WYOMING SUPERINTENDENTS AND SECONDARY SCHOOL PRINCIPALS

PERCEPTIONS REGARDING THE IMPLEMENTATION OF ONLINE

EDUCATIONAL PROGRAMS IN WYOMING SECONDARY SCHOOLS AND

THEIR PERCEPTIONS OF THE BARRIERS TO AND SUPPORTS NEEDED FOR

THE EFFECTIVE IMPLEMENTATION OF ONLINE EDUCATION

by

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A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Education in the Department of Educational Leadership

Idaho State University

Spring 2016

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Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

DEDICATION

To my wife Carla, who has always stood by my side in all of my efforts with loving support and encouragement.

ACKNOWLEDGEMENTS

There are many individuals who have provided great support and encouragement to me as I pursued my Ed. D. and this dissertation study. I am forever grateful for their inspiring support.

Special acknowledgement is owed to my advisor, Dr. Mark Neill for his professional support, patience, and personal assistance. I would also like to acknowledge with gratitude those who served on my Dissertation Committee for their time and insight.

I also want to thank my wife, Carla, and my children for their patience and loving support. The journey was long, yet very worthwhile.

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ABSTRACT

The purpose of this study was to determine the perceptions of Wyoming superintendents and secondary school principals regarding the implementation of online educational programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education.

The following five research questions guided this study: (1) What are Wyoming administrator perceptions regarding online education as an educational option at the secondary level? (2) What are Wyoming administrator perceptions regarding the outcomes of online education programs at the secondary level? (3) What are Wyoming administrator perceptions regarding barriers associated with effective online education programs at the secondary level? (4) What are Wyoming administrator perceptions regarding the supports necessary to effectively implement online education programs at the secondary level? (5) How do Wyoming school district superintendent perceptions compare with Wyoming secondary school administrator perceptions with relationship to research questions one through four.

The results of this study indicated Wyoming superintendents and secondary school principals generally agree that online education is an important option at the secondary level. However, Wyoming superintendents and secondary school principals did not agree that current outcomes of online learning were equal to educational outcomes of a traditional brick and mortar school. Respondents also perceived that the barriers to online education were minimal. Lastly, perceptions indicated slight agreement that current supports were in place for effective implementation of online education in

Wyoming. When analyzing the survey results further, superintendents and principals statistically held similar perceptions on the four general research topics.

As a result of this study, educational leaders and policymakers in Wyoming were provided an improved understanding of the current level of implementation of online learning opportunities in the state as well as improved understanding of the supports needed for and barriers to the successful implementation of these learning opportunities for students. Additionally, one thing is clear: Online education is needed as an educational option for Wyoming students.

Chapter I

Introduction

On the bus ride to the first day of school, Sarah Techno posted a comment on her Facebook page, tweeted to her friends she had met while visiting her grandmother who lived in a neighboring city, took a photo of another friend sitting in the aisle across from her, and updated her ringtone to include music from the latest concert she recently attended.

That same morning, Sarah's school principal, Mr. Limitech, welcomed the staff during the early morning faculty meeting. He handed out updated class enrollment sheets and requested each teacher post the sheets on their classroom doors to help the newly arriving students find their appropriate classroom. He also reminded the teachers to take the lunch count promptly after the bell rings, and to place the lunch count totals on the clip outside their classroom doors for the office aide to pick up.

Although Sarah Techno and Mr. Limitech were both preparing for their first day of school, each used completely different methods to disseminate information and collaborate with others. Prensky (2010a) labeled individuals like Sarah Techno and Mr. Limitech as digital natives and digital immigrants, respectively. The term digital native described individuals who were born during or after the general introduction of digital technology. Digital immigrants adopted technology later in life. Both have embarked on the same first day of school with very different communication tools.

Today's students are plugged in to an engaging technological world. This connection has created high expectations for technology to engage today's learners and transform education to support 21st century skills. It has also opened the door for further

development of varying learning strategies and educational platforms.

As society and education transition from the industrial age into the technology and information age, more and more schools have recognized that learning opportunities exist via multiple modalities. The traditional face-to-face classroom is no longer the only method for providing learner-appropriate instruction. Technological advances in instruction have created learning opportunities beyond the traditional approach. One of the most common alternatives to face-to-face education occurs through online learning opportunities. According to the National Association of State School Boards of Education (NASBE) (2001) and as repeated by Wallis and Steptoe (2006), online learning is positioned to become an instructional necessity at the secondary level.

Worldwide, more than 3.3 billion people have some sort of access to the internet (Internet World Stats, 2015). Access to the internet has increased more than 832% in the past 15 years (Internet World Stats, 2015). As a result of the tremendous growth of and accessibility to the internet, increasing numbers of public and private education institutions are identifying alternate approaches to teaching their curricula utilizing the internet and associated online resources.

During the 2012-2013 school year, 31states operated a virtual school, which accounted for 619,847 students enrolled in on-line courses, representing an annual increase of 16% (Watson, Murin, Vashaw, Gemin, & Rapp, 2012). In 2013, 29 states offered fully online schools with Iowa and New Mexico the most recent states joining this movement. Policy makers in several other states, including North Carolina, Maine, and New Jersey, considered allowing fully online schools for the first time in 2013, but ultimately decided against it (Watson, Murin, Vashaw, Gemin, & Rapp, 2013). Two

years later, *Keeping Pace with K-12 Digital Learning* estimated 2.2 million students were taking online courses (Watson, Pape, Gemin, & Vashaw, 2015).

Florida was the first state in the country to legislate that all K–12 public school students have full- and part-time virtual options. Florida Virtual School continued to be the largest state virtual school in the country with more than 520,000 student course completions. Students enrolled full time in online courses reached approximately 11,000 (Watson, Pape, Gemin, & Vashaw, 2015).

Supplemental online course offerings are not widely accessible in some middle and high schools throughout Wyoming (Watson, Murin, Vashaw, Gemin, & Rapp, 2013). During the 2012-2013 school year, 1942 Wyoming students enrolled into distance education courses. Of these, 1377 were full-time, representing a 21% increase in growth from the previous school year. The 1377 full-time enrollments represented a five year growth of 1,277% (Watson, Murin, Vashaw, Gemin, & Rapp, 2012). As the use of online learning accelerated, Wyoming lawmakers and educators examined the effective delivery of online instruction to assist in the development of appropriate policy and effective implementation practices of this learning modality.

As of July 1, 2008, the Wyoming legislature enacted legislation known as Chapter 41, Distance Education (Wyoming Department of Education, 2015). The 14 page document detailed a uniform and understandable process for all distance education courses offered by Wyoming school districts. The document also outlined the process by which academic credit would be transferred to or accepted by a Wyoming school district. Thus, all deliveries of distance education were required to comply with the Chapter 41 rules and regulations established and adopted by the Legislature. In 2011, the Chapter 41

rules and regulations were amended to include distance education coursework accepted from out-of-state providers.

In 2015, the Wyoming Legislature formed a distance education task force with House Bill 0011 (Sate of Wyoming, 2015). The task force was created to review current distance education programs, delivery methods, transparency in accounting and administration of distance education programs followed by recommendations for modifications by October 15, 2015. The intention of the task force was to review the current challenges in distance education and to explore the possibilities of how to best afford increased access to quality individualized learning opportunities to every Wyoming learner.

Incorporating individualized instruction into the teaching and learning curriculum dates back to the work of both Dewey (1899) and Freire (1994), who expressed the importance of understanding the student's world inside, as well as outside of the classroom. Dewey and Freire both criticized passive learning, citing the importance of students' active engagement in the learning process. Observations of students within the traditional classrooms often revealed unengaged students. An Indiana University-Bloomington survey of more than 81,000 high school students revealed that two out of three students enrolled in traditional classrooms reported being bored in class as a result of inadequate student engagement (Yazzie-Mintz, 2007).

In addition, traditional classrooms may have arbitrarily advanced students to the next sequential grade level without the student achieving the necessary academic preparedness required to advance to the subsequent grade level. According to the American Federation of Teachers (AFT) (1997), a majority of teachers reported that they

had promoted unprepared students in the previous year. This advancement was referred to as "social promotion" rather than academic advancement. Research suggested that neither social promotion nor retention was effective for improving student achievement. The U.S. Department of Education (USDE) concluded that the results of both were unacceptably high dropout rates, especially for poor and minority students, and inadequate knowledge and skills for students (U.S. Department of Education, 1999).

With neither social promotion nor retention being an attractive option for improving student achievement or enhancing student motivation, some educators and policymakers supported the development of more personalized options to help ensure that all children succeeded in school (American Federation of Teachers, 1997; Darling-Hammond, 1998; Wheelock, 1998). Utah was among the first states to replace seat time requirements with subject mastery requirements, which allowed students to advance to the next grade level based on competency rather than fulfilling seat time requirements (Watson, Murin, Vashaw, Gemin, & Rapp, 2012).

In an online learning environment, student engagement can be enhanced by frequent communication and correspondence (Kranzow, 2013; Motte, 2013). Students may be required to engage synchronously or asynchronously with the instructor. Online courses can be technologically structured to require the completion of assignment number one prior to advancing to assignment number two (Moodle, 2015). The traditional classroom may allow a student to ignore a chapter one assignment and yet move on to chapter two. Online courses often track, or log, the specific amount of time a student spends on a specific task required to be completed within a specified time period. For example, the log could identify the exact amount of time a student spent answering

question number two during a specific assessment. The instructor would be able to analyze the log for discrepancies, trends, and warnings. This log could then assist in verifying student engagement. Traditional classroom assessments were often unable to reveal this type of data.

Online learning has the unique ability to offer educational opportunities that can meet students' changing needs and provide increased flexibility in terms of learning time, place, and at a pace that meets individual learning styles. Online learning can provide opportunities for students with varied learning styles, and allows flexibility in terms of attention to time on task that simply isn't practical in traditional classroom settings (Heckman & Annabi, 2006). The National Association of State Boards of Education (NASBE) (2001) stated, "Evidence to date convincingly demonstrates that, when used appropriately, electronically delivered education e-learning can improve how students learn, can improve what students learn, and can deliver high-quality learning opportunities to all children" (p. 4). The NASBE concluded, "E-learning will improve American education in valuable ways and should be universally implemented as soon as possible" (p. 4).

Ensuring students received an education based on 21st century skills were identified as a necessity more than a decade ago (Wallis & Steptoe, 2006). These skills included knowing more about the world, learning different languages, being creative and innovative, and becoming smarter about recognizing the reliability of the mass amounts of information at their fingertips. Online learning helped bridge the continents. For example, students in China and Korea were able to be taught English from certified teachers residing in rural Ten Sleep, Wyoming (Eleutian, 2012).

The National Center for Educational Statistics (NCES) (2011) reported during the 2007–08 school year, approximately 4.3 million undergraduate students, or 20 percent of all undergraduates, took at least one distance education course. About 0.8 million, or 4 percent of all undergraduates, took their entire program through distance education. The percentage of undergraduates who took any distance education courses rose from 16 percent in 2003–04 to 20 percent in 2007–08. Almost half (48%) of public four-year institutions reported they offer degree programs delivered exclusively through distance education formats. The National Center for Educational Statistics (2011) further reported from 2000 to 2008, the percentage of undergraduates enrolled in at least one distance education course expanded from eight to 20 percent, and the percentage of undergraduates enrolled in a distance education degree program increased from two to four percent.

The growth in courses offered using asynchronous Internet-based delivery continued to increase: 88 percent of post-secondary institutions reported plans to begin offering or increase the number of such courses over the next three years (National Center for Educational Statistics, 2011). Recently, the National Center for Education Statistics' Integrated Postsecondary Education Data System (IPEDS) included distance education information to the data collected and reported regarding U.S. higher education institutions. The data showed that nearly 71% of all currently active, degree-granting institutions that are open to the public offered some distance education courses (Allen & Seaman, 2015).

Another example of the growth of online coursework was observed in Wyoming's neighboring state - Idaho. In 2002, Idaho code 33-5502 created within the Idaho State

Department of Education the Idaho Digital Learning Academy, also known as Idaho Digital Learning (IDL) (Idaho Digital Learning, n.d., para. 1), a school-choice learning environment that theoretically joined the best available technology with the best instructional practices. The IDL faculty has served thousands of Idaho students since its inception (Watson, Murin, Vashaw, Gemin, & Rapp, 2012).

Many mission and vision statements in secondary schools across the country charge themselves with the role of educating students to be successful contributors to society. As society becomes increasingly dependent on different forms of technology, schools must ensure that all learners meet minimum technology competencies. According to Borja (2005), "More and more school districts, as well as for-profit companies and nonprofit organizations, are offering internet-based classes in core subjects, such as algebra and reading, and electives such as creative writing" (p. 15).

According to John Watson, the founder of the Evergreen Education Group, an organization that researches online learning, district administrators in close to half of all states recognized they were losing students to online schools, (as cited in Ash, 2012). Traditional school districts strive to prepare students for post-secondary education and employment opportunities. Traditional school districts must also adopt policies and procedures to incorporate online learning experiences within their curriculum if they are to remain a viable option for preparing students for success within the 21st century (Heckman & Annabi, 2006; National Association of State Boards of Education, 2001; Wallis & Steptoe, 2006).

Problem Statement

Online learning seems to be rapidly increasing at the university level, yet the concept at the high school level has gained momentum and prominence at a much slower rate. During the 2002-2003 school year, approximately 9% of k-12 public schools offered students some sort of online learning opportunity (Picciano & Seaman, 2007). Keeping Pace 2014 reports 30 states have fully online schools operating across the entire state, an increase of 6.2% from the previous year (Watson, Pape, Murin, Gemin, & Vashaw, 2014). Predictions were that within the next 10 years public secondary schools would experience a high level of demand for online learning programs. The purpose of this study was to determine the perceptions of Wyoming superintendents and secondary school principals regarding the implementation of online educational programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education.

Research questions. To more clearly guide effective implementation of online learning opportunities for students, district leaders, specifically superintendents and school boards, must understand the current level of implementation of these learning approaches as well as the barriers to and supports for the effective implementation of online learning opportunities for Wyoming students. The following research questions guided this study:

Research question 1: What are Wyoming administrator perceptions regarding online education as an educational option at the secondary level?

Research question 2: What are Wyoming administrator perceptions regarding the outcomes of online education programs at the secondary level?

Research question 3: What are Wyoming administrator perceptions regarding barriers associated with effective online education programs at the secondary level?

Research question 4: What are Wyoming administrator perceptions regarding the supports necessary to effectively implement online education programs at the secondary level?

Research question 5: How do Wyoming school district superintendent perceptions compare with Wyoming secondary school administrator perceptions with relationship to research questions one through four?

The researcher formulated the following subsequent research questions for this study:

Subsequent Research Question1a: There is no significant difference between respondent's school/ district size and respondent's perceptions of online learning as an option for secondary education.

Subsequent Research Question1b: There is no significant difference between respondent's school/ district size and respondent's perceptions of outcomes of online education for secondary education.

Subsequent Research Question1c: There is no significant difference between respondent's school/ district size and respondent's perceptions of barriers of online education for secondary education.

Subsequent Research Question1d: There is no significant difference between respondent's school/ district size and respondent's perceptions of supports needed for online education for secondary education.

Subsequent Research Question2a: There is no significant difference between respondent's age and respondent's perceptions of online learning as an option for secondary education.

Subsequent Research Question2b: There is no significant difference between respondent's age and respondent's perceptions of outcomes of online education for secondary education.

Subsequent Research Question2c: There is no significant difference between respondent's age and respondent's perceptions of barriers of online education for secondary education.

Subsequent Research Question2d: There is no significant difference between respondent's age and respondent's perceptions of supports needed for online education for secondary education.

Definitions

The following definitions were important to the purpose of this study.

Barriers. Barriers within this study were defined as those aspects perceived by the respondents that hindered the implementation of online learning programs.

Distance education/learning. Distance education was an educational situation in which the instructor and students were separated by time, location, or both (Blomeyer, 2002).

Online course. Online courses were defined by having 80%, or more, of the instruction, as defined by learning objectives, delivered through the use of the Internet and accessible by a computer 24 hours a day, seven days a week (Davidson, 2005).

Perceptions. For the purpose of this study, Wyoming superintendent and secondary school administrator perception was defined as the way the Wyoming administrator reasoned or understood.

Secondary level. For the purpose of this study, secondary level was defined as those respondents associated with the education of students in school grades six through twelve.

Supports. Within this study, supports were defined as those practices and components that aided in the implementation of an online educational program.

Virtual school. A virtual school was an educational organization that offered k-12 courses through the Internet (Blomeyer, 2002).

Assumptions, Limitations, Delimitations

Assumptions. Several assumptions were inherent in this study. Included in these assumptions were that the respondents remained honest with their responses to the survey questions; the respondents were knowledgeable enough about online learning in their schools that they understood the study prompts; and they had reasonable knowledge about the barriers to and supports for online educational opportunities within their schools.

Limitations. Educator familiarity and past experiences with online learning may have limited their participation in the study and influenced their potential bias and receptivity toward the idea of online k-12 teaching and learning. A further limitation of the study could have resulted from the participant's understanding of the barriers and supports for online learning programs. The researcher's experience in secondary education recognized Wyoming secondary school administrators and district

superintendents are extremely busy. As a result, potential respondents may have elected not to participate in the study as a result of their schedules. In addition, a limitation of the study could have resulted from the participant's familiarity with the researcher.

Delimitations. Wyoming is a rural state comprised of 48 school districts, thus restricting sample size. Such findings may not be generalizable to other states or other educational levels. The research was delimited to superintendents and secondary school principals currently employed in Wyoming schools.

Significance of Study

The rapid growth of educational technologies and innovative instructional opportunities promote further exploration of the use of technology as a means of educating students in Wyoming. Much of the current model of public education remains tied to the organizational paradigms of early America (Sack, 2003). Online education may not yet be a significant learning tool for all educators; particularly in rural and sparsely populated states, like Wyoming. According to Blomeyer (2002), investments in computers, Internet access, professional development in technology, and content development have allowed teachers and students to experience more of the benefits associated with these new learning technologies. This study has the potential to influence policy, identify supports and barriers to the implementation of online educational opportunities for school districts in Wyoming and other rural states, and shape educational delivery methodology throughout Wyoming and similar rural areas.

Summary

It is important that educational leaders and policymakers have a thorough understanding of the current level of implementation of online learning opportunities and

a clear sense of the supports needed for and barriers to the successful implementation of these learning opportunities for Wyoming students. Therefore, the purpose of this study was to determine the perceptions of Wyoming superintendents and secondary school principals regarding the implementation of online educational programs in secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education.

Chapter II

Review of the Literature

The purpose of this study was to determine the perceptions of Wyoming superintendents and secondary school principals regarding the implementation of online educational programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education.

This chapter reviewed literature relevant to the following topics: (a) a brief historical perspective of k-12 public education that reviewed principles of teaching and learning, including learning theory, theory-based teaching, and 21st century skills; (b) online education including history, trends, perceptions, barriers, advantages, and disadvantages; (c) implemented distance education models; and, (d) Wyoming implementation of online learning. These four topics transitioned the research from a historical overview of k-12 education to today's implementation of online education in Wyoming.

The literature review resulted in a researcher-developed survey instrument associating relevant research with four focus topics or constructs. The four constructs were: (a) availability of online educational opportunities; (b) outcomes of online learning; (c) barriers to effective online learning; and, (d) the supports required for effective implementation of online learning.

Principles of Teaching and Learning

Learning can be defined as a fairly permanent change in observable behavior as well as internal processes including attitudes, thinking, and emotions (Burns, 1995). A number of theories have been formulated relating to the learning process. This section

reviews some of the more widely known theories, including sensory learning theory, reinforcement theory, cognitive revolution, Gestalt theory, holistic learning theory, facilitation theory, and experiential learning. These theories present the foundation for successful online learning practices.

Sensory stimulation theory. One theory used to describe learning was the Sensory Stimulation Theory. According to this theory, stimulation of the senses was necessary for effective learning (Laird, 1985). The theory considered the sense of sight as the most essential sense in the learning process followed by the sense of hearing and then other senses of smell, taste, and touch. Laird referenced research that indicated 75% of knowledge held by adults was acquired through seeing. Hearing was identified as the second most effective sensory stimulation and accounted for 13% of knowledge learned. Touch, smell, and taste accounted for the remaining 12% of the way knowledge was acquired.

Stimulating these senses, especially the visual sense, enhanced the learning process. The learning process was most effective when multiple senses were stimulated (Laird, 1985). Stimulation of these senses were achieved by using a variety of colors, volume levels, powerful statements, visual presentation of facts, the use of a variety of instructional techniques, as well as the use of various multimedia platforms, including video and presentation programs. This theory suggested that if multiple senses were stimulated, greater learning resulted (Laird, 1985).

Reinforcement theory. Another widely acknowledged learning theory was Reinforcement Theory proposed by Harvard psychologist B. F. Skinner (Burns, 1995). This theory was based on the belief that behavior depends on related consequences. This

theory suggested that if a behavior was followed by a pleasant consequence, the learner would strive to repeat the behavior (Burns, 1995; Laird, 1985). The pleasant consequences included verbal reinforcement, promotion to a higher level of authority, financial status, or recognition for a job well done. For example, a school administrator developed rewards or recognitions for desirable outcomes by staff by sponsoring a lunch recognition program each month.

Negative consequence may also reinforce a behavior. The same school administrator might employ punishments for undesirable behavior to help motivate staff toward intended goals or objectives. A staff member that is repeatedly late to work may be asked to have an unpleasant conversation with the principal later that morning. This may serve as a negative reinforcer and encourage the staff member to be on time to work in the future.

Cognitive-Gestalt theory. The cognitive revolution was the name for an intellectual movement in the 1950's that began with what were recognized as the cognitive sciences. The cognitive revolution began in the modern context of greater communication and research (Cognitive Revolution, n.d.). Two of the well-known figures in cognitive psychology were Jean Piaget and Lev Vygotsky (as cited in Gagne, 1970). These researchers proposed that psychology could only become an objective science if it was based on observable behavior in test subjects. Since mental events are not publicly observable, behaviorist psychologists avoided description of mental processes or the mind in their literature.

Cognitive psychology focused on the study of how people thought, understood, and distinguished. The cognitive theories presented a positive view of development,

emphasizing conscious thinking. From a cognitive learning perspective, learning involved the transformation of information into knowledge that was stored. Learning occurred when new knowledge was acquired or existing knowledge was modified through experiences (Gagne, 1970).

