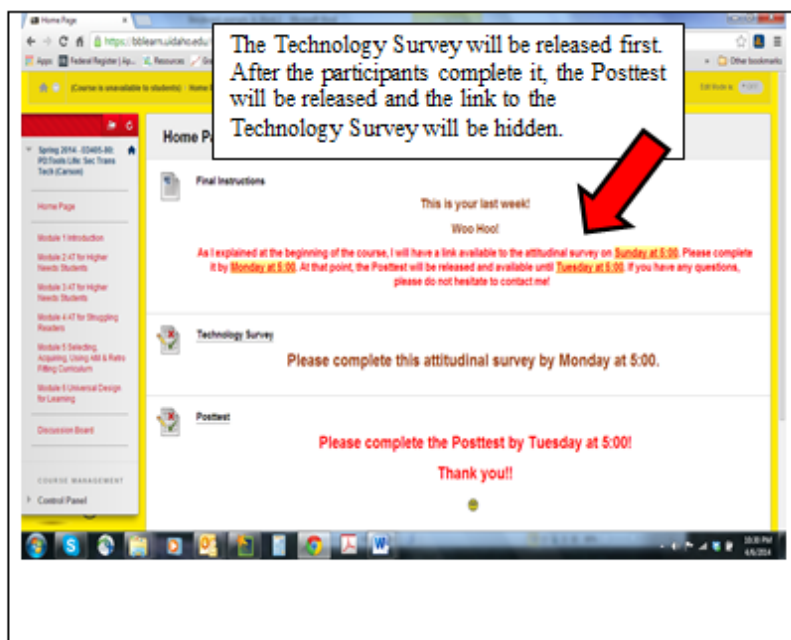
Storyboard for Assistive Technology Professional Development - Main

Name:	Janice Carson	Media:	Blackboard LMS, text, presentation software, videos
Project Name:	Assistive Technology Professional Development	Concept Map/Flowchart Reference:	Post Assessments
Screen Name:	Home Page	Screen #:	4
Topic:	Assistive Technology for K12	Subtopic:	Post Assessments

File Name(s)	Type
Final Instructions	Text
Technology Survey	
Posttest	

Navigation
The participants will complete Module 6 and then they will be given access to the Technology Survey first. After it is complete the Posttest will be available.

HTML Code File



Button Name	Button Type	Places to Go
Technology Survey	Internal Link	Technology Survey
Posttest	Internal Link	Posttest
Home Page	Internal Link	Home Page
Module 1	Internal Link	Introduction
Module 2	Internal Link	AT for Students Higher Needs Students
Module 3	Internal Link	AT for Students Higher Needs Students.
Module 4	Internal Link	AT for Struggling Readers
Module 5	Internal Link	AIM
Module 6	Internal Link	Universal Design for Learning
Discussion Board	Internal Link	Reflective Questions

Text Field Name	Contents File Name	Font	Style	Color	Size

Table 57
Experts' Responses to the Delphi Survey
ADDIE Design Phase - Task D03: Storyboards
Mean Score Tabulation with IDE's Individualized Scoring

Item	IDE 1	IDE 2	IDE 3	Mean
1. There is a series of storyboards aligned with the flowcharts (Task D02).	3	4	4	3.67
2. The placement for graphical elements is included in the storyboards.	3	4	4	3.67
3. The type of graphical elements is identified in the storyboards.	3	4	4	3.67
4. The size parameters of graphical elements are identified in the storyboards.	3	3	4	3.33
5. The placement for textual elements is included in the storyboards.	3	4	4	3.67
6. The font style for textual elements is included in the storyboards.	3	4	4	3.67
7. The font size for textual elements is included in the storyboards.	3	4	4	3.67
8. Hypertext links (where needed) are indicated in the storyboards.	3	4	4	3.67
9. The placement of hypertext links is indicated in the storyboards.	3	4	4	3.67
10. Navigation buttons (where needed) are indicated in the storyboards.	3	4	4	3.67
11. The placement of navigation buttons is indicated in the storyboards.	3	4	4	3.67
12. The style of navigation buttons is indicated in the storyboards.	3	4	4	3.67

Appendix F-4

Task D04:

Delphi Panel Letters

Delphi 08 Survey Instrument & Artifacts

Raw Data

TO: Delphi Panel
FROM: Janice Carson
RE: Task D04
DATE: May 20, 2014

Good Morning Delphi Panel Subject Matter Experts (SME's):

Attached to this email you will find the documents Assessment Instruments Knowledge Acquisition Pretest/Posttest and an AT Plan Rubric (D04) and, for reference, the Task Analysis (D01) associated with the Delphi Technique analysis. I will be using the ADDIE (Analyze, Design, Develop, Implement, Evaluate) model of instructional design as a systematic approach to inform the design for this research. I will be asking you, as SME's, to evaluate the face and/or content validity of certain documents relating to professional development on AT, in the "Analyze and Design" phases of the model. Please go through the attached documents and then complete the survey questionnaire. Return the completed survey to me via email by Monday, May 26, 2014.