Cognitive-Gestalt theory suggested that people had varying concerns and needs which came at different times. Different individuals interpret things differently at different times and within different contexts. The basic idea of Gestalt psychology described learners as predisposed to organizing experience in particular ways (Ormrod, 1999). Gestalt psychologists were of the view that psychological organization will always be as good as prevailing conditions allowed. For Gestalt psychologists, form was the primitive unit of perception. When we perceived, we tended to pick out a form. Our perceptions were influenced by our past experiences (Tan, Parsons, Hinson, & Sardo-Brown, 2003). The Gestalt effect was the ability of our intellect to generate whole forms, especially visual recognition of whole figures, instead of simply a collection of unrelated objects. For example, what do you see in this picture? Do you see a lady or a saxophone player?

Figure 1. Example of Gestalt theory. Reprinted from *The 8th Habit* (p. 211), by S. R. Covey, 2004, New York. NY: Free Press.

The learner's dictionary definition of Gestalt means "something that is made of many parts and yet is somehow more than or different from the combination of its parts" (Gestalt, n.d. para. 1).

Holistic learning theory. The Holistic Learning Theory was also used to describe the learning process (Laird, 1985). This theory suggested that one's personality was made up of several elements including emotions, intellect, imagination, intuition, and desire. It required the activation of all the elements to create effective learning (Laird). The primary focus of holistic learning was making associations. Three key elements assisted in this process: balance, inclusion, and connection (Miller, 1999).

Holistic learning theory suggested that classroom teachers were obligated to find a balance between various learning emphases, such as individual learning and group learning, analytic thinking and intuitive thinking, content and process, and learning and assessment. Influenced by the work of developmentalists such as Piaget, educators in the 1960s and early 1970s had given emphasis to *how* students learned (Miller, 1999). This led to such approaches as open education, active learning, and learning centers in the classroom. At that time, however, schools did not stress student assessment, and some educators saw the need to raise academic standards. Today, education seems more concerned with testing what students have learned than with nurturing the learning process itself. Gardner (2011) stated,

> Students who have been well trained and who exhibit all the overt signs of success; faithful attendance at schools, high grades and high test scores, and accolades from their teachers, typically do not display an adequate understanding of the materials and concepts with which they have been working. (p. 3)

From a holistic learning perspective, education seeks to balance learning and assessment rather than to favor one over the other (Miller, 1999).

In holistic learning, schools and classrooms included students of diverse races and abilities. Miller (1999) described three types of learning that were significant to the inclusion process of holistic learning; transmission learning, transactional learning, and transformational learning.

Transmission learning involved a one-way flow of information from the teacher or the textbook to the student. The focus of transmission learning was on accumulating factual information and basic skills.

A second form of holistic learning was transactional learning, characterized by greater interaction between student and teacher. This form focused on solving problems and developing cognitive skills. Through the transaction of teaching and learning, students examined a broad range of problems and issues (Miller, 1999).

The third form of holistic learning described by Miller (1999) was transformational learning. At the transformational level, the focus was not just on intellectual development, but also on physical, emotional, aesthetic, moral, and spiritual growth. Through a holistic learning approach, significant connections developed between the student and the subject matter. Transformational learning nurtured the student's sense of self through such approaches as storytelling and the arts.

Given a holistic learning approach, a wide range of teaching and learning strategies were employed. Holistic educators did not take sides in battles between traditionalists and progressive educators or between whole language and phonics advocates. Instead, they sought a comprehensive structure that let the teacher practice a

variety of approaches. If a classroom focused on only one type of learning, then the child's development would be thwarted (Miller, 1999).

Furthermore, Miller (1999) discussed connections among different academic subjects that occurred at different levels. For example, the teacher could link a novel to a particular historical time period, as in the novel, *The Last of the Mohicans*, by James Fenimore Cooper (1826), which is set in the mid-1700s when France and Great Britain were at war to obtain territory in North America. Students reading this novel would connect history and English language arts, simultaneously. At another level, subjects could be integrated around major themes. For example, students could explore the theme of personal identity by linking literature, history, art, music, and even science.

Miller (1999) also declared that students must see the classroom as a learning community where they could work collaboratively with other students in cooperative learning groups. Bruffee (1993) indicated collaborative learning involved two or more people learning together. Listening carefully to students and showing respect through small acts of attention built a sense of classroom community. The school, itself, should also be a place where people know one another and feel a sense of responsibility toward the total school environment (Miller).

Facilitation theory. Facilitation Theory, sometimes referred to as facilitative teaching, was another learning theory which suggested that learning occurred most effectively when the educator took on the role of a facilitator. This approach involved the creation of a free and comfortable learning environment where the learners could consider new ideas without being under the threat of external factors, such as social conformity (Laird, 1985). Rogers (1967), an influential American psychologist, stated,

The function of the teacher is to concentrate on creating a classroom climate to facilitate self-initiated learning, the freedom to learn and learning to be free. First, the students must be allowed to be free and responsible then they must confront real life problems. The teacher who is genuine and sincere, with a confident view of man and a profound trust in the human organism, functions effectively in a student-centered setting for education. (p. 57)

Among the founders of the humanistic approach, Rogers (1967) clarified his theory of an effective teacher by stating,

Equally important to these attitudes is the teacher's function as a provider of resources and raw materials that the student can use. The teacher offers himself as the main resource and the degree to which he is used is up to the student. In this student-centered educational setting, students discover what it means to be autonomous, spontaneous, creative, and self-disciplined in their efforts to reach their own goals. With hard work, frustration, and perseverance they learn the satisfaction of responsible freedom. (p. 57)

As a facilitator of learning, Goble (1977) realized that knowledge was all around us. "The teacher's primary task is to be a mediator in the encounter between the student and the mass of information, factual, conjectural, and mythological" (p. 56). The teacher's responsibility goes far beyond the transmission of knowledge, and must address how knowledge could be sought, validated, assimilated, and used as a basis for further learning, for forming and modifying goals and ideas, and for rational decision making. The teacher is not so much a source of information, but served as a guide to sources, an

organizer of opportunities, and an instructor in the techniques of inquiry and thought (Goble, 1977).

Experiential learning. Further still, Experiential Learning had been proposed by Kolb (1976) to describe the learning process. Kolb presented learning in the form of a four-stage model in which the learning process could start from any of four stages: (1) concrete experience, (2) abstract conceptualization, (3) active experimentation, and (4) reflective observation. According to Kolb, different people may develop one stage better than another.

Kolb's (1976) experiential learning model stated that in order to gain genuine knowledge from an experience, certain abilities are required, including: (a) the learner must be willing to be actively involved in the experience, (b) the learner must be able to reflect on the experience, (c) the learner must possess and use analytical skills to conceptualize the experience; and, (d) the learner must possess decision-making and problem-solving skills in order to use the new ideas gained from the experience.

These learning theories, described in Kolb's experiential learning model, were widely applied in the field of education. Theory-based learning worked on the assumption that children's understanding was always associated with a particular theory or set of theories. Research had shown that theories played an exceedingly integral role in the learning process (Simone, Beth, & Ashley, 2011).

Complex concepts in the real word could best be described through theories. The power of theory-based learning was widely utilized in the education field and was effective in various ways. Theory-based learning was synonymous with problem-based learning, and represented an instructional method of hands-on, active learning centered

on the investigation and resolution of messy, real-world problems (LearningTheories.org, 2012).

K-12 Education

K-12 education incorporated many different learning theories and numerous instructional models. K-12 represented an acronym where K represented kindergarten-aged children, and 12 signified the 12 grade levels of elementary and secondary school education (Presidential Communications Development and Strategic Planning Office & PREGINET, 2010). Kindergarten was used to refer to the setting in which learners were around five years old. Elementary education was considered to be the six to eight years of primary schooling, while secondary education was used in reference to the high school. Education in America has been primarily provided by public schools with a mix of parochial and private schools added. Public education has been universally available in America, with funding provided from state, local, and federal resources (Federal Education Budget Project, 2014).

A typical k-12 model would consist of one year of kindergarten, a five year elementary education, followed by three years in middle school or junior high school, and then four years in senior high school, during which time students typically advanced together from one grade level to the next (Presidential Communications Development and Strategic Planning Office & PREGINET, 2010). In some countries, such as Canada and the United States, a k-12 education was available to all citizens and was sponsored by the government (Department of Education, Newfoundland, Labrador, Canada, 2012). In some countries, such as Canada, entry into the post-secondary levels of learning required that one had successfully completed the k-12 education curriculum. In the United States,

entry into a post-secondary institute generally required demonstrated ability in reading and mathematics, and was typically measured by the Scholastic Aptitude Test (SAT) or the American College Test (ACT).

With society's advancement into the digital era, the development of digital proficiencies has become an increasingly important learning outcome for k-12 students (International ICT Literacy Panel, 2001; North Central Regional Educational Laboratory, 2014). The education system was, therefore, faced with the issue of adopting the changes necessary to equip learners with the skills to survive in the digital age. One of the most basic skills that students need to develop is digital age literacy (21st Century Workforce Commission, 2000). The North Central Regional Educational Laboratory (2014) (NCREL) identified basic literacy, scientific literacy, economic literacy, technological literacy, visual literacy, information literacy, multicultural literacy, and global awareness as basic necessary skills. These digital age literacy skills are vital in order to negotiate the complexities of life brought about in the 21st century.

Basic literacy. Basic literacy has been defined as the ability to read, write, listen, and speak and was identified as significantly important (North Central Regional Educational Laboratory, 2014). The definition of basic literacy had changed over time to reflect an increasing importance on emerging skills. In the early 1900s, basic literacy meant the ability to write one's name. That definition was later expanded to mean the decoding of text. But by the 1930s, basic literacy had come to include reading and expressing oneself through writing (Bransford, Brown, & Cocking, 1999).

The National Literacy Act of 1991 defined literacy as "an individual's ability to read, write, and speak in English, and compute and solve problems at levels of

proficiency necessary to function on the job and in society to achieve one's goals, and develop one's knowledge and potential" (National Literacy Act of 1991, Sec. 3). The authors of Digital Transformation, a report published by the Educational Testing Service's Center for Global Assessment, defined 21st century literacy as the ability to use "digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society" (International ICT Literacy Panel, 2001, p. 2). Although reading, writing, listening, and speaking continued to be important skills, basic literacy required students to be able to decipher meaning and express ideas through a range of media.

Scientific literacy. Scientific literacy has been identified as a knowledge and understanding of the scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity (National Academy of Sciences, 1995). Students who were scientifically literate had the knowledge and understanding of scientific concepts and processes required for participation in a digital age society. Students could ask, find, or determine answers to questions derived from curiosity about everyday experiences. In addition, they had the ability to describe, explain, and predict natural phenomena and had the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately (North Central Regional Educational Laboratory, 2014).

Economic literacy. Economic literacy has been acknowledged as the ability to identify economic problems, alternatives, costs, and benefits; analyze the incentives at work in economic situations; examine the consequences of changes in economic conditions and public policies; collect and organize economic evidence; and weigh costs

against benefits. Students who were identified as economically literate could evaluate costs, benefits, and the limitations of resources; using this knowledge to make informed choices as consumers, producers, savers, investors, and citizens (North Central Regional Educational Laboratory, 2014). In addition, students understood that economists often held differing views on economic issues. This last understanding was especially important for topics, such as the appropriate size of government in a market economy, how and when a government should deal with unemployment and inflation, and how and when it should promote economic growth.

   Technological literacy. Technological literacy recognized knowledge about technology, how it worked, what purposes it could serve, and how it could be used efficiently and effectively to achieve specific goals (North Central Regional Educational Laboratory, 2014). Students who were technologically literate demonstrated a sound conceptual understanding of the nature of technology systems and viewed themselves as proficient users of these systems. Technologically literate students understood and modeled positive, ethical uses of technology in both social and personal contexts. They used a variety of technology tools in effective ways to increase creative productivity. Just 20 years ago, cell phones, laptops, pagers, and fax machines occupied the realm of science fiction. Today, these technologies and the Internet have gained widespread public acceptance and use. It was clear that in today's digital age, students are required to be technologically literate to live, learn, and work successfully.

   The No Child Left Behind Act (2001) required states to provide for technological literacy by the time the student finishes the eighth grade. Students are not only required to become competent in the use of technology and associated applications; they also are

required to be able to apply their skills to practical situations. Most experts agreed that students should develop technological skills in the context of learning and solving problems related to academic content (Baker & O'Neil, 2003).

Visual literacy. Visual literacy was recognized as the ability to interpret, use, appreciate, and create images and video using both conventional and 21st century media in ways that advanced thinking, decision making, communication, and learning (North Central Regional Educational Laboratory, 2014). Students needed to have a working knowledge of the meaning of visual messages produced or displayed through electronic media, and the ability to apply that knowledge of visual messages in electronic media.

Visualization tools enable students to make their thinking visible in all academic areas. Students were able to build interactive models to test theories in real time and use graphics to display results. Graphic organizers and visual mapping tools enabled students to make sense of complex subjects by exploring linkages, relationships, similarities, and differences between phenomena, and visually representing interplay among system components (Linn & Hsi, 2000).

Information literacy. Information literacy has been described as the ability to evaluate information across a range of media; recognize when information was needed; locate, synthesize, and use information effectively; and, accomplish these functions using technology, communication networks, and electronic resource skills (International ICT Literacy Panel, 2001). Students who are information literate are able to identify different sources of information, including text, people, video, audio, and databases. Information literate students could identify and retrieve relevant information from sources to accomplish a relevant task.

The digitizing of resources raised new issues of analysis and evaluation. The International ICT Literacy Panel (2001) asked education entities to consider a student who was asked to prepare a presentation based on information from the World Wide Web. Students in the digital age were required to demonstrate the skills necessary to access large quantities of information without a lot of understanding, because search engines made accessing information straightforward. But, the International ICT Literacy Panel cautioned:

> Using search engines well requires an increased skill level. Evaluating and synthesizing information found in a variety of sources requires even more advanced skills, representing a literacy that is far beyond what is needed in a more constrained environment, such as with textbooks where all the information is contained within one source. In effect, because technology makes the simple tasks easier, it places a greater burden on higher-level skills. (p. 6)

Multicultural literacy. Multicultural literacy is the recognized ability to understand and appreciate the similarities and differences in the customs, values, and beliefs of one's own culture and the cultures of others (North Central Regional Educational Laboratory, 2003, p. 20). Students who were multiculturally literate appreciated and accepted similarities and differences in beliefs, appearances, and lifestyles. These students understood how technology impacted culture.

Every student should have the opportunity to interact cross-culturally in meaningful ways. Such interaction might include communicating via e-mail or videoconference with peers in other countries to enhance language proficiency; participating in a shared environmental science project; or sharing viewpoints on

international events via moderated, online exchanges. Whether across town or across the globe, the learning that took place from both formal and informal dialogue could serve as a bridge to openness and appreciation of diversity and other cultures (North Central Regional Educational Laboratory, 2003).

Global awareness has been defined as the, "Recognition and understanding of interrelationships among international organizations, nation-states, public and private economic entities, sociocultural groups, and individuals across the globe" (North Central Regional Educational Laboratory, 2003, p. 30). Students who are globally aware are knowledgeable about the historic, political, economic, technologic, social, linguistic, and ecological connectedness of the nations of the world. They are able to recognize, analyze, and evaluate major trends in global relations and the interconnections of these trends with both their local and national communities (North Central Regional Educational Laboratory, 2003).

Thomas Friedman (1999) noted that globalization had replaced the Cold War in defining international relationships. Access to telecommunications and technology had resulted in shifts in power from nation-states to multinational corporations, public and private economic entities, sociocultural groups, and even individuals. According to John Naisbitt (1994),

> With the activities of the world being replayed for us in our living rooms each night, none of us can feign ignorance about affronts to society's ethical standards. We have all become our brother's keepers, at least in this sense. Communications technology has empowered individuals and communities through instant access to information of all kinds. Responsibility comes with that access. (p. 193)

The Committee on Workforce Needs in Information Technology (2001) defined intellectual capabilities as "one's ability to apply information technology in complex and sustained situations and to understand the consequences of doing so" (p. 18). These capabilities are "life skills" (p. 18) formulated in the context of digital age technologies. Apart from acquiring digital skills, it is also important for digital age learners to develop inventive thinking (21st Century Workforce Commission, 2000).

Inventive thinking included adaptive thinking which developed the skills needed to manage the complexities that came about as a result of rapid changes in society and rapidly evolving technologies (21st Century Workforce Commission, 2000). As technology became more prevalent in our everyday lives, cognitive skills became progressively more critical. "In effect, because technology makes the simple tasks easier, it places a greater burden on higher-level skills" (International ICT Literacy Panel, 2001, p. 6).

The arrival of the digital age brought with it the necessity for digital literacy skills. These 21st century digital literacy skills were being driven by the fact that the world was turning into a global village, thanks largely to the internet (21st Century Workforce Commission, 2000). Education systems were given the task of supporting the learning of the 21st century literacy skills necessary to function effectively in the digital age. The digital age came with many complex challenges and tasks that, unless one was properly equipped with the necessary skills, navigating the complexities and developing into a digital age learner may prove to be extremely challenging.

Online Education History and Trends

The roots of online education can be traced to the corporate world of the 1980s

when companies used computer-based programs to offer training to their new employees

(Kentnor, 2015). Many companies found this process to be very cost effective as fewer

trainers were required, thus significantly reducing training expenses. In 1989, the

University of Phoenix created one of the first online educational programs (Kentnor,

2015; University of Phoenix, 2015). Three years later, the World Wide Web was

revealed, with the University of Phoenix becoming one of the first educational

institutions to offer online education programs through the internet. Although the

University of Phoenix was a for-profit organization, the transition toward the online

educational market encouraged many institutions and not-for-profit colleges and

universities to follow (Carlson & Carnevale, 2001).

     The Alfred P. Sloan Foundation (2015), a philanthropic, not-for-profit grant-

providing institution, developed the Asynchronous Learning Networks (ALN) in 1992 to

explore educational alternatives for those unable to attend traditional classes in the

classroom (Alfred P. Sloan Foundation, 2015). As online education continued to develop,

the Foundation also began funding organizations that offered online programs in an effort

to advance the quality of online education. The effectiveness of distance education was

obvious. As Kentnor (2015) stated, "It was only a matter of time before academia entered

the market" (p. 28). Within just a few years, universities and colleges began

experimenting in online courses. Although online learning witnessed moderate growth in

the mid-1900s, the rapid progress of online education in traditional nonprofit institutions

did not start until 1998 (Arenson, 1998).

     The first purely online curriculum was introduced in 1986 by CALCampus, a

distance learning organization, by founder Margaret Morabito (2015). Founded in 1982

as a computer assisted learning center for adults, CALCampus quickly expanded its operating mission to include utilization of the World Wide Web. As of 2015, CALCampus methods of course delivery included directed individual study as well as the option to meet live with their instructors on campus (Morabito, 2015). Myriads of universities and colleges have followed suit and begun to offer courses and program through online formats.

Other online education programs began to develop shortly after CALCampus. In 1996, a U.S. Department of Education grant enabled the Concord Consortium in Massachusetts and the Hudson Public School District to create the Virtual High School (VHS) project (Kozma, Zucker, & Espinoza, 1998). During the 1998-1999 school year, 700 students were enrolled in 35 different internet courses. The following school year, VHS expanded their course offerings to include more than 100 various internet courses which resulted in approximately 4,000 additional students enrolled in these internet courses (Espinoza, Drove, Zucker, & Kozma, 1999).

The mid-1990s saw significant growth in the field of computer technology, making online education not only more effective but also more accessible. Assignments could be completed and submitted online without the necessity of printing. Presently, different types of online learning have emerged catering to a variety of learning styles and learning levels. While some courses are purely online, others consist of a combination of online and in-class meetings, often referred to as blended or hybrid models of instruction.

Distance education continued to show an important role in education in the United States, as it provided greater access and an affordable option (Kentnor, 2015).

Transitioning from the Postal Service, to spark transmitters, to television broadcasting, to the Internet and the Web, developments in communication technology have changed the landscape of education and the spread of distance education. Kentnor stated, "Online education is the fastest growing form of distance education and is valued at both traditional and non-traditional colleges and universities" (p. 30). In 2011, 65% of institutions reported that online learning was essential to their long-term strategic plans (Allen & Seaman, 2011). In short, online education was no longer simply a trend.

As the National Association of State Boards of Education (NASBE) (2001) historically proclaimed, "Evidence to date convincingly demonstrates that, when used appropriately, electronically delivered education, e-learning, can improve how students learn, can improve what students learn, and can deliver high-quality learning opportunities to *all* children" (p. 4). The NASBE study examined the data, considered the uncertainties and concerns related to online learning, and concluded, "E-learning will improve American education in valuable ways and should be universally implemented as soon as possible" (p. 4).

Early studies revealed distance education's effectiveness was not statistically different compared to regular face-to-face classroom learning (Johnson, Aragon, Shaik, & Palma-Rivas, 2000; U.S. Department of Education, 2010). As a result, policymakers reasoned that if online instruction was comparable to face-to-face instruction in terms of student learning, then online education could be justified on the basis of cost efficiency or improved learner access. Today, research suggests students generally learn as much online as they do in traditional face-to face classrooms (Ragan & Kleoppel, 2004; Reasons, Valadares, & Slavkin, 2005). Recent studies revealed students who took part or

all of their courses online performed better than those who completed the same course through face-to-face courses (Patrick & Powell, 2009; U.S. Department of Education, 2010). A 2012 survey showed a substantial improvement in the opinion of academic leaders on the relative quality of the learning outcomes for online education. The percent of academic leaders who initially reported learning outcomes in online environments were inferior or somewhat inferior dropped from 32.4 percent in 2011 to 23.0 percent in 2012 (Allen & Seaman, 2013).

Distance learning has offered educational opportunities that met students' changing needs and granted them the flexibility to access learning opportunities anytime, anyplace, and at a pace that meets their individual learning styles (Natriello, 2005). Distance learning has provided educational opportunities that had the potential to meet students' changing needs and afford them increased flexibility in terms of those individual learning needs (Penn State University, 1998).

Online learning has provided specialized learning opportunities for students who have unique and varied learning styles and intelligences, and allowed flexibility in terms of attention to time on task that simply was not practical in traditional classroom settings. When used correctly, distance learning applications utilized the computer and internet to create opportunities for discovery learning (Ally, 2004).

On-line learning also had the potential to provide the most current and timely information (Penn State University, 1998). Traditional printed textbooks are potentially out of date the moment they were printed. However, with the use of the World Wide Web, the learner could have almost instant access to the most updated information.

Online education is increasingly prevalent throughout our modern world (Burgess & Strong, 2003; Watson, Pape, Gemin, & Vashaw, 2015). Burgess & Strong (2003) reported that online education opportunities would continue to rise given the high number of learning institutions increasingly opting for online instructional delivery.

Perceptions, Advantages, and Barriers

Perceptions. Different groups of people, including students and educational professionals, have widely varying perceptions of online education. Educators themselves have held conflicting attitudes toward online education. The overall quality of online education has often been called into question. According to Shelton and Saltsman (2005), some of the most common complaints from faculty regarding online education were the lack of understanding of this method of teaching; the lack of institutional support; and fear that the quality of education in the online environment suffered.

One issue frequently discussed suggested that online learning could suffer from subpar instruction. Teachers in an online setting were often required to assume new roles, learn non-traditional teaching methods, and continually update their knowledge as technology evolved. A teacher that was not adept at adopting new technologies or tailoring lessons to work well in an online learning format could experience significant struggles (Moeller & Reitzes, 2011).

Other issues arose when discussing the online delivery of education services. For example, the course content in an online course might not be considered as rigorous as the content taught in traditional face-to-face institutions (Watson, 2015). Or, the technology used in online learning formats may have had negative effects on an online student's educational experience. For example, online classes could experience

technological glitches, making it difficult for learners to access the course and actively or consistently participate in online courses. In addition, if a student was unfamiliar with a new computer program or wary of using new programs, his or her perceptions of the online course might be altered. Further, a student's inexperience and/or frustration with a new online tool or course would undoubtedly affect the quality and depth of his or her learning (Allen & Seaman, 2013).

Many educators who were very familiar with the online education environment strongly supported it as a viable method of instructional delivery (Allen & Seaman, 2013; Hannay & Newvine, 2006). Though most educators were willing to facilitate online learning, some viewed the delivery of online education as being of lower quality than the traditional face-to-face learning environment. Allen and Seaman (2013) reported the percentages of academic leaders viewing online learning inferior or somewhat inferior from 2003 through 2006 remained constant. However, opinions from the same group of academic leaders improved significantly by 2011, with fifty percent fewer academic leaders rating online learning as inferior.

Experienced educators perceived that some of the interactions that typically took place in the traditional classroom could not be replicated online. For example, teachers could not see the expressions on their students' faces, and were, therefore, unable to gauge how well the material was being received. Similarly, online educators had fewer options to use classroom theatrics to intrigue their students or fewer observations of physical cues for feedback (Hawkins, Graham, & Barbour, 2012). Instructors who were not effective at stimulating communication and interaction in online courses could cause students to feel secluded, uninterested, and over-loaded (Borup, West, & Graham, 2012;

Reilly, Gallagher-Lepak, & Killion, 2012). Effective teachers adjusted to student needs, used meaningful examples, motivated students to do their best, facilitated the course successfully, communicated well, and showed concern for student learning outcomes (Young, 2006).

Another identified potential drawback of online learning was that it might offer very little social interaction with peers. Joseph E. Aoun, (2011) president of Northeastern University, stated,

> Compared with online students, students in place-based higher-education settings are exposed to something subtle but vital: The chance encounters that come with membership in a diverse intellectual community, whether a guest lecture, a conversation with a peer majoring in a different field, or the experience of befriending someone from a different background, place-based encounters can spark new interests and set students on fulfilling paths they might never have traveled otherwise. (para. 14)

Consequently, online learning was not regarded as an ideal learning situation for those learners who value such interactions.

Online education is also not the best learning style for all learners, especially those who require a more personal interaction with the instructors, those with problems of procrastination, and those who require regular motivation from the instructor (Allen & Seaman, 2013).

Conversely, students seemed to be very receptive to distance learning opportunities. Howell, Williams, and Lindsay (2003) stated, "The literature is replete with evidence of the growing demand for distance education" (Distance Learning Trends

Section, #28, para. 1). Watson et al. (2012, 2013, 2014, & 2015) further reported evidence of the continued growth of online learning opportunities. Historical explanations for these notable growths included efforts to expand access to more students and the capitalization on emerging market opportunities (Oblinger & Kidwell, 2000). Recent explanations included student demand and the significance of chief academic leaders identifying online learning as a critical component to their long-term strategies (Allen & Seaman, 2013).

Students did not raise many concerns regarding limited interaction with the instructors. Students touted reduced tuition, increased personalized educational experiences, flexibility, and accessibility as benefits of online instruction (Allen & Seaman, 2013). Still, many employers continued to have a negative perception of online education and were reluctant to acknowledge post-secondary degrees resulting from this mode of learning (Hannay & Newvine, 2006). A study conducted in 2013 by the Babson Survey Research Group revealed just over 40 percent of academic leaders believe a lack of acceptance of online degrees by potential employers remained a barrier to widespread option of online learning (Allen & Seaman, 2013).

Durrington, Berryhill, and Swafford (2006) claimed the change in delivery system from traditional face-to-face instruction to an online mode presented challenges to distance education administrators, students, and faculty. Students often faced a dilemma, because they preferred traditional face-to-face courses with which they were most familiar, yet their life situations made it necessary for them to take online courses.

Bower and Hardy (2004) emphasized distance education had changed numerous aspects of teaching, such as course content selection and coverage, teaching methods,

teaching roles, student interaction, and communication. Research has also shown that teaching online involved different skills and pedagogies from those needed in face-to-face environments (Fetherston, 2001). In 2006, Allen and Seaman (2013) reported 40.7 percent of post-secondary academic leaders believed online courses required more time and effort to teach. Subsequently, in 2012, the report revealed an increase to 44.6 percent of post-secondary academic leaders believed it required more time and effort to teach online.

Advantages. One of the most desirable characteristics of online education has been its flexibility. Courses could be completed from anywhere as long as an internet connection and a computer were available, making it very convenient for many learners (Allen & Seaman, 2013). Similarly, online education saved the learner the trouble of commuting to the learning institution, thus reducing travel expenses and time. Given that the learner was no longer restricted by geographic proximity to learning institutions, online education offered the learner a wide range of schools and programs to attend from across the world.

Online education could also be delivered at a relatively low cost; often lower than their counterpart of on-campus delivered education (Allen & Seaman, 2013). For example, digital textbooks could be marketed, sold, and updated more inexpensively than a traditional printed textbook (Allen & Seaman, 2013). Lastly, online education was much easier to participate in while working since it could be completed on an individualized schedule (Allen & Seaman, 2013).

Picciano and Seaman (2010) stated,

Online learning is seen as a means to broaden and expand student experiences. It

allows students looking for more advanced work to test and challenge their skills

by taking more demanding instructional material. It also allows students who

might be at risk to make up coursework that they have missed in order to

graduate. (p. 2)

Picciano and Seaman also reported that high school administrators observed benefits to

online learning programs and were moving forward with expanded online learning

opportunities.

Barriers. Online education had verifiable advantages for many students and has

been successful in numerous educational settings (Allen & Seaman, 2013; Blomeyer,

2002; Kozman, Zucker, & Espinoza, 1998; Natriello, 2005). However, several types of

barriers continue to exist with online learning. For example, personal barriers have

hindered this method of learning since it is not suitable for all individuals. Learners who

need more personal attention, for instance, or those who required constant motivation,

have found online learning environments to be insufficient for their learning needs

(Muilenburg & Berge, 2005).

Another barrier has been associated with the learning style employed by some

online learning organizations. Instructional barriers serve as a hindrance to online

learning as the result of learners and instructors being separated by time and or space,

thus limiting their full interaction (Hannay & Newvine, 2006).

There were other problems that have emerged as online education has tried to

gain a more secure foothold in American education. Technological barriers have limited

access to learning opportunities. Access to advanced video and World Wide Web

multimedia required significant bandwidth and advanced technology to implement

effectively. These resources have not always been available to learners at every location. In addition to the costs associated with increased bandwidth, online learning programs cost more than traditional face-to-face learning. A study from the Colorado Department of Education detailed "the cost per student of a high-quality online learning program is the same as or greater than the per-student cost of physical school [i.e., traditional] education" (Branigan, 2003, p. 1).

The suitability of some academic content and the age appropriateness of some curriculum materials have also been identified as additional barriers to effective online education, especially because of the broad scope of this kind of education, making it difficult to formulate a suitable curriculum for all the learners. Dr. Tanya Byron (2008), stated,

> Technology offers extraordinary opportunities for all of society including children and young people. The internet allows for global exploration, which can also bring risks, often paralleling the offline world. Video gaming offers a range of exciting interactive experiences for children; however, some of these are designed for adults. There is a generational digital divide between parents and children which means that many parents do not feel empowered to manage risks in the digital world in the same way that they do in the 'real' world. (p. 3)

Additionally, Picciano and Seaman (2010) stated, "Educators express concerns that online learning is not as effective as face-to-face instruction" (p. 2). Concerns reported included the maturity level of the learners in the online setting, the level of self-motivation evident with these learners, and the study habits, organizational skills, and level of academic preparedness demonstrated by these learners that would facilitate

success in an online learning environment.

Added barriers to effective online learning implementation might exist between differences in superintendent and principal pedagogical knowledge and operational considerations. Bowman (2005) concluded that superintendents use different factors when making decisions. EdSource (2007) affirmed this position by acknowledging that, superintendents, as executives, oversee their district's implementation of policies. Superintendents must make certain that their districts use state and federal funds appropriately and meet reporting requirements and deadlines. They are ultimately responsible for all educational and support programs within their school district, such as feeding students, transporting them to and from schools, and providing clean, safe environments favorable to teaching and learning. Every aspect of educating a student falls under their responsibility.

Principals are both school leaders and middle managers. Most principals must work within the systems set up by their school districts. "Many experts say that the most effective principals are those who can create learning environments that are supportive, professional, and collaborative" (EdSource, 2007, p. 3). These variations of responsibilities between superintendent and principals may create barriers to implementing online learning efficiently and effectively.

Additionally, online education has been affected by organizational barriers. The complexity of the World Wide Web made organizing and managing the vast amounts of information available on the internet significantly complex (Muilenburg & Berge, 2005). For example, Knewton® was an adaptive educational platform partnering with companies such as Pearson, Cengage, Houghton Mifflin, Harcourt, and Wiley to create

personalized digital learning coursework for students using predictive analytics (Maccarthy, 2014). The use of big data analytics required the collection of millions of data points representing annual student academic performance. This data had to be collected, organized, analyzed, and stored. The International Finance Corporation, an affiliate of the World Bank Group, stated, "Perhaps the biggest stumbling block to using data in schools isn't technological, though. Rather, it's the fear that doing so will invade the privacy of students" (Maccarthy, 2014, p. 1).

Furthermore, some employers and institutions may be reluctant to acknowledge online degrees, which may result in problems within the job field. Allen and Seaman (2013) reported opinions of academic leaders changed very little from 2007 through 2012 in regards to employer's acceptance of online education as viable preparation for the world of work.

Adams and DeFleur (2005) conducted a national survey to assess the acceptability of a job applicant who hypothetically earned a doctoral degree from a traditional, online, or mixed-delivery program. One hundred and nine surveys were received from chairpersons of search committees from thirty-seven states. A significant number (98%) of the respondents selected the candidate with the traditional degree. As Adams and DeFleur stated, "It seems clear that those applying for a faculty position in the institutions included in this analysis would have virtually no prospect of gaining employment if they had earned their doctorate solely online" (p. 79).

Online learning also required the learner to adapt to the new technology which may not be ideal for those who are not comfortable working with computer and online programs, or are unable to keep pace with the rapidly evolving advancements in

technology. Ryan Barton (2013), president of Mainstay Technologies, stated,

> There is an ancient Persian tale of the inventor of the game of chess. When the
> ruler of the land was presented with the chessboard he was so pleased, he offered
> a gift. Upon reflection, the inventor asked for rice. He put a single grain of rice on
> the first square, and his request was simple: he asked that the rice double for each
> square. The emperor readily greed, believing he had gotten off easy. The net
> result? For the final square alone, the king owed 2 to the 64th power, or
> 18,446,744,073,709,551,616 grains of rice. The entire country's wealth was
> forfeit to keep the promise. (para. 2)

Intel co-founder Gordon Moore coined the term "Moore's Law" in 1965 to
describe the rate of change within technology advancements (Clark, 2015). Moore
predicted that transistor speeds on computer processors would double every two years.
Many predicted this would be a short-term law and could not continue for any significant
length of time. However, almost 50 years later, Moore's Law continues. Moore's Law
emphasized the importance of the learner to be able to continually adapt to new
technology.

Lastly, some courses cannot be entirely completed online, especially those that
required some practical sessions like nursing and teaching. The University of Phoenix
(2014) presented a Master of Science in Nursing degree program that was accredited by
the Commission of Collegiate Nursing Education (CCNE). The online program prepared
registered nurses who had previously earned their bachelor's degree to receive their
Master degree. Although the coursework was offered online, there was a practicum
project and a sixty-hour clinical requirement to be completed within twelve months

(University of Phoenix, 2014). According to the National Council for Teacher Quality (2011), "The student teaching experience, which should last no less than 10 weeks, should require no less than five weeks at a single local school site and represent a full-time commitment" (p. 3).

Adoption of Technology

Prensky (2010a) coined the terms digital natives and digital immigrants in 2001. Digital natives were also referred to as the Net Generation (Oblinger, 2004). The Net Generation or digital natives described the generation born after 1980, around the time of significant increase in the nature of communications technologies, which brought about email, the Internet, and the World Wide Web (Oblinger, 2004; Prensky, 2010a). Prensky (2010a) further described those born prior to 1980 as digital immigrants. Prensky stated, "As digital immigrants learn – like all immigrants, some better than others – to adapt to their environment, they always retain, to some degree, their "accent," that is, their foot in the past" (p. 2). Prensky explained,

> The digital immigrant accent can be observed in actions, such as turning to the Internet for information second rather than first, or in reading the manual for a program rather than assuming that the program itself will teach us to use it. Today's older folks were "socialized" differently from their kids, and are now in the process of learning a new language. And a language learned later in life, scientists tell us, goes into a different part of the brain. (Prensky, 2010b, p. 2)

The most extensive research to date on the question of the disparity between digital natives and digital immigrants has been the longitudinal study conducted by Guo, Dobson, and Petrina (2008). The study, conducted from 2001 to 2004, included a sample

of 2,583 pre-service teachers divided into four different age groups, (1) 20-24, (2) 25-29, (3) 30-40, and (4) over 40. Through their observed testing of the teachers' information technology literacy skills, Guo et al. came to the conclusion that no statistically significant difference existed between digital natives and digital immigrants. While Guo et al. agreed that there may be psychological, social, and learning behavior differences in the approach to digital technologies between adult and young users, Guo et al. stated the native-immigrant divide, "Does not appear to hold up" (p. 252).

Recent research was beginning to reveal generational differences of users of technology. The Pew Research Center (2015) reported as of January 2014, 97% of 18-29 year olds in America use the internet as compared to 88% of 50-64 year olds and 57% of adults older than 65 years of age. Adult internet use in America had risen from 14% in 1995 to 87% in 2014 (Pew Research Center, 2015).

The level of education attainment associated with technology users appeared to have minimal effects on technology adoption. Colley and Comber (2003) found differences in attitudes towards technology use between young users grouped into 11-12 year-olds and 15-16 year-olds. A survey conducted by Weiss and Hanson-Baldauf (2008) on email utilization by students and faculty at the University of North Carolina at Chapel Hill, found that differences between the two cohorts were associated with the approach to matters such as netiquette, response turnaround, and text structure, than of actual volume of usage.

There has been limited research conducted regarding gender differences among technology users. Sauter (2012), referenced studies that utilized a stereotype threat construct to explain why women tended to reject information technology opportunities as

a profession. Sauter determined whether or not a stereotype threat existed in an

instructional technology (IT) program in a college of business and, if present, how it

affected women's confidence in their ability and motivation to continue their IT

education. Sauter's results showed no support for the stereotype threat hypothesis. Wang,

Wu, and Wang (2009) also noted that the effects of gender and age had received

comparatively little literature review.

Implemented Models of Distance Education

Distance learning incorporated various educational models of instruction with

each model exhibiting individual strengths and weaknesses. The models were described

in terms of the instructional delivery method used and the types of interaction involved

between learner and instructor (Hannay & Newvine, 2006). This section examined the

strengths and weakness of several distance learning models that have been implemented.

The model that initially dominated the field of distance learning was identified as

the independent model. The Moody Bible Institute (2012) had implemented this model

for about a century. In this model, the student completed the course without any direct

interaction from either the instructor or other students. After receiving the learning

materials, which may have included books, lectures, and assignments at the beginning of

the class, the learner had the opportunity to learn at an individualized pace. After

finishing all the assignments and in some cases a proctored exam, the student received a

grade for the course within a predetermined time. This model had the advantage of

allowing the learner to learn at his or her own pace as well as to study at his or her own

convenience.

In January 2000, the Moody Bible Correspondence School pioneered a Bachelor of Science degree in Biblical Studies completely online (Moody Bible Institute, 2012). However, the weakness of this model was that it denied the learner access to feedback from his or her classmates as well as regular interaction with the instructor.

The limitations of the independent model led to the development of the tutorial model of online learning. The tutorial model facilitated improved interaction between the instructor and the learner, thus addressing one of the shortcomings of the independent model (Hannay & Newvine, 2006). The tutorial model allowed the learner to work at an individualized pace while offering the learner an opportunity to regularly interact with the instructor. Interaction between the learner and the instructor could be in the form of weekly or monthly phone calls or submission of the completed assignment that required instructor feedback. The strength of this model resided on the fact that the learner was not left to complete the course totally independently. The learner regularly received assistance from the instructor. However, a significant weakness of the tutorial model was the speed at which the learner could progress through the course, especially if each assignment had to be submitted and the feedback provided prior to the learner advancing to the next assignment.

The last model in this category was the group model (Hannay & Newvine, 2006). This model allowed the learners to interact with their instructors as well as their fellow learners. The group model simulated the traditional classrooms, except for the fact that the learners and the instructor were far apart. This model had the strength of reducing the feeling of isolation that had long been associated with online learning. This model provided students with opportunities to interact and even form relationships with other

students and the instructor as they progress through a course together. However, this model had the shortcoming of limiting students who would have otherwise preferred going through the course at a pace faster or slower than the stipulated academic calendar.

Instructions had to be delivered to the learners if effective distance learning was to be achieved. Instructional delivery acquired the model of videoconferencing, viewing television or videocassette recordings, listening to audiocassette recordings, or the posting of prerecorded video materials posted on the World Wide Web. Initial models of online learning included the use of audiocassettes used to deliver the learning content (Hannay & Newvine, 2006). Audiocassettes were preferred by instructors and learning institutes because they were affordable, very portable, and could be used by the learner anywhere. This model allowed the instructors to supplement the required reading with their own comments in an effort to make the content more understandable. However, this model did not work well with visual learners, making it necessary to develop a more advanced model (Franklin, Yoakam, & Warren, 1995).

Audiocassettes were shortly followed by televised or videotaped lectures because this technology was able to incorporate the sense of sight into the learning process (Hannay & Newvine, 2006). This model allowed for the wide use of television clips, graphs, charts, and other visual information to enhance the learning process. The model also allowed the learner to view the instructor as they presented the lesson, thus making the learning process more personal. Video recorded lectures were very effective since they could be paused, rewound, and then viewed again until the learner fully grasped the intended concept. Despite the advantages, this model proved to be quite expensive, thus increasing the cost of distance learning (Franklin, Yoakam, & Warren, 1995).

Video conferencing was a more technologically advanced model that required the students and the instructors to be in specifically equipped rooms with microphones, cameras, and television screens that enabled two-way conferencing. The learning process resembled the form of a traditional classroom style where everyone could participate in the process, even though the students were located in remote locations (Moore & Kearsley, 1991). The students were able to watch the instructor and ask questions, and they were able to interact with other students, giving the learning environment the feel of a more traditional classroom. However, this model was often accompanied by extremely high costs. Video conferencing was often inconvenient as different learners had to present themselves at a particular time and each of them had to be in an appropriately equipped room.

The most recent model of distance learning was the multiple educational delivery model (Hill, 2012). The multiple educational delivery model combined the advantages of each of the other delivery models and did it more efficiently. Early online models experienced significant limitations as a result of the slow internet connection speeds that were available to students and instructors. Students with slow modems or limited internet bandwidth availability were not able to access large multimedia files and experienced difficulty in accessing streaming videos and audios. Today, these limitations are minimized by the advancement in online technology through high-speed internet, cable modem, or satellite to access high-speed bandwidth. Ragan (2015) stated, "Today's online learner recognizes this requirement as a cost of the advantage of the "anytime/anyplace" educational opportunity" (p. 23).

The State of Michigan, recognizing that it could no longer count on the auto industry to absorb its traditional schooled workers, redesigned its high schools to include more rigorous graduation requirements. The Michigan State Board of Education (2005) required that all high school students complete at least one online course or e-learning experience in order to graduate. A Michigan State Board of Education member noted that the inclusion of an online educational experience represented, "A great balance that creates flexibility for school districts. It gets us where we should be today and challenges us to think more of where we need to get to tomorrow" (p. 1).

Within one year of requiring an online experience in order to graduate high school, a member of the Michigan State Board of Education (2006) commented, "Completing a meaningful online learning experience in grades 6-12 with a specific emphasis at the high school level will allow students to become familiar with a key means of increasing their own learning skills and knowledge" (p. 1). Members of the Michigan State Board of Education noted that online activities called for learning activities that used technology with web tools and resources as the delivery method for instruction. The Michigan State Board of Education believed completing a meaningful online learning experience would better prepare students for the demands present in higher education, the workplace, and in life-long learning. Michigan's required online learning experience was the first of its kind in the nation.

Idaho code 33-5502 created within the Idaho State Department of Education the Idaho Digital Learning Academy(IDLA) in 2002 (Idaho Digital Learning Academy, n.d., Our Mission Section, para. 1); a school-choice learning environment that joined the best technology with the best instructional practices. The IDLA attempted to unite 115 school

districts with highly qualified teachers, online course opportunities, and expertise in online education for the entire state of Idaho (Idaho Digital Learning Academy, n.d., Our Mission Section, para. 2). The Idaho Digital Learning Academy received funding from course fees charged to participating schools in addition to an annual appropriation. The IDLA does not grant credit or issue diplomas.