Thank You,
Janice Carson

Task D04: Assessment Instruments Delphi Survey 08

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.
2. Mark the rating that best represents your expert evaluation for each item in the survey.
3. Return your completed instrument via reply email as an attachment no later than May 26, 2014.

Item	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1. The multiple-choice assessment Knowledge Acquisition Pretest has item (question) stems related to the Objectives.				
2. The multiple-choice assessment Knowledge Acquisition Pretest has logical distractors for each item related to the Objectives.				
3. The multiple-choice assessment Knowledge Acquisition Pretest has items with random distribution, as expected, in the Posttest.				
4. The multiple-choice assessment Knowledge Acquisition Pretest is formatted for readability.				
5. The assessment Knowledge Acquisition Pretest/Posttest includes a sufficient number of items related to each Objective.				
6. The rubric has items related to the Objectives.				
7. The rubric is formatted for readability.				
8. The rubric assessment includes a sufficient number of items related to the Objectives.				

Table 58
 Experts' Responses to the Delphi Survey
 ADDIE Design Phase
 Task D04: Assessment Instruments - Delphi Survey 08
 Mean Score Tabulation with SME's Individual Scoring

Item	SME 1	SME 2	SME 3	Mean
1. The multiple-choice assessment Knowledge Acquisition Pretest has item (question) stems related to the Objectives.	4	4	4	4.0
2. The multiple-choice assessment Knowledge Acquisition Pretest has logical distractors for each item related to the Objectives.	4	4	4	4.0
3. The multiple-choice assessment Knowledge Acquisition Pretest has items with random distribution, as expected, in the Posttest.	4	4	4	4.0
4. The multiple-choice assessment Knowledge Acquisition Pretest is formatted for readability.	4	4	4	4.0
5. The assessment Knowledge Acquisition Pretest/Posttest includes a sufficient number of items related to each Objective.	4	4	4	4.0
6. The rubric has items related to the Objectives.	4	4	4	4.0
7. The rubric is formatted for readability.	4	4	4	4.0
8. The rubric assessment includes a sufficient number of items related to the Objectives.	4	4	4	4.0

Appendix G

Idaho State University & University of Idaho

Institutional Review Board Modification Letters

Idaho State UNIVERSITY

Office for Research Integrity
921 South 8th Avenue, Stop 8046 • Pocatello, Idaho 83209-8046

June 3, 2014

Janice Carson
University of Idaho-College of Education
121 W. Sweet
Moscow, ID 83843

RE: Your application dated 5/30/2014 regarding study number 4111: A Structured Approach in the Development of an Online Assistive Technology Professional Development Training

Dear Ms. Carson:

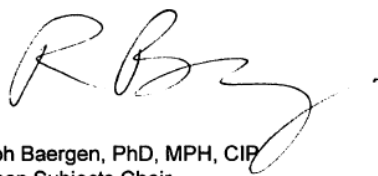
I agree that this study qualifies as exempt from review under the following guideline: 1. Research on educational practices in educational settings. This letter is your approval, please, keep this document in a safe place.

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

You are granted permission to conduct your study effective immediately. The study is not subject to renewal.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; fax 208-282-4723; email: humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

A handwritten signature in black ink, appearing to read 'R Baergen', with a long horizontal flourish extending to the right.

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

July 2, 2014

Janice Carson
University of Idaho-College of Education
121 W. Sweet
Moscow, ID 83843

RE: Your application dated 6/30/2014 regarding study number 4111: A Structured Approach in the Development of an Online Assistive Technology Professional Development Training

Dear Ms. Carson:

I have reviewed your application for revision of the study listed above. The requested revision involves changes to the protocol:

* Adding focus group questions.

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

Please note that any further changes to the study must be promptly reported and approved. Contact Thomas Bailey (208-282-2179; fax 208-282-4723; email: humsbj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

University of Idaho

Office of Research Assurances

Institutional Review Board

875 Perimeter Drive, MS 3010

Moscow ID 83844-3010

Phone: 208-885-6162

Fax: 208-885-5752

irb@uidaho.edu

To: Matthew Wappett

From: Traci Craig, Ph.D.,
Chair, University of Idaho Institutional Review Board
University Research Office
Moscow, ID 83844-3010

Date: 5/30/2014 11:20:11 AM

Title: A STRUCTURED APPROACH IN THE DEVELOPMENT OF AN ONLINE ASSISTIVE
TECHNOLOGY PROFESSIONAL DEVELOPMENT TRAINING

Project: 14-269

Certified: Certified as exempt under category 1 at 45 CFR 46.101(b)(1).