Additional evidence of successful implementation of online learning was found in the study produced by Heckman and Annabi (2006). The results of this study demonstrated that asynchronous online discussions could generate a higher level of cognitive analysis than the same discussions conducted in the face-to-face classroom. Furthermore, Heckman and Annabi demonstrated the role of the teacher in an online course changed in five important ways:

> From (a) choreographer of an implicit Socratic dialogue to designer of explicit new learning structures, (b) from questioner of students to trainer of student questioners, (c) from provider of feedback to teacher of student responders, (d) from provider of information to teacher of student information providers, and (e) from analyst (with a focus on rational deduction) to editor (with a focus on story values). (p. 149)

Picciano and Seaman (2007) conducted a study to explore the nature of online learning in k-12 schools. Three hundred and sixty-six school districts responded to the survey. The study results revealed that thirty-eight percent of responding public high schools had students currently participating in online courses. However, seventy-two percent of the responding school districts were planning to broaden their distance education course offerings.

Three years later, Picciano and Seaman (2010) conducted another study focusing on high school reform and the role of online learning. Four hundred and forty-one high school administrators participated in the study. Eighty-two percent had at least one student enrolled full time in an online course of study and thirty-eight percent had at least one student enrolled part-time in an online course.

In 2008, Clayton Christensen, a professor at the Harvard Business School, with the assistance of Michael Horn and Curtis Johnson, published the book, *Disrupting Class: How Innovation Will Change the Way the World Learns*. Christensen, Horn, and Johnson (2008) supported online learning as an integral part of high school reform. They argued schools should place a greater use of online technology to provide more student-centered and individualized instruction. Additionally, Christensen, Horn, and Johnson (2008), predicted about twenty-five percent of all high school courses would be offered online by the year 2016, and that approximately one-half of all high school courses would be online by the year 2019.

Wyoming Implementation

With the increase of internet usage in America, coupled with an abundance of online course opportunities for all students now available across the country, Wyoming school district administrators must decide whether to exercise online learning options. Wyoming had demonstrated a desire to further the educational opportunities for all Wyoming high school graduates.

The University of Wyoming (2014) made available Hathaway Scholarship opportunities to all qualified Wyoming students. All Wyoming graduating high school seniors with a 2.5 grade point average and a minimum ACT composite score of 19 were

eligible for the minimum Hathaway Scholarship of $840 per semester. Students

graduating with an ACT score of 25 or better and a 3.5 or better grade point average

would receive the maximum amount of $1680 per semester (University of Wyoming,

2014). The Hathaway Scholarship would essentially encourage numerous high school

students to pursue post-secondary education.

A report to the U.S. Congress and the Secretary of Education (Pathways to

Success, 2012) stated,

> College completion rates are stagnant or falling today, particularly among young
>
> Americans, a trend that threatens to undermine the nation's global
>
> competitiveness and further exacerbate inequality in the nation's income
>
> distribution. In the past, efforts to ensure academic quality, access, and student
>
> success in higher education have produced among the highest college completion
>
> rates in the world. Thus, reversing the current trend and increasing college
>
> completion has become an imperative at all levels of American government. (p. 1)

As colleges and universities have offered more and more online courses, there has

been an increased need to prepare Wyoming secondary students to be successful in an

online learning environment. In June 2014, the National Center for Education Statistics

reported that 11.2 percent of University of Wyoming students were enrolled exclusively

in distance education courses, with 17.7 percent enrolled in some, but not all distance

education courses (National Center for Education Statistics, 2014). Wyoming secondary

schools must prepare students for post-secondary success in order to assist in successful

college completion.

As society became increasingly dependent on technology, schools have had to

ensure that their graduates meet minimum technology competencies. According to Borja (2005), "More and more school districts, as well as for-profit companies and nonprofit organizations, are offering internet-based classes in core subjects, such as algebra and reading, and electives such as creative writing" (p. 15).

A survey conducted in September 2015 by the Wyoming Department of Education (WDE) (2015) asked school district superintendents, counselors, principals, technology directors, and gifted and talented coordinators working in Wyoming if their school or district would participate in part-time online courses if they were made readily available. A resounding 93.3% of responses replied "Yes" (p. 15).

Policy adoption was an additional component to ensure students received an adequate education. The allocation of fiscal resources was an additional element necessary to ensure students receive an appropriate education. Determining the cost of an adequate education remained a challenge for most state agencies. Picus (2004) stated, "Adequacy as a concept is still relatively new, and today there are not enough data to help policymakers be absolutely certain that the amount they determine will actually be adequate" (p. 4).

Picus (2004) outlined four approaches, linked with spending and performance, to determine adequate education costs for Wyoming schools. The first approach was "cost functions" (p. 5). This approach attempted to estimate the funding necessary for a student to attain a certain level of performance, while evaluating the financial characteristics of the local district and its students.

The next approach defined by Picus (2004) was the "successful school districts" approach (p. 6). Policymakers examined successful school districts and evaluated their

spending characteristics. This approach was easy to explain to the public, but did not specify a way to make adjustments for characteristics of individual districts as well as students. "Professional judgment" (p. 6), utilized a group of professional educators to evaluate the characteristics of a local district and determine the funding necessary for that district to meet accountability standards. This approach was easily explained to the public, but generally expensive and arguably subjective.

The fourth method was entitled "evidence based" (Picus, 2004, p. 7). This approach was also often referred to as the "whole-school reform approach" (p. 7). The evidence-based approach utilized current educational research to evaluate school performance in order to meet defined standards. Once identified, the specifications were applied to the actual school within the state of Wyoming. Within this model, adjustments were made for low-income families, children with special needs, or students with limited English proficiency. Picus stated, "The major advantage of this model is its reliance on the growing research base about what programs and models have been successful in improving student learning" (p. 7). The significant drawback of the evidence model was that research-based designs are not applicable in every situation.

Adequacy models tended to become quite complex as they attempted to equalize a wide range of special needs. Regardless of the model used, the overall goal of any education program should be to increase student achievement. Wyoming has been fortunate to have the fiscal resources necessary to ensure every student received a quality education.

This study had the potential to assist in identifying barriers and supports associated with effective implementation of online learning opportunities and modalities.

Expanded understanding of online education may lay the groundwork to reduce the restrictions associated with face-to-face classroom instruction and broaden course opportunities through online curricula for students in Wyoming. The research may also provide Wyoming administrators with valuable information regarding online education opportunities.

Chapter III

Methodology

The purpose of this study was to determine the perceptions of Wyoming superintendents and principals regarding the implementation of online educational programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education. This study defined the current state of online education in Wyoming and helped identify the barriers and supports associated with the effective implementation of online learning opportunities and modalities. Understanding the perceptions of Wyoming superintendents and secondary school administrators regarding online education will provide the groundwork needed to reduce or eliminate the restrictions associated with online instruction, and advance course opportunities for thousands of Wyoming students.

This chapter includes information relative to (a) the selection of study participants, (b) the development of the study instrument, (c) procedures for implementing the study, and (d) the process for analysis and interpretation of the data generated from this study. The following research questions guided the study:

Research question 1, "What are Wyoming administrator perceptions regarding online education as an educational option at the secondary level?"

Research question 2, "What are Wyoming administrator perceptions regarding the outcomes of online education programs at the secondary level?"

Research question 3, "What are Wyoming administrator perceptions regarding the barriers associated with effective online education programs at the secondary level?"

Research question 4, "What are Wyoming administrator perceptions regarding the supports necessary to effectively implement online education programs at the secondary level?"

Research question 5, "How do Wyoming school district superintendent perceptions compare with Wyoming secondary school administrator perceptions with relationship to research questions one through four"?

Participants and Sampling

This study employed a quantitative research design to determine the perceptions of Wyoming superintendents and sixth through twelfth grade secondary school principals regarding their perceptions of the current status of secondary online education programs in Wyoming. Wyoming currently consists of 47 public school districts with one superintendent each (including the researcher of this study), and one school district with two superintendents. In addition, Wyoming currently consists of 81 high schools classified according to student enrollment, and 68 total middle schools, junior highs, and elementary schools educating any configuration including sixth through ninth grade students. The researcher was not a respondent in this study. The study solicited responses from the 48 remaining Wyoming superintendents and all 149 secondary school principals of schools educating sixth through twelfth grade students.

The State of Wyoming Department of Education (WDE) maintains a current directory of all secondary school principals and school district superintendents within the state. This directory, entitled the 2015-2016 Wyoming Education Directory, was used by the researcher to individually identify and invite all district superintendents and secondary school principals to participate in the study.

Once all potential participants were identified, the researcher emailed perspective respondents an invitation to participate in the study. The researcher recognized that administrative changes within the schools and superintendent changes within the districts might occur from time to time. The *2015-2016 Wyoming Education Directory* contained email address contact errors as a result. The researcher contacted all schools and school districts associated with undeliverable email notifications in an attempt to update Wyoming superintendent and secondary school participant email addresses, and enhance the study response rate.

Prospective participants received information providing consent to participate in the study along with a copy of the electronic survey. Participants were requested to complete and submit the completed survey within 10 days. Consent to participate in the study was obtained by clearly explaining to prospective respondents that submission of the completed survey constituted informed consent (Appendix E) to participate in the study. Human subject approval for the study from the researcher's Institutional Review Board was obtained prior to the invitation to participate in the study. All Institutional Review Board protocols were strictly followed.

The name of the Wyoming school or school district in which potential respondents were currently employed was included in the demographic data collected. The name of the school or school district in which the Wyoming administrator was currently employed was cross referenced with the 2014-2015 Wyoming Education Directory used to identify potential respondents. After 10 days, those potential respondents who were identified as not having completed the survey were contacted a second time via email to encourage them to complete and submit the survey within five

days in an attempt to increase the study response rate. The names of the school or school district were available only to the researcher and remained as confidential information until completion of the study, at which time the information was destroyed.

The study instrument solicited demographic information that included the name of the Wyoming school or school district, along with the age, gender, years of experience as an educator, years of experience as an administrator, and current administrative position within the Wyoming school or school district of each respondent. A link to the study instrument, including directions for completing and submitting the survey, accompanied the initial electronic correspondence. Responses were submitted electronically via Qualtrics®, a secure data collection website. Demographic data related to respondents were grouped into categories based on predetermined criteria for statistical analysis.

Instrumentation

Development. This study used a researcher-developed survey instrument informed by the literature examined within this study to solicit responses relative to the research questions. Survey prompts on the researcher developed study instrument were generated from four constructs. The four constructs were: (Group A) availability of online educational opportunities; (Group B) outcomes of online learning; (Group C) barriers to effective online learning; and, (Group D) the supports required for effective implementation of online learning.

The research instrument (Appendix A) consisted of 35 items. For example, item one on the research instrument asked respondents to provide their perception to this prompt, "Online courses should be an important part of my school's education program" (see Appendix A). This research item was identified as an important consideration of

online learning programs in eleven resources identified within the literature reviewed for this study. Research prompt two, "Students in my school/district want online courses to be part of the academic program," (see Appendix A) was identified in three different articles reviewed for this study as an important consideration of online education programs. Each item on the survey instrument was supported by multiple references identified in the review of related literature conducted for this study. The survey questionnaire design followed the 27 principles for internet surveys provided and shared by Dillman, Smyth, and Christian (2009). The 27 principles appear in Appendix B.

The literature support for each instrument item enhanced the construct validity of each item included on the instrument. Appendix C is a matrix that correlates each of the four constructs and the literature source reviewed for this study, identified as supporting the inclusion of each specific prompt on the research instrument.

Items for the study instrument were developed from general focus questions that were revealed through a comprehensive review of the related literature. Part one of Appendix D identified specific research items related to the 35 research prompts used to guide this study. Part two of Appendix D identified the four construct topics associated with the 35 research prompts. These general focus questions were assembled into four constructs (see Appendix D part two). Questions in Group A focused on online education as an education option for Wyoming students. Questions clustered in Group B construct focused on the outcomes of online education. Group C construct questions focused on the barriers to online learning. And Group D construct questions focused on the supports needed for online education. Researcher-developed general focus questions for each of the four constructs were:

Construct – Group A - online educational option:

1.   Should school districts in Wyoming offer online courses at the secondary

        school level?

2.   Do Wyoming students request online course opportunities?

3.   Does your district/school currently offer online courses for students?

4.   Are you satisfied with the current number of online course offerings

        available to students in your school?

5.   Are online learning opportunities important to the preparation of students

        entering post-secondary schools?

Construct- Group B - advantages and disadvantages:

1.   Are academic expectations for online learning in my school/district equal

        to the academic expectations of traditional brick and mortar students?

2.   Do online students perform equally well on end-of-course assessments as

        compared with traditional brick and mortar students?

3.   Do online students achieve comparably or better than traditional students?

4.   Are online educational opportunities available for all groups of learners

        (gifted, advanced, struggling, etc.) in your school?

Construct – Group C - barriers:

1.   Are online programs advantageous for your students?

2.   Are disadvantages of online programs for your students identified?

3.   Do online teacher-student relationships compare to traditional classroom

        teacher-student relationships?

4.   Do teaching strategies used for online courses meet student needs?

5.   Is the impact of scheduling on the availability and delivery of online

learning opportunities for students enhanced?

Construct – Group D - supports needed:

1.   Is the impact of online learning on the school or school district's budget

negligible?

2.   Are online courses cost effective?

3.   Are online educational opportunities for students adequately funded in

your school or school district?

4.   Is teacher training provided to help teachers utilize online learning in their

classrooms?

5.   Are teachers prepared for teaching online courses?

6.   Is assistance available for students taking online courses?

The study instrument utilized a five-point Likert scale to assess respondent

perceptions of each item. The Likert scale included a range of responses that included 5-

very important/strongly agree, 4 - important/agree, 3 – neutral, 2 - not very

important/disagree, and 1 - not important/strongly disagree (Gall, Borg, & Gall, 2007). A

copy of the survey instrument can be found in Appendix A. Allen and Seaman (2007)

explained that using alternatives to a formal Likert scale could include the use of a

continuous line or track bar. A track bar used in this way can result in a continuous

interval measure. Allen and Seaman (2007) affirmed,

Your initial analysis of Likert scalar data should not involve parametric statistics

but should rely on the ordinal nature of the data. While Likert scale variables

usually represent an underlying continuous measure, analysis of individual items

should use parametric procedures. Combining Likert scales into indexes (indices) adds values and variability to the data. If the assumptions of normality are met, analysis with parametric procedure can be followed. Finally, converting a five or seven category instrument to a continuous variable is possible with a calibrated line or track bar. (Conclusion Section, para. 1)

Reliability and validity. Informed by the literature reviewed for this study, a survey instrument aligned with the purpose of the study and research questions that guided the study were developed. Development of a valid and reliable questionnaire was necessary to decrease measurement errors (Radhakrishna, 2007).

Ary, Jacobs, Razavieh, and Sorenson (2006) stated there were two kinds of measurement errors, "Random errors of measurement and systematic errors of measurement" (p. 254). A random error would occur as the result of pure chance and may inflate or deflate results. Because random errors were unpredictable, they contributed to reliability problems associated with data interpretation. Systemic errors were predictable and may inflate or deflate results. Ary et al. explained that systematic errors of measurement are the root of validity problems associated with a study. Failure to follow appropriate procedures in design, development, and implementation of a research questionnaire may undermine the quality and utilization of the data collected (Esposito, 2002).

The researcher followed Radhakrishna's (2007) five-step process to develop a valid and reliable questionnaire in order to enhance the quality of the research. Step one of this process examined the purpose, objectives, research questions, and hypotheses of this study. Radhakrishna described the importance of developing a thorough

understanding of the problem through a complete and systematic literature search and associated readings. Following a thorough review and analysis of the literature, step two of this process generated a collection of questions to be included on the survey instrument. A systematic review of the literature related to this topic revealed four constructs, which subsequently led to the development of focus questions used to guide the development of a final survey instrument. The four constructs identified included the current availability of online educational opportunities within the school or school district, outcomes of online learning, barriers to effective online learning, and the supports required for effective implementation of online education (See Appendix C which correlated the four constructs with the research, and Appendix D Part 2 which correlated the four constructs with the 35 research prompts).

Step three focused on writing questions and selecting appropriate measurement scales, along with formatting and designing the study instrument. Measurement scales are devices used to quantify a response on a particular question (Radhakrishna, 2007). Independent and dependent variables were identified during step three. Independent variables in this study included the demographic data related to (a) administrative position (superintendent or principal), (b) age, (c) gender, (d) years of administrative experience, and (e) school size. Responses to survey items served as the dependent variable in this study.

Step four was designed to establish the validity of the survey instrument. Validity is the most important consideration in developing and evaluating measuring instruments (Ary, Jacobs, Razavieh, & Sorensen, 2006). Validity for this research instrument was established by utilizing the Delphi technique. The Delphi technique is a widely used

method for achieving convergence of opinion from experts within the field. Delbecq, Van de Ven, and Gustafson (1975) explain that the Delphi technique could be used for achieving the following five objectives:

> To (a) determine or develop a range of possible program alternatives, (b) to explore or expose underlying assumptions or information leading to different judgments, (c) to seek out information which may generate a consensus on the part of the respondent group, (d) to correlate informed judgments on a topic spanning a wide range of disciplines, and (e) to educate the respondent group as to the diverse and interrelated aspects of the topic. (p. 11)

Custer, Scarcella, and Stewart (1999) noted that three rounds of the Delphi technique were sufficient to collect the needed information and to reach consensus. Round one of the Delphi technique traditionally used an open-ended questionnaire as the keystone of soliciting specific information (Hsu & Sandford, 2007). This questionnaire was used as the survey instrument for the second round. Hsu and Sandford stated, "It should be noted that it is both an acceptable and a common modification of the Delphi process format to use a structured questionnaire in round one that is based upon an extensive review of literature" (p. 2).

Round one of validating the survey instrument to be used in this study utilized a structured questionnaire based upon extensive review of the literature. In round two, the Delphi participants reviewed and completed the questionnaire. As a result of the feedback from round two, areas of agreement and disagreement were identified. In round three, each Delphi participant received the questionnaire that included the ratings summarized by the participants in round two. This provided the Delphi participants with a final

opportunity to clarify their perceptions and selections with the survey questionnaire. Participant ratings, minority opinions, and items achieving consensus ratings were distributed to the Delphi participants.

Hsu and Sandford (2007) discussed the most important step in the Delphi process was the selection of the participants to participate in the Delphi process. Since the process focused on receiving expert opinions, Delbecq, Van de Ven, and Gustafson (1975) agreed that three groups of people are well qualified to be subjects of a Delphi study: (a) top management decision makers who will utilize the outcomes of the study, (b) professional staff members together with their support team, and (c) the respondents to the Delphi questionnaire whose judgments are being sought.

The researcher utilized Delbecq, Van de Ven, and Gustafson's (1975) recommendations by selecting a panel of well-qualified subjects to participate in the Delphi process. The panel of well-qualified, top management decision makers consisted of three superintendents and three secondary school principals from the neighboring state of Idaho. The researcher selected and contacted the six administrators from Idaho to conduct the Delphi process. The researcher had 13 years of prior education experience in Idaho and utilized previous contacts and associations to identify and select the six administrative Delphi process participants.

The Delphi process participants were contacted via phone and/or email requesting their participation in the process. Once a panel of respondents was determined, an initial email correspondence was sent to each participant that included an invitation to participate in the Delphi process, information regarding informed consent (Appendix F) to participate in the process, and directions and a timeline for completing and providing

their feedback. A website link to the study instrument accompanied the email request to participate in the Delphi process. The Delphi process survey questionnaire was administered following the same procedures as for the general study.

Feedback from the Delphi process respondents was collected and reviewed by the researcher to determine whether any changes needed to be made to the research instrument prior to distribution to Wyoming superintendents and secondary school principals. Based upon the results of the Delphi process, the survey instrument and study procedures were modified and finalized as necessary.

The final step in developing a valid and reliable research instrument was to establish item reliability. Reliability refers to the chance error in measurement and indicates the accuracy of the measuring instrument (Ary, Jacobs, Razavieh, & Sorensen, 2006). Reliability was established by calculating a Cronbach alpha coefficient. The coefficient was based on the relationship of scores derived from the four constructs of general research prompts within the survey and the Delphi process. Ary et al. (2006) described this relationship as the internal consistency coefficient.

Cronbach alpha is a, "Widely used measure when utilizing a Likert-type scale" (Ary, Jacobs, Razavieh, & Sorensen, 2006, p. 264). Ary et al. stated, "The degree of reliability you need in a measure depends to a great extent on the use you will make of the results" (p. 267). Although a reliability coefficient of .70 or higher was considered to be an acceptable level of reliability (Radhakrishna, 2007), "Coefficients in the range of .50 to .60 were acceptable for making a decision about a group or for research purposes" (Ary, Jacobs, Razavieh, & Sorensen, 2006, p. 267). The researcher utilized SPSS© to calculate the Cronbach's alpha reliability coefficient.

Once validity and reliability procedures were established, the survey instrument was ready for distribution to potential respondents via email, along with an introductory letter explaining the study purpose, an explanation of protocols for maintaining anonymity and confidentiality, an explanation for providing informed consent, protocols for enhancing respondent participation, a timeline for completion and submission of the responses, and a summary of how the study findings will be distributed.

Implementation Procedures

The researcher utilized a commercial survey program called Qualtrics® to administer the survey and collect and store the responses. The survey and completed responses remained on the password protected website until the researcher completed all data analysis. A record of potential respondents was confidentially maintained and cross-referenced with submitted responses to identify respondents who did not respond to the invitation to participate in the study. This record resided on the password protected Qualtrics® website.

The researcher had sole access to the responses provided on the completed surveys. The Qualtrics® website was a cloud-based website that specialized in the collection of sensitive data. Respondents' completed surveys were encrypted and stored on password secured Qualtrics® servers. Upon successful completion of researcher's dissertation, all respondent surveys will be permanently deleted from the Qualtrics® website.

Data Analysis

Ordinal Likert-type items are predominate and most accurate (Huck, 2012). For this study, the researcher first treated all responses as ordinal data. Clason and Dormody

(1994) stated, "To test a hypothesis of the form, 'Does subpopulation A (i.e., large schools or districts) differ from subpopulation B (i.e., small schools or districts)?' it is appropriate to perform a Chi-squared test" (p. 33).

As a general rule, the mean and standard deviation were invalid parameters for analyzing descriptive statistics whenever ordinal scale data were collected (Boone & Boone, 2012). Nonparametric procedures based on the rank, median, or range, were appropriate for analyzing these data. Distribution free methods such as tabulations, frequencies, contingency tables, and chi-squared statistics, were used to analyze these data.

Following the ordinal data analysis, the researcher examined summations of responses (several questions together) and treated the responses as interval data. For example, when examining the relationship between school size and overall perceptions of online learning as an option for secondary education, the researcher combined responses of very important and important (5's & 4's) to generate a general "important" summation. This offered additional analysis possibilities to check for possible differences in agreement between groups (i.e., do Wyoming administrators of various school sizes agree or disagree that their school/district has the necessary supports in place to facilitate online learning).

Clason and Dormody (1994) stated,

Likert scaling presumes the existence of an underlying (latent or natural) continuous variable whose value characterizes the respondents' attitudes and opinions. If it were possible to measure the latent variable directly, the measurement scale would be, at best, an interval scale. (p. 31)

The researcher conducted all necessary preliminary and descriptive analyses to insure all appropriate assumptions had been met, such as (a) approximately equal variances, (b) approximate normality, and (c) sufficient sample size and power for the chosen alpha, before treating the data as interval data and performing the appropriate parametric statistical tests (i.e., t-tests and multiple linear regression analyses).

Clason and Dormody (1994) affirmed,

A single Likert-type item asks the respondent to which of several ordered alternatives they belong. Each Likert-type item provided a discrete approximation of the continuous latent variable. A proper analysis of single items from Likert scales should acknowledge the discrete nature of the response. (p. 32)

Ignoring the discrete nature of the response can lead to inferential errors.

When treating Likert-scale data as interval data, the scale item should include at least five categories (Grace-Martin, 2015). For the purposes of this study, the researcher utilized a five point Likert-type scale and treated Likert summations as interval data. An alpha level of $<.05$ was used for all statistical tests of significance. All statistical tests were performed using Microsoft Excel© and SPSS©.

Recognizing that all survey studies run the risk of encountering non-response bias, the researcher distributed the invitation to participate in the research study to all administrators in Wyoming secondary schools, thus giving all administrators an equal chance at participation. Further, the researcher followed four guidelines set forth by Fluid Surveys University (2015) to ensure that the survey had low non-response bias. The four guidelines were: (1) pretest your survey mediums, (2) avoid rushed or short data

collection periods, (3) send reminders to potential respondents, and (4) ensure confidentiality.

Guideline number 1 was followed by conducting the Delphi process. The Delphi process was conducted by sharing the study protocols and instrument with three superintendents and three secondary school principals from the neighboring state of Idaho. Feedback from the Delphi process respondents was collected and reviewed by the researcher to determine changes that needed to be made to the research instrument prior to distribution to Wyoming superintendents and secondary school principals. Guidelines number 2 and 3 were met by providing an initial two-week timeline to complete the survey. A reminder was sent to all respondents who did not complete the initial survey providing them with an additional five days to complete the survey. Guideline 4 was met in the initial email inviting the respondents to participate in the study. The initial email stated that the respondents completed survey results were encrypted and would reside on the password protected website. The researcher had sole access to the responses provided on the completed surveys. Upon successful completion of researcher's dissertation, all respondent surveys were permanently deleted from the secure website.

The survey instrument utilized different types of questions requiring different methods of analysis. The researcher advanced the methods of analysis from most simple to most complex. Initially, the researcher conducted data analysis by examining and summarizing each individual Likert-item (question) with descriptive statistics (i.e. counts, percentages, mode, and measures of spread). Following the initial data analysis, the researcher conducted inferential statistical techniques. The purpose of this quantitative research study was to more fully understand results related to the following research

constructs: (1) perceptions of online learning as an option for secondary education in Wyoming, (2) Wyoming school administrator perceptions of the outcomes of online learning, (3) perceptions of Wyoming school administrators regarding the barriers associated with online education, and (4) the perceptions of Wyoming school administrators regarding the supports necessary to effectively implement online education programs in their schools or school districts.

Concurrently, the analysis determined the impact of demographic factors of age, and school or district enrollment size of each respondent on respondent's perceptions to the study's research prompts. The researcher formulated subsequent research questions for this study were as follows:

Subsequent Research Question1a: There is no significant difference between respondent's school/ district size and respondent's perceptions of online learning as an option for secondary education.

Subsequent Research Question1b: There is no significant difference between respondent's school/ district size and respondent's perceptions of outcomes of online education for secondary education.

Subsequent Research Question1c: There is no significant difference between respondent's school/ district size and respondent's perceptions of barriers of online education for secondary education.

Subsequent Research Question1d: There is no significant difference between respondent's school/ district size and respondent's perceptions of supports needed for online education for secondary education.

Subsequent Research Question2a: There is no significant difference between respondent's age and respondent's perceptions of online learning as an option for secondary education.

Subsequent Research Question2b: There is no significant difference between respondent's age and respondent's perceptions of outcomes of online education for secondary education.

Subsequent Research Question2c: There is no significant difference between respondent's age and respondent's perceptions of barriers of online education for secondary education.

Subsequent Research Question2d: There is no significant difference between respondent's age and respondent's perceptions of supports needed for online education for secondary education.

In the third step of the data analysis, the researcher conducted a Shapiro-Wilk test of normality and found that the data was not normally distributed (p-values were <.05). As a result of the normality assumption not being satisfied, it was appropriate to use non-parametric tests for data analysis. The researcher selected the Mann-Whitney Test as the non-parametric test for this analysis. This level of detail allowed the researcher to understand the results and obtain more detailed information from this statistic.

The researcher was also interested in comparing the perceptions of superintendents and secondary school principals in relation to the student enrollment size of the respondent school as well as the age of the respondent. The Kruskal-Wallis test is a non-parametric test designed to compare three or more groups. As a result of respondents being grouped into one of five student enrollment categories, (a) 1-100, (b) 101-150, (c)

251-500, (d) 501-750, and (e) larger than 750, as well as being grouped into one of six

age groups, (a) 25 or under, (b) 26-35, (c) 36-45, (d) 46-55, (e) 56-65, and (f) 66 or older,

the researcher opted to utilize the Kruskal-Wallis nonparametric test.

Methods Summary

The purpose of this study was to determine the perceptions of Wyoming

superintendents and secondary school principals regarding the implementation of online

educational programs in Wyoming secondary schools and their perceptions of the barriers

to and supports needed for the effective implementation of online education. The findings

from this study may not be generalizable to education systems outside of Wyoming

public schools; However, Wyoming education policymakers and stakeholders were

provided with the information necessary to better inform the successful implementation

of online learning modalities into Wyoming public secondary schools.

Chapter IV

Results

Educational leaders in Wyoming want to be effective k-12 educational leaders, yet the rural nature of Wyoming schools present challenges for many students who attend schools that are able to provide only limited course opportunities. Expanded understanding of online education in Wyoming will help to create greater awareness of online learning and broaden opportunities for course delivery through online curricula for students within the state.

This study determined the perceptions of Wyoming superintendents and secondary school principals regarding the implementation of online educational programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education. A multivariate analysis of the data collected from this study was conducted to address the research questions that guided the study. Statistical processes included mean, standard deviation, Cronbach's alpha, Mann-Whitney, and Kruskal-Wallis tests.

This chapter presents a brief overview of the research questions and design. A description of the respondents is included and research results are presented in tables and narrative format. Finally, responses to the research questions are provided.

Research Questions

The study was guided by the following research questions:

Research question 1, "What are Wyoming administrator perceptions regarding online education as an educational option at the secondary level?"

Research question 2, "What are Wyoming administrator perceptions regarding the

outcomes of online education programs at the secondary level?"

Research question 3, "What are Wyoming administrator perceptions regarding the barriers associated with effective online education programs at the secondary level?"

Research question 4, "What are Wyoming administrator perceptions regarding the supports necessary to effectively implement online education programs at the secondary level?"

Research question 5, "How do Wyoming school district superintendent perceptions compare with Wyoming secondary school administrator perceptions with relationship to research questions one through four"?

Research Design

This study determined the perceptions of Wyoming superintendents and secondary school principals regarding the implementation of online educational programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education. The researcher designed and implemented a quantitative study to identify these perceptions. The first phase in the development of the research instrument was completed by creating a structured questionnaire based upon an extensive review of the literature. The study questionnaire was developed to evaluate four underlying study constructs: educational options (Group A), outcomes of online educational programs (Group B), barriers to providing online educational opportunities at the secondary level (Group C), and supports needed at the secondary level to providing online educational opportunities (Group D).

In an effort to validate the survey instrument, the researcher conducted a Delphi process to achieve convergence of opinion about the questionnaire from experts within

the field of education. Delbecq, Van de Ven, and Gustafson (1975) explained that the

Delphi technique could be used to achieve the following five objectives:

> To (a) determine or develop a range of possible program alternatives, (b) to
>
> explore or expose underlying assumptions or information leading to different
>
> judgments, (c) to seek out information which may generate a consensus on the
>
> part of the respondent group, (d) to correlate informed judgments on a topic
>
> spanning a wide range of disciplines, and (e) to educate the respondent group as
>
> to the diverse and interrelated aspects of the topic. (p. 11)

The researcher originally contacted three superintendents and three secondary

school principals via phone and/or email who were employed as Idaho administrators

during the 2015-2016 school year. The six Idaho administrators were asked to participate

in the Delphi method and complete the initial survey within five days.

The purpose of the Delphi process was to determine whether each of the items on

the study questionnaire would be interpreted consistently by study respondents. This was

to be accomplished by reaching consensus on each of the survey instrument items. On the

sixth day, four of the six Idaho administrators had responded (three superintendents and

one secondary school principal). In an attempt to ensure that a minimum of three-

secondary school principals participated in the Delphi process, the researcher contacted

three additional Idaho secondary school administrators via email and asked them to

participate in the Delphi process. All three additional administrators agreed to participate

and completed round one of the Delphi process the same day.

The first round of the Delphi process provided participants the opportunity to

complete the study questionnaire and share with the researcher areas of agreement or

disagreement regarding any of the study items. Round one of the Delphi process resulted in one superintendent recommending a minor word change to question 4 of Group A. The researcher accommodated this minor word change and distributed the survey instrument to the Delphi participants a second time to gather input and recommendations regarding the recommended change or any additional interpretations. This activity provided participants with another opportunity to clarify their interpretations and provide any additional recommendations for the study questionnaire items. No changes were identified during the second round of the Delphi process. The researcher then accepted the survey instrument as amended and began the process of distributing it to potential study respondents.

All seven Delphi respondents were male. One Idaho administrator fit into the 26-35 year old age range, one into the 36-45 year old group, three were in the 45-55 years old group, and two fell into the 56-65 years old age range. Four of the Delphi participants were school district superintendents and three of the Delphi participants were school principals; one from each of the three traditional school levels - elementary school, middle or junior high school, and high school. Table 1 describes the student enrollment of the school districts or schools of the seven Idaho participants in the Delphi process.

Table 1

School/district student enrollment of the Delphi participants

#	Student Enrolment	Response	%
1	1-100	0	0%
2	101-250	0	0%
3	251-500	1	14%
4	501-750	3	43%
5	750 or greater	3	43%
	Total	7	100%

Upon completion of the Delphi process, the researcher administered the survey via email to 47 Wyoming superintendents and 149 secondary school principals currently working in school districts and schools within the state of Wyoming. As described in the initial contact email with prospective respondents, submission of the completed survey constituted informed consent on the part of the respondent to participate in the study.

Response Rate

The researcher distributed the study instrument to all Wyoming superintendents and sixth through twelfth grade secondary school principals in Wyoming. Wyoming consists of 48 public school district superintendents, 81 high school principals, and 68 total middle school and junior high school principals. The researcher is a practicing superintendent in a school district in Wyoming but was not a respondent in this study. The researcher received 36 completed surveys from the 48 superintendents (75%), and 65 completed surveys from the 149 secondary school principals (43.62%). Overall, 101 responses were received from 197 potential participants, representing a 51.27% overall participation rate.

Respondent Demographics

Table 2 and Table 3 display the age and current administrative position retrospectively, of the 101 Wyoming administrator respondents. Eighty-five percent of the respondents were male, whereas 15% of respondents were female.

Table 2

Age of Respondents (N=101)

Age	Number of Respondents	Percentage
1 = 25 or under	0	0%
2 = 26-35	3	2.97%
3 = 36-45	24	23.76%
4 = 46-55	46	45.54%
5 = 56-65	27	26.73%
6 = 66 or older.	1	.99%

Table 3

Administrative Position of Respondents (N=101)

Position	Number of Respondents	Percentage
Superintendent	36	35.64%
HS	25	24.75%
Middle/Jr.	24	23.76%
MS/Jr. HS & HS	16	15.84%

Student enrollment numbers for the respondents in this study are reported in Table 4. Approximately one-fifth of the participants *(n = 17)* had a student enrollment of 1-100. Just over one-third of the participants (*n* = 35) represented school enrollments of 101-150 students, while 14.9% (*n* = 15) had 251-500 students enrolled. Lastly, 8.9% (*n* = 9) of survey participants had 501-750 students, and 25% (*n* = 25) of respondents represented schools with enrollments of greater than 750 students. District student enrollment numbers of superintendent respondents and student enrollment numbers for secondary school principals were not disaggregated for the purpose of this study.

Table 4

Student Enrollment of Respondents' Schools (N= 101)

School/district Enrollment	Number of Participants	Percentage
1-100	17	16.83
101-150	35	34.65
251-500	15	14.85
501-750	9	8.91
>750	25	24.75

Respondent perceptions:

To determine the perceptions of Wyoming superintendents and secondary school principals relative to the research prompts, the researcher used the descriptive statistics of means and standard deviation to address the five questions that guided the study.

Research question 1, "What are Wyoming administrator perceptions regarding online education as an educational option at the secondary level?"

The first research construct regarding online education as an education option at the secondary level was composed of eight survey questions (Group A). Responses ranged from 1 (not important/strongly disagree), 2 (not very important/disagree), 3 (neutral), 4 (important/agree), to 5 (very important/strongly agree). An analysis of the mean scores for each of the survey items indicated that responses had similar values ranging from $M = 2.58$ to $M = 3.83$ with standard deviations ranging from 0.99 to 1.29. Table 5 shows the means and standard deviations for the Group A survey questions.

Table 5

Mean scores and standard deviation for Group A Survey Items (N = 101)

Questions	Mean	Std. Deviation
1	3.66	1.03
2	3.28	.97
3	2.81	1.22
4	3.71	1.02
5	3.72	1.17
6	3.32	1.29
7	3.83	1.21
8	2.58	1.14

The researcher employed a Cronbach's alpha to determine the level of reliability for the eight Group A survey items. The Cronbach's alpha generated a coefficient of .72 that indicated a relatively high level of internal reliability between the eight survey items associated with the Group A questions for this study.

The histogram displayed in Figure 2 shows the distribution of the survey data relative to Group A focus questions. The mean score for the first research question was 3.37. The mean score was generated by combining the responses from all 101 respondents to each of the five Likert scale responses of 1 (not important/strongly disagree), 2 (not very important/disagree), 3 (neutral), 4 (important/agree), to 5 (very important/strongly agree) associated with the eight survey questions comprising group A. The 101 respondents that replied to the eight survey questions resulted in 808 total responses. These items were designed to determine respondent's perceptions of online education as an educational option at the secondary level in Wyoming schools.

Figure 2

Group A Histogram

_____
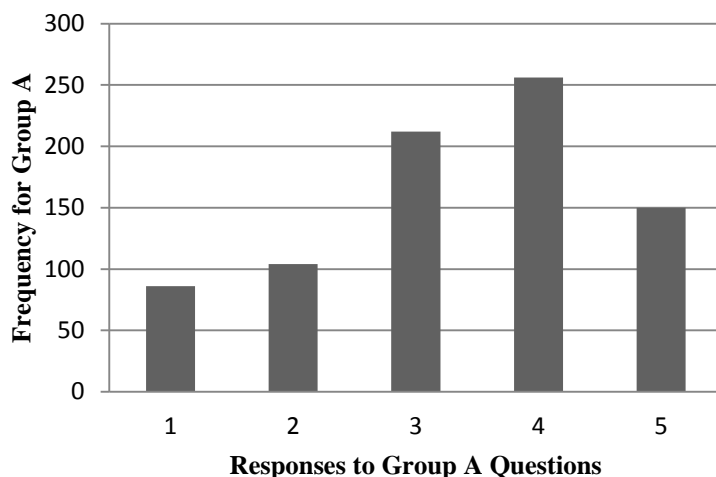
A mean score of 3.37 suggested that respondents generally agree that online education is an important education option for Wyoming students at the secondary level. Group A focus questions generated a standard deviation of .67 meaning that about 68 percent of respondent's answers were within .67 points of the mean (3.37). Most respondents agreed that online education was an important education option for the students in their school building or school district.

Research question 2, "What are Wyoming administrator perceptions regarding the outcomes of online education programs at the secondary level?"

The second research construct in this study related to the outcomes of online education programs at the secondary level (Group B) and was composed of nine instrument items. Consistent with Group A, responses ranged from 1 (not important/strongly disagree), 2 (not very important/disagree), 3 (neutral), 4 (important/agree), to 5 (very important/strongly agree). The means and standard deviation

for each of the responses related to Group B are displayed in Table 6.

Table 6

Mean and Standard Deviation for Group B Survey Items (N = 101)

Questions	Mean	Std. Deviation
1	2.95	1.22
2	2.74	1.00
3	2.75	1.01
4	4.24	.89
5	2.53	.93
6	2.53	1.15
7	2.80	1.14
8	2.48	1.21
9	1.61	.85

Group B consisted of nine survey items. A Cronbach's alpha generated a

reliability coefficient of .78, indicating a relatively high level of internal reliability for the

nine survey items associated with the second research question.

The histogram in Figure 3 shows the distribution of the survey data relative to

Group B focus questions. Group B questions focused on respondent's perceptions of

current outcomes of online learning. The mean score was generated by combining the

responses from all 101 respondents to each of the five Likert scale responses of 1 (not

important/strongly disagree), 2 (not very important/disagree), 3 (neutral), 4

(important/agree), to 5 (very important/strongly agree) associated with the nine survey

questions comprising group B. Totaling the responses from all 101 respondents replying

to nine survey questions resulted in 909 total responses. The Group B questionnaire items

were designed to collect Wyoming administrator perceptions regarding online education

outcomes at the secondary level. Figure 2 shows the histogram of total scores for survey

responses to group B focus questions.

Figure 3

Histogram of survey responses specific to group B focus items
_____
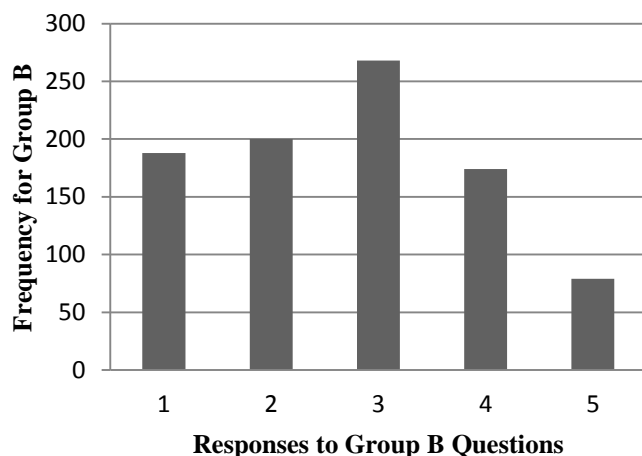
The mean response for Group B research question was 2.74. A mean score of 2.74 suggested respondents generally did not agree that current outcomes of online learning were equal to the educational outcomes of a traditional brick and mortar school.

Research question 3, "What are Wyoming administrator perceptions regarding the barriers associated with effective online education programs at the secondary level?"

The third construct consisted of nine questionnaire items related to the barriers to effective online education programs at the secondary level in Wyoming (Group C). Table 7 shows the mean scores and standard deviation for Group C survey items. As with the other constructs, responses ranged from 1 (not important/strongly disagree), 2 (not very important/disagree), 3 (neutral), 4 (important/agree), to 5 (very important/strongly agree). For the barriers to effective online education construct, the means of the respondent perceptions had a wider range with values from 1.74 to 3.83. The standard deviations, however, had similar values that ranged from 1.00 to 1.21.

Table 7

Mean and Standard Deviation for Group C Survey Items (N = 101)

Questions	Mean	Std. Deviation
1	3.83	1.03
2	2.03	1.04
3	3.54	1.18
4	3.39	1.10
5	2.94	1.04
6	1.74	1.00
7	2.33	1.21
8	1.90	1.20
9	2.38	1.06

A Cronbach's alpha was run on the nine Group C survey items to determine the level of consistency of the responses. A Cronbach's alpha of .63 indicated a moderate level of internal consistency for these survey items.

The histogram in Figure 4 shows the distribution of the survey responses relative to the Group C survey questions.

Figure 4

Histogram of survey responses specific to group C focus questions

_____
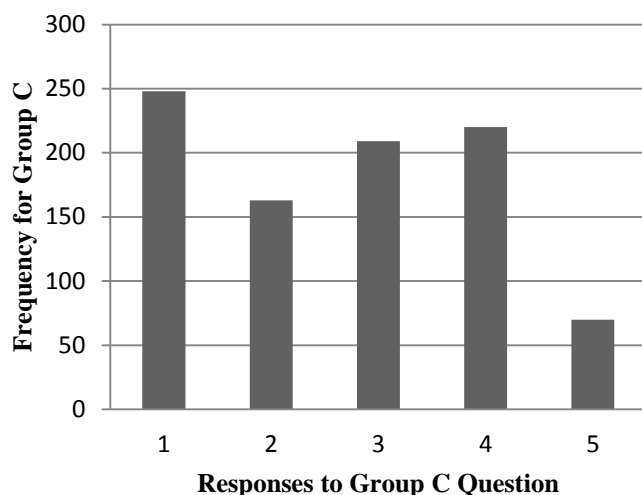
The mean response for the third research question was 2.68. This value was generated by combining the results from all 101 responses to the nine research prompts associated with Group C designed to gather respondent perceptions about the barriers to online education in Wyoming. The prompts associated with Group C were worded in such a way that a strongly disagree or disagree response indicated respondents perceived minimal, if any, barriers were associated with online learning. For example, the term *barrier* referred to a difficulty or hindrance to the effective delivery of online education opportunities in Wyoming. The term *barrier* in this context was regarded as negative; therefore, disagreeing with a negative prompt was actually viewed as a supportive statement for the effective delivery of online education opportunities in Wyoming. A mean score of 2.68 in this instance, with a standard deviation of .55, suggested that respondents tended not to agree with the proposed barriers.