On behalf of the Institutional Review Board at the University of Idaho, I am pleased to inform you that the protocol for the above-named research project has been certified as exempt under category 1 at 45 CFR 46.101(b)(1).

This study may be conducted according to the protocol described in the Application without further review by the IRB. As specific instruments are developed, modify the protocol and upload the instruments in the portal. Every effort should be made to ensure that the project is conducted in a manner consistent with the three fundamental principles identified in the Belmont Report: respect for persons; beneficence; and justice.

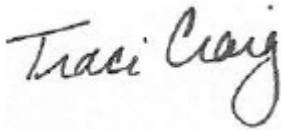
It is important to note that certification of exemption is NOT approval by the IRB. Do not include the statement that the UI IRB has reviewed and approved the study for human subject participation. Remove all statements of IRB Approval and IRB contact information from study materials that will be disseminated to participants. Instead please indicate, 'The University of Idaho Institutional Review Board has Certified this project as Exempt.'

Certification of exemption is not to be construed as authorization to recruit participants or conduct research in schools or other institutions, including on Native Reserved lands or within

Native Institutions, which have their own policies that require approvals before Human Subjects Research Projects can begin. This authorization must be obtained from the appropriate Tribal Government (or equivalent) and/or Institutional Administration. This may include independent review by a tribal or institutional IRB or equivalent. It is the investigator's responsibility to obtain all such necessary approvals and provide copies of these approvals to ORA, in order to allow the IRB to maintain current records.

As Principal Investigator, you are responsible for ensuring compliance with all applicable FERPA regulations, University of Idaho policies, state and federal regulations.

This certification is valid only for the study protocol as it was submitted to the ORA. Studies certified as Exempt are not subject to continuing review (this Certification does not expire). If any changes are made to the study protocol, you must submit the changes to the ORA for determination that the study remains Exempt before implementing the changes. Should there be significant changes in the protocol for this project, it will be necessary for you to submit an amendment to this protocol for review by the Committee using the Portal. If you have any additional questions about this process, please contact me through the portal's messaging system by clicking the 'Reply' button at either the top or bottom of this message.

A handwritten signature in cursive script that reads "Traci Craig". The signature is written in dark ink on a light background.

Traci Craig, Ph.D.

University of Idaho

Office of Research Assurances
Institutional Review Board

875 Perimeter Drive, MS 3010

Moscow ID 83844-3010

Phone: 208-885-6162

Fax: 208-885-5752

irb@uidaho.edu

<https://www.sites.uidaho.edu/osp-portal/>

To: Matthew Wappett

From: Traci Craig, Ph.D.,
Chair, University of Idaho Institutional Review Board
University Research Office
Moscow, ID 83844-3010

Date: 7/21/2014 8:25:44 AM

Title: A STRUCTURED APPROACH IN THE DEVELOPMENT OF AN ONLINE ASSISTIVE
TECHNOLOGY PROFESSIONAL DEVELOPMENT TRAINING

Project: 14-269

Certified: Certified as exempt under category 1 at 45 CFR 46.101(b)(1).

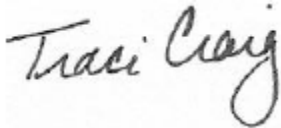
The modification to the protocol has been determined to retain the exempt certification. This study may be conducted according to the protocol described in the Application without further review by the IRB. As specific instruments are developed, each should be forwarded to the ORA, in order to allow the IRB to maintain current records. Every effort should be made to ensure that the project is conducted in a manner consistent with the three fundamental principles identified in the Belmont Report: respect for persons; beneficence; and justice.

It is important to note that certification of exemption is NOT approval by the IRB. Do not include the statement that the UI IRB has reviewed and approved the study for human subject participation. Remove all statements of IRB Approval and IRB contact information from study materials that will be disseminated to participants. Instead please indicate, 'The University of Idaho Institutional Review Board has Certified this project as Exempt.'

Certification of exemption is not to be construed as authorization to recruit participants or conduct research in schools or other institutions, including on Native Reserved lands or within Native Institutions, which have their own policies that require approvals before Human Subjects Research Projects can begin. This authorization must be obtained from the appropriate Tribal Government (or equivalent) and/or Institutional Administration. This may

include independent review by a tribal or institutional IRB or equivalent. It is the investigator's responsibility to obtain all such necessary approvals and provide copies of these approvals to ORA, in order to allow the IRB to maintain current records.

This certification is valid only for the study protocol as it was submitted to the ORA. Studies certified as Exempt are not subject to continuing review (this Certification does not expire). If any changes are made to the study protocol, you must [submit an amendment](#) for determination that the study remains Exempt before implementing the changes.

A handwritten signature in black ink that reads "Traci Craig". The signature is written in a cursive style with a large, looped "C" at the end.

Traci Craig, Ph.D.