Research Question 4, "What are Wyoming administrator perceptions regarding the supports necessary to effectively implement online education programs at the secondary level?"

The fourth set of survey items (Group D) focused on the respondent perceptions of the supports necessary to effectively implement online education programs in Wyoming at the secondary level. Group D was comprised of nine survey responses ranging from 1 (not important/strongly disagree), 2 (not very important/disagree), 3 (neutral), 4 (important/agree), to 5 (very important/strongly agree). Table 8 provides a list of the mean and standard deviation for each of the nine survey items included in Group D.

Table 8

Descriptive Statistics for Group D Survey Items (N = 101)

Questions	Mean	Std. Deviation
1	3.27	1.25
2	3.29	1.09
3	2.01	1.10
4	2.54	1.11
5	2.45	1.04
6	3.01	1.01
7	3.51	1.38
8	3.84	1.31
9	3.84	1.21

The mean value for the 101 responses generated for each of the nine survey items associated with the supports necessary for effective online education ranged from 2.01 to 3.84 and standard deviations ranged from 1.10 to 1.39. These values indicated a greater variation in responses than was noted on the other three constructs. A Cronbach's alpha

of .84 for the nine survey items that comprised Group D indicated a high level of internal consistency.

The histogram in Figure 5 shows the distribution of the survey data relative to Group D survey items.

Figure 5

Histogram of survey responses specific to group D focus questions
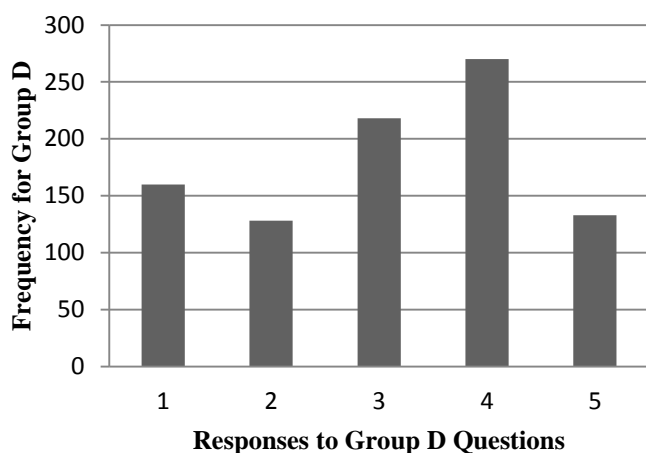
The mean value of 3.08, with a standard deviation of .79, was generated by combining the 101 responses for each of the nine survey questions associated with the Group D questions designed to analyze administrator perceptions regarding the supports necessary to effectively implement online education programs in Wyoming secondary schools. Generally, perceptions of survey respondents' indicated slight agreement that current supports were in place for the effective implementation of online education in Wyoming.

Research question 5, "How do Wyoming school district superintendent perceptions compare with Wyoming secondary school administrator perceptions with relationship to research questions one through four?"

The researcher was interested in comparing superintendent perceptions to those of secondary school principals for each of the four focus group constructs (Group A-D). Research question five compared superintendent responses to those of secondary school principals. Table 9 displays the mean and standard deviation for focus Group A questionnaire items.

Table 9

Summary statistics for Group A

Participant position	Mean	Std. Deviation
Superintendent (N=36)	3.47	.44
Secondary school principal (N=65)	3.31	.76

The researcher initially conducted an exploratory analysis to satisfy the necessary assumptions of normality and equal variances. Although, the samples achieved equal variance, the researcher conducted a Shapiro-Wilk test of normality and found that the data was not normally distributed (p-values were <.01). As a result of the normality assumption not being satisfied, a non-parametric test of these data were conducted. The researcher used the Mann-Whitney U Test as the non-parametric test. Table 10 displays the computed p-value of .17, which was greater than the significance level (alpha) of 0.05 set prior to the test.

Table 10

Mann-Whitney U Test for Group A:

U	976.50
Test Statistic	976.50
SE	140.72
Z	-1.38
Asymptotic Sig (2-sided test) p-value	.17

As a result, the researcher concluded there was no statistical difference between the mean of superintendent responses and the mean of principal responses for Group A of the survey, "What are Wyoming administrator perceptions regarding online education as an educational option at the secondary level?"

Table 11 displays mean and standard deviation for focus Group B questionnaire items consisting of nine survey items.

Table 11

Summary statistics for Group B

Participant position	Mean	Std. Deviation
Superintendent (N=36)	2.78	.64
Secondary school principal (N=65)	2.72	.64

Table 12 displays the computed p-value (.94) for the Group B construct of the survey that asked, "What are Wyoming administrator perceptions regarding the outcomes of online education programs at the secondary level?" A significance level .05 was also set for the Mann-Whitney U Test prior to the analysis.

Table 12

Mann-Whitney U Test for Group B:

U	1159.00
Test Statistic	1159.00
SE	140.54
Z	-.08
Asymptotic Sig (2-sided test) p-value	.94

The Mann-Whitney U test resulted in a p-value of .94, which was greater than the alpha level of .05 that was set for this test. The researcher concluded there was no statistical difference between the mean score for superintendents' responses and the mean score for principals' responses for question 10 of the survey.

Table 13 reveals the mean, standard deviation, and the number of superintendent and principal respondents for Group C questions, which focused on perceptions of barriers associated with online learning.

Table 13

Summary statistics for Group C

Participant position	Mean	Std. Deviation
Superintendent (N=36)	2.69	.59
Secondary school principal (N=65)	2.67	.54

Table 14 displays the computed p-value (.94) for Focus Group C. As a result of the p-value being greater than the .05 level of significance, the researcher concluded there is no statistical difference between the mean of superintendents' responses and the mean of principals' responses for research focus group C questions addressing, "What are

Wyoming administrator perceptions regarding the barriers associated with effective online education programs at the secondary level?"

Table 14

Mann-Whitney U Test for Group C

U	1159.00
Test Statistic	1159.00
SE	140.75
Z	-.08
Asymptotic Sig (2-sided test) p-value	.94

Table 15 shows the summary statistics for the final Focus Group (D) aimed at comparing superintendent perceptions to those of secondary school principals for each of the four focus group constructs (Group A-D).

Table 15

Summary statistics for Group D

Participant position	Mean	Std. Deviation
Superintendent (N=36)	3.04	.64
Secondary school principal (N=65)	3.11	.86

Table 16 displays the Mann-Whitney U Test for Group D. The test computed a p-value of .66, which is, once again, larger than the significance level of <.05.

Table 16

Mann-Whitney U Test for Group D

U	1231.50
Test Statistic	1231.50
SE	140.79
Z	.44
Asymptotic Sig (2-sided test) p-value	.66

The final Mann-Whitney U Test revealed no statistical difference in the mean of superintendents' responses and the mean of principals' responses for research focus Group D questions derived to address the construct "What are Wyoming administrator perceptions regarding the supports necessary to effectively implement online education programs at the secondary level?"

Interpreting the results:

The researcher initially conducted an exploratory analysis to satisfy the necessary assumptions of normality and equal variances. Although, the samples achieved equal variance, the researcher conducted a Shapiro-Wilk test of normality with a stated alpha level of <.05. The null hypothesis for a test of normality stated there was no difference between the data generated in this study and the normal distributed data. However, the researcher concluded the data were not normally distributed (p-values were <.05). As a result of the normality assumption not being satisfied, a non-parametric test for the data analysis was selected. The researcher elected to use Kruskal-Wallis / Two-tailed test as the non-parametric test method.

Group A research prompts focused on Wyoming secondary school administrators' and superintendents' perceptions of online learning as an option for education. Perceptions were collected using eight questionnaire items. There were two null

hypotheses formulated for group A; namely, (1a) there is no significant difference between respondent's school/district size and respondent's perceptions of online learning as an option for secondary education, and (1b) there is no significant difference between respondent's age and respondent's perceptions of outcomes of online education for secondary education.

Initially, the researcher was interested in comparing the perceptions of superintendents and secondary school principals in relation to the student enrollment size of the respondent school (if respondent was employed as a secondary school principal) or school district enrollment size (if respondent was a superintendent in the school district). Table 17 shows the participant student enrollment numbers along with the mean and standard deviation for Focus Group A.

Table 17

Summary statistics: School size compared to Focus Group A questions

Enrollment	Mean	Std. Deviation
1-100	3.35	.72
101-150	3.35	.78
251-500	3.35	.58
501-750	3.29	.64
>750	3.43	.56
Total	3.37	.67

The Kruskal-Wallis test is a non-parametric test designed to compare three or more groups. Because respondents could be grouped into one of five student enrollment categories: (a) 1-100, (b) 101-150, (c) 251-500, (d) 501-750, and (e) larger than 750, the researcher opted to utilize the Kruskal-Wallis non-parametric test to compare the responses from respondents at schools with different ranges of student enrollment.

Table 18

Kruskal-Wallis / Two-tailed non-parametric test- Group A

N =	101
Test Statistic	.78
DF	4
p-value (Two tailed)	.94
alpha	< .05

The Kruskal-Wallis test (Table 18) revealed the computed p-value of .94, which was greater than the *a priori* alpha < .05. Therefore, *Subsequent Research Question1a* that stated, "There is no significant difference between respondent's school/ district size and respondent's perceptions of online learning as an option for secondary education," was supported. There was no significant difference between respondent's school/district size and their perceptions of online learning as an education option at the secondary level.

Group B research prompts focused on Wyoming secondary school administrators' perceptions and superintendents' perceptions of online learning outcomes at the secondary level. Group B utilized nine research prompts. The two null hypotheses for Group B were: (1b) there is no significant difference between respondent's school / district size and respondent's perceptions of outcomes of online education for secondary education, and (2b) there is no significant difference between respondent's age and respondent's perceptions of outcomes of online education for secondary education. Table 19 shows the enrollment size, mean, and standard deviation associated with Focus Group B.

Table 19

Summary statistics: School size compared to Focus Group B questions

Enrollment	Mean	Std. Deviation
1-100	2.77	.57
101-150	2.80	.70
251-500	2.70	.58
501-750	2.45	.67
>750	2.76	.63
Total	2.74	.64

The Kruskal-Wallis test (Table 20) revealed the computed p-value of .74, which

was greater than the significance level of 0.05. Therefore, *Subsequent Research*

Question1b that stated, "There is no significant difference between respondent's school/

district size and respondent's perceptions of outcomes of online education for secondary

education," was supported.

Table 20

Kruskal-Wallis / Two-tailed non-parametric test- Group B

N =	101
Test Statistic	2.01
DF	4
p-value (Two tailed)	.74
alpha	< .05

Group C research prompts focused on Wyoming secondary school administrators'

and superintendents' perceptions of current barriers associated with online learning. The

researcher was interested in determining if the size of the school or district (as measured

by student enrollment) generated a statistically significant difference between the two

groups of Wyoming administrators: superintendents and secondary school principals.

Two null hypotheses were formulated for Group C and followed the pattern of groups A and B; namely, (1c) there is no significant difference between respondent's school / district size and respondent's perceptions of barriers of online education for secondary education, and (2c) there is no significant difference between respondent's age and respondent's perceptions of barriers of online education. Table 21 displays the mean and standard deviation for the five student enrollment groups in comparison to Focus Group C.

Table 21

Summary statistics: School size compared to Focus Group C questions

Enrollment	Mean	Std. Deviation
1-100	2.53	.51
101-150	2.77	.56
251-500	2.80	.60
501-750	2.53	.57
>750	2.62	.53
Total	2.68	.55

The Kruskal-Wallis test (Table 22) revealed the computed p-value of .38, which was greater than the significance level of .05. Therefore, *Subsequent Research Question1c* that stated, "There is no significant difference between respondent's school/ district size and respondent's perceptions of barriers of online education for secondary education," was supported.

Table 22

Kruskal-Wallis / Two-tailed non-parametric test- Group C

N =	101
Test Statistic	4.19
DF	4
p-value (Two tailed)	.38
alpha	< .05

The concluding group of focus question (Group D) concentrated on Wyoming

secondary school administrators' and superintendents' perceptions of the supports

necessary to effectively implement online education programs at the secondary level in

Wyoming. The two null hypotheses for Group D were: (1d) there is no significant

difference between the school / district size and respondent's perceptions of supports

needed for online education for secondary education, as well as (2d) there is no

significant difference between respondent's age and respondent's perceptions of supports

needed for online education for secondary education. Table 23 displays the mean and

standard deviation for the five student enrollment groups in relation to Focus Group D.

Table 23

Summary statistics: School size compared to Focus Group D questions

Enrollment	Mean	Std. Deviation
1-100	2.84	.88
101-150	3.22	.81
251-500	3.12	.49
501-750	3.07	.81
>750	3.04	.82
Total	3.08	.78

The Kruskal-Wallis test (Table 24) revealed the computed p-value of .35, which

was larger than significance level of .05. Consequently, *Subsequent Research Question1d* that stated, "There is no significant difference between respondent's school/ district size and respondent's perceptions of supports needed for online education for secondary education" was supported.

Table 24

Kruskal-Wallis / Two-tailed non-parametric test- Group D

N =	101
Test Statistic	4.44
DF	4
p-value (Two tailed)	.35
alpha	.05

Secondly, the researcher was interested in exploring the relationship between the survey respondent ages in comparison to the four Focus Group questions. Group A questions concentrated on Wyoming secondary school administrators and superintendents' perceptions of supports necessary to effectively implement online education programs at the secondary level. Table 25 provides the summary statistics related to the respondent age and Focus Group A.

Table 25

Summary statistics: Respondent's age compared to Focus Group A questions

Age of participants	Mean	Std. Deviation
26-35	3.13	.98
36-45	3.32	.65
46-55	3.32	.64
56-65	3.50	.72
*66<	3.63	

*One respondent for the 66 and above age group

The Kruskal-Wallis test (Table 26) revealed the computed p-value of .72, which was greater than the .05 significance level. Therefore, *Subsequent Research Question2a* that stated, "There is no significant difference between respondent's age and respondent's perceptions of online learning as an option for secondary education," cannot be rejected.

Table 26

Kruskal-Wallis / Two-tailed non-parametric test- Group A

N =	101
Test Statistic	2.12
DF	4
p-value (Two tailed)	.72
alpha	.05

Wyoming secondary school administrators' and superintendents' perceptions of online learning outcomes at the secondary level comprise Group B research prompts. Table 29 shows the mean and standard deviation for respondent's age in relation to responses to Group B.

Table 27

Summary statistics: Respondent's age compared to Focus Group B questions

Age of participants	Mean	Std. Deviation
26-35	2.26	.32
36-45	2.82	.61
46-55	2.72	.64
56-65	2.74	.69
*66<	3.11	

*One respondent for the 66 and above age group

The Kruskal-Wallis non-parametric test (Table 28) revealed a computed p-value of .52, which was greater than the significance level of .05. Therefore, the *Subsequent*

Research Question2b that stated, "There is no significant difference between respondent's age and respondent's perceptions of outcomes of online education for secondary education," cannot be rejected.

Table 28

Kruskal-Wallis / Two-tailed non-parametric test- Group B

N =	101
Test Statistic	3.24
DF	4
p-value (Two tailed)	.52
alpha	< .05

Group C research prompts of the survey instrument focused on Wyoming principals' and superintendents' perceptions of current barriers associated with online learning at the secondary level. Table 29 contains the summary statistics associated with the age of the respondent and Focus Group C.

Table 29

Summary statistics: Respondent's age compared to Focus Group C questions

Age of participants	Mean	Std. Deviation
26-35	2.74	.46
36-45	2.54	.54
46-55	2.72	.59
56-65	2.70	.52
*66<	3.11	

*One respondent for the 66 and above age group

The Kruskal-Wallis test (Table 30) revealed the computed p-value of .65, which was greater than the alpha .05 significance level. Once again, the *Subsequent Research Question2c* that stated, "There is no significant difference between respondent's age and

respondent's perceptions of barriers of online education for secondary education," cannot be rejected.

Table 30

Kruskal-Wallis / Two-tailed non-parametric test- Group C

N =	101
Test Statistic	2.5
DF	4
p-value (Two tailed)	.65
alpha	.05

The researcher concluded the final comparison of interest by examining the comparison of superintendent and secondary school principal's age with Group D research prompts from the survey instrument, which focused on Wyoming secondary school administrators' and superintendents' perceptions of supports necessary to effectively implement online education programs at the secondary level.

Table 31

Summary statistics: Respondent's age compared to Focus Group D questions

Age of participants	Mean	Std. Deviation
26-35	3.22	.29
36-45	2.96	.78
46-55	3.00	.91
56-65	3.30	.54
*66<	3.56	

*One respondent for the 66 and above age group

The concluding Kruskal-Wallis test (Table 32) revealed the computed p-value of .44 which is greater than the .05 significance level. Lastly, the *Subsequent Research Question2d* that stated. "There is no significant difference between respondent's age and

respondent's perceptions of supports needed for online education for secondary

education," was supported. There is no significant difference between respondent age and

respondent perceptions of supports needed for online education for secondary education.

Table 32

Kruskal-Wallis / Two-tailed non-parametric test- Group D

N =	101
Test Statistic	3.76
DF	4
p-value (Two tailed)	.44
alpha	< .05

Results Summary

This study examined the perceptions of Wyoming superintendents and secondary

school principals regarding the level of implementation of online educational programs in

Wyoming secondary schools and their perceptions of the barriers to and supports needed

for the effective implementation of online education. The surveys were formulated to test

four constructs: (Group A) administrator perceptions of current online educational

options at the secondary level; (Group B) administrator perceptions regarding the

outcomes of online education at the secondary level; (Group C) administrator perceptions

regarding barriers associated with effective online educations at the secondary level; and,

(Group D) administrator perceptions regarding current supports necessary to effectively

implement online education at the secondary level.

Based on the survey results, Wyoming administrator perceptions on online

education as an educational option at the secondary level (Group A) were favorable.

Respondents perceived online courses as an important option for their students. On the

other hand, survey results on the outcomes of online education at the secondary level

(Group B) indicated school Wyoming administrators had less than favorable perceptions of online learning outcomes as compared with the learning outcomes of traditional brick and mortar schools. Respondents generally did not agree that online courses typically attracted a higher caliber of student or that student engagement was higher for students in online courses. For the third construct (Group C), survey results indicate that perceptions of barriers associated with online learning were minimal. Respondents did not agree that the barriers addressed in Group C were significant. The fourth and final construct (Group D) revealed respondents were favorable about the current supports in place to effectively implement online education at the secondary level. Supports included adequate bandwidth, technical support, and student and teacher technology availability.

Results also indicated there was no statistically significant difference between the perceptions of school district superintendents and those of the secondary school principals, between respondents from different categories of district/school enrollments, or between respondents in different age groups.

Chapter V

Discussion of Findings

Digital technology has changed the way society works, does business, and interacts. Since the introduction of the World Wide Web in the early 1990s, the number of internet users had risen to 3.4 billion by 2015 (Internet World Stats, 2015). Dewey (1899) and later Freire (1994) referenced the importance of education that is relevant to the outside world and actively engages the learner in the learning process. Today's secondary students participate in an ever increasing and highly engaging digital, online world. This exposure to online information and interaction with technology brings with it the expectation that school leaders will provide instruction and experiences that prepare students for today's world.

Online education emerged in the business sector in the 1980s as organizations employed computer-based programs to offer training to their new employees (Kentnor, 2015). In 1986, the first purely online curriculum was introduced by CALCampus, a distance learning organization (Morabito, 2015) and included directed individual study as well as the option to meet live with instructors on campus (Morabito, 2015). Three years later, as a result of the introduction of the World Wide Web, the University of Phoenix became one of the first post-secondary educational institutions to offer online education programs through the internet (Carlson & Carnevale, 2001; Kentnor, 2015; University of Phoenix, 2015). In 1996, a U.S. Department of Education grant enabled the Concord Consortium in Massachusetts and the Hudson Public School District to create the Virtual High School (VHS) project (Kozma, Zucker, & Espinoza, 1998). After a mere four years, VHS course offerings grew to more than 100 different internet courses with

approximately 4,000 enrolled students (Espinoza, Drove, Zucker, & Kozma, 1999). In

2011, 65% of post-secondary institutions reported that online learning was essential to

their long-term strategic plans (Allen & Seaman, 2013). Online education was no longer

simply a trend.

The No Child Left Behind Act (NCLB) (2001) required states to provide for

technological literacy by the time the student finished the eighth grade. Students must not

only become competent in the use of technology and associated applications; they also

must be able to apply their skills to practical situations. As society becomes increasingly

dependent on different forms of technology, schools must ensure that all learners meet

minimum technology competencies, an important learning outcome for k-12 students.

The education system is faced with the issue of adopting the changes necessary to equip

learners with the skills necessary to succeed in the digital age.

One of the most basic skills required of today's students is to develop digital-age

literacy (21st Century Workforce Commission, 2000). In December 2015, President

Obama signed into law the Every Student Succeeds Act (ESSA). The ESSA was a

bipartisan bill aimed at addressing the unmanageable prescriptive requirements of the No

Child Left Behind Act (2001). Consistent with NCLB, ESSA required students be taught

to high academic standards that prepared them for success in both college and their

chosen careers. Expanding access to needed technology essential for students to succeed,

including cutting the digital divide in half, were also significant components of the newly

adopted ESSA.

Wyoming lawmakers and educators have examined some of the most successful

online instruction methodologies to guide the development of appropriate policies and

effective implementation practices of this learning modality. On July 1, 2011, the Wyoming Legislature enacted legislation known as *Chapter 41, Distance Education*, which explained in detail a uniform process for all distance education courses offered by Wyoming school districts, including the transfer or acceptance of academic credits by a Wyoming school district. In 2015, the Wyoming Legislature formed a distance education task force that reviewed the challenges related to distance education and explored the possibility of increasing access to quality individualized learning opportunities for every Wyoming learner.

Online education has not yet become an accepted learning tool in all classes, especially in more remote areas like Wyoming (Watson, Murin, Vashaw, Gemin, & Rapp, 2012). Computer technology and especially the internet offer many benefits to students and teachers (Blomeyer, 2002). The outcomes of this study will assist in shaping Wyoming educational policy and influence the delivery of educational opportunities to students in Wyoming and similar areas.

The educational system has been resistant to change. Sizer (2004) stated, "Society looks to schools to provide certainty in times of turmoil" (p. 210). Sizer concluded that the prevalent support for students taking subjects "in a systematized, conveyor-belt way" (p. 83) and narrowly tested outcomes resulted from a belief that schools simply "cannot achieve loftier goals" (p. 10). This inevitability reinforced the status quo and created an inherently cautious approach to educational reform. Sack (2003) argued the public education model of today largely replicated the organizational structure of early America.

Respondent Participation

This study determined the perceptions of Wyoming superintendents and secondary school principals regarding online educational programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education. In all, 51.3% of Wyoming superintendents and secondary school principals responded to the survey items that informed the results of this study. District superintendents responded at a rate of 75% (n = 36) and secondary school principals had a 43.63% (n = 65) response rate, comprising slightly less than half of all secondary principals. This response rate was an indication of the interest Wyoming administrators had about online education in the state and their commitment to exploring online education as a viable option to provide the best learning opportunities for the students.

Of the 101 Wyoming administrators who responded, 86 were male and 15 were females. Nearly half (46%) of the respondents were between the ages of 46-55 years. The next largest age group was aged 56-65 years (27%). According to Prensky (2010a), the Net Generation was born after 1980 and Digital Immigrants were born before 1980. The majority of respondents in this study could be identified as Digital Immigrants. Guo, Dobson, and Petrina (2008) specified there was no significant difference between the two groups. This study indicated the respondents had similar views despite any age differences, confirming the findings of Guo et al.

The relative low response rate of females in this study directly corresponded to the gender demographics of Wyoming administrators and aligned with national gender demographics of public school administrators. The American Association of School

Administrators (2015) reported females made up 27 percent of the superintendency, an increase of 2 percent from 2010. This stands in direct disparity to the female-dominated teaching force. Studies that examined the difference in male and female computer and internet use indicated there was no statistical difference (Sauter, 2012).

All 197 Wyoming superintendents and principals of secondary schools were contacted and invited to participate, and 101 completed the survey instrument. Due to the size of the sample generated in this study, the results may not be applicable to other populations. According to the Center for Education Reform (2016), the 36 Wyoming school district superintendents who responded represent less than 1% of all districts in the US in 2016. Until additional studies that include larger samples are conducted, generalizations are restricted.

Research Questions

The research survey was divided into four constructs or groups of research prompts (A-D) designed to address the first four research questions that guided this study. The fifth research question considered the differences in perceptions of superintendents and principals pertaining to the other four research questions. The research instrument (Appendix A) consisted of 35 research prompts; each supported by multiple references identified in the review of related literature. Part one of Appendix D identifies specific research items related to the 35 research prompts. (Part two of Appendix D identifies the four construct topics associated with the 35 research prompts.)

Wyoming Administrator perceptions of online education as an education option

Survey items within Group A of the survey instrument dealt with Wyoming administrators' perceptions of online education as an option for students in secondary schools. The items in this group included statements such as: (a) online courses should be important in the school/district; (b) students want online courses; (c) [the respondent was] satisfied with the content of the available online courses; (d) online courses were [perceived] as an important learning opportunity for students going to post-secondary education; (e) online courses are available for (f) regular students; (g) struggling students, and (h) advanced students; and (i) the quality of online courses' compared favorably with traditional school courses.

The responses to this group of prompts indicated respondents favored online education options for secondary school students, but only slightly. This slight favorable perception of online learning as an option for Wyoming secondary students was supported by the research by Watson et al. (2013) that indicated online course offerings were not widely utilized in middle and high schools throughout Wyoming.

The Educational Testing Service's Center for Global Assessment described literacy in the 21st century as the ability to use electronic technology and communication devices to locate and utilize the needed information that would enable one to function in the knowledge society (International ICT Literacy Panel, 2001). Burgess and Strong (2003) noted online education was increasingly prevalent throughout our modern world. Burgess and Strong also indicated that online education opportunities would continue to rise given the high number of learning institutions opting for online instructional delivery. Although the Wyoming administrators in this study generally agreed that online

education was an important education option for Wyoming students at the secondary

level, their perceptions did not reveal a strong conviction to online learning.

According to the analysis of the data collected in this study, Wyoming

administrators as a group, superintendents and principals alike, expressed a desire to

provide online education as an option for their secondary school students (Group A).

Wyoming superintendents and secondary school principals indicated students desired

online learning opportunities. Wyoming Administrators expressed the need to increase

the number of online course opportunities available to struggling and advanced students.

Wyoming superintendent and secondary school administrators also indicated the

importance of providing online learning opportunities to better prepare students for post-

secondary schooling.

Wyoming Administrator perception of online education outcomes

The items included within Group B proposed statements such as: (a) the academic

expectations for online courses are equal to regular school courses; (b) online students

perform well on end-of-course assessments; (c) online students perform well on state

assessments; (d) online courses enhance the course offerings in the school/district; (e)

online courses attract students of a higher caliber; (f) student engagement is higher with

online courses; (g) post-secondary online degree programs compare well to traditional

degree programs; (h) online courses provide more personalized attention; and, (i) online

courses in the school/district are synchronous.

Respondents to this study did not agree that current educational outcomes from

online learning experiences were equal to the educational outcomes of a traditional brick

and mortar school (Group B). Wyoming superintendents and secondary school

administrators did not indicate online courses generated a higher level of student learning than traditional brick and mortar schools. This perception of online learning was in contrast with results of studies that revealed online students performed better than their traditional schooling peers taking the same course (Patrick & Powell, 2009; U.S. Department of Education, 2010).

The study results revealed respondent perceptions to Group A and Group B prompts were notably mirrored. Interestingly, respondents expressed a desire to provide online educational options; however, respondents did not perceive online learning outcomes were comparable to traditional learning.

A 2012 survey indicated academic leaders' opinion of online education had changed substantially in favor of the outcomes of online education. A 2011 study showed that 67.6% of academic leaders reported that learning outcomes in online environments were equal to or better than the learning outcomes of traditional education methods (Johnson, Aragon, Shaik, & Palma-Rivas, 2000; U.S. Department of Education, 2010). In a similar survey the following year, the percentage of academic leaders perceiving online education as equal to or better than traditional education methods grew to 77 percent (Allen & Seaman, 2013).

Some of the perceptions of respondents in this study may be attributed to Wyoming administrator experiences related to struggling students exiting traditional brick and mortar schools and enrolling in online educational opportunities within the state. Some Wyoming administrators may perceive online learning as an appropriate alternative school placement for struggling students, rather than an appropriate option for the advanced student.

The results of the current study indicate the perceptions of Wyoming secondary school administrators and district superintendents do not align with current national research. This perception warrants further investigation as the success of online education rests on educators' (and other stakeholders) perception that the outcomes are equal to or better than the outcomes of traditional education. An investigation that analyzes the outcomes of online courses with the outcomes of traditional brick and mortar courses in Wyoming is warranted.

Wyoming Administrator perceptions of the barriers associated with online education

Regarding the perceived barriers to online education for secondary students (Group C), the Wyoming secondary school administrators and school district superintendents did not agree that the online learning barriers presented were actually barriers. Potential barriers presented within Group C survey items included costs, student/teacher interaction, online course rigor, technological skills necessary for successful online learning, as well as the negative perception of online learning by employers revealed by the review of literature. Interestingly, respondents did not indicate the presented barriers were issues within their school districts or secondary schools.

Items in Group C included statements such as: (a) concerns about sufficient social interaction of online students; (b) the costs of online courses were exorbitant; (c) online students had less communication with their teachers; (d) the pedagogical requirements were dramatically different for online education; (e) teachers were not eager to teach online courses; (f) the online courses did not significantly enhance the school course offerings; (g) the online courses were not as rigorous as traditional courses; (h)

reservations regarding the technological skills of the students to cope with online courses; and, (i) employers had a negative impression of online courses.

The prompts associated with this group were worded in such a way that a strongly disagree or disagree response indicated respondents perceived minimal, if any, barriers associated with online learning. The term *barrier* referred to an obstacle or obstruction to the effective delivery of online education opportunities in Wyoming. The barrier in this context was regarded as negative; therefore, disagreeing with a negative prompt was actually viewed as a supportive statement for the effective delivery of online education opportunities in Wyoming.

Throughout the literature review, opinions varied regarding the barriers associated with online learning. A common complaint expressed was that a lack of understanding of this teaching approach could lead to a substandard quality of education in the online environment (Shelton & Saltsman, 2005). Moeller and Reitzes (2011) pointed out that for teachers who were not adept with the new technologies, adapting lessons for this method of instruction could pose significant challenges. The literature also suggested that online course content might not be as rigorous as compared to the traditional classroom (Watson, 2015), or the technology requirements associated with online learning might have a negative impact on the student's learning experience (Allen & Seaman, 2013).

Other barriers identified through a review of the literature included student and teacher interactions that might suffer in online education environments as a result of teachers not physically observing the expressions on their students' faces, and were therefore unable to gauge how well the material was being received (Hawkins, Graham, & Barbour, 2012). Online learning may offer very little social interaction with peers.

Students might feel secluded due to limited interaction stimulation by the online teacher (Borup, West, & Graham, 2012; Reilly, Gallagher-Lepak, & Killion, 2012).

Additional research could be done to identify the barriers to online learning that exist within the secondary school system in Wyoming. Topics to consider include: (a) identifying the disadvantages of online programs for Wyoming students; (b) comparing online teacher-student relationships with traditional classroom teacher-student relationships; (c) use of online teaching strategies in online courses designed to meet student needs; (d) determining the impact of scheduling on the availability and delivery of online learning opportunities for Wyoming students; and, (e) examining teacher training required to help teachers utilize online learning in their classrooms?

Wyoming Administrator perception of the supports necessary for effective online education

Perceptions of survey respondents indicated slight agreement that supports for online education currently exist within their school or district to effectively implement online education in Wyoming. The items clustered in Group D included statements such as: at the schools/district the online courses were (a) adequately funded and (b) cost effective. The school district provided (c) adequate bandwidth for the successful delivery of and participation in the online course at the school. Teachers of online courses (d) were adequately prepared, (e) received adequate technical support for the duration of the course, and (f) received adequate pedagogical support. Adequate technological resources existed to (g) support successful online learning opportunities. Students (h) received adequate support for the duration of the course, and adequate technological resources existed to (i) support successful online learning opportunities for students. Respondents

indicated adequate bandwidth existed, adequate student and teacher technical support existed, online course opportunities were cost effective and adequately funded, and teachers received adequate pedagogical support.

Perceptions regarding necessary teacher preparation and training for teaching online were relatively subjective and may help explain why the results yielded a greater variation in responses than was noted in any other construct. In this study, supports referred to technological and funding necessary to maintain the system. The current video technology available in Wyoming is attractive when dealing with online education. Modern high-speed internet, cable modems, and satellite access to high-speed bandwidth has significantly changed the online education experience in Wyoming. These modern advancements necessitated the need for more technology assistance. The study revealed that both the teacher and student were receiving appropriate support. The strategies to address the supports needed for successful implementation of online learning within Wyoming was not contained in this study. However, technological support remains a need that warrants further attention.

Comparison of the perceptions of Wyoming school district superintendents and secondary school administrators

The researcher was interested in comparing respondents' age with their perceptions of online learning. Research has indicated age can influence one's use of technology (Tweed, 2013). The results of this study showed there were no statistical differences between the perceptions of the superintendents and those of the secondary principals. This finding should create enthusiasm among policy makers in Wyoming.

Traditional wisdom suggests superintendents are older and perhaps less technologically savvy when compared to often younger, building principals who work daily with students to meet their educational needs. However, secondary school principals and district superintendents provided similar perceptions of online learning, which should allow for parallel professional development opportunities to improve and increase online learning opportunities for Wyoming students. It was reassuring to validate that the perceptions of superintendents and secondary school principals were closely aligned throughout this study.

The researcher was also interested in exploring the belief that smaller schools and school districts were more reliant on online learning options as a result of limited course offerings, and, thus, may have a very different perception of online learning compared to larger schools or school districts. The results of the study, however, indicated no statistical difference existed between the size of school or school district enrollment.

The researcher concluded these statistical similarities indicated secondary school principals and school district superintendents in Wyoming are like-minded, regardless of school size or the age of the administrator. Similarities in perceptions of online learning may prove beneficial when creating strategies to enhance online learning opportunities for secondary students. The literature on educational change, motivation, and effective organizations suggests that having a "shared vision" is a prerequisite for success (Ewing, 2008; Hoyle, 2007; & Kouzes and Posner, 2007). The results of this study suggest that superintendents and secondary school principals already share a common vision regarding the role of online education in Wyoming.

Recommendations for Future Research

The rapid growth of educational technologies and ground-breaking instructional techniques encouraged the investigation of technology as a means of educating students in the U.S., especially in rural areas and sparsely populated states, such as Wyoming. Supplemental online course offerings were not widely accessible in some middle and high schools throughout Wyoming (Watson, Murin, Vashaw, Gemin, & Rapp, 2013). During the 2012-2013 school year, 1942 Wyoming students enrolled into distance education courses, of which 1377 were full-time enrollments, representing a 21% increase in growth from the previous school year and a five year growth of 1,277% (Watson, Murin, Vashaw, Gemin, & Rapp, 2012). Recognizing that Wyoming superintendents and secondary school principals perceived that online learning supports are in place, the question remains, 'Why have online educational opportunities in Wyoming decreased in recent years?' Neighboring states, such as Utah, have experienced significant growth (151%) in online learning in 2013-14. Watson et al. (2014) reported that Wyoming experienced a decrease of 13% in online learning enrollments during the same year. Generating an explanation for this decrease and dramatic difference is worthy of further study.

Why isn't every secondary school in the state of Wyoming utilizing online learning in some capacity? Watson et al. (2013) revealed supplemental online course offerings were not widely accessible in some middle and high schools throughout Wyoming. Plausible speculation included the conservative nature of many Wyoming citizens that place a higher value on tradition than on modern trends. According to Swift (2014), Wyoming replaced Alabama as the most conservative US state in 2013.

Additional explanations include the more multifaceted understanding that Wyoming administrators are under enormous accountability pressure to their stakeholders, and as a result have not invested the time, training, and/or implementation structures necessary to effectively deliver online learning options. Johnsen (2014) stated, "Stress in the principalship is a redundancy – the two terms are synonymous" (para. 1). The researcher surmised that a mixture of both the conservative nature of Wyoming citizens and overworked administrators who do not believe they have the time to tackle something new contributed to the decline in online education options for Wyoming students.

There are a number of recommendations for further research emanating from this study. Similar research could be conducted in other rural states. Alaska, North Dakota, and South Dakota are very similar in many ways to Wyoming. Exploring perceptions of key stakeholders regarding online learning in other rural states would ensure greater generalizability of the results.

The survey instrument designed for this study may serve as a platform for future research. The research instrument (see Appendix A) consisted of 35 items supported by multiple references identified in the review of related literature. Enriching the research reviewed throughout this study will further enhance the construct validity of each item included on the instrument.

A mixed-methods study is another suggestion for future research that would include interviews that could be triangulated with the results of the quantitative survey. A qualitative study, specifically designed to reveal perceptions would provide the researcher with the opportunity to probe beyond preliminary responses and rationales

(Qualitative Research Consultants Association, 2016). A mixed-method study that included students participating in online educational programs and their parents would provide a broader perspective of online education and its suitability in the 21st century.

Another study could be conducted to assess the complexity of the content of online courses with that of traditional brick and mortar courses. An analysis of the nature of the content provided in online and traditional learning environments may explain some of the apparent discrepancies shared by respondents in this study. Similarly, an analysis of the instructional strategies used in online and traditional learning environments may shed light on the perceptions shared by respondents in this study that online education was not as rigorous or demanding as traditional courses.

A comparison of the pass rates on end-of-course assessments and state assessments in rural educational settings is another study that is warranted. Early national research suggests little or no difference in the learning outcomes of students enrolled in online courses and that of students enrolled in traditional courses (Johnson, Aragon, Shaik, & Palma-Rivas, 2000; U.S. Department of Education, 2010). Recent studies revealed that students who take part or all of their courses online perform better than those taking the same course through face-to-face courses (Patrick & Powell, 2009; U.S. Department of Education, 2010). However, respondents in this study suggested that online learning was not comparable with traditional learning. Validation of this perception is required.

Furthermore, schools and school districts with high dropout rates could conduct a study to determine the effectiveness of online educational opportunities to support at-risk learners and reduce the dropout rates of students in these settings. For example, Heussner

(2012) reported a program of 2,000 remedial math students' utilized online learning technology at Arizona State University (ASU) experienced withdrawal rates that dropped by 56 percent and pass rates that rose 11 percent. Post-secondary schools with high dropout rates utilizing online learning technology equivalent to ASU's online learning technology warrant additional research.

Additional research to clarify the notable mirrored perceptions of Group A and Group B prompts is merited. Why did respondents express a desire to provide online educational options to secondary students, yet not perceive online learning outcomes as comparable to traditional learning? Reasonableness would lead one to assume the desire to provide online options would be nonexistent when perceived outcomes of online learning are unfavorable. Further examination of responses received in Group A and B constructs warrants additional examination.

A further study to assess the age appropriateness of students utilizing online learning modalities could be conducted. For example, a study to address whether online learning options are better suited for upper secondary school students, mid-level secondary school students, or lower level secondary school students when incorporating age appropriate cognitive and social development strategies could be conducted. An analysis of appropriate student grade level best suited for achieving optimal online learning results would assist in improving student achievement.

Lastly, an online educational program that offers courses that enhance the local brick and mortar school course options could be piloted by the Wyoming Department of Education to expose school districts to online education and create additional interest.

Such a program would not only expose Wyoming students to online education but would serve to enlighten the whole community to the value of online learning.

Concluding Thoughts

The findings of this study indicated secondary school administrators and school district superintendents of Wyoming agreed that online education was an important education option for their students. The results of this study validated a survey conducted in September 2015 by the Wyoming Department of Education (2015) that asked school district superintendents, counselors, principals, technology directors, and gifted and talented coordinators working in Wyoming if their school or district would participate in online courses if they were made readily available. A resounding 93.3% of responses replied, "Yes" (p. 15). However, the results of this study indicated Wyoming superintendents and secondary school principals did not agree that current outcomes of online learning were equal to educational outcomes of a traditional brick and mortar school. Wyoming secondary school administrators and district superintendents also perceived that the barriers to online education were minimal.

When analyzing the survey results further, it is worth mentioning that superintendents and principals held similar perceptions on this topic. The fact that there were no statistical differences between respondent groups indicated that Wyoming secondary school administrators' and district superintendents' perceptions were aligned. Although the perceptions of the Wyoming administrators were in accordance with numerous earlier studies completed in this field; in some cases, the Wyoming administrators' perceptions were occasionally misaligned with research that revealed viewpoints that were more in favor of online education and associated outcomes. Watson

et al. (2012) concluded online education has not yet become an accepted learning tool, especially in more remote areas like Wyoming. Watson's research is validated by the results of this study.

Wyoming superintendents and secondary school principals revealed less than favorable perceptions of online learning outcomes as compared with the learning outcomes of traditional brick and mortar schools. Contrary to the results of this study, other research has revealed an increasing demand for online learning across the country (Borja, 2005; National Center for Education Statistics, 2014; Wyoming Department of Education, 2015). Allen and Seaman (2011) reported that 65% of institutions described online learning as essential to their long-term strategic plans.

Survey respondents also did not agree that the proposed barriers presented within the nine survey instrument items contained within construct Group C were actually barriers. Given that the respondents did not believe that online and traditional education options were equal, this suggested that some barriers did exist. Identifying those barriers and developing strategies to address them is an important next step in providing for the needs of learners in the digital age.

Clearly, one size does not fit all. Schools must personalize learning in an attempt to effectively educate an increasingly diverse student population. Utilizing technology through online learning opportunities may assist teachers in creating meaningful student learning opportunities customized to each and every learner.

Respondents indicated a slight agreement that current supports were in place for effective implementation of online education in Wyoming. If this is, in fact, the case, then the question of why there is not greater utilization of online educational opportunities in

Wyoming must be further examined. The availability of effective and qualified online instructors may provide a defensible explanation. Issues related to secondary school schedules that may impact student access to online learning opportunities may also explain the limited utilization of online educational opportunities.

Wyoming superintendents and secondary school principals indicated that supports were in place to better utilize online learning. Consequently, policymakers, educational leaders, and opportunistic teachers must act to shift instruction away from a focus on teaching to a greater focus on student learning through engagement strategies that are readily available through online learning opportunities.

Today's students are digital natives: Students who interacted with technology in their early years. This early technology exposure provided greater familiarity and understanding of the uses of technology to learn, explore, and create (Prensky, 2010b). Conversely, many teachers are digital immigrants who were exposed to technology later in life and may teach with methods similar to those they were exposed to during their years as a student (Prensky, 2010a). Emerging online learning opportunities will connect digital natives with techniques that engage them in an educational system that is individualized to the specific needs of each learner. Simply put, students who are interested learn more. An online education system that actively engages learners is essential in the 21st century.

Education systems are tasked with providing 21st century literacy skills necessary to function effectively in the digital age. Most experts agree that students should develop technological skills in the context of learning and solving problems related to academic content (Baker & O'Neil, 2003; North Central Regional Educational Laboratory, 2014,

Partnership for 21st Century Skills, Association for Career and Technical Education, &

National Association of State Directors of Career Technical Education Consortium,

2010). Technologically literate students understand and model positive, ethical uses of

technology in both social and personal contexts. They use a variety of technology tools in

effective ways to increase creative productivity.

Based on the findings from this study, Wyoming administrator perceptions of

online education as an educational option at the secondary level were somewhat

favorable. These respondents indicated a belief that online education must provide

educational opportunities to the students in Wyoming. However, the findings of this

study indicated Wyoming administrators did not agree that current outcomes of online

learning are equal to educational outcomes of a traditional brick and mortar school. This

suggests that there is still significant work to do in order to bring online education options

up to the level of more traditional opportunities. Determining where these perceived

shortcomings exist in the current online system available in Wyoming and designing and

developing systems and responses to them will be an important next step.

Fifteen years ago, research revealed, "Evidence to date convincingly demonstrates

that when used appropriately, electronically delivered education, e-learning, can improve

how students learn, can improve what students learn, and can deliver high-quality

learning opportunities to *all* children" (National Association of State Boards of

Education, 2001, p. 4). It is important that educational leaders and policymakers in

Wyoming have a thorough understanding of the current level of implementation of online

learning opportunities in the state and a clear sense of the supports needed for and

barriers to the successful implementation of these learning opportunities for Wyoming

students. Determining the extent to which electronically-delivered education is being

appropriately implemented in Wyoming is another important question to be determined.

Subsequent to greater implementation of online educational opportunities will be the

determination of the level of effectiveness of these learning environments and the

potential impact to various groups of Wyoming learners. As a result of this study, one

thing is clear: Online education is a needed educational option for Wyoming students, but

much work remains to make it a viable, robust, and available option.

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APPENDIX A

Survey Instrument

The following survey questions will be posed to Wyoming superintendents and secondary school administrators participating in the study: Prompts are derived from the research to explore educator implementation of online education focusing on the following general research questions. Appendix A and B correlate the research references within the study to specific research prompts derived from the research. The survey instrument will utilize a five point Likert scale. Each category of questions will include selections from strongly disagree through strongly agree, not important through significantly important, etc.

All prompts will target the following research categories: topic (a), current online educational option in my building/district; topic (b), outcomes of online education; topic (c), barriers associated with effective online education programs in my building/district; topic (d), supports necessary to effectively implement online education in my building/district; and topic (e), demographic factors of age, gender, school size, years of experience as an administrator, and current administrative position.

General research focus prompts – Group A - online educational option:

1. *Should school districts in Wyoming offer online courses at the secondary school level?*
2. *Do Wyoming students request online course opportunities?*
3. *Does your district/school currently offer online courses for students?*
4. *Are you satisfied with the current number of online course offerings available to students in your school?*
5. *Are online learning opportunities important to the preparation of students entering post-secondary schools?*

General research focus prompts- Group B – outcomes of online learning:

1. *Are academic expectations for online learning in my school/district equal to the academic expectations of traditional brick and mortar students?*
2. *Do online students perform equally well on end-of-course assessments as compared with traditional brick and mortar students?*
3. *What evidence is used to determine that online students are achieving comparably or better than traditional students?*
4. *Are online educational opportunities available for all groups of learners (gifted, advanced, struggling, etc.) in your school?*

General research focus prompts – Group C - barriers:

1. *What are the advantages of online programs for your students?*
2. *What are the disadvantages of online programs for your students?*
3. *How do online teacher-student relationships compare to traditional classroom teacher-student relationships?*
4. *How do teaching strategies used for online courses meet student needs?*
5. *What is the impact of scheduling on the availability and delivery of online learning opportunities for students?*

General research focus prompts – Group D - supports needed:

1. *What is the impact of online learning on the school or school district's budget?*
2. *Are online courses cost effective?*
3. *Are online educational opportunities for students adequately funded in your school or school district?*
4. *What teacher training is provided to help teachers utilize online learning in their classrooms?*
5. *What do you consider necessary teacher preparation for teaching online courses?*
6. *What assistance is available for students taking online courses? All of these questions will elicit numerical data.*

Survey

S1 The following questions will provide an opportunity for you to share your perceptions of the barriers to and supports needed for the effective implementation of online education. Please answer openly and truthfully.

Q1 Name of building or school district

Q2 Current administrative position/title. In the event you serve your school district as both a building principal and a superintendent, please respond as a superintendent.
○ Superintendent (1)
○ Middle/Jr. HS principal (2)
○ HS principal (3)
○ Both Middle/Jr. HS principal and HS principal (5)

Q3 Administrator age range
○ 25 or under (1)
○ 26-35 (2)
○ 36-45 (3)
○ 45-55 (4)
○ 56-65 (5)
○ 66 or older (6)

Q4 Gender
○ Male (1)
○ Female (2)

Q5 Superintendents, please select the student enrollment number that best describes your district enrollments for all of your secondary schools combined. Building level principals, please select your school size.
○ 1-100 (1)
○ 101-250 (2)
○ 251-500 (3)
○ 501-750 (4)
○ 750 or greater (5)

Q6 Years of experience as an educator
○ 0-5 (1)
○ 6-10 (2)
○ 11-15 (3)
○ 16-20 (4)
○ 21-25 (5)
○ 26 or more (6)

Q7 Years of experience as an administrator
- ⭘ 0-5 (1)
- ⭘ 6-10 (2)
- ⭘ 11-15 (3)
- ⭘ 16-20 (4)
- ⭘ 21-25 (5)
- ⭘ 26 or more (6)

Q8 Years of experience in Wyoming as an administrator
- ⭘ 0-5 (1)
- ⭘ 6-10 (2)
- ⭘ 11-15 (3)
- ⭘ 16-20 (4)
- ⭘ 21-25 (5)
- ⭘ 26 or more (6)

The four construct groups utilize a 5 point Likert scale as follows:

Not important/strongly disagree	Not very important/disagree	Neutral	Important/agree	Very important/strongly agree

Q9 Construct Group A prompts focus on your perception of current online educational options within your building or school district.

_____ 1. Online courses should be an important part of my school's education program.
_____ 2. Students in my school/district want online courses to be part of the academic program.
_____ 3. I am satisfied with the current number of online course offerings available in my school/district.
_____ 4. Online learning opportunities are important to the preparation of students entering post-secondary schools.
_____ 5. Online courses are available to students in our school/district.
_____ 6. Online courses are available to struggling learners?
_____ 7. Online courses are available to advanced learners?
_____ 8. The qualities of online learning programs are comparable to traditional brick and mortar courses.

Q10 Construct Group B prompts focus on you perceptions of current outcomes of online learning.

_____ 1. Academic expectations for online learners are equal to the academic expectations of traditional brick and mortar students.

_____ 2. Online students perform as well on end-of-course assessments as traditional brick and mortar students.

_____ 3. Online students perform as well as traditional brick and mortar students on state assessments.

_____ 4. Online courses enhance the availability of course offerings to our students. (4)

_____ 5. Student engagement is higher for students in online courses than in traditional brick and mortar courses.

_____ 6. Online courses typically attract a higher caliber of student than traditional brick and mortar courses.

_____ 7. Post-secondary degree programs delivered online are comparable to degrees delivered traditionally.

_____ 8. Online courses provide a more personalized educational experience than traditional brick and mortar courses.

_____ 9. Online courses offered in my building/district are only synchronous (synchronous courses are those that require the student and the instructor to be online at the same time).

Q11 Construct Group C prompts focus on you perceptions of current barriers associated with online learning.

_____ 1. Social interaction for students is an important part of their educational experience, a concern associated with online learning is whether they are getting adequate social interaction.

_____ 2. Online learning is cost prohibitive.

_____ 3. Interaction/communication between online students and their online teacher is less than that of traditional teachers and students?

_____ 4. Pedagogical requirements for online teaching are dramatically different than those in the traditional classroom.

_____ 5. Teachers are less eager to teach online courses than traditional courses.

_____ 6. Online courses don't significantly enhance our school/district's course availability.

_____ 7. Online courses are not as rigorous as traditional face-to-face taught courses.

_____ 8. I have concerns about our students possessing the necessary technological skills to be successful online learners.

_____ 9. Employers have a negative perception of online education.

Q12 Construct Group D prompts focus on you perceptions of current supports needed for online learning.

_____ 1. Online educational opportunities are adequately funded in my school/district.

_____ 2. Online course opportunities are cost effective for our school/district.

_____ 3. Teachers in our school/district are adequately prepared to teach online courses.

_____ 4. Teachers of online courses receive adequate technical support/assistance throughout the duration of the online course.

_____ 5. Teachers of online courses receive adequate pedagogical support/assistance throughout the duration of the online course.

_____ 6. Students enrolled in online courses receive adequate support/assistance throughout the duration of the online course.

_____ 7. Adequate bandwidth exists within our school/district to support successful online learning opportunities.

_____ 8. Adequate student technology exists within our school/district to support successful online learning opportunities.

_____ 9. Adequate teacher technology exists within our school/district to support successful online learning opportunities.

Appendix B

27 Principles

1. Recognize that web surveys are subject to the same sources of error as other surveys.
2. Develop a satisfactory identification system for respondents to control coverage error and assure survey credibility.
3. Design web surveys for those with older browsers and poorer communication rather than those with state of the art access.
4. Define desired response path by placing information in the order respondent should process it.
5. To the extent practical, place needed definitions, explanations, and instructions in response path exactly where needed by the respondent.
6. Use graphical languages to guide respondents through the desired response path.
7. Anticipate potential mode effects that flow from these sources: no interviewer, respondent control, visual processing of information.
8. Avoid visual composition that runs counter to the designer's measurement intentions.
9. Avoid construction techniques that require multiple steps to answer items that require only one step in other survey modes.
10. When respondents need to prepare information before answering, provide a printable version of the questionnaire as an email attachment.
11. Keep questionnaire short on voluntary surveys.
12. Design introductory page and first questions so that they are relevant, fast, and easy.
13. Use conventional formula similar to those normally used on paper self-administered questionnaires, e.g. numbered items, left justification, vertical response choices.
14. Avoid difference in the visual appearance of questions that result from different screen configurations, operating systems, browsers, partial screen displays, and wrap-around text.
15. Don't require respondents to reconfigure computers, switch browsers, or download software in order to complete the survey.
16. Provide instruction commensurate with population need. Instructions on how to take computer actions may or may not be necessary.
17. Use drop down boxes only when answering process is simplified and identify each with click here.
18. Do not require respondent to provide an answer to each question before being allowed to answer any subsequent question, unless a branching instruction depends on it.
19. Provide missing item requests in non-threatening language.
20. Chose scroll, page by page, or mixed construction deliberately based upon measurement and response considerations.
21. Avoid question structures that require scrolling or toggling between screens.

22. Avoid excessive use of check all that apply questions because of the tendency of respondents to choose earlier listed answer choices.
23. To avoid premature termination, insert words and/or symbols that accurately communicate progress towards completion.
24. Recognize that non-response stems from multiple sources: technological considerations, questionnaire design decisions, respondent computer skills, as well as implementation decisions.
25. Develop an implementation strategy that includes elements past research has shown to be effective in improving respondent to self-administered questionnaires.
26. If web survey is short, consider embedding it into an email message so that one does not have to click to another location.
27. Tailor implementation procedures to the population. (University of New England, 2012, summary of courses taught by Dr. Dillman. Retrieved February 14, 2015 from https://www.une.edu/sites/default/files/Microsoft-Word-Guiding-Principles-for-Mail-and-Internet-Surveys_8-3.pdf)

Appendix C

	Focus Constructs Associated with Research			
Specific Research Question	Educational Opportunities w/in My District/Building (1 2 3 4 5 6 7 8)	Outcomes of Online Learning (9 10 11 12 13 14 15 16 17)	Barriers to Effective Online Programs (18 19 20 21 22 23 24 25 26)	Supports required for effective implementation of online education (27 28 29 30 31 32 33 34 35)
Research			Moeller & Reitzes, 2011	
	OnlineEducation.org, 2011	OnlineEducation.org, 2011	OnlineEducation.org, 2011	OnlineEducation.org, 2011
		Hannay & Newvine, 2006	Hannay & Newvine, 2006	Hannay & Newvine, 2006
	Howell, Williams, & Lindsay, 2003			
		Oblinger & Kidwell, 2000		
	Durrington, Berryhill, & Swafford, 2006	Durrington, Berryhill, & Swafford, 2006	Durrington, Berryhill, & Swafford, 2006	
	Bower & Hardy, 2004	Bower & Hardy, 2004	Bower & Hardy, 2004	
				Fetherston, 2011
	Kozman, Zucker, & Espinoza, 1998	Kozman, Zucker, & Espinoza, 1998	Kozman, Zucker, & Espinoza, 1998	
	Natriello, 2005	Natriello, 2005	Natriello, 2005	
	Blomeyer, 2002	Blomeyer, 2002	Blomeyer, 2002	
		Muilenburg & Berge, 2005	Muilenburg & Berge, 2005	
			Branigan, 2003	Branigan, 2003
			Byron, 2008	
		Maccarthy, 2014		
		Adams & Defleur, 2005	Adams & Defleur, 2005	Adams & Defleur, 2005
			National Council on Tacher Quality, 2011	National Council on Tacher Quality, 2011
		Franklin, Yoakam, & Waqren, 1995	Franklin, Yoakam, & Waqren, 1995	Franklin, Yoakam, & Waqren, 1995
	Moore & Kersley, 1991		Moore & Kersley, 1991	Moore & Kersley, 1991
		Michigan State Board of Ed, 2005	Michigan State Board of Ed, 2005	
	IDLA, Online, 2008	IDLA, Online, 2008	IDLA, Online, 2008	IDLA, Online, 2008
	Heckman & Annabi, 2006	Heckman & Annabi, 2006		Heckman & Annabi, 2006
	UW, 2014, Hathaway Scholarships			UW, 2014, Hathaway Scholarships
	Pathways to success, 2012			Pathways to success, 2012
	Borja, 2005			Borja, 2005
	21st Century Workforce Commission, 2000		21st Century Workforce Commission, 2000	21st Century Workforce Commission, 2000
	NCREL, 2014	NCREL, 2014	NCREL, 2014	NCREL, 2014
	NCREL, 2003	NCREL, 2003	NCREL, 2003	NCREL, 2003
	National Assoc. of State Boards of Ed, 2001	National Assoc. of State Boards of Ed, 2001	National Assoc. of State Boards of Ed, 2001	National Assoc. of State Boards of Ed, 2001
	Burgess & Strong, 2003	Burgess & Strong, 2003	Burgess & Strong, 2003	Burgess & Strong, 2003

Research correlated to construct topics

Appendix D
Part 1

Research	Question Associated with Research																																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Moeller & Reitzes, 2011	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
OnlineEducation.org, 2011	.	.	X	X	.	X	X	X	X	X	X	X	X	.	X	X	X	X	X	X	X	.	.	X	X	.	X	X	X	.	.	.	X	X	X
Hannay & Newvine, 2006	.	.	.	.	.	.	.	.	.	X	X	X	X	X	X	.	X	X	X	.	.	.	X	.	.	X	X	X	X	.	X	.	X	.	.
Howell, Williams, & Lindsay, 2003	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oblinger & Kidwell, 2000	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Durrington, Berryhill, & Swafford, 2006	.	.	X	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
Bower & Hardy, 2004	.	.	.	.	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
Fetherston, 2011	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.
Kozman, Zucker, & Espinoza, 1998	.	X	.	.	X	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
Natriello, 2005	.	X	.	X	X	X	X	X	X	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
Blomeyer, 2002	.	X	.	X	.	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
Muilenburg & Berge, 2005	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Branigan, 2003	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	X	X	.	.	.	.	.	X	.	.
Byron, 2008	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Maccarthy, 2014	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Adams & Defleur, 2005	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	X	.	X	.	.	.	X	X	X	.	.	.
National Council on Tacher Quality, 2011	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.
Franklin, Yoakam, & Waqren, 1995	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	X	X	.	.	.	.	.	X	.	.
Moore & Kersley, 1991	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	X	X	.	X	.	.	.	.	.	X	X	.	.	.	.	.	X	.	.
Michigan State Board of Ed, 2005	.	.	.	.	.	.	.	.	X	.	.	.	.	.	X	X	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
IDLA, Online, 2008	.	X	.	X	X	X	X	X	X	X	.	.	X	.	.	.	X	.	.	X	.	X	.	X	.	X	X	.	.	.	.	X	X	.	.
Heckman & Annabi, 2006	.	.	.	.	.	.	.	X	.	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	X	X	X	X	X	.	.
UW, 2014, Hathaway Scholarships	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
Pathways to success, 2012	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
Borja, 2005	.	.	.	X	.	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
21st Century Workforce Commission, 2000	.	X	.	.	X	X	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.
NCREL, 2014	.	X	.	.	X	.	.	.	.	X	.	.	.	X	.	.	.	X	.	.	.	X	X	.	.	X	.	.	.	X	X	X	.	X	X
NCREL, 2003	.	X	.	X	X	X	X	X	.	X	.	.	.	.	.	.	.	X	.	.	.	X	.	.	.	X	.	.	.	.	.	.	X	.	.
National Assoc. of State Boards of Ed, 2001	.	X	.	X	X	X	X	.	X	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	X	.	.
Burgess & Strong, 2003	.	X	.	.	X	.	.	.	X	X	.	.	.	.	.	.	.	.	.	.	.	.	X	.	.	.	X	.	.	.	.	.	X	.	.

Research correlated with survey question

Appendix D
Part 2

Research prompts per Construct Group

Online educational opportunities within my school/district

1. Online courses should be an important part of every school's education program.
2. Students in my school/district want online courses to be part of the academic program.
3. I am satisfied with the current number of online course offerings available in my school/district.
4. Online learning opportunities are important to the preparation of students entering post-secondary schools
5. Online courses are available to students in our school/district.
6. Online courses are available to struggling learners?
7. Online courses are available to advanced learners?
8. The qualities of online learning programs are comparable to traditional brick and mortar courses.

Outcomes of online learning

9. Academic expectations for online learners are equal to the academic expectations of traditional brick and mortar students
10. Online students perform as well on end-of-course assessments as traditional brick and mortar students.
11. Online students perform as well as traditional brick and mortar students on state assessments.
12. Online courses enhance the availability of course offerings to our students.
13. Student engagement is higher for students in online courses than in traditional brick and mortar courses.
14. Online courses typically attract a higher caliber of student than traditional brick and mortar courses.
15. Post-secondary degree programs delivered online are comparable to degrees delivered traditionally.
16. Online courses provide a more personalized educational experience than traditional brick and mortar courses.
17. Online courses offered in my building/district are only synchronous (synchronous courses are those that require the student and the instructor to be online at the same time).

Barriers to effective online programs

18. Social interaction for students in an online learning environment is important.
19. Online learning is cost prohibitive.

20. Interaction/communication between online students and their online teacher is comparable with that of traditional teachers and students?
21. Pedagogical requirements for online teaching are dramatically different than those in the traditional classroom.
22. Teachers are eager to teach online courses.
23. Online courses enhance our school/district's course availability.
24. Online courses are not as rigorous as traditional face-to-face taught courses.
25. Our students possess the necessary technological skills to be successful online learners.
26. Employers have a negative perception of online education.

Supports required for effective implementation of online education

27. Online educational opportunities are adequately funded in my school/district.
28. Online course opportunities are cost effective for our school/district.
29. Teachers in our school/district are adequately prepared to teach online courses.
30. Teachers of online courses receive adequate technical support/assistance throughout the duration of the online course.
31. Teachers of online courses receive adequate pedagogical support/assistance throughout the duration of the online course.
32. Students enrolled in online courses receive adequate support/assistance throughout the duration of the online course.
33. Adequate bandwidth exists within our school/district to support successful online learning opportunities.
34. Adequate student technology exists within our school/district to support successful online learning opportunities.
35. Adequate teacher technology exists within our school/district to support successful online learning opportunities.

APPENDIX E

Informed Consent

Dear Wyoming superintendent or secondary school principal:

I would like to enlist your help. My name is Shon Hocker and I am a doctoral candidate at Idaho State University. I am also the Superintendent of Schools for Big Horn County School District #1 in Cowley, Wyoming.

I would like to ask you to complete a survey that has been distributed to all Wyoming superintendents and sixth through twelfth grade secondary school principals. The purpose of this study is to determine the perceptions of Wyoming superintendents and secondary school principals, including principals of students in grades 6-12, regarding the level of implementation of online education programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education.

The short survey will ask questions regarding your perceptions of online learning within your school building or district. Your participation in this survey is completely voluntary and should take under 15 minutes to complete. This study has the potential to assist in identifying barriers and supports associated with effective implementation of online learning opportunities and modalities. Expanded understanding of online education may lay the groundwork to reduce the restrictions associated with face-to-face classroom instruction and open course opportunities through online curricula for students in Wyoming. The research may also provide Wyoming administrators with valuable information regarding online education opportunities.

Although names are not recorded, this survey does ask about details of your position and it would be possible for someone to work out a participant's identity. To prevent this, all reasonable steps will be taken to protect your anonymity. Data from this research will remain protected by the researcher in a password-protected file.

Participation is completely voluntary and you may withdraw at any time. There is no reward for participating or consequence for not participating.

If you have any questions about your rights as a research participant you may contact the Idaho State University Institutional Review Board at (208) 282-2179.

Your submission of the completed survey will constitute informed consent to participate in the study.

Thank you in advance for helping me to complete my dissertation research. If you have any questions, please contact me.

Sincerely,

Shon Hocker
shocker@bighorn1.com
307-272-3008

APPENDIX F

Informed Consent - Delphi Participants

Dear Idaho superintendent or secondary school principal:

I would like to enlist your help. My name is Shon Hocker and I am a doctoral candidate at Idaho State University. I am also the Superintendent of Schools for Big Horn County School District #1 in Cowley, Wyoming

I would like to ask you to complete a survey that will be given to all Wyoming superintendents and sixth through twelfth grade secondary school principals. The purpose of this study is to determine the perceptions of Wyoming superintendents and secondary school principals, including principals of students in grades 6-12, regarding the level of implementation of online education programs in Wyoming secondary schools and their perceptions of the barriers to and supports needed for the effective implementation of online education.

The short survey will ask questions regarding your perceptions of online learning within your school building or district. The survey should take approximately 10-15 minutes to complete. This study has the potential to assist in identifying barriers and supports associated with effective implementation of online learning opportunities and modalities. Expanded understanding of online education may lay the groundwork to reduce the restrictions associated with face-to-face classroom instruction and open course opportunities through online curricula for students in Wyoming.

Your participation in the questionnaire will help validate the study instrument. Using the Delphi method, I will send the original online survey instrument that will be sent to all Wyoming secondary principals and superintendents to you for your participation. Upon completion of the initial survey (round one), I will report areas of agreement and disagreement and make recommended modifications to the survey. At this time, you will receive the questionnaire a second time (round two). The questionnaire will include your ratings, minority opinions, and items achieving consensus ratings. Round two will provide each of you with a final opportunity to clarify your perceptions and selections.

Although names are not recorded, this survey does ask about details of your position and it would be possible for someone to work out a participant's identity. To prevent this, all reasonable steps will be taken to protect your anonymity. Data from this research will remain protected by the researcher in a password-protected file.

Participation is completely voluntary and you may withdraw at any time. There is no reward for participating or consequence for not participating.

If you have any questions about your rights as a research participant you may contact the Idaho State University Institutional Review Board at (208) 282-2179.

Your submission of the completed survey will constitute informed consent to participate in the study.

Thank you in advance for helping me to complete my dissertation research. If you have any questions, please contact me.

Sincerely,

Shon Hocker
shocker@bighorn1.com
307-272-3